WEST DAPTO URBAN RELEASE AREA (Stage 3)
Horsley & Cleveland Precincts

Environmental Management Plan

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Revision: A

Revisions and Distribution

Revisions

Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

Date	Rev	Remarks	Section	Prepared By	Reviewed By & Approved By
01/09/2023	1	Initial draft for D4C internal review and SW review		[redacted]	
23/10/2023	2	Updated revision to address SW and internal D4C review comments		[redacted]	
13/12/2023	3	Update to reflect address of DPE initial review		[redacted]	
12/01/2024	4	Update to reflect address of DPE initial review		[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW		[redacted]	[redacted]

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1. Scope of the Environmental Management Plan

1.1. Overview

Delivering 4 Customers (D4C) is an unincorporated Joint Venture comprising of John Holland (Principal Contractor), Service Stream and WSP and have been contracted by Sydney Water to provide wastewater infrastructure to service Stage 3 of the West Dapto Urban release Area, specifically 5.5 kms of gravity sewer main and associated maintenance hole construction and approximately 4 kms of water mains within the Horsley and Cleveland areas, as seen in Figure 2 below.

The purpose of this Environmental Management Plan (EMP) is to effectively identify and manage environmental aspects and impacts throughout the execution of the works. Implementing this EMP will ensure that D4C conducts all work in accordance with environmental legislation and contractual requirements.

The EMP has been prepared in accordance with:

- John Holland ISO 14001:2015 accredited Environmental Management System.
- Minister's Conditions of Approval (MCoA) for MP 09_0189 'the project'.
- the project Statement of commitment as detailed in the West Dapto Urban Release and Adjacent Growth Areas Submissions Response Report (SoC).
- Sydney Water contractual environmental requirements; and
- Sydney Water's Environmental Management System (SWEMS), specifically SWEMS0026 (Preparation of Environmental Management Plan procedure).

This EMP has also been prepared in accordance with "Environmental Management Plan Guideline for Infrastructure Projects (Department of Planning, Industry and Environment, 2020" and 'Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources 2004'

It shall be submitted to the Director-General for approval no later than one (1) month prior to the commencement of construction or demolition or within such period otherwise agreed by the Director-General.

This EMP:

- identifies mitigation measures and controls that must be applied on-site to avoid or minimise adverse environmental impacts and actions to manage soil and water, flora and fauna, Aboriginal and non-Aboriginal heritage, noise and vibration, and traffic and access including specific environmental control plans.
- addresses Ministers Conditions of Approval (MCoA) and SoC applicable to this plan
- identifies applicable policies, approvals, licenses, permits, consultation agreements and legislation.
- describes the environmental management related roles and responsibilities of project personnel.
- defines environmental risks and associated mitigation measures including those as taken from D4C Environmental procedures.

1.2. Environment Management Framework

John Holland (JH) is the Principal Contractor within the Delivering for Customers Joint Venture. As such D4C works under all JH Management Systems and accreditations, including the Environmental Management System which is ISO AS/NZS 14001 accredited.

John Holland, established, implemented, maintains and continually improved an ISO AS/NZS 14001 certified EMS since 1999 **(Appendix 1).** The EMS has applied to all John Holland projects since inception, it is a proven and robust EMS. This Environmental Management Plan (EMP) explains how the existing EMS will be applied on this Project. The basis for the John Holland and subsequently D4C EMS (and also this EMP) is the concept of Plan-Do-Check-Act (PDCA). The PDCA model provides an iterative process to achieve continual improvement. It can be briefly described as follows.

- Plan: establish environmental objectives and processes necessary to deliver results in accordance with the Environment Policy.
- Do: implement the processes as planned.
- Check: monitor and measure processes against the Environment Policy, including its commitments, environmental objectives and operating criteria, and report the results.
- Act: take actions to continually improve.

Figure 1 shows how the framework introduced in ISO AS/NZS 14001 is integrated into a PDCA model within the John Holland EMS (and this EMP).

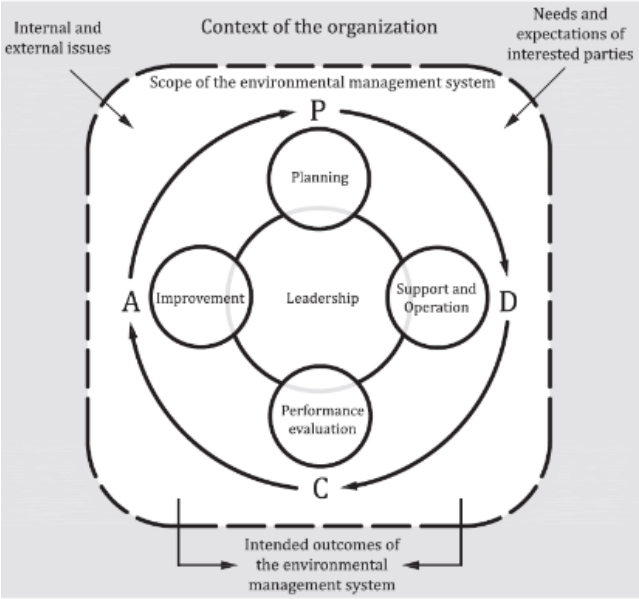


Figure 1: Overview of PDCA model utilised by D4C

This EMP specifies the requirements of the EMS, that West Dapto Stage 3 (the Project) will use to enhance its environmental performance. Consistent with the Environment Policy, the intended outcomes of this EMP include:

- enhancement of environmental performance on the Project;
- fulfilment of the Project's compliance obligations; and
- achievement of the Project's environmental objectives.

This EMP enables the Project to manage its environmental responsibilities in a systematic manner and contribute to the environmental pillar of sustainability. This EMP is applicable to the Project and applies to the environmental aspects of the Project's activities, products and services that the Project determines it can either control or influence considering a life cycle perspective.

The scope of the EMS on the Project includes all activities, products and services that D4C have authority and ability to exercise control over, as defined in **28585-0130-CW2241158 West Dapto Stage 3, Scope and Methodology**.

The EMP provides a 'roadmap' that links the relevant legislative, ministerial and client requirements to the project's EMS and describes the document structure that is used to manage and address the environmental requirements on the project.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Environmental Management Plan	Construction Lead	InEight - Document Management System
Document Management Guidelines (PROMGT-A-GDL-0008)	Construction Lead	InEight - Document Management System

1.3. Environmental Policy

D4C senior management have endorsed Environment Policy. The project will operate in accordance to this Environment Policy. It provides a framework for setting objectives and includes a commitment to the protection of the environment, including prevention of pollution and other specific commitments relevant to the context of D4C. The Environment Policy is maintained as documented information, communicated within the Project, and is available to all interested parties. A copy of the Environment Policy is always available on the internal D4C SharePoint site, the InEight Document Management System and in hard copy at the main Project office.

Required Project documentation	Responsibility	D4C tools to be used to manage documentation
Environment Policy	D4C Program Lead	InEight Document Management System D4C SharePoint site

1.4. Plan Authorisation Distribution and Display

The EMP has been submitted to the Planning Secretary for approval no later than one month prior to the commencement of Stage 3 construction.

The EMP will require approval by the NSW Department of Planning (DPE) and Environment prior to the commencement of construction. No construction associated with Stage 3 shall commence until approval from DPE has been received.

This document is authorised, distributed and revised in accordance with Document Management Guidelines.

The EMP will be explained to all personnel and sub-contractors in the project induction.

This Plan will be publicly available through the Sydney Water Talk website www.sydneywatertalk.com.au

The document is uncontrolled when printed. One controlled hard copy of the EMP and supporting documentation will be maintained at the project site and be electronically available through the D4C InEight document control system.

Registered copies of the EMP will also be distributed to:

- Sydney Water;
- DPE;
- D4C Construction Lead (CL);
- WDURA Stage 3 Environmental Representative (ER); and
- D4C Community Engagement Manager (CEM).

2. The Project

2.1. Project Background

The West Dapto Urban Release Area (WDURA) is anticipated to provide approximately 19,400 new residential dwellings and 175 ha of non-residential land to cater for housing supply, continuing population and job growth in the Illawarra region. This is divided into five stages and Sydney Water has gradually been delivering trunk water and wastewater assets to service development needs.

The West Dapto Stage 3 – Cleveland precinct will provide approximately 4,500 new residential dwellings. The existing water and wastewater trunk assets have currently insufficient capacity to serve the proposed development in the area.

This project will be delivered by the South Regional Delivery Consortia (RDC); Delivering 4 Customers (D4C) in collaboration with Sydney Water as part of the Partnering for Success initiative.

2.2. Project Description

The project includes the design and construction of the 'West Dapto Urban Release Area Stage 3', which comprises approximately 5.5 kms of gravity sewer main and associated maintenance hole construction and approximately 4 kms of water mains within the Horsley and Cleveland areas.

This is further broken up into:

- Lot A watermain
- Lot B line 1 gravity sewer main.
- Lot B line 2 gravity sewer main

The gravity main will be installed using a combination of micro-tunnelling and conventional open excavation (trenching). Bore shafts would also need to be constructed prior to the commencement of micro-tunnelling. The selection of micro-tunnelling methodology was selected as a preferred design for the project in order to minimise surface disturbance to areas of environmental sensitivity such as endangered ecological communities, Category 1 watercourse crossings, areas of Aboriginal archaeological potential as well as main roads and train lines.

2.3. Project Location

The Lot A watermain runs southwest along Cleveland Road from Dapto High School for approximately 3.5kms and along Bong Bong Road from the intersection of Hayes Lane Westerly for 0.5kms.

Lot B line 1 gravity main travels south from The Grange Golf Club for approximately 3.3kms alongside Mullet creek.

Lot B line 2 gravity main begins at the intersection of Fowlers Road and Fairwater Drive It runs Westerly for approximately 2kms.

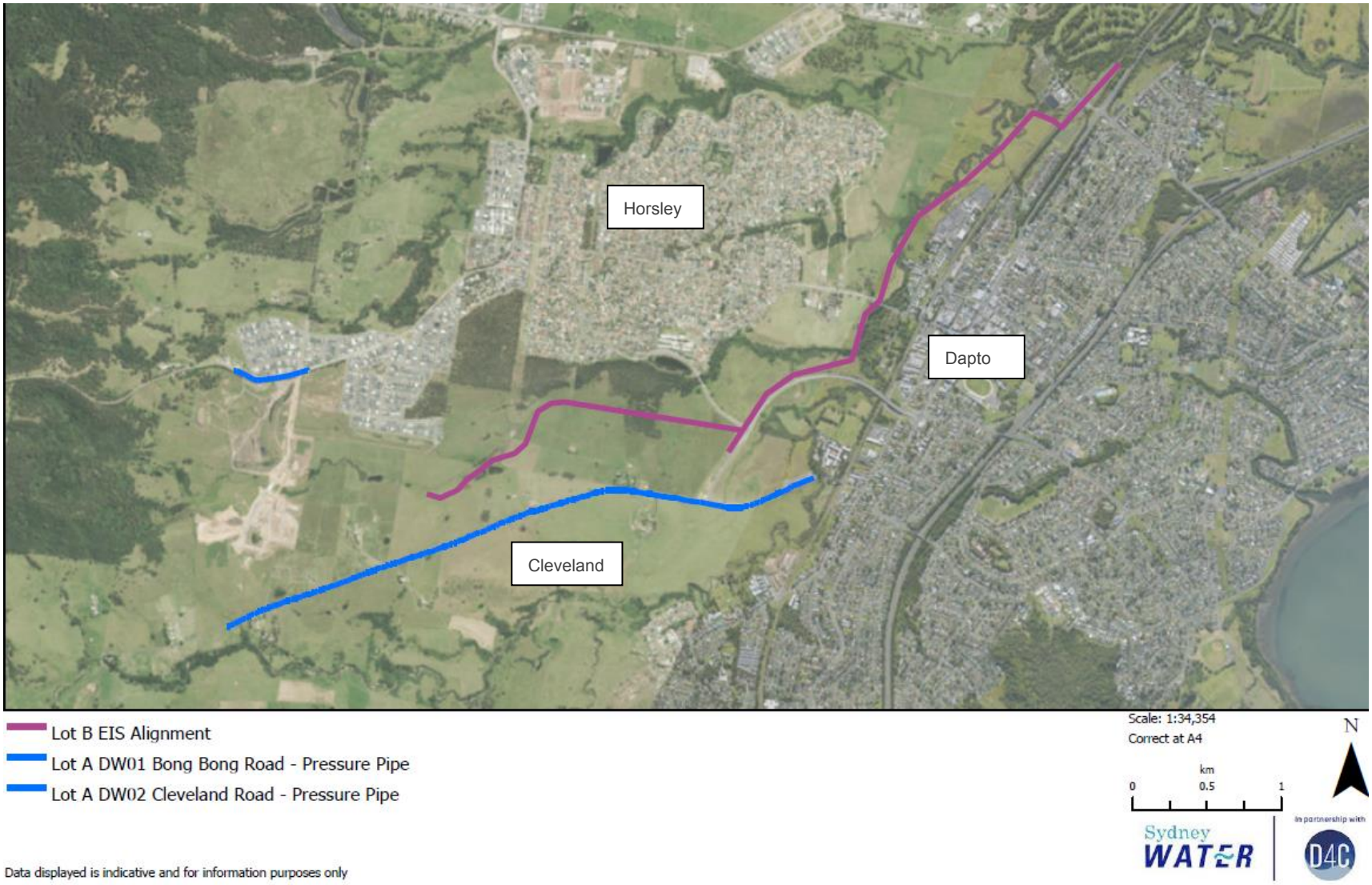


Figure 2: Alignment this EMP applies to.

2.4. Project Context

The Project have determined external and internal issues that are relevant to the project purpose and that affect its ability to achieve the intended outcomes of the EMS. An overview of the Project specific external and internal issues that are relevant is provided below.

- Environmental conditions related to climate, air quality, water quality, land use, existing contamination, natural resource availability, and biodiversity
- External cultural, social, political, legal, regulatory, financial, technological, economic, natural and competitive circumstances

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Environmental Management Plan	Construction Lead	InEight - Document Management System

2.5. Construction Methodology

The construction will consist predominantly of open cut trench with pipeline installation. There will be microtunneling undertaken at strategic locations throughout the alignment.

Potential impacts have been minimised in the detailed design and preconstruction stage by:

- engaging ecology and Aboriginal heritage specialists to identify sensitive areas and planning the compounds, access tracks, and construction corridor widths to minimise impacts
- following existing cleared power/utility easements where possible
- identifying which creeks are feasible to underbore, including the potential for the bed and bank to scour or migrate.

The construction footprint avoids impacts to threatened ecological communities and exclusion zone refinements will further reduce impacts (e.g. where native vegetation is on the edge of the construction footprint).

The trenched methodology will consist of 2 crews with approximately 7 personal, 1 x 45T and 1 x 20T excavators a 9T dump truck and associated support vehicles. Through this methodology the trench will be excavated to depth, A cover base will be installed prior to the pipe being laid. The trench will then be backfilled with the previously excavated material. Any remaining spoil will go to a central stockpile prior to being classified and removed to an appropriate facility.

In accordance with the EA, trenchless construction in the form of microtunneling has been chosen where feasible. This includes where engineering or environmental constraints from open trenching would lead to excessive environmental or community impacts, such as major creek crossings, rail crossings, and to minimise impacts to watercourses, wetlands and vegetation.

The required trenchless launch/receive pits are outside sensitive riparian vegetation wherever possible. The coastal wetlands on the SW and NE ends of the wastewater pipeline are avoided, and construction technologies that avoid indirect impacts will be used where the corridor is close. If Key Fish Habitat (KFH) or dynamic watercourses or watercourses in highly erodible soils cannot be underbored, the methodology to implement the approved design will be developed by a suitably qualified person in consultation with the appropriate regulators such as Fisheries NSW.

This work, as will be completed by a specialist subcontractor will involve the construction of launch/ receival shafts.

Construction of the shafts will proceed with install of shoring systems suitable to the ground conditions. Crew is expected to consist of 6 personnel as well as a 20t excavator, 36t excavator, 9t dump truck and a trade tool truck. Each of the shafts will be developed utilising the below sequence;

- Area of each shaft is to be stripped and levelled utilising a 36t excavator.
- Excavation down to the level required for microtunneling rig.
- Establishment of a base/ foundation slab poured to the base of the shaft to form a level working area for the micro tunnelling equipment.
- Microtunnelling equipment mobilised to site, including any auxiliary equipment required.
- Microtunnelling jacking frame will be installed in the base of the launch shaft.
- Tunnel head will be installed to jacking frame.
- Pipejacking head is jacked into the ground utilising jacks, with the wastewater carrier pipe used as the jacking pipes.
- Microtunnelling machine progresses from launch shaft towards receival shaft, guided by laser to ensure grade is as per design requirements.
- Bore is completed, and Microtunnelling head can be removed from the retrieval shaft.
- Proceed with civil works as required for connections prior to progressive backfilling.

2.6. Ancillary Construction Facilities

Ancillary Construction Facilities as have been selected in accordance with McoA C12 will be used to support the construction of the project. One main project compound with parking for up to 40 housing the project workshop and main project administration offices.

This will be supported by 5 minor ancillary site construction facilities selected in accordance with MCoA C13 with parking for up to 15 along the project alignment for the works.

The specific management measures for each of these areas are detailed in the ECP's in Appendix 6 and will be the subject of site environmental plans to be progressively developed and attached to this plan as Appendix 9.

2.7. Needs and expectations of interested parties.

The Project has determined the interested parties that are relevant to the EMS, the relevant needs and expectations of these interested parties, and which of these needs and expectations become its compliance obligations. An overview is provided in the table below. Key compliance obligations are recorded in the Project's Licences and Approvals register (**Appendix 2**), Ministers Conditions of Approval (**Appendix 3**) and the Statement of Commitments (**Appendix 4**).

Interested Parties	Needs and Expectations	Compliance Obligation
NSW Department of Planning and Environment (DPE)	Laws, regulations, authorisations, etc.	Yes
NSW Environment Protection Authority (EPA)	Laws, regulations, authorisations, etc.	Yes
NSW Department of Primary Industries - fisheries	Laws, regulations, authorisations, etc.	Yes
Client Sydney Water	Contracts, agreements	Yes
Delivering for Customers	Policy, GMRs & System requirements	Yes

Table 1: Overview of the Project specific interested parties, needs and expectations and compliance obligations.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Environmental Management Plan.	Construction Lead	InEight - Document Management System
Minsters Conditions of Approval	Project Environment Coordinator	InEight - Document Management System
Statement of Commitments	Project Environment Coordinator	InEight - Document Management System

2.8. Working Hours

Standard construction hours for the Project as defined by MCoA C21 will be applied to works.
MCoA C22 defines where work may be undertaken outside of these standard hours. No works outside of normal working hours have been identified as required.
Refer to the Noise and Vibration ECP-02 for further detail on working hours, variations to working hours, and highly noise intensive works as detailed in MCoA C23.

3. Leadership

3.1. Leadership and commitment

D4C Project management demonstrate leadership and commitment with respect to the EMS by:

- taking accountability for the effectiveness of the EMS on the Project;
- ensuring that the Environment Policy and environmental objectives are established and are compatible with the strategic direction and the context of the Project;
- ensuring the integration of EMS requirements into the Project's business processes;
- ensuring that the resources needed for the EMS are available on the Project;
- communicating the importance of effective environmental management and of conforming to the EMS requirements;
- ensuring that the EMS achieves its intended outcomes on the Project;
- directing and supporting Project personnel to contribute to the effectiveness of the EMS;
- promoting continual improvement;
- supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.

3.2. Project Roles, Responsibilities and Authorities

The project management team ensure that the responsibilities and authorities for relevant roles are assigned and communicated within the Project. On the Project the following roles are critical to the effective implementation of the EMS.

Role	Responsibilities and Authorities
D4C Program Lead (PL)	▪ Overall responsibility and authority for ensuring that the EMS conforms to the requirements of the John Holland IMS and ISO14001 ▪ Overall responsibility and authority for reporting on the performance of the EMS ▪ Assign environmental responsibilities to project personnel, nominating alternates in the absence of a site based environmental professional ▪ Ensure appropriate environmental training is identified in a Training Needs Analysis and training is provided to project personnel where required ▪ Monitor environmental performance to ensure compatibility and continued effectiveness with the policy and objectives ▪ Participate in the review of the Project Environmental Management System ▪ Stop work immediately if an activity is carried out in an environmentally unsatisfactory manner (where an 'environmentally unsatisfactory manner' is defined in Section 95 of Part 4.3, Chapter 4 of the Protection of the Environment Operations Act 1997 ("POEO Act")) ▪ Notify pollution incidents as defined under s148 of the POEO Act, being pollution incidents that cause or threaten material harm to the environment (s147). immediately and report to Sydney Water no later than 24 hours after the incident was first identified.
Construction Lead (CL)	▪ Ensure environmental controls are established prior to commencement of construction activities ▪ Participate in the preparation of SQE Risk Management documentation ▪ Identify and report any environmental non-conformances ▪ Verify corrective actions are undertaken where non-conformances are identified ▪ Ensure environmental procedures, management plans and policies are implemented for their work site. ▪ Conduct regular visual inspections of work areas and report on any environmental non-conformances, ▪ Immediately report any non-conformances, near misses or environmental incidents to the EC. ▪ Stop work immediately if an activity is carried out in an environmentally unsatisfactory manner (where an 'environmentally unsatisfactory manner' is defined

	in Section 95 of Part 4.3, Chapter 4 of the Protection of the Environment Operations Act 1997 ("POEO Act")) ▪ Notify pollution incidents as defined under s148 of the POEO Act, being pollution incidents that cause or threaten material harm to the environment (s147). The Contractor must notify any such pollution incident to the appropriate authorities immediately and report to Sydney Water no later than 24 hours after the incident was first identified.
D4C Environment Manager	▪ Ensuring that the EMS is established, implemented and maintained in accordance with the requirements of AS/NZS ISO 14001 and the Contract ▪ Participating in the initial ERA workshop and subsequent reviews ▪ Ensuring compliance with the Planning Approval Documents and Approvals (e.g. EDA, REF, REF Addendums) and requirements appropriately cascaded. ▪ Preparing, updating, reviewing and overseeing implementation of the D4C EMS ▪ Providing specialist environmental advice to the Program team ▪ Oversight of any additional environmental impact assessment as required ▪ Preparing and overseeing implementation of the Environmental Management Program ▪ Undertaking internal EMS audits and providing information on the results of audits to Sydney Water ▪ Responding to Action Requests issued by Sydney Water as a result of audits or site inspections. ▪ Ensuring audit outcomes are tracked, recorded and implemented. ▪ Preparing and submitting to Sydney Water the required quarterly reporting to support external reporting requirements e.g NGERs for D4C ▪ Preparing and maintaining the D4C Environmental Incident Management Plan (IMP) ▪ Ensuring environmental information is prepared and communicated to D4C, including alerts, communications, lessons learnt, guidelines etc. ▪ Complaint investigation related to environmental aspects ▪ Recording and closing out incidents in SW Delivery Portal for investigation and management ▪ Incident investigation, including leading ICAM investigations ▪ Preparing information for monthly reporting, including trending analysis ▪ Ensuring clear and efficient communication between D4C and Sydney Water on all environmental issues related to the Contract. ▪ Stop work immediately if an activity is carried out in an environmentally unsatisfactory manner (where an 'environmentally unsatisfactory manner' is defined in Section 95 of Part 4.3, Chapter 4 of the Protection of the Environment Operations Act 1997 ("POEO Act")) ▪ Requiring employees, Sub-contractors, suppliers and consultants to implement any other reasonable steps to avoid or minimise any adverse impact on the environment, and Notify pollution incidents as defined under s148 of the POEO Act, being pollution incidents that cause or threaten material harm to the environment (s147). D4C must notify any such pollution incident to the appropriate authorities immediately and report to Sydney Water no later than 24 hours after the incident was first identified.
Project Environmental Coordinator (PEC)	▪ Day to day responsibility and authority for ensuring that the EMS (as applied on the Project) conforms to the requirements of the John Holland EMS and ISO14001 ▪ Day to day responsibility and authority for reporting on the performance of the EMS (as applied on the Project) to senior management ▪ Ensure compliance with the listed requirements throughout Program delivery ▪ Ensure correct and ongoing implementation of EMP, ECPs and associated sub-plans ▪ Liaise with project staff for ongoing monitoring and maintenance of environmental controls ▪ Ensure reporting of incidents and practices that are non-conforming to the CL. ▪ Conduct and document weekly inspections ▪ Ensure actions relating to environmental non-conformances, incidents and/or inspections are actioned and closed out in a timely manner

	▪ Actively participate in and facilitate SQE Risk Management workshops ▪ Manage and track compliance with all environmental approvals, licences, and permits relating to the project. ▪ Identifying and documenting environment system problems ▪ Assisting in the auditing/assessment of suppliers/sub-contractors ▪ Responsibility for ensuring compliance with all applicable statutory requirements, including but not limited to Planning Approvals, Environment Protection Licence (EPL) and third-party approvals. ▪ Training and awareness (including inductions) ▪ Respond to Action Requests issued by Sydney Water and or the Project Environmental representative (ER) ▪ Complaint investigation
Community Engagement Manager (CEM)	▪ Ensure that all community consultation activities are carried out. ▪ Report any environmental issues to the PEC raised by stakeholders or members of the community. ▪ Communicate general Project progress, performance and issues to stakeholders including the community. ▪ Maintain the 24-hour complaints hotline.
Construction Engineer (CE)	▪ Ensure all workers have been inducted ▪ Approval for site specific Management Plans ▪ Ensure Risk Assessments are completed and works conducted in accordance ▪ Stop works if requested by Sydney water, if works are conducted in an environmentally unsound manner, if required in intsance of chance find ▪ Ensure works are being conducted in accordance statutory requirements ▪ Liaise with the Environment team as required
Site Engineer (SE)	▪ Ensure environmental controls are established prior to commencement of construction activities ▪ Participate in the preparation of SQE Risk Management documentation ▪ Immediately report any non-conformances, near misses or environmental incidents to the EC. ▪ Ensure and verify that corrective actions are undertaken when required for non-conforming work
Site Supervisor (SS)	▪ Ensure that the EMP and associated plan 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, chance finds, near misses or environmental incidents to the PEC.
Wider D4C Team (including sub-contractors, suppliers and consultant)	▪ Participate in the mandatory Project/site induction programs. ▪ Report any environmental incidents to the foreman immediately or as soon as practicable if reasonable steps can be adopted to control the incident. ▪ Undertake remedial action as required to ensure environmental controls are maintained in good working order. ▪ Stop activities where there is an actual or immediate risk of harm to the environment and advise the Project Manager, Construction Manager, Superintendent or PEC.

Table 2: Overview of critical roles.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Organisation Chart(s)	HR Representative	InEight Document Management System
Position Descriptions	HR Representative	InEight Document Management System

4. Planning

4.1. Planning Approvals

In June 2013, the former Department of Planning and Infrastructure approved Sydney Water's concept plan application, made under Part 3A of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), to provide water and wastewater infrastructure services to the West Dapto Urban Release Area (WDURA) and the Adjacent Growth Areas. As part of the same application (MP09_0189) Sydney Water also received project approval to develop infrastructure in certain defined areas within the overall concept plan approval area including the Kembla Grange, Sheaffes / Wongawilli and West Horsley precincts.

In 2016, Sydney Water sought a modification to the Concept Approval to align the boundary of the Concept Approval to the boundary of the Project Approval. This change removed the AGA and three precincts from the Concept Approval and any proposed infrastructure within the AGA and these precincts would be assessed under Part 5 of the EP&A Act. The Modification also had the effect of removing equivalent or duplicate requirements for a number of MCoA for the Concept Approval. The Minister for Planning and Infrastructure granted approval of Modification 1 under Part 3A on 6 January 2016. The project approved under the Concept and Project Approval was then named "Water and Wastewater Servicing of the West Dapto Urban Release Area precincts of Kembla Grange, Sheaffes/Wongawilli and West Horsley.

The proposed West Dapto Package 2 works required to manage the demand for wastewater services expected from developments in the Kembla Grange and West Horsley precincts were completed in mid 2022.

4.2. Risks and opportunities

4.2.1. Environmental Risk Assessment

The Project have determined the environmental aspects of its activities, products and services that it can control and those that it can influence, and their associated environmental impacts. The Project have determined those aspects that have or can have a significant environmental impact i.e. significant environmental aspects, by using established criteria. An overview of the Project's specific aspects is provided in the table below. Comprehensive information on aspects and impacts is provided in the Environmental Risk Assessment (**Appendix 5).**

Project Aspects
Emissions to air
Releases to water
Releases to land
Use of raw materials and natural resources
Use of energy
Generation of waste
Energy emitted (e.g. noise, vibration, light)
Use of space (e.g. biodiversity, heritage, economic, contaminated land, community assets, flood plain, etc.)

Planning of the Project
Design of the Project
Procurement for the Project
Construction of the Project
Commissioning of the Project

Table 3: Overview of Projects Environmental Aspects

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
This Environmental Management Plan; in particular the Environmental Aspects Table above	Construction Lead	InEight Document Management System
D4C Risk and Opportunities Across Region (ROAR)	D4C RDC lead	InEight Document Management System
Activity Method Statements (AMS)	Construction lead	InEight Document Management System

4.3. Compliance obligations

The Project have determined the compliance and legal obligations related to its environmental aspects, determined how these obligations apply including all relevant licences, permits and approvals, and taken these compliance obligations into account when establishing the EMP as outlined in table below

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Legal Register	Project Environment Coordinator	Envirolaw
Approvals & Licences Register (Appendix 2)	Project Environment Coordinator	D4C SharePoint
Ministers Conditions of Approval (MCoA) (Appendix 3)	Project Environment Coordinator	D4C SharePoint
Statement of Commitments Register (Appendix 4)	Project Environment Coordinator	D4C SharePoint

4.3.1 EMP Conditions of Approval

The following conditions are directly linked to this EMP.

B1.	**The proponent shall implement management and mitigation measures to prevent and/or minimise any harm to the environment that may result from the construction or operation of the project in accordance with the commitments made in documents listed under condition B2, except as amended by this approval. In the event or likelihood of unforeseen environmental harm, the proponent shall implement all feasible and reasonable measures to prevent or minimise environmental harm.**

B2.	**The Proponent shall carry out the project generally in accordance with the:** **(a) Project Application MP 09_0189;** **(b) the Water and Wastewater servicing of the West Dapto Urban Release Area and Adjacent Growth Areas Environmental Assessment, SW92 11/11, dated September 2012, prepared by Sydney Water Corporation;** **(c) the Water and Wastewater servicing of the West Dapto Urban Release Area and Adjacent Growth Areas Submissions Response Report, SW 260 02/13, dated February 2013, prepared by Sydney Water Corporation;** **(d) Updated Appendix 1 of Appendix G: Non-Aboriginal Heritage Assessment, Volume 3 of EA, dated 11 March 2013, prepared by Sydney Water Corporation; and** **(e) conditions of this approval.**
B3.	**If there is any inconsistency between any document or plan referred to in B2, the most recent document or plan shall prevail to the extent of the inconsistency. However, conditions of the approval prevail to the extent of any inconsistency with any plan or document referred to in condition B2.**
B4.	**The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of:** **(a) any reports, plans or correspondence that are submitted in accordance with this approval or any related approvals; and** **(b) the implementation of any actions or measures contained within these reports, plans or correspondence**

4.4. Environmental objectives

The Project have established environmental objectives, taking into account the Projects significant environmental aspects and associated compliance obligations, and considering its risks and opportunities. The Project objectives are detailed in the table below.

Project Objectives	
Significant Environmental Incidents (SEI)	0
Reuse of classified ENM	100%

Table 4: Overview of Project Objectives

4.5. Planning action

The Project has planned to take actions to address significant environmental aspects, compliance obligations and the risks and opportunities they present, as well as its objectives. The Project have determined what will be done, what resources will be required, who will be responsible, when it will be completed and how the results will be evaluated.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Ministers Conditions of Approval (MCoA) Tracking Register	Project Environment Coordinator	D4C SharePoint

Environmental Control Plans (ECPs)	Project Environment Coordinator	InEight Document Management System D4C SharePoint
Site Environment Plans	Project Environment Coordinator	InEight Document Management System D4C SharePoint

In developing the EMS and its subplans including the ECP in addition to the information the as above the D4C IMS was reviewed, and additional relevant standard controls were included. At the time of insertion these measures were checked to ensure they were written in a committed, clear manner with any identified hold point made clear where required.

5. Support

5.1. Competence, Awareness and Training

The Project shall:

a. determine the necessary competence of persons doing work under its control that affects its environmental performance and its ability to fulfil its compliance obligations;
b. ensure that these persons are competent on the basis of appropriate education, training or experience;
c. determine training needs associated with its environmental aspects and its environmental management system;
d. where applicable, taken actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken

The Project shall ensure that persons doing work under the Projects control are aware of:

a. the Environment Policy;
b. the environmental requirements described in the D4C Mandatory Requirements #9
c. the significant environmental aspects and related actual or potential environmental impacts associated with their work;
d. their contribution to the effectiveness of the environmental management system, including the benefits of enhanced environmental performance
e. the implications of not conforming with the environmental management system requirements, including not fulfilling the organisation's compliance obligations

5.1.1 Environmental Induction

All personnel (including subcontractors) are required to attend a compulsory site induction that includes an environmental component prior to commencement of works on site. This is done to make all personnel involved in the Project aware of the requirements of the EMP, the associated Sub Plans and the MCoA and Statement oif Commitments. The Project Environment Coordinator (or delegate) will prepare the environmental component of the site inductions.

Short-term visitors to site undertaking inspections / entering the site (such as regulators) will be required to undertake a visitor's induction and be accompanied by inducted personnel at all times. Temporary visitors to site, for purposes such as deliveries, will be required to be accompanied by inducted personnel at all times.

The environmental component of the induction must cover applicable elements of the EMP and will include as a minimum:

- Relevant details of the EMP including purpose and objectives,
- Requirements of due diligence and duty of care,
- The Ministers Conditions of Approval
- Conditions of environmental licences, permits and approvals,
- Potential environmental emergencies on site and the emergency response procedures,
- Approved working hours, including out-of-hours work processes,
- Reporting and notification requirements for pollution and other environmental incidents,
- High-risk activities and associated environmental safeguards,
- Working in or near environmentally sensitive areas,
- Specific environmental management requirements and responsibilities,
- Mitigation measures for the control of environmental issues,
- Incident response and reporting requirements,
- Information relating to the location of environmental constraints, and
- Key environmental issues.

Inductions will also include information about the community we are working in, residents and key stakeholders and location-specific sensitivities, behavioural expectations, what to do when approached by a member of the public or media, and an outline of our responsibilities and Project obligations relating to the community.

A record of all environment inductions will be maintained and kept on site. The Project Environment Coordinator may authorise amendments to the induction at any time. Possible reasons for changes to the induction may be Project modifications, legislative changes or amendments to this EMP or related documentation.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Induction questionnaire	Project Training Coordinator	InEight Document Management System D4C SharePoint
Induction register	Project Training Coordinator	InEight Document Management System D4C SharePoint
Induction	Project Environment Coordinator	InEight Document Management System D4C SharePoint

5.1.2 Environmental Training

Targeted environmental awareness training, such as controlling dewatering, will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Topics covered may include those detailed above, or others deemed necessary in the lead up to or during delivery of the Project. Sydney Water fundamental training modules (i.e. incident response, heritage impact, etc.) will also need to be undertaken by all workers before commencing works on Project.

5.1.3 Environmental Awareness

Development and distribution of awareness notes would also be employed and typically take the form of a poster and factsheets and will be distributed to engineers, leading hands, foreman and others with a responsibility for managing specific work locations or activities. This documentation will be used to inform the broader workforce through either daily pre-start meetings or provision in worker crib sheds / break facilities.

6. Communication

The Project has established the processes needed for internal and external communications relevant to the EMS, including:

a) on what it will communicate;
b) when to communicate;
c) with whom to communicate;
d) how to communicate;

When establishing its communication processes, the Project has

- taken into account its compliance obligations;
- ensured that environmental information communicated is consistent with information generated within the environmental management system and is reliable.

The Project shall respond to relevant communications on its EMS. The Project shall retain documented information as evidence of its communications, as appropriate.

6.1. Internal communication

The Project shall:

a. internally communicate information relevant to the EMS among the various levels and functions of the Project and John Holland, including suggested changes to the EMS, as appropriate.
b. ensure its communication processes enable persons doing work under the Project's control to contribute to continual improvement.

Internal communication will include meetings. Meetings may include Pre-start Meetings, Toolbox Talks, Project Team Meetings, HSEQ Team Meetings, Client Meetings, Subcontractor Meetings, and HSEQ System Review Meetings. Meetings shall include appropriate environmental information and shall be minuted and recorded.

6.1.1. Toolbox Talks

Toolbox talks will be used to raise awareness and educate personnel on environmental issues relevant to the D4C Program and the West Dapto project

Toolbox talks will include details of EWMSs or CEMPs for relevant personnel involved in the task. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works undertaken within environmentally sensitive areas. Relevant environmental issues may include, but are not limited to:

- Erosion and sedimentation control;
- Hours of work;
- Noise and vibration;
- Emergency and Incident response
- Spill response and chemical management;
- Aboriginal and Non-Aboriginal heritage;
- Threatened species, endangered ecological communities, clearing controls and vegetation protection;
- Weed management;
- Housekeeping;
- Washout facilities – concrete, vacuum truck waste, etc;
- Air quality;
- Waste and recycling;
- Sustainability;
- Working near, over or within waterways;

- Community and stakeholder;
- Lessons Learnt;
- Incidents and outcomes; and
- Sydney Water toolbox, factsheets and communication.

Toolbox attendance is mandatory and attendees of toolbox talks are required to sign an attendance form and the records maintained.

6.1.2. Pre-Start Meetings

The pre-start meetings are a tool for informing the workforce of the day's activities, safe work and environmental practices along with work area restrictions and activities that may affect the day's work.

Site supervisors or leading hands are responsible to conduct the daily pre-start meeting with the site workforce before the commencement of work each day (or shift) where changes occur during a shift.

The environmental component of the pre-starts will be discussed between the environmental team and supervisors and will include any environmental issue that could potentially be impacted by, or impact on, the day's activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues and management measures explained.

Pre-start topics, dates delivered, and a register of attendees will be recorded.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Communication records - general	All personnel	InEight Document Management System D4C SharePoint ComplyFlow
Meeting minutes	All personnel	InEight Document Management System D4C SharePoint ComplyFlow
Reports	All personnel	InEight Document Management System D4C SharePoint
Event Notifications	HSEQ Representatives/Construction Lead	Sydney Water Delivery Portal JH - Soteria

6.2. External Communication

The D4C Project Environmental Coordinator (PEC) will be the main point of contact regarding specific environmental issues with government agencies (i.e. Environmental Protection Authority).

Any enquiries received are to be directed to the community information line.

Aside from the PEC being the primary contact person, the following D4C leads have been nominated as alternatives who can be contacted and will immediately take action to minimise environmental impacts by stopping the activity:

- D4C Program Lead;
- D4C Regional Construction Lead; and/or
- Sydney Water Environmental Lead.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Communication records – client and regulators	Community Manager	Sydney Water Consultation Manager

Communication records – design consultants	Community Manager	Sydney Water Consultation Manager
Communication records - community	Community Manager	Sydney Water Consultation Manager
Meeting minutes	Construction Lead	D4C InEight
Reports	Construction Lead	D4C InEight
Media release	SW Media Team	Via SW External Affairs only

6.3. Stakeholder and Community Consultation

6.3.1. Community and Stakeholder Engagement Plan

A Community Communication Strategy (CCS) was approved by the then Director General of the Department of Planning and Environment (DPE) for West Dapto Package 1. As per the CCS, a package-specific Community and Stakeholder Engagement Plan (CSEP) has been developed for the project to provide mechanisms to facilitate communication between D4C, Sydney Water, the relevant local government authority, government stakeholders and the local community on the construction-related and environmental matters. All new and existing landowners will be consulted in accordance with it.

Directly impacted receivers will be contacted to organise and carry out individual meetings in order to create a “home plan” document, that will record the work to be done on their property, the approximate timeframe for the work, how the property will be impacted during the works including any potential access constraints and what we’ll do to restore the property when the work is completed.

6.3.2.

6.3.3. Complaints and Enquires Procedure

A Complaints Handling Process, consistent with AS 4269-1995: Complaints Handling; and Sydney Water procedures has been developed and is included in the CSEP for the Project.

Information on all complaints received, including the means by which they were addressed and whether resolution was reached and whether mediation was required or used, will be included in a complaints register. The information contained within the register will be made available on request.

The PEC will apply an adaptive approach to ensure that corrective actions are applied in consultation with the appropriate construction staff members to ensure modifications and improvements in the management of any environmental issues which have resulted in community complaints.

6.4. Documentation

The EMS includes:

a. documented information required by the Standard;
b. documented information determined by John Holland as being necessary for the effectiveness of the EMS

When creating and updating documented information, the Project shall ensure appropriate:

a. identification and description (e.g. a title, date, author, or reference number);
b. format (e.g. language, software version, graphics) and media (e.g. paper, electronic);
c. review and approval for suitability and adequacy

This EMP is a 'live' and 'working' document. The PEC will conduct regular reviews of the EMP at intervals of not less than six months and ensure that the EMP is formally reviewed and updated at least annually, or earlier as change requirements dictate.

Documented information required by the EMS and by the Standard shall be controlled to ensure:

a. it is available and suitable for use, where and when it is needed;
b. it is adequately protected (e.g. from loss of confidentiality, improper use, or loss of integrity)

For the control of documented information, the Project shall address the following activities as applicable:

- distribution, access, retrieval and use;
- storage and preservation, including preservation of legibility;
- control of changes (e.g. version control);
- retention and disposition

Documented information of external origin determined by the Project to be necessary for the planning and operation of the EMS shall be identified, as appropriate, and controlled.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Policy, Standards, Manuals, Procedures, Workflows	Various Owners (see documentation for details)	Integrated Management System D4C InEight
All other documentation referred to in this EMP	Project Manager	D4C InEight

7. Operation

7.1. Operational planning and control

Operational planning and controls processes are implemented by the Project in order to incorporate the actions identified in relation to risks and opportunities, and the achievement of environmental objectives, by establishing operating criteria and controls.

7.2. Managing SQE risks procedure

This procedure involves preparing a series of progressively more in-depth risk assessments and method statements, further information on key documents required by the procedure is provided below.

- Workplace Risk Assessment (WRA); (strategic risk assessment conducted on workplace and broken down into work components for the purpose of identifying system, training, legislative, and the identification of further detailed planning and risk assessment activities). Must engage relevant subject matter experts.
- Activity Method Statement (AMS); are operational planning risk assessments which aim to address the detailed hazard/risk control reduction strategies for workplace activities. The AMS includes the methodology for the conducting activities, resources, plant, equipment and materials necessary to do the work safely. The requirements for an AMS will be identified in the WRA.
- Task Risk Assessment (TRA); are team base planning risk assessments which aim to address hazard/risk control reduction at the task level. TRAs are facilitated by the Supervisor, Leading Hand and/or Engineer and are primarily identified in the AMS. Must be completed prior to work commencing.

The WRA, AMSs and TRAs are pivotal to the management of all activities during delivery. They allow operational controls to be developed and implemented, case by case, for all the different workplaces, activities and tasks that are encountered in the contracting industry.

The WRA's, AMS's and TRA's are owned by Project Management, Project Engineers, Supervisory Staff and Workforce. Subject matter experts act as advisors during the preparation of these documents ensuring that information from, this EMP, Environmental Control Plans and other relevant project documentation, are suitably incorporated and acted upon. Implementation of the Managing SQE Risk Procedure by the Project, will allow the actions identified in relation to risks and opportunities, and the achievement of environmental objectives, to be incorporated and used to establish operating criteria and controls.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Workplace Risk Assessment	Construction Lead	InEight - Document Management System
Activity Method Statements	Project Engineer(s)	InEight - Document Management System
Task Risk Assessments	Supervisor(s)	InEight - Document Management System

7.3. Environmental Control Plans

Environmental Control Plans (ECP) have been developed, to address specific aspects which the project and the MCoA have deemed necessary to require additional and specific mitigation measures. These plans can be found in **Appendix 6**.

The specific conditions of approval relevant to the environmental aspects described in the MCoA are detailed in the specific ERCP below and as referenced in Appendix 3.

Environmental Control Plan	Responsibility	D4C tools to be used by Project to manage documentation
Water, Erosion and Sediment ECP-01	Project Environmental Coordinator	InEight - Document Management System
Noise and Vibration ECP-02	Project Environmental Coordinator	InEight - Document Management System
Biodiversity ECP-03	Project Environmental Coordinator	InEight - Document Management System
Aboriginal & Non-Aboriginal Heritage Management ECP-04	Project Environmental Coordinator	InEight - Document Management System
Dewatering Management ECP-05	Project Environmental Coordinator	InEight - Document Management System
Air Quality ECP-06	Project Environmental Coordinator	InEight - Document Management System
Hazardous Chemical ECP-07	Project Environmental Coordinator	InEight - Document Management System
Drill Fluid Management ECP-08	Project Environmental Coordinator	InEight - Document Management System
Traffic and Access Management ECP-09	Project Environmental Coordinator	InEight - Document Management System
Contaminated Land Management ECP-10	Project Environmental Coordinator	InEight - Document Management System

Visual Amenity ECP-11	Project Environmental Coordinator	InEight - Document Management System
Waste Management ECP-12	Project Environmental Coordinator	InEight - Document Management System
Acid Sulfate Soils ECP-13	Project Environmental Coordinator	InEight - Document Management System

Two additional Sub Plans have also been developed. These plans can be found in Appendices 7 & 8.

Environmental Sub Plans	Responsibility	D4C tools to be used by Project to manage documentation
Traffic Management Plan	Project Environmental Coordinator	InEight - Document Management System
Rehabilitation and Landscape Management Plan	Project Environmental Coordinator	InEight - Document Management System

7.4. Global mandatory requirements

When developing the operational controls to be included in the WRA, AMSs and TRAs the Mandatory Requirements must be incorporated, as applicable, on every project. The Mandatory Requirements exist to protect the lives of the people we work with and the environment we work in. They are made of 10 key risks that would result in significant consequence if not appropriate managed and include a number of mandatory critical controls.

Mandatory Requirement 9-Environmental Management

I will protect the environment, prevent pollution, and minimise waste and resource use

Required Project documentation	Responsibility	JH tools to be used by Project to manage documentation
Workplace Risk Assessment	Project Manager	InEight - Document Management System
Activity Method Statements	Project Engineer(s)	InEight - Document Management System
Task Risk Assessments	Supervisor(s)	InEight - Document Management System

7.5. HSE behavioural framework

The HSE Behaviours describe a set of everyday behaviours that are expected of all people working on behalf of The Project. The HSE Behavioural Framework encourages a culture that serves as an operational control.

At the Project, the HSE behaviours will be implemented accordingly as per the JH EMS system.

The HSE Behaviours are outlined in a framework below (excerpt from the “Our HSE Behaviours”).

Theme	Everyone	Supervisors	Managers
Standards	Follow rules	Ensure compliance	Set high standards
Communications	Speak up	Encourage the team	Communicate openly
Risk management	Be mindful	Promote risk awareness	Confront risk
Involvement	Get Involved	Involve the team	Involve others

Figure 2: Overview of HSE Behavioural Framework

The framework describes the behaviours that are expected of 'Everyone', 'Supervisors' and 'Managers'. Four themes (that are critical to any strong HSE culture) are displayed. These are 'Standards', 'Communication', 'Risk Management' and 'Involvement'. These are the key elements of our strong safety culture which supports our vision.

There are twelve sets of behaviours across each of the three employee groups and the four themes, all of which are interdependent. Each of the twelve sets of behaviours are supported by a set of positive and negative statements that provide practical guidance on what is expected.

Below is an example of the guidance that sits behind one of the behaviours.

Everyone's HSE Behaviours *(including Supervisors and Managers)*
To improve our HSE performance

		I will...		*I will not...*
Follow rules	EP1.1	Learn the standards, rules and procedures that apply to me in my job	EN1.4	Ignore rules and procedures
STANDARDS	EP1.2	Follow rules and use the right procedure for the job	EN1.5	Disregard the consequences of not following a rule or procedure
	EP1.3	Identify impractical rules and procedures, and suggest improvements promptly	EN1.6	Rush or take short cuts to get the job done
			EN1.7	Fail to seek approval or advice if the plan changes or deviates

Figure 3: Example of specific HSE Behaviours

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Personal Action Plans	Senior Manager(s)	D4C HR SharePoint site.
Induction Records	Project Management Team	D4C SharePoint site

Toolbox Records	Supervisors	ComplyFlow

7.6. Emergency preparedness and response

EMS reference
Emergency Preparedness and Response PROMGT-W-PRO-0008

D4C have established an Emergency Preparedness and Response Procedure PROMGT-W-PRO-0008. This procedure outlines the required training to prepare for emergencies and the required responses.

The Program will also undertake annual emergency response trials to ensure individuals are aware of the procedure and actions to take, to ensure their safety and others is paramount. Records of each trial will be kept on InEight.

The Project shall:

a) prepare to respond by planning actions to prevent or mitigate adverse environmental impacts from emergency situations;
b) respond to actual emergency situations;
c) take action to prevent or mitigate the consequences of emergency situations, appropriate to the magnitude of the emergency and the potential environmental impact;
d) periodically test the planned response actions, where practicable;
e) periodically review and revise the process and planned response actions, in particular after the occurrence of emergency situations or tests;
f) provide relevant information and training related to emergency preparedness and response, as appropriate, to relevant interested parties, including persons working under its control.

The Project shall maintain documented information to the extent necessary to have confidence that the process is carried out as planned.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Emergency Preparedness and Response Checklist	Construction Lead	InEight - Document Management System/SharePoint

8. Performance evaluation

8.1. Monitoring, measurement, analysis, evaluation and reporting

The Project will monitor, measure, analyse and evaluate its environmental performance.

The Project have determined:

a. what needs to be monitored and measured;
b. the methods for monitoring, measurement, analysis and evaluation, as applicable, to ensure valid results;
c. the criteria against which the organisation will evaluate its environmental performance, and appropriate indicators;
d. when the monitoring and measuring shall be performed;
e. when the results from monitoring and measurement shall be analysed and evaluated

The Project will ensure that calibrated or verified monitoring and measurement equipment is used and maintained, as appropriate. The Project shall evaluate its environmental performance and the effectiveness of the EMS.

The Project will communicate relevant environmental performance information both internally and externally, as identified in its communication processes and as required by its compliance obligations.

The Project will retain appropriate documented information as evidence of the monitoring, measurement, analysis and evaluation results.

The Project have:

a. determine the frequency that compliance will be evaluated;
b. evaluate compliance and take action if needed;
c. maintain knowledge and understanding of its compliance status.

The Project will retain documented information as evidence of the compliance evaluation results.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Site Diary (daily)	Supervisor(s)	ComplyFlow
Weekly General Inspections	Workplace Manager	Sydney Water Delivery portal
NGERs Data	Construction Engineer	SharePoint
Vegetation Clearing Data	Construction Engineer	SharePoint
Waste data (monthly)	Construction Engineer	SharePoint
MCoA (monthly)	Project Environment Coordinator	SharePoint
Approvals and Licences Register Status (monthly)	Project Environment Coordinator	SharePoint
Obligations Register Status (monthly)	Project Environment Representative	SharePoint
Actions arising	Project Environment Coordinator	Sydney Water Delivery Portal

8.2. Environmental Inspections

8.2.1. Site inspections

The Environmental Coordinator (or delegate) will undertake Environmental Site inspections to evaluate the effectiveness of the environmental controls using the inspection checklist module in ComplyFlow.

A pre-rainfall inspection will be undertaken to prepare for significant rainfall events (i.e. forecast events in excess of 10 millimetres of rain across a 24-hour period), whereas post rainfall inspections are undertaken after more than 7 millimetres of rain in a 24-hour period.

If any maintenance and/or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded on ComplyFlow and Sydney Water Delivery Portal. Records will also include details of any maintenance required, the nature of the deficiency, Photographic evidence of the deficiency, any actions required and an implementation priority. Actions will be closed out in accordance with the identified priority and evidence of close out would be kept.

It is of first preference to communicate all identified environmental deficiencies with the responsible person or their supervisor at the time of observation for immediate action. This will allow both parties to discuss the environmental risk and possible mitigation measures that is feasible and practicable to minimise the risk. In addition, this type of interaction will allow both parties to update required documents to cover the identified risk and new controls.

Reports generated from Sydney Water Delivery portal will be used to identify individuals or groups who have expressed a high degree of environmental awareness and management to be recognised for their good work or innovations. Recognition of good work or innovation will range from vouchers to awards.

8.2.2. Environmental Representative and Sydney Water Inspections

The Environment Lead will undertake inspections of any work and rehabilitation site under the project. The inspections can be conducted at an interval to be determined by the risk or complexity of the works being undertaken. The PEC or delegate along with a site nominee (such as the D4C Supervisor) may participate in this process.

Records of the inspection shall be kept on SW Delivery Portal and ComplyFlow and any deficiencies shall be actioned immediately. These inspections shall also form part of the review process and will be used by Sydney Water for KPI purposes.

8.3. Audits

An Independent Auditor will be engaged to conduct an audit (as per 3.6 of the Concept Plan Approval) during construction and operation, in accordance with ISO 19011:2003 – Guidelines for Quality and/or Environmental Management Systems Auditing. Audits will be programmed to coordinate with compliance reporting.

The first external audit shall be concluded within the first year of construction and then continue annually from this date. As the construction program is approximately two years long it is envisaged that there will be a requirement for only 2 audits

John Holland shall conduct internal HSE audits of the D4C Project at planned intervals to provide information on whether the EMS:

a. conforms to:
    1. the organisation's own requirements for its EMS;
    2. the requirements of the International Standard;
b. is effectively implemented and maintained

D4C will establish, implement and maintain (an) internal audit programme(s) which will detail the frequency, method, responsibilities, planning requirements and reporting of internal audits. When establishing the internal audit programme, the Program shall take into consideration the environmental importance of the processes concerned, changes affecting the Program and the results of previous audits. Internal HSE and other High-Risk Audits will be scheduled using both the Sydney Water requirements and the Regional Audit Schedule in accordance with the D4C Monitoring and Review Procedure.

D4C will retain documented information as evidence of the implementation of the audit programme and the audit results.

Required Project documentation	Responsibility	D4C tools to be used for audits
Audit Programme	Business Unit HSEQ Personnel	JH Soteria
Audit Reports	Business Unit HSEQ Personnel	JH Soteria
Actions Arising	Business Unit HSEQ Personnel	JH Soteria

9. Improvement

9.1. Incidents, non-conformities and corrective actions

EMS reference
Quality Management Plan PROMGT-Q-TEM-0001

As per WDURA Concept Plan Approvals, sections 3.7 and 3.8, Incident Reporting:

D4C commit to notifying the Director General of any incident with actual or potentially significant offsite impacts on people or the biophysical environment within 24 hours of becoming aware of the incident. D4C shall provide full written details of the incident to the Director General within seven days of the date on which the incident occurred.

D4C commit to meeting the requirements of the Director General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 3.7 of this Concept Plan Approval, within such period as the Director General may require.

When a nonconformity (including an incident, or a verified complaint) occurs, the Project shall:

a. react to the nonconformity and, as applicable:
   1. take action to control and correct it;
   2. deal with the consequences, including mitigating adverse environmental impacts;

b. evaluate the need for action to eliminate the causes of the nonconformity, in order that it does not recur or occur elsewhere, by:
   1. reviewing the nonconformity;
   2. determining the causes of the nonconformity;
   3. determining if similar nonconformities exist, or could potentially occur;

c. implement any action needed;

d. review the effectiveness of any corrective action taken;

e. make changes to the environmental management system, if necessary

Corrective actions shall be appropriate to the significance of the effects of the nonconformities encountered, including the environmental impact(s).

The Project shall retain documented information as evidence of:

- the nature of the nonconformities and any subsequent actions taken;
- the results of any corrective action

External contacts	Phone numbers	
NSW EPA	13 15 55	
NSW Fire and Rescue	9265 2999 (Emergency call 000)	
NSW Rural Fire Service	1800 679 737	
Wollongong City Council	4227 7111	
Police Assistance	13 14 44 (When bone material is discovered)	
Heritage NSW	9873 8500	
DPI Fisheries	1300 550 474	
Sydney Water Customer Hub	13 20 92	

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Event Records	Project Environment Coordinator	Sydney Water Delivery Portal JH Soteria
Actions Arising	Project Environment Coordinator	Sydney Water Delivery Portal JH Soteria

9.2. Continual improvement

D4C commits to the continual improvement of the suitability, adequacy and effectiveness of the EMS and supporting documents (such as this EMP) in order to enhance environmental performance.

The outcomes of monthly, annual and periodic reviews may trigger amendments to the EMS including this EMP and related documentation. The document review process outlined within this plan will be implemented to ensure that environmental documentation (including this EMP and supporting documentation) is updated as appropriate for the specific program.

Should the document review process identify any issues or items within the documents that are either redundant or in need of updating, it is the responsibility of the D4C Project Environment Coordinator (PEC) to prepare the revised documents. Revised documents would be issued to Project Environmental Representative (ER) for certification of the changes. A revised version would then be issued to Sydney Water for endorsement and will be made available through the processes described in Section 1.1.

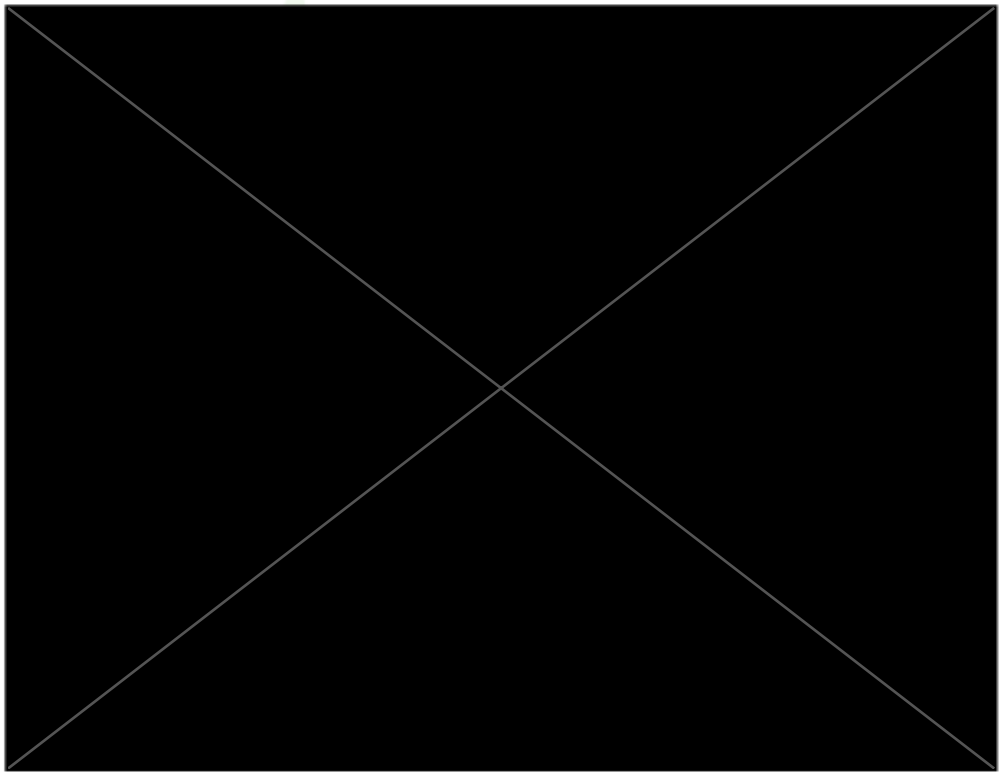
D4C is committed to complying with any requests made by Sydney Water for additional information or revision of EMS documents or records to ensure the effective planning, operation and control of the processes related to the significant environmental risks of the Program. D4C also commits to adapting and reviewing the Environmental Management Documentation (e.g. Environmental Management Plan (EMP)) to align with current and future Sydney Water environment and sustainability policies and strategies.

The Project shall continually improve the suitability, adequacy and effectiveness of the John Holland EMS to enhance environmental performance.

Required Project documentation	Responsibility	D4C tools to be used by Project to manage documentation
Actions Arising	Project Environment Representative	Sydney Water Delivery Portal JH Soteria
Lessons Learned	Project Environment Representative	Sydney Water Delivery Portal JH Soteria

Appendix 1 – EMS ISO 14001 Accreditation

Certificate of Conformity



John Edwards, Operations Director
dlcs international

Certification is subject to ongoing surveillance assessments
The validity of this certificate can be verified at www.jas-anz.org/register

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Australia and New Zealand.
Acc. No. MS250513AM

Appendix 2 – Obligations, Approvals and Licences Register

Environmental Element	Obligations/ Approvals/ Licences Required	Source	Relevance to Project	Relevant Authority	Responsibility	Status/Timing
Modification to Concept Approval		Environmental Planning and Assessment Act 1979	Project Approval area	NSW Department of Planning and Environment	Sydney Water	Submitted for approval
Environmental assessment and Consistency review West Dapto package 3		Environmental Planning and Assessment Act 1979	Project Approval area	NSW Department of Planning and Environment	Sydney Water	Submitted for approval
Dewatering of Groundwater	Water Supply Works Approval (WSWA)	Water Management Act 2000	Pipeline Alignment	NSW Department of Planning and Environment	Sydney Water	Submitted for approval
Dewatering of Groundwater (>3ML)	Water Access Licence	Water Management Act 2000	Pipeline alignment	NSW Department of Planning and Environment	Sydney Water	Submitted for approval

Appendix 3 – Ministers Conditions of Approval (MCoA)

MCoA table

MCoA no.	Condition requirements	Document Reference
B1.	The proponent shall implement management and mitigation measures to prevent and/or minimise any harm to the environment that may result from the construction or operation of the project in accordance with the commitments made in documents listed under condition B2, except as amended by this approval. In the event or likelihood of unforeseen environmental harm, the proponent shall implement all feasible and reasonable measures to prevent or minimise environmental harm.	CEMP & Project Induction
B2.	The Proponent shall carry out the project generally in accordance with the: (a) Project Application MP 09_0189; (b) the Water and Wastewater servicing of the West Dapto Urban Release Area and Adjacent Growth Areas Environmental Assessment, SW92 11/11, dated September 2012, prepared by Sydney Water Corporation; (c) the Water and Wastewater servicing of the West Dapto Urban Release Area and Adjacent Growth Areas Submissions Response Report, SW 260 02/13, dated February 2013, prepared by Sydney Water Corporation; (d) Updated Appendix 1 of Appendix G: Non Aboriginal Heritage Assessment, Volume 3 of EA, dated 11 March 2013, prepared by Sydney Water Corporation; and (e) conditions of this approval.	CEMP Section 1.1 Section 1.1, Appendix 3 Section 1.1, Appendix 2
B3.	If there is any inconsistency between any document or plan referred to in B2, the most recent document or plan shall prevail to the extent of the inconsistency. However conditions of the approval prevail to the extent of any inconsistency with any plan or document referred to in condition B2.	CEMP
B4.	The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of: (a) any reports, plans or correspondence that are submitted in accordance with this approval or any related approvals; and (b) the implementation of any actions or measures contained within these reports, plans or correspondence	CEMP- Section 4.3.1 EMP conditions of approval
B7.	The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required throughout the life of the project. No condition of this approval removes any obligation for the Proponent to obtain, renew or comply with any licences, permits or approvals required by any other legislation.	CEMP section 4.3 Appendix 2
B9.	With the approval of the Director-General, the Proponent may: (a) submit any strategy, plan or program required by this consent on a progressive basis; and (b) combine any strategy, plan or program required by this consent with any similar strategy, plan or program required. Notes: While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.	Staging Report
B10.	The Proponent shall: (a) ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities; and (b) be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	CEMP section 5.1 Competence, Awareness and Training
C1.	The project shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of causal works, as appropriate, such that visible dust emissions cease.	ECP-06 D4C Air Quality
C2.	No clearing of Illawarra Lowland Grassy Woodland is permitted at the Avondale Reservoir site without the written approval of the Director-General. If refinement of the reservoir design and construction methods indicates that clearing of Illawarra Lowland Grassy Woodland cannot be avoided, the proponent shall demonstrate, to the satisfaction of the Director-General, in consultation with the	ECP-03 D4C Biodiversity

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	OEH, that all feasible and reasonable options to avoid clearing have been considered and that residual clearing has been minimised to the greatest extent practicable. Offset measures shall be identified and provided before any clearing of Illawarra Lowland Grassy Woodland occurs at this location.	
C3.	The proponent shall include in the Rehabilitation and Landscape Plan, required by condition E7, measures to offset the impacts of clearing 0.15 ha of lllawarra Lowland Grassy Woodland resulting from the wastewater pipeline construction. Demonstration of how the measures meet the objective of maintain or improve shall be provided and consideration of the efficacy of the measures proposed.	ECP-03 D4C Biodiversity
C4.	The proponent shall continue to consult with Wollongong City Council with regards to the proposed road network along which the water pipeline will be located with the aim of encouraging vegetation avoidance wherever possible. Impacts of vegetation clearing shall be offset with measures to be undertaken included in the Rehabilitation and Landscape Plan required by condition E7 unless biodiversity certification of the WDURA and AGA is implemented and the impacts accounted for through this process. Should biodiversity certification be implemented, the proponent shall demonstrate, to the satisfaction of the Director General, that the impacts have been appropriately addressed.	ECP-03 D4C Biodiversity Appendix 8 - Rehabilitation and Landscape Management Plan
C5.	Except as may be provided by an EPL, the project shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters.	ECP-01 - D4C Water Quality, Erosion, and Sediment ECP
C6.	All crossings of Category 1 watercourses, dynamic watercourses, highly erodible soils and key fish habitats shall be under-bored unless otherwise agreed by the Director-General in consultation with the NOW and Fisheries NSW as appropriate.	ECP-01 - D4C Water Quality, Erosion, and Sediment
C7.	All watercourse beds and banks impacted during construction shall, as a minimum, be rehabilitated to their pre-construction condition, or, where it is consistent with the project objectives, improved to more closely reflect the pre-disturbance state.	ECP-01 - D4C Water Quality, Erosion, and Sediment
C8.	The project shall minimise impacts on riparian corridors to the greatest extent practicable. Where disturbance is unavoidable, these shall be rehabilitated to their pre-construction condition, including ground, shrub and canopy strata, where appropriate. All seed and plant material shall be sourced from species of local provenance where practicable.	ECP-01 - D4C Water Quality, Erosion, and Sediment
C9.	Soil and water management measures consistent with Managing Urban Stormwater - Soils and Construction Vols 1 (Landcom, 2004) shall be employed during the construction to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters.	ECP-01 - D4C Water Quality, Erosion, and Sediment
C10.	The Project shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	ECP-06 D4C Air Quality
C11.	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian standards ; (b) for liquids, a minimum bund volume requirement of 110 per cent of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirements shall prevail to the extent of the inconsistency.	ECP-07 Hazardous Chemicals
C12.	Unless otherwise approved by the Director General, the location of Ancillary Construction Facilities shall: (a) be located more than 50 metres from a waterway; (b) be located within or adjacent to land where the project is being carried out; c) have ready access to the road network; (d) be located to minimise the need for heavy vehicles to travel through residential areas;	CEMP Appendix 9 -Site Environmental Plans Appendix 7 – Traffic Management Plan

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	(e) be sited on relatively level land; (f) be separated from nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant); (g) not require vegetation clearing beyond that already required by the project; (h) not impact on heritage items (including areas of archaeological sensitivity) beyond those already impacted by the project; (i) not unreasonably affect the land use of adjacent properties; (j) be above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented; and (k) provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours. Where any of the criteria cannot be met for any proposed ancillary construction facility, the Proponent shall demonstrate to the satisfaction of the Director General that there will be no significant adverse impact from the facility(ies)'s construction or operation. The location of and proposed measures to manage the ancillary construction facilities shall be identified in the CEMP required by condition E5.	CEMP section 2.6
C13.	The Director General's approval is not required for minor ancillary construction facilities (e.g. lunch sheds, office sheds, and portable toilet facilities, etc.) that do not comply with the criteria set out in condition C12 of this approval and which: (a) are located within an active construction zone within the approved project footprint; and (b) have been assessed by the Environmental Representative to have: (i) minimal amenity impacts to surrounding residences, with consideration to matters such as noise and vibration impacts, traffic and access impacts, dust and odour impacts, and visual (including light spill) impacts, and (ii) minimal environmental impact in respect to waste management, and no impacts on flora and fauna, soil and water, and heritage beyond those approved for the project; and c) have environmental and amenity impacts that can be managed through the implementation of environmental measures detailed in a Construction Environment Management Plan for the project. All Ancillary Construction Facilities shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the landowner where relevant.	CEMP Appendix 9 -Site Environmental Plans Appendix 7 – Traffic Management Plan CEMP section 2.6
C14.	Where available, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources shall be used in preference to potable water for construction activities, including concrete mixing and dust control.	ECP-06 - D4C Air Quality
C15.	All waste material removed during construction of the project shall only be directed to waste management facilities or premises lawfully permitted to accept the materials.	ECP-12 D4C Waste Management
C16.	Waste generated outside the project area shall not be received at the project area for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by an Environment Protection Licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	ECP-12 D4C Waste Management
C17.	All liquid and/or non-liquid waste generated by the project shall be assessed and classified in accordance with Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2009), or any superseding document.	ECP-12 D4C Waste Management
C18.	Nothing in this approval permits blasting during construction or operation.	ECP-02 - D4C Noise Vibration and Light Escape
C19.	Wherever practical, piling activities shall be undertaken using quieter alternative methods than impact or percussion piling, such as bored piles or vibrated piles.	ECP-02 - D4C Noise Vibration and Light Escape
C20.	Where feasible and reasonable, operation noise mitigation measures shall be implemented at the start of construction (or at other times during Construction) where they may be effective in managing construction noise impacts.	ECP-02 - D4C Noise and Vibration and Light Escape

MCoA no.	Condition requirements	Document Reference
C21.	Construction activities associated with the project shall be undertaken during the following standard construction hours: (a) 7:00am to 6:00pm Mondays to Fridays, inclusive; and (b) 8:00am to 1:00pm Saturdays; and (c) at no time on Sundays or public holidays.	ECP-02 - D4C Noise Vibration and Light Escape CEMP section 2.8
C22.	Construction works outside of the standard construction hours identified in condition C21 may be undertaken in the following circumstances: (a) construction works that generate noise that is: (i) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009); and (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers; or (b) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reason; or (c) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; (d) works approved through an EPL, or (e) works as approved through the out-of-hours work protocol outlined in condition E6(c).	ECP-02 - D4C Noise Vibration and Light Escape CEMP section 2.8
C23.	Except as expressly permitted by an EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken: (a) between the hours of 8:00 am to 5:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1:00 pm Saturday; and (c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.	ECP-02 - D4C Noise Vibration and Light Escape
C24.	The Project shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the CEMP.	ECP-02 - D4C Noise Vibration and Light Escape
C25.	The Project shall be constructed with the aim of achieving the following construction vibration goals: (a) for structural damage to heritage structures, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures; (b) for damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-1:1990 – Evaluation and measurement for vibration in buildings. Guide for measurement of vibration and evaluation of their effects on buildings; and (c) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).	ECP-02 - D4C Noise Vibration and Light Escape
C26.	Construction vehicles (including staff vehicles) associated with the project shall be managed to: (a) minimise parking or queuing on public roads; (b) minimise idling and queuing in local residential streets where practicable; and (c) minimise the use of local roads (through residential streets and town centres) to gain access to construction sites and compounds	ECP-02 - D4C Noise Vibration and Light Escape ECP-09 - D4C traffic and Access
C27.	The project shall be designed with the objective of minimising adverse changes to existing access arrangements and transport services, including school bus services. Any need to alter public transport services or their routes shall be discussed with the provider and suitable alternative arrangements agreed.	ECP-09 – D4C traffic and Access
C28.	All landowners or residents whose access will be affected during construction shall be notified a minimum of 48 hours in advance. Access to a property that is physically affected by the project shall be reinstated to an equivalent standard, in consultation with the property owner.	ECP-09 - – D4C traffic and Access

MCoA no.	Condition requirements	Document Reference
C29.	Upon determining the haulage route(s) for construction vehicles associated with the project, and prior to construction, an independent and qualified person or team shall undertake a Road Dilapidation Report. The report shall assess the current condition of the road. The Report shall be submitted to the relevant road authority for review and comment prior to the commencement of haulage. Following completion of construction, a subsequent report shall be prepared to identify any damage that can be attributed to the construction of the project and describe measures to restore any damage caused by construction of the project. The Report shall be submitted to the relevant road authority for review and comment. Measures proposed to restore or reinstate roads affected by the project shall be implemented in a timely manner, in accordance with the reasonable requirements of the relevant road authority, and at the full expense of the Proponent.	ECP-09 – D4C traffic and Access
C30.	This approval does not allow the Proponent to destroy, modify or otherwise physically affect human remains, with the exception of Item 2, Settler's Cemetery (Kembla Grange Cemetery) where the proponent is able to demonstrate, to the satisfaction of the Director General (under condition C35) that impacts to burials within the cemetery cannot be avoided.	ECP-04 – D4C Heritage Plan
C31.	The Proponent shall not destroy, modify or otherwise physically affect: (a) item 18, 'Brisbane Grove' Homestead, Garden and Dairy; and (b) the non-Aboriginal sites identified as being not impacted in the document listed under condition B2(d).	Not Applicable to Stage 3 as sites listed not in project area
C32.	Impacts to Aboriginal heritage identified in Tables 25 and 26 of Appendix F in the document listed under condition B2(b) shall be minimised to the greatest extent practicable through both detailed design and construction. Where impacts are unavoidable, works shall be undertaken in accordance with condition C36 and the actions to manage construction Aboriginal heritage required by condition E6(b).	ECP-04 – D4C Heritage Plan
C33.	Impacts to non-Aboriginal heritage identified in the document listed under condition B2(d) shall be minimised to the greatest extent practicable through both detailed design and construction. Where identified impacts are unavoidable, works shall be undertaken in accordance with condition C35 and the actions to manage construction non-Aboriginal Heritage required by condition E6 e)	ECP-04 – D4C Heritage Plan
C34	Undertake archival recording of the heritage items identified for archival recording in the document listed under condition B2(d) in accordance with the NSW Heritage Council guidelines.	ECP-04 – D4C Heritage Plan
C35.	Prior to the commencement of pre-construction and construction activities affecting the non- Aboriginal archaeological items 2 (the Settler's Cemetery /Kembla Grange Cemetery) 20 (the chapel, West Dapto Catholic Cemetery),182, 183, 184, 185, 186 and 187 the Proponent must: (a) Undertake an Historic archaeological investigation program in accordance with the Heritage Council's Archaeological Assessments Guideline (1996) and Skeletal Remains (1998) using a methodology prepared, in consultation with the OEH (Heritage Branch), and to the satisfaction of the Director-General. This work should be undertaken by an archaeological heritage consultant approved by the Director-General. The nomination for the Excavation Director shall demonstrate ability to comply with the Heritage Council's Criteria for the Assessment of Excavation Directors (July 2011). (b) Report on the results of the non-Aboriginal archaeological investigation program, including recommendations (such as for further archaeological work), in consultation with the Heritage Branch OEH and to the satisfaction of the Director General and shall include, but not necessarily be limited to: (i) consideration of measures to avoid or minimise disturbance to archaeology, where archaeology of non-Aboriginal archaeological significance is found to be present; (ii) where it cannot be avoided, recommendations for any further investigations for archaeology of historical archaeological significance; and (iii) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities. (c) Undertake any further archaeological excavation works recommended by the results of the non-Aboriginal archaeological investigation program. Within twelve months of completing the above work, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the excavations, including artefact analysis, and the identification of a final	ECP-04 – D4C Heritage Plan

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	repository for finds, prepared in consultation with the OEH (Heritage branch) and to the satisfaction of the Director-General. Note: other Acts/ regulations such as the Coroner's Act, the Public Health Act and Public Health Regulations may apply in relation to human remains.	
C36.	Prior to the commencement of pre-construction and construction activities affecting the Aboriginal archaeological sites identified in Table 25 and Table 26 of Appendix F in the document listed under condition B2(b), the Proponent must: (a) undertake an Aboriginal archaeological investigation program using a methodology prepared, in consultation with the OEH (Aboriginal heritage) and the Registered Aboriginal Stakeholders, and to the satisfaction of the Director-General. (b) report on the results of the Aboriginal archaeological investigation program, including recommendations (such as for further archaeological work), in consultation with the Registered Aboriginal Stakeholders, the OEH and to the satisfaction of the Director General, and shall include, but not necessarily be limited to: (i) consideration of measures to avoid or minimise disturbance to Aboriginal objects where objects of moderate to high significance are found to be present; (ii) where it cannot be avoided, recommendations for any further investigations; and (iii) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities. (c) Undertake any further archaeological excavation works recommended by the results of the Aboriginal archaeological investigation program. Within twelve months of completing the above work, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the excavations, including artifact analysis, and the identification of final storage place for Aboriginal objects, prepared in consultation with the Registered Aboriginal Stakeholders, the OEH (Aboriginal objects) and to the satisfaction of the Director-General.	ECP-04 – D4C Heritage Plan
E1.	Appropriate studies and assessments shall be undertaken prior to construction to identify and manage any localised contaminated soils. Soils shall be analysed for a broad range of potential contaminants to provide an indication of potential waste classification against the Waste Classification Guidelines-Part 1 (DECCW 2009) for off-site disposal purposes and to determine mitigation measures required. Should contaminated soil be encountered, consideration of the provisions of SEPP 55 - Remediation of Land and any relevant guidelines made or approved under the Contaminated Land Management Act 1997 is required.	ECP-10 - D4C Contaminated land
E2.	The Proponent must address management of drilling slurry for all directional drilling sites as part of the Construction Environmental Management Plan (CEMP) required by Condition E5 including monitoring of cutting fluid returns and actions to be taken in the event of losses in drilling fluid.	ECP-08 - D4C Drill Fluid Management Plan
E3.	Following the completion of construction, the Proponent shall confirm the extent of vegetation impacts was commensurate with and not greater than that identified in Table C1 If clearing is greater than assess in Table C1 of the EA) the Proponent shall consult with OEH and demonstrate how the offset package will be modified to offset the value of actual biodiversity loss.	ECP-03 EMP Appendix 8
E4.	Hollow-bearing trees shall be protected where feasible and reasonable. Where impacts cannot be avoided specialist advice from a qualified ecologist shall be sought prior to and during vegetation removal to mark any hollow-bearing trees, check for fauna prior to removal and undertake any necessary fauna rescue.	ECP-03 - D4C Biodiversity
E5.	The Proponent shall prepare and implement a Construction Environmental Management Plan for the project in accordance with the Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources 2004). No construction associated with the project shall commence until written approval of this plan has been received from the Director-General or his nominee. The Plan must: (a) be submitted to the Director-General for approval no later than one (1) month prior to the commencement of construction or demolition or within such period otherwise agreed by the Director-General; (b) include actions to manage: (i) soil and water;	EMP Section 1.1 EMP Appendix 6

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	(ii) flora and fauna; (iii) Aboriginal and non-Aboriginal heritage; (iv) noise and vibration; and (v) traffic and access.	
E6.	As well as the general requirements of an EMP as outlined in condition E5, the following shall be addressed: **(a) Soil and Water** (i) identification of management measures consistent with Managing Urban Stormwater – Soils and Construction Vols 1 (Landcom, 2004) to be employed during construction to minimise soil erosion, discharge of sediment and other pollutants to land and/or waters, spoil and fill material management; dewatering and disposal procedures; and measures to be implemented following rainfall; (ii) all watercourse crossings (vehicle access and pipeline crossings) shall be designed by a suitably qualified person and the design and measures shall generally be prepared and implemented in accordance with the NOW's Guidelines for Controlled Activities, (NSW Fisheries, 2004) and Why Do Fish Cross Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2004)); **(b) Aboriginal Heritage** (i) actions to manage identified Aboriginal objects directly and indirectly impacted by construction, developed in consultation with registered Aboriginal stakeholders prior to any archaeological or salvage works commencing, including but not limited to: - management measures and strategies for protection, monitoring, salvage, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; - procedures for dealing with previously unidentified Aboriginal objects (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, involvement of a suitably qualified archaeologist and consultation with the Department and registered Aboriginal stakeholders, actions required to enable construction to recommence and notification to the OEH, in accordance with section 89A of the National Parks and Wildlife Act 1974, and the department;; - procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH; - training and induction processes for construction personnel on site identification, protection and conservation of Aboriginal cultural heritage;. - procedures for ongoing stakeholder consultation and involvement for the duration of the project; and - procedures for monitoring and reporting effectiveness of management measures, including reporting of non-compliance. **(c) Non-Aboriginal Heritage** (i) actions to manage identified non-Aboriginal items directly and indirectly impacted by construction, developed in consultation with the Heritage Branch, OEH prior to any archaeological works commencing, including but not limited to: - management measures and strategies for protection, excavation, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; - procedures for monitoring and reporting on effectiveness of management measures, including reporting of non-compliance; - procedures for dealing with previously unidentified heritage items (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, including involvement of a suitable qualified archaeologist and consultation with the Department and actions required to enable construction to recommence and notification of the Heritage Council of NSW, in accordance with Section 146 of the NSW Heritage Act 1977, and the department; - procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH; and	ECP-01 - D4C Water Quality, Erosion, and Sediment ECP-04 D4C Heritage Plan ECP-04 D4C Heritage Plan

MCoA no.	Condition requirements	Document Reference
	- training and induction processes for construction personnel on site identification, protection and conservation of heritage. **(d) Noise and Vibration** (i) measures identified shall be developed and implemented in accordance with the Interim Construction Noise Guidelines (DECC, 2009); and (ii) include an out-of-hours work (OOHW) protocol for the assessment, management and approval of works outside of standard construction hours as defined in condition C21, including a risk assessment process under which the Environmental Representative may approve out-of-hour construction activities deemed to be of low environmental risk and refer high risk works for the Director General's approval. The OOHW protocol shall detail standard assessment, mitigation and notification requirements for high and low risk out-of-hour works, and detail a standard protocol for referring applications to the Director General. **(e) Traffic and Access** (i) identification of construction traffic routes and construction traffic volumes (including heavy vehicle/ spoil haulage) on these routes; (ii) details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points; (iii) identification of construction activities that could disrupt traffic, public transport, pedestrian, cycle and property access; (iv) management measures to minimise traffic impacts, including temporary road work traffic control measures, onsite vehicle queuing and parking areas and management measures to minimise peak time congestion and measures to ensure safe pedestrian and cycle access; (v) a response plan which sets out a proposed response to any traffic, construction or other incident; and (vii) mechanisms for the monitoring, review and amendment of this plan.	ECP-02 – D4C Noise, Vibration, and light escape ECP-02 OOHW Protocol ECP-09 D4C Traffic and Access EMP Appendix 7
E7.	A Rehabilitation and Landscape Plan shall be prepared and implemented for the project to manage rehabilitation/revegetation of disturbed areas and landscaping or screening of built features. The Plan shall be prepared by an appropriately qualified person(s) in consultation with the relevant landowner(s) or Council. The Plan shall include, but not necessarily be limited to: (a) identification of principles, standards and objectives for rehabilitation and landscaping; (b) the location of vegetation to be cleared, high risk areas experiencing erosion and waterway crossings that have been identified as sensitive and prone to erode if disturbed; (c) proposed rehabilitation or landscaping (including use of indigenous and native species where possible); (d) monitoring and maintenance procedures for the rehabilitated or revegetated areas and landscaping including performance indicators, responsibilities, timing and duration and contingencies where rehabilitation of vegetation and landscaping measures fail; and (e) provisions for the rectification of any damage caused to property as a result of the construction of the project. The Plan shall be submitted for the approval of the Director General prior to disturbance of areas requiring rehabilitation or landscaping, unless otherwise agreed by the Director General.	CEMP Appendix 8
E8.	The Proponent shall ensure that all rehabilitation measures are implemented progressively where possible and in all cases within one month of the cessation of construction activities at the relevant area unless otherwise agreed with the local council or other stakeholders.	CEMP appendix 8
E9.	All Ancillary construction facilities sites shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the landowner, where relevant.	CEMP appendix 8
E10.	Prior to the commencement of pre-construction and/or construction activities that will impact the Aboriginal archaeological sites identified in Table 6-22 of the document listed under condition B2(b), the Proponent shall undertake an archaeological salvage program using a methodology prepared in consultation with the registered Aboriginal stakeholder, and to the satisfaction of the Director-	ECP-04 D4C Heritage Plan

MCoA no.	Condition requirements	Document Reference
	General. This work shall be undertaken by an appropriately qualified archaeological heritage consultant. Within two years of completing the salvage, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the salvage, including artefact analysis , and the identification of a final repository for any Aboriginal objects, prepared in consultation with the Aboriginal stakeholders and to the satisfaction of the Director-General.	
E11.	Prior to the commencement of pre-construction and/ or construction activities that will impact the non-Aboriginal archaeological sites identified in the document listed under condition B2(b) as items 182, 183, 184, 185, 186 and 186, the Proponent shall undertake an archaeological salvage program using a methodology prepared in consultation with the OEH (Heritage Branch) and to the satisfaction of the Director-General. This work shall be undertaken by an appropriately qualified archaeological heritage consultant. Within two years of completing the salvage, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the salvage, including artefact analysis, prepared in consultation with the OEH (Heritage branch) and to the satisfaction of the Director-General	ECP-04 - D4C Heritage Plan
E12.	During construction, affected education institutions shall be consulted and reasonable steps taken to ensure that noise generating construction works in the vicinity of affected buildings are not timetabled during examination periods where practicable, unless other reasonable arrangements to the affected institutions are made at no cost to the affected institution.	ECP-02 D4C Noise, Vibration, and light escape
E13.	During the detailed design stage of the project, the Proponent shall consult with all landowners of those properties that are to be traversed by the project, for the purposes of ensuring landowner concerns are considered in determining the final project alignment.	CEMP appendix 8
E14.	Any damage caused to property as a result of the construction of the project shall be rectified or the property owner compensated, within a reasonable timeframe, with the costs borne by the Proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.	CEMP appendix 8

Appendix 4 – Statement of Commitments (SOC)

Statement of Commitments

SOC #	Commitment	Reference
1.	Erosion and sedimentation control will be managed using measures developed in accordance with Managing Urban Stormwater, Soils and Construction (Volume 1, Landcom 2004 and Volume 2A, DECC 2008).	ECP-01
2.	Groundwater encountered during construction will be pumped out of the work area into a contained area, tested and if necessary, appropriately treated, prior to re-use, appropriate discharge or disposal.	ECP-01 & ECP- 15
3.	ASS will be managed in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).	ECP 13
4.	The Proposal will be designed and operated to meet wastewater system EPLs.	ECP-01
Riparian and Aquatic habitats		
5.	Detailed design will consider how impacts to riparian and aquatic habitats can be avoided or minimised by: • placing pipeline alignments outside the 'top of bank' • utilising existing and/or proposed road infrastructure to cross watercourses • avoiding farm dams and freshwater lagoons • applying pipeline construction methods for watercourse crossings in accordance with the objectives of with the DIPNR (2004) Riparian Corridor Management Study.	ECP-03
6.	Sydney Water will design and construct the Proposal's wastewat+B8:B13er pipelines using techniques to minimise inflow/infiltration.	ECP-03
Terrestrial Flora and Fauna		
7.	Detailed design will consider how impacts to native vegetation can be avoided or minimised by: • placing pipelines to have the least impact to native vegetation and avoid EECs and significant hollow-bearing trees • using construction methods that avoid and minimise impacts.	ECP-03
8.	Construction management measures will be developed and implemented to minimise impacts to flora and fauna.	ECP-03
9.	Sydney Water will progressively rehabilitate work sites following completion of construction.	ECP-03
Aboriginal Heritage		
10.	Sydney Water is committed to avoiding impacts on items of Aboriginal cultural heritage significance where practicable.	ECP-04
11.	Where it is not practicable to avoid impacts, management measures will be implemented to mitigate impacts.	ECP-04
12.	Sydney Water will undertake on-going consultation with RAPs.	ECP-04
13	Procedures will be implemented to ensure planned maintenance activities are undertaken in a manner that minimises impact on the Aboriginal heritage items.	ECP-04
Non Aboriginal heritage		
14.	Where practicable, the pipelines will be re-located to avoid areas of non-Aboriginal heritage value.	ECP-04
15.	Where impacts on unlisted items of possible non-Aboriginal heritage significance are unavoidable, specific mitigation measures will be followed for each item.	ECP-04
16.	Relevant construction personnel will be inducted on actions to take if previously unrecorded non-Aboriginal heritage items are found.	ECP-04
17	Procedures will be implemented to ensure maintenance activities are undertaken in a manner that minimises impact on the non-Aboriginal heritage items.	ECP-04
Air Quality		
18.	Potential impacts from dust generation will be managed through standard industry suppression measures.	ECP-06

19.	Odour management will be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational, and other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.	ECP-06
Noise and Vibration		
20.	Mitigation measures will be used to reduce the construction noise impact on sensitive receivers. Including limiting noise work to less sensitive time periods, selecting low noise plant equipment and using quieter construction methods where practicable.	ECP-02
21.	Where vibration from construction activities may impact on residents, the activities will be managed in accordance with the British Standard BS 6472 – 1992 and AS 2436-1981.	ECP-02
22.	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385:Part 1 – 1993 Evaluation and Measurement for Vibration on Buildings.	ECP-02
23	For historic buildings, which have a higher sensitivity to vibration, the guidelines within the German Standard DIN 4150 - Part 3 will be adhered to.	ECP-02
SOC #	**Commitment**	**Reference**
24.	Development of the detailed design will include industry standard noise treatments to control operational noise levels.	ECP-02
Hazards and risks		
25.	Fuel and chemical storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily AS 1940: The Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes.	ECP-07
Consultation		
26.	During construction, communities will be informed prior to the start of any works in their area and will be notified at regular intervals throughout the construction process.	CEMP Appendix 8
Traffic transport and access		
27.	Road closures will be developed and implemented in consultation with the relevant road authorities (council and/or the RMS).	ECP-09
28.	Appropriate construction methodologies for road crossings will be developed and implemented in consultation with the relevant council and/or the RMS.	ECP-09
29.	Where there is a potential to impact on access to private property or pedestrian pathways, property owners, the local community and councils will be informed appropriately. Mitigation measures may include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.	ECP-09
Waste generation and management		
30.	Excavated spoil will be reused on site for backfilling, landscaping and other uses. Where spoil is unsuitable for reuse, spoil would be classified according to the DECCW Waste Classification Guidelines (DECCW 2009a) and disposed of at an appropriately licensed facility.	ECP-12
31.	Where relevant, soil contamination studies will be carried out prior to construction. Soils will be analysed for a broad range of potential contaminants to provide an indication of potential waste classification Waste Classification Guidelines (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.	ECP-12
32.	All wastes generated by the construction and operation of the Proposal will be classified and disposed in accordance with Waste Classification Guidelines (DECCW 2009a).	ECP-12
Energy and Greenhouse gas emissions		
33.	All vehicles and equipment will be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.	ECP-06

34.	The project will be implemented in accordance with Sydney Water's policy on energy efficiency and greenhouse gas mitigation.	ECP-06
Visual amenity		
35.	Areas disturbed by pipeline construction will be progressively rehabilitated.	ECP-11
36.	Visual impacts of reservoirs and ventilation shafts will be minimised through painting the structures a dark 'bush green' colour, which has been chosen as the colour most compatible with the surrounding environment.	ECP-11
Land use and services		
37.	Relevant service providers will be consulted during detailed design to identify interactions and develop procedures to be implemented to minimise service interruptions. This will involve confirming any requirements or standards that will apply if it is determined that existing utilities or services need to be temporarily or permanently relocated. Inspections will be undertaken before construction starts in each location to confirm that there are no services in the area that were previously unknown.	CEMP Appendix 8

Appendix 5 – Environmental Risk Assessment (ERA)

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ACTIVITY / ASPECT	HAZARD / SOURCE OF IMPACT	IMPACT	SYDNEY WATER PRE-CONTROL RISK			MITIGATION MEASURES	SYDNEY WATER POST-CONTROL RISK		
			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
General									
Overall construction Activities	Non compliance with Project approval	Potential Harmful Environmental Impact	Major	Unlikely	High 3	. Preparation of an Environmental Management Plan (EMP) which includes incident management procedures outlining actions and responsibilities during: - predicted/onset of heavy rain during works - spills - unexpected finds (eg heritage and contamination) - other potential incidents relevant to the scope of works Preparation of Site Environmental Plans (SEP's) as attachments to the EMP, showing - location of environmental controls (such as erosion and sediment controls, spill kits etc) - no-go areas and the approved environmental study area . - boundaries of the work area/disturbance corridor including locations of lay-down and storage areas for materials and equipment - location of environmental controls (such as erosion and sediment controls, spill kits etc) All site personnel must be inducted into the EMP. Sydney Water's employees and contractors will follow SWEMS0009. Attach SWEMS0009 to the CEMP. Should works change from the EIA, no further environmental assessment is required provided the change: - remains within the study area for the EIA and has no net additional environmental impact; or is outside the study area for the EIA but: • reduces impacts to biodiversity, heritage or human amenity; or • avoids engineering (for example, geological, topographical) constraints; and • after consultation with any potentially affected landowners and relevant agencies. If thi is to occur, D4C will demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives	Major	Rare	Low 6
Change management	Change of scope	Potential Harmful Environmental Impact	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	Increased clearing		Major	Possible	High 3		Major	Rare	Low 6
	Increase in excavation/ pipe locations		Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Incident Management	Non compliance with Sudney water incident management procedure	Potential infringement notice from regulator	Moderate	Possible	High 3		Moderate	Very Unlikely	Low 6
Topography, geology and soils									
Vegetation clearing and topsoil stripping	* Sediment laden runoff from disturbed areas	Reduced water quality in local waterways due to increased turbidity and sediment loading	Moderate	Possible	Medium 4	Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including: • develop a Water Quality, Erosion and Sediment Management Plan as part of the EMP • divert surface runoff away from disturbed soil and stockpiles • install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • inspect controls at least weekly and immediately after rainfall • rectify damaged controls immediately • remove controls once surfaces have been stabilised, including removing trapped sediment behind controls.	Moderate	Very Unlikely	Low 6
	* Diesel/fuel spills	Contamination of surface water by petroleum hydrocarbons	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Removal of noxious or environmental weeds	Inadequate disposal or spread of noxious and/or environmental weeds	Minor	Possible	Medium 5		Minor	Unlikely	Low 6

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			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
Earthworks	* Sediment laden runoff from disturbed areas	Reduced water quality in local waterways or stormwater due to increased turbidity and sediment loading	Moderate	Possible	Medium 4	Minimise ground disturbance and stabilise disturbed areas progressively. Contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption or is a commercially supplied material that is not waste. If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the contractor must ensure the conditions in that Order/Exemption are strictly adhered to. Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative (who will contact Property Environmental Services) to agree on proposed management approach. Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site. Sweep up any sediment/soil transferred off site at least daily, or before rainfall. Eliminate ponding and erosion by restoring natural landforms to the pre-works condition. Manage acid sulfate soils in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998). Prepare an Acid Sulfate Soils Management Plan (ASSMP) (if required).	Moderate	Very Unlikely	Low 6
	* Diesel/fuel spills	Contamination of surface and groundwater by petroleum hydrocarbons or unexpected contaminated land	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Mud tracking	Mud tracking on public roads resulting in road safety issues and community complaints	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Disturbance/ poor management of acid sulfate soils	Sulfuric acid generation leading to heavy metal leaching both of which have terrestrial and aquatic ecological impacts, including fish disease, kills, loss of food resource, reduced fish migration and recruitment potential, disturbance to water plant communities and secondary effects on water quality and potential human health risks	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Encountering unknown contaminated materials	Reduced land and soil conditions, potentially inhibiting growth of vegetation and land quality degradation	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Management of known contaminated materials identified at the work location.	Soil structure degradation and loss (including infrastructure instability)	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Loss of infrastructure integrity (i.e. corrosion).	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Risk to public health and worker safety	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Soil, surface and groundwater impacts associated with poor management and disposal of contaminated material.	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Potential breach of legislation including the Contaminated Land Management Act and POEO Act.	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Uncontrolled discharges of groundwater	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Culvert and drainage works	* Sediment laden runoff * Diesel/fuel spills	Reduced water quality in local waterways and stormwater due to increased turbidity and sediment loading	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Concrete slurry spills	Contamination of soils, surface and groundwater by petroleum hydrocarbons or unexpected contaminated land	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Groundwater seepage in excavations	Contamination of surface water by concrete slurry	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Flooding	Uncontrolled discharges of groundwater	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Services/ utilities relocation	* Sediment laden runoff from disturbed areas * Diesel/fuel spills	Reduced water quality in local waterways and stormwater due to increased turbidity and sediment loading	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6

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			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
	* Mud tracking	Contamination of soils, surface and groundwater by petroleum hydrocarbons or unexpected contaminated land	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Groundwater seepage in excavations	Uncontrolled discharges of groundwater	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Paving activities	* Hydrocarbon spills	Contamination of soil and/or surface water by petroleum hydrocarbons	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Operation of ancillary facilities, including e.g. chemical storage, refuelling.	* Diesel/fuel spills, including those resulting from maintenance activities	Contamination of soil and/or surface water by petroleum hydrocarbons	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Chemical spills	Contamination of soil and/or surface	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Water and drainage									
Stockpiling within flood prone areas	* Obstruction of flow paths and reduced capacity of floodplain to store floodwaters	Potential flooding impacts to people and property	Major	Unlikely	Medium 4	Use appropriate controls to avoid potential sedimentation to waterbodies (eg floatation boom). Bund potential contaminants and store on robust waterproof membrane, away from drainage lines. Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills and/or aquatic spill kit on site for clean-up of accidental chemical/fuel spills in mapped key fish habitat. Keep the spill kits stocked and located for easy access. Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas. Sydney Water will obtain a groundwater Water Supply Works Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NRAR will also be obtained. The D4C is responsible for complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes). Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible. Dewater excavations in accordance with the Delivery Management Guidance Standard 9.1 Excavation Dewatering (ENV-GS-001). Dewater excavations in waterways as follows: • Pumps used in waterways are to be screened with mesh of no greater than 6mm in diameter, • Daily checks of the sediment levels in the dewatering sediment dams are to be conducted to ensure adequate storage capacity, • Dewatering operations must ensure retention of spoil for a long enough period to allow mobilised sediments to settle out • A visual inspection of the waterway is to be conducted at all times during dewatering operations to ensure that no visible plumes are generated within the waterway from dewatering operations. If discharge to the environment is not possible, seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge to the wastewater system. Otherwise tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility. Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Bunded areas to have 110% capacity of the largest vessel stored and to be stored away from drainage lines. Chemicals and fuels in vehicles must be tightly secured. All chemicals to be clearly labelled. Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by. Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item. Prior to use at the site and/or entry into the waterway, machinery is to be	Major	Rare	Low 6
Ancillary sites within flood prone areas	* Obstruction of flow paths and reduced capacity of floodplain to store floodwaters	Potential flooding impacts to people and property	Major	Unlikely	Medium 4		Major	Rare	Low 6
Materials stockpiling e.g. mulch, topsoil, acid sulfate materials	* Tannin leachate runoff * Sediment laden runoff	Contamination of surface water by tannins	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Acidic surface or groundwater	Negative impact on aquatic ecosystems, i.e. habitat degradation, fish kills and weed invasion	Major	Possible	High 3		Major	Rare	Low 6
	* Strong winds	Reduced water quality in local waterways due to increased turbidity and sediment loading from unstabilised stockpiles	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Site access, including temporary waterway crossings (where required)	* Disturbance of creek beds * Over clearing in riparian areas * Fines from aggregate materials	Reduced water quality in local waterways due to increased turbidity and sediment loading	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Mud tracking	Adverse impact on aquatic ecosystems associated with waterway crossings or waterway diversions	Major	Possible	High 3		Major	Very Unlikely	Medium 5

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			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
	* Diesel/fuel spills	Contamination of surface water by petroleum hydrocarbons	Moderate	Possible	Medium 4	appropriately cleaned degreased and serviced. Spill kits are to be available on site at all times during the works. Prepare Drilling Fluid Management plan to avoid impacts, including: • contain and monitor drilling fluids at entry/exit points • identify and manage frac-outs • re-use and/or disposal of drilling fluids (checking waste classification). Silt curtains or a coffer dam should be deployed around instream work sites and stormwater outlet headwall construction zones where required. In addition to standard erosion and sediment control measures, to protect against any impacts to water quality. The stockpiling of sediment should be located as far away from the waterway as possible. Where natural banks exist (e.g. not constructed from gabions or lined with concrete), these banks should be reformed or remediated to resemble the pre-works condition and form to the fullest extent practicable. To the fullest extent practicable, minimise disturbance to any native vegetation, including aquatic vegetation within the study area. This may include the demarcation of areas of native vegetation to be retained during works. DPI Fisheries (1800 043 536) and the Environment Protection Authority (131 555) is to be notified immediately if any fish kills occur in the vicinity of the works. In such cases, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by DPI Fisheries and/or the Environment Protection authority for the works to proceed. The horizontal directional drilling/micro-tunneling process would include monitoring of the pressure of the drilling fluid to determine if there is a sudden decrease in pressure which indicates that a frac-out has occurred. An EMP would be prepared and include contingency measures to be implemented to respond to a frac-out. Any material removed from the waterway that is to be temporarily deposited or stockpiled on land is to be located well away from the waterway and to be contained by appropriate erosion and sediment control devices.	Moderate	Very Unlikely	Low 6
Earthworks	* Sediment laden runoff from disturbed areas	Reduced water quality in local waterways or stormwater due to increased turbidity and sediment loading	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Diesel/fuel spills	Contamination of surface and groundwater by petroleum hydrocarbons or unexpected contaminated land	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Mud tracking	Mud tracking on public roads resulting in road safety issues and community complaints	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Uncontrolled discharges of groundwater	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
Flooding	* Onset of flooding following rainfall in the catchment	Potential flooding impacts to people and property	Major	Unlikely	Medium 4		Major	Rare	Low 6
Flora and fauna									
Earthworks, including vegetation clearing	* Sediment laden runoff from disturbed areas	Loss of unexpected threatened ecological communities (TEC)/species	Major	Possible	High 3	Impacts to hollow-bearing trees should be avoided where possible. Should hollow-bearing trees need to be removed, it should occur in a two-stage process: • Stage 1: All surrounding vegetation to be cleared and grubbed • Stage 2: 24 to 48 hours later, the hollow-bearing trees to be inspected by an ecologist. If resident fauna is observed, the hollow section is to be lowered to the ground and the animal allowed to move on of its own volition. If injured, the fauna is to be taken to a WIRES carer or veterinarian for care. Stag watches should be undertaken no more than one week prior to the removal of hollow-bearing trees, to determine if hollow dependent microbats are residing in any hollows recorded within the study area. Appropriate 'No Go Zone' fencing should be installed around areas of high ecological value and around Illawarra Lowlands Grassy Woodlands or other threatened flora species if they become known. Underbore vegetation where possible, to reduce impacts. Avoid land containing moderate condition Illawarra Lowlands Grassy Woodland (PCT 838) and Illawarra Subtropical Rainforest EEC vegetation (PCT 1300) meeting EPBC Act and BC Act listing criteria and forming threatened fauna breeding and foraging habitat. Minimise vegetation clearance on land containing: • low condition Illawarra Lowlands Grassy Woodland (PCT 838), Illawarra Subtropical Rainforest EEC vegetation (PCT 1300) and Coastal freshwater lagoons of the Sydney Basin Bioregion • River Oak open forest of major streams, Sydney Basin Bioregion and South East Corner Bioregion (PCT 1105). Ensure appropriate vegetated riparian zones from the 'top of bank' are maintained for all waterways in the impact area, in accordance with the NSW Natural Resource	Major	Unlikely	Medium 4
	* Vehicular movements	Inadvertent loss of native vegetation/ fauna habitat identified to be protected	Major	Possible	High 3		Major	Unlikely	Medium 4
	* Vegetation clearing occurs outside the clearing limits	Terrestrial fauna mortality / injury	Major	Possible	High 3		Major	Unlikely	Medium 4
		Invasion of weeds	Minor	Possible	Medium 5		Minor	Very Unlikely	Low 6
		Reduced water quality in local waterways and loss of fish and aquatic habitat	Major	Possible	High 3		Major	Unlikely	Medium 4

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			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
Stockpiling	* Sediment laden runoff from disturbed areas	Loss of unexpected threatened TEC/species	Major	Unlikely	Medium 5	Regulator (NRAR). Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13). Residual impacts to native vegetation and trees will be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13). Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per SWEMS0015.26 Contractor Native Vegetation Clearing and Rehabilitation template. Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants. Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing. Adjust methodology (eg avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities). Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone. Potentially affected residents will be notified of any tree removal. Retain dead tree trunks, bush rock or logs in-situ unless they are in the disturbance corridor and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should inspect the removal and undertake fauna relocation. Inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence, including removal of hollow bearing trees, engage WIRES or a licenced ecologist to inspect and relocate fauna before works. If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES or a licenced ecologist if assistance is required to move fauna. Where possible, avoid impeding/blocking fish passage. Retain snags and natural obstructions in waterways where possible. If any threatened species (flora or fauna) is discovered during the works, stop work immediately and notify the Sydney Water Project Manager. Work will only recommence once the impact on the species has been assessed and appropriate control measures provided. If any damage occurs to vegetation outside of the disturbance corridor (as shown in the EMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed. On completion of the works all disturbed areas are to be remediated, as agreed with land owners and documented in the Home Plans. Manage biosecurity in accordance with: • Biosecurity Act 2015 (see NSW Weedwise), including reporting new weed infestations or invasive pests • contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility. Record Pesticides and Herbicides use in accordance with SWEMS0017. To prevent the spread of weeds: • clean all equipment including PPE prior to entering or leaving the work sites • wrap straw bales in geofabric to prevent seed spread. Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility. In TOBAN period: 1. Check specific TOBAN notice to confirm whether the work can be carried out under standard exemptions (Govt Gazette No18 Feb 2018). 2. If not, apply to RFS for specific exemption.	Major	Rare	Low 6
	* Vehicular movements	Inadvertent loss of native vegetation/ fauna habitat identified to be protected	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Stockpiling occurs outside allowable areas	Invasion of weeds	Minor	Possible	Medium 5		Minor	Very Unlikely	Low 6
	* Strong winds	Reduced water quality in local waterways and loss of fish and aquatic habitat	Major	Possible	High 3		Major	Rare	Low 6
Works around and within watercourse and aquatic environment	* Vehicular movements	Loss of unexpected threatened TEC/species	Major	Possible	High 3		Major	Very Unlikely	Medium 4
	* Vegetation clearing occurs outside the clearing limits	Inadvertent loss of native vegetation/ fauna habitat identified to be protected	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Sediment laden runoff from disturbed areas	Terrestrial fauna mortality / injury	Major	Possible	High 3		Major	Unlikely	Medium 4
		Invasion of weeds	Minor	Possible	Medium 5		Minor	Very Unlikely	Low 6
		Reduced water quality in local waterways and loss of fish and aquatic habitat	Major	Likely	High 3		Major	Unlikely	Medium 4

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			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
						1. Erosion and sediment mitigation devices are to be erected in a manner consistent with current Best Management Practice (i.e. Managing Urban Stormwater: Soils and Construction 4th Edition Landcom, 2004). To prevent entry of sediment into the waterway prior to any earthworks being undertaken. These are to be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal; 2. A habitat survey of the bed of the waterway at the crossing site should be conducted before the works. On filling the trench post works, the bed of the waterway should be returned to the pre-trenching condition. This will need to include the replacement of existing in water habitat types. I.e. if a pool is at the site prior to construction then that pool must be reinstated to the same level as it was before construction; 3. The temporary crossing is to be underlaid with geotech and the crossing and geotech are to be removed when the pipe laying activity is complete; 4. Banks of the waterway disturbed during construction are to be reseeded and revegetated with native species. It will not be sufficient to just lay jute matting and leave the bank to revegetate. Over time this will represent a significant risk of sediment input into the creek and Lake Illawarra downstream; and 5. All other conditions on the Fisheries.199 issued for under boring at this site (Our ref: C22/481, 8 August 2023) are adhered to during construction.			
Air and energy									
Earthworks, including vegetation clearing, materials processing	* Mud tracking	Loss of reusable material, such as topsoil and backfill material	Minor	Possible	Medium 5	Use alternatives to fossil fuels where practical and cost-effective. Track energy use as per SWEMS0015.28 Contractor NGER template. Maintain equipment in good working order, comply with the clean air regulations of the Protection of the Environment Operations Act 1997, have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions. Switch off vehicles/machinery when not in use. Implement measures to prevent offsite dust impacts, for example: • water exposed areas (using non-potable water source where possible such as water from excavation pits) • cover exposed areas with tarpaulins or geotextile fabric • modify or cease work in windy conditions • modify site layout (place stockpiles away from sensitive receivers) • vegetate exposed areas using appropriate seeding.	Minor	Unlikely	Low 6
	* Wind erosion	Mud tracking on public roads resulting in road safety issues and community complaints	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Poorly maintained equipment	Amenity impacts to sensitive receivers when dust is deposited on surfaces resulting in community complaints.	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Reduced water quality in local waterways when dust is deposited in waterways.	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
		Health and environmental impacts due to poorly maintained equipment	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
Stockpiling, material loading and material haulage	* Mud tracking	Mud tracking on public roads resulting in road safety issues and community complaints	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Wind erosion, including from strong winds	Amenity impacts to sensitive receivers when dust is deposited on surfaces resulting in community complaints.	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
	* Poorly maintained equipment	Reduced water quality in local waterways when dust is deposited in waterways.	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
		Health and environmental impacts due to poorly maintained equipment	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
Waste management and hazardous materials									
Demolition	* Demolition waste including pipe work and pavements.	Inappropriate disposal of waste	Moderate	Possible	Medium 4	Manage waste in accordance with relevant legislation and maintain records to show compliance eg waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report. Provide adequate bins for general waste, hazardous waste and recyclable materials. Minimise stockpile size and ensure delineation between different stockpiled	Moderate	Very Unlikely	Low 6
		Greenhouse gas emissions due to consumption of energy from non-renewable resources, such as diesel.	Minimal	Very Likely	Medium 4		Minimal	Likely	Medium 5

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ACTIVITY / ASPECT	HAZARD / SOURCE OF IMPACT	IMPACT	SYDNEY WATER PRE-CONTROL RISK			MITIGATION MEASURES	SYDNEY WATER POST-CONTROL RISK		
			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
		Cross-contamination of waste	Minor	Possible	Medium 5	materials. Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the Waste Avoidance and Resource Recovery Act 2001. Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility. Prevent pollutants from escaping, including covering skip bins. Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility. Stop works and notify the Sydney Water Project Manager if any contamination (eg asbestos, discoloured soil, chemical or petrol odours, refuse or leachate) is discovered. If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607. Contact Sydney Water Project Manager (who will consult with Property Environmental Services (propertyenvironmental@sydneywater.com.au).	Minor	Unlikely	Low 6
Clearing and grubbing	* Green waste	Inappropriate disposal of waste	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Waste received on site unlawfully	Moderate	Unlikely	Medium 5		Moderate	Rare	Low 6
		Greenhouse gas emissions due to consumption of energy from non-renewable resources, such as diesel.	Minimal	Very Likely	Medium 4		Minimal	Likely	Medium 5
Site establishment and general works, including at ancillary facility sites	* Surplus material. * Packaging materials from items delivered to the site, such as pallets, crates. * General office wastes generated by onsite personnel, such as paper, cardboard, beverage containers and food wastes. * Effluent generated at site amenities during works. * Operation of site compounds and lighting.	Inappropriate disposal of waste	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Litter	Minimal	Possible	Low 6		Minimal	Possible	Low 6
		Excessive packaging on products delivered to site.	Minimal	Possible	Low 6		Minimal	Possible	Low 6
		Excessive paper use.	Minimal	Possible	Low 6		Minimal	Unlikely	Low 6
		Paper from office cross-contaminated with food waste.	Minimal	Possible	Low 6		Minimal	Unlikely	Low 6
		Over-ordering of materials resulting in waste.	Minimal	Possible	Low 6		Minimal	Unlikely	Low 6
		Greenhouse gas emissions due to consumption of energy from non-renewable resources, such as diesel.	Minimal	Very Likely	Medium 4		Minimal	Likely	Medium 5
		Waste received on site unlawfully	Moderate	Unlikely	Medium 5		Moderate	Rare	Low 6
		Cross-contamination of waste	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
Earthworks	* Soil and rock, unable to be reused. * Exposure of contaminated soils.	Inappropriate disposal of waste	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Inefficient use of available resources.	Minimal	Possible	Low 6		Minimal	Unlikely	Low 6
		Greenhouse gas emissions due to consumption of energy from non-renewable resources, such as diesel.	Minimal	Very Likely	Medium 4		Minimal	Likely	Medium 5
		Waste received on site unlawfully	Moderate	Unlikely	Medium 5		Moderate	Rare	Low 6
		Increased greenhouse gas emissions due to the purchase of non-local products/services.	Minimal	Possible	Low 6		Minimal	Possible	Low 6
		Spread of contaminated waste	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
Plant and vehicle maintenance	* Waste fuel, oil and chemical containers.	Inappropriate disposal of waste	Moderate	Possible	Medium 4		Moderate	Very Unlikely	Low 6
		Cross-contamination of waste	Minor	Possible	Medium 5		Minor	Unlikely	Low 6
Aboriginal and non-Aboriginal heritage									
Earthworks (topsoil, new and existing concrete, fill), including vegetation clearing	* Ground disturbance, clearing, vibration from plant and equipment, non-adherence to exclusion zones, vehicle movement	Damage/impacts to known heritage item/site	Major	Possible	High 3	All work is to be conducted within the assessed corridor. All vehiclular access is to be along the nominated tracks only.	Major	Very Unlikely	Medium 5
		Damage to unknown heritage item	Major	Very Unlikely	Medium 4		Major	Rare	Low 6

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ACTIVITY / ASPECT	HAZARD / SOURCE OF IMPACT	IMPACT	SYDNEY WATER PRE-CONTROL RISK			MITIGATION MEASURES	SYDNEY WATER POST-CONTROL RISK		
			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
Stockpiling, site compound use, loading and haulage	* Ground disturbance, over-clearing, vibration from plant and equipment, non-adherence to exclusion zones, vehicle movement	Damage/impacts to known heritage item/site	Major	Possible	High 3	The Mt Kiera Osbourne Wallsend Tramway shall be clearly deligneated and sign posted as a no-go zone. Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location. Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works. All works are to be planned, managed and monitored as per SWC Heritage Compliance Procedure SWEMS0031. If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify the Project Environmental Coordinator, to determine is recording of the object is required All site personnel must be inducted by a heritage specialist before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, processes and measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.	Major	Very Unlikely	Medium 5
		Damage to unknown heritage item	Major	Very Unlikely	Medium 4		Major	Rare	Low 6
Water and sewer network adjustment, upgrade, and replacement	* Ground disturbance, vibration, non-adherence to exclusion zones, vehicle movements	Damage/impacts to known heritage item/site	Major	Possible	High 3		Major	Very Unlikely	Medium 5
		Damage to unknown heritage item	Major	Very Unlikely	Medium 4		Major	Rare	Low 6
Maintenance of Sydney Water facility	* impact (mechanical or vibration) to known heritage structure or building	Damage/impacts to known heritage item/site	Major	Possible	High 3		Major	Very Unlikely	Medium 5
Piling	* Ground disturbance, vibration, non-adherence to exclusion zones, vehicle movements.	Damage/impacts to known heritage item/site	Major	Possible	High 3		Major	Very Unlikely	Medium 5
		Damage to unknown heritage item	Major	Very Unlikely	Medium 4		Major	Rare	Low 6
Noise and vibration									
Mobilisation and site establishment	* Noise and vibration generated during mobilisation and site establishment, including utility diversions.	Noise from mobilisation and site establishment activities causes disturbance and leads to community complaints	Moderate	Possible	Medium 5	Works must comply with the Construction Noise Guideline (Draft, 2021), including schedule work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sundays or public holidays. The Proposal will also be carried out in accordance with Sydney Water's Noise Management Procedure SWEMS0056. All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts. Incorporate standard daytime hours noise management safeguards into the EMP: • identify and consult with the potentially affected residents prior to the commencement: •describe the nature of works; the expected noise impacts; approved hours of work; duration, complaints handling and contact details. •determine need for, and appropriate timing of respite periods (eg times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for works near residences) • implement a complaints handling procedure for dealing with noise complaints • plant or machinery will not be permitted to warm-up near residential dwellings before the nominated working hours. • appropriate plant will be selected for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers) • engine brakes will not be used when entering or leaving the work site(s) or within work areas. • regularly inspect and maintain equipment in good working order • arrange work sites where possible to minimise noise (eg generators away from	Moderate	Very Unlikely	Low 6
		Vibration from mobilisation and site establishment works causes disturbance or damage to structures and leads to community complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
Earthworks	* Noise and vibration generated during earthworks	Noise from earthworks causes disturbance and leads to community complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
		Vibration from excavation or compaction works causes disturbance or damage to structures and leads to community complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
Drainage works	* Noise and vibration generated during drainage works	Noise from drainage works causes disturbance and leads to community complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6

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ACTIVITY / ASPECT	HAZARD / SOURCE OF IMPACT	IMPACT	SYDNEY WATER PRE-CONTROL RISK			MITIGATION MEASURES	SYDNEY WATER POST-CONTROL RISK		
			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
		Vibration from drainage works causes disturbance or damage to structures and leads to community complaints	Moderate	Possible	Medium 5	sensitive receivers, minimise use of vehicle reversing alarms). • schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active). If works beyond standard daytime hours are needed, the D4C would: • justify the need for out of hours work (OOHW) and why it is not possible to carry out the works during standard daytime hours • consider potential noise impacts and implement the relevant standard daytime hours safeguards; Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and other reasonable and feasible management measures • identify community notification requirements • seek approval from the Environmental Representative prior to endorsement from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives. If night works are needed, the Contractor would: • justify the need for night works • consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and document consideration of all reasonable and feasible management measures • identify community notification requirements (ie for scheduled night work (not emergency works)), • notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work. • seek approval from the Environmental Representative prior to endorsement from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives. If works on Sundays or public holidays are required, the Contractor would: • justify why all other times are not feasible • consider potential noise impacts and, implement relevant standard daytime, out of hours and night-time safeguards and other reasonable and feasible management measures • identify community notification requirements • seek approval from the Environmental Representative prior to endorsement from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives. Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures.	Moderate	Very Unlikely	Low 6
Rehabilitation / landscaping (finishing works)	* Noise and vibration from rehabilitation / landscaping works	Noise from works causes disturbance and leads to community complaints	Moderate	Unlikely	Medium 5		Moderate	Very Unlikely	Low 6
		Vibration from works causes disturbance or damage to structures and leads to community complaints	Moderate	Unlikely	Medium 5		Moderate	Very Unlikely	Low 6
Out of Hours works	* Noise outside of standard hours	Noise from works carried out outside of the standard hours results in community complaints	Moderate	Likely	High 3		Moderate	Possible	Medium 5
		Vibration from out of hour works results in community complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
Stockpiling and other activities associated with the operation of ancillary facilities.	* Noise and vibration from plant operations.	Extended operations of noise intensive activities at ancillary activities results in complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
		Vibration generated by compaction works or other vibration intensive works results in complaints	Moderate	Possible	Medium 5		Moderate	Very Unlikely	Low 6
Traffic and access									
All works	* Vehicles movements, deliveries of materials and access restrictions	Works impacts on traffic and local roads	Minor	Likely	Medium 4	Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority. Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100m of traffic signals when construction commences. Minimise traffic impacts near residential properties, schools and businesses by consulting with them (eg no major materials deliveries at school drop off or pick up times etc.).	Minor	Unlikely	Low 6

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ACTIVITY / ASPECT	HAZARD / SOURCE OF IMPACT	IMPACT	SYDNEY WATER PRE-CONTROL RISK			MITIGATION MEASURES	SYDNEY WATER POST-CONTROL RISK		
			CONSEQUENCE	LIKELIHOOD	RISK RATING		CONSEQUENCE	LIKELIHOOD	RISK RATING
		Works impacts on pedestrians and cyclists	Minor	Likely	Medium 4	Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycles, pram and wheelchair access. Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required. Erect signs to inform road users of the proposed works and any temporary road closures. Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided. The Construction Contractor will consult with relevant waterway authority for waterway access.	Minor	Unlikely	Low 6

Risk Matrix

Sydney WATER

	Public health	Injury/Illness	Reputation	Environment	Compliance	Financial loss	Customer & Community	Performance	Rare	Very Unlikely	Unlikely	Possible	Likely	Very Likely
	Exposure to unsafe product (acute, contaminant, chronic contaminant or hazardous material)	Harm to health and wellbeing (including psychological harm) of employees, contactors, members of public	Impact to our brand and/or reputation in terms of stakeholders, customers and trust	Adverse effect on flora, fauna, soil, waterways, resources, air quality Harm to natural and/or cultural heritage (including Aboriginal objects and Aboriginal places	Breach of legal or regulatory compliance	Financial losses or unrecoverable expenditure is incurred	Disruption to and/or cost associated with loss or damage to customer, community & developers	Impact on achieving strategic initiative Project performance impacts achieving program benefits and delivery	A very distant chance of occurring under exceptional circumstances	Not expected to occur	More likely to not occur, surprised if it happens	Might occur in some circumstances	Will occur in most circumstances	Expected to occur frequently
									< 0.004	0.004 to 0.02	0.02 to 0.1	0.1 to 0.5	0.5 to 2.5	> 2.5
									< 1 in 250	1 in (250 to 50)	1 in (50 to 10)	1 in (10 to 2)	1 in (2 to 0.4)	> 1 in 0.4
									< 0.4%	0.4% to 2%	2% to 10%	10% to 50%	50% to 90%	> 90%
Extreme	• Exposure of whole drinking water supply delivery system or high exposure recycled water schemes to an Acute Hazard.	• Multiple Fatalities.	• Government enquiry or extended, negative, continuous national/international media coverage >1 week. • Loss of customer trust.	• Irreversible harm to a high value/significant or highly sensitive receiving environment. • Irreversible wilful harm to state/nationally/world listed heritage or wilful desecration to registered Aboriginal cultural heritage.	• Loss of operating licence. • High impact prosecution due to wilful act.	• >$250m	• >$125m in customer or community loss/damage • Loss of service/product reliability of >200,000 customer days	• Majority of corporate/enterprise objectives/benefits not achieved. • Majority of project objectives not achieved which are essential for program outcomes. • Level 1 & 2 Projects: $250M cost change or schedule change of >12 months. • Level 3 & 4 Projects: > $25M cost change or schedule change of >12 months.	**Medium**	**High**	**High**	**Very High**	**Very High**	**Very High**
Critical	• For a drinking water supply system or a recycled water scheme: Exposure of large numbers of people (>10,000 but not meeting Extreme criterion) to an Acute Hazard, or • For biosolids or recreational water: Exposure of >10,000 people annually to an Acute Hazard.	• Single Fatality.	• Ministerial intervention or extended, negative, continuous national/Sydney metro and social media coverage >3 days. • Decrease in customer trust.	• Long term event, requires extensive environmental remediation effort for 1 month or more. • Significant biodiversity damage (acute or long term) to a high value/significant or highly sensitive receiving environment. • Negligent harm to state/nationally/world listed heritage or desecration to registered Aboriginal cultural heritage.	• Government intervention. • High-profile prosecution due to negligence.	• $50m to $250m	• $25m to $125m in customer or community loss/damage • Loss of service/product reliability of 40,000 to 200,000 customer days	• Multiple corporate/enterprise objectives/benefits not achieved. • Multiple project objectives not achieved which are essential for program outcomes. • Level 1 & 2 Projects: $50M - $250M cost change or schedule change of 6 to 12 months. • Level 3 & 4 Projects: $5M - $25M cost change or schedule change 6 to 12 months.	**Medium**	**Medium**	**High**	**High**	**Very High**	**Very High**
Major	• For a drinking water supply system or recycled water scheme: Exposure of <10,000 people to an Acute Hazard, or • >10,000 people or whole of supply system repeatedly exposed to Chronic Hazard, or • For biosolids or recreational water: Exposure of <10,000 people annually to an Acute Hazard.	• Permanent total disability/loss of capacity.	• Ministerial interest or unbalanced, primarily Sydney metro and social media coverage >24 hours. • Widespread complaints or multiple escalated complaints to Minister or ombudsman.	• Medium term reversible pollution, requires substantial environmental remediation (multiple weeks). • Major biodiversity damage, harm to a high value/significant or sensitive receiving environment. • Major adverse impact to state and local-listed heritage or significant harm to registered Aboriginal cultural heritage.	• Regulatory sanction (Multiple statutory fines, Enforceable Undertaking). • Low level prosecution.	• $10m to $50m	• $5m to $25m in customer or community loss/damage • Loss of service/product reliability of 8,000 to 40,000 customer days	• Majority of Group objectives/benefits not achieved. • Majority of project objectives not achieved which are important for program outcomes. • Level 1 & 2 Projects: $10M - $50M cost change or schedule change of 3 to 6 months. • Level 3 & 4 Projects: $1M - $5M cost change or schedule change of 3 to 6 months.	**Low**	**Medium**	**Medium**	**High**	**High**	**Very High**
Moderate	• For a drinking water supply system, recycled water scheme, recreational water or biosolids: Repeated exposure of <10,000 people to Chronic Hazard in a year.	• Immediate admission to hospital as an inpatient and/or permanent partial disability/loss of capacity.	• Local MP interest and/or local media and social media coverage >24 hours. • Multiple and repeated customer complaints.	• Short term reversible pollution, requires some environmental remediation (1 week). • Harm to local high value/significant or sensitive environment. • Damage to locally listed heritage or partial harm to registered Aboriginal cultural heritage.	• Ministerial requirement due to Operating Licence non-compliance. • Regulatory sanction (statutory fine, Penalty Infringement Notice).	• $2m to $10m	• $1m to $5m in customer or community loss/damage • Loss of service/product reliability of 1,600 to 8,000 customer days	• Majority of business objectives/benefits not achieved. • Multiple project objectives not achieved which are important for program outcomes. • Level 1 & 2 Projects: $2M - $10M cost change or schedule change of 1 to 3 months. • Level 3 & 4 Projects: $200K - $1M cost change or schedule change of 1 to 3 months.	**Low**	**Low**	**Medium**	**Medium**	**High**	**High**
Minor	• Isolated sample(s) above Chronic Hazard guideline values. No trend.	• Treatment by a registered medical practitioner requiring ongoing treatment with no permanent disability/loss of capacity.	• Balanced coverage (i.e. includes Sydney Water's position) <24 hours. • Some customer complaints.	• Temporary pollution, requires some environmental remediation (days). • Localised harm to a natural environment, impact minimal to overall biodiversity value and plant and/or animals. • Minor adverse impact to heritage values or unregistered Aboriginal objects.	• Minor corrective action or additional business requirement imposed.	• $400,000 to $2m	• $200,000 to $1m in customer or community loss/damage • Loss of service/product reliability of 320 to 1,600 customer days	• Minority of business objectives/benefits not achieved. • Minority of project objectives not achieved which are desirable for program outcomes. • Level 1 & 2 Projects: $400k - $2M cost change or schedule change of 2 weeks to 1 month. • Level 3 & 4 Projects: $40k - $200k cost change or schedule change of 2 weeks to 1 month.	**Low**	**Low**	**Low**	**Medium**	**Medium**	**High**
Minimal	• Sample(s) above operational target(s). No trend.	• Recoverable injury or illness requiring first aid or medical treatment with no follow up required.	• One-off informative media coverage. • Some customer contacts.	• Temporary pollution contained with controls. • Insignificant, naturally reversible biodiversity damage. • Trivial/negligible impact to potential heritage value or unregistered Aboriginal objects.	• Technical compliance issue or breach with no material impact.	• <$400,000	• <$200,000 in customer or community loss/damage • Loss of service/product reliability of <320 customer days	• Very few/limited business objectives/benefits not achieved. • Very few/limited project objectives not achieved which are desirable for program outcomes. • Level 1 & 2 Projects: < $400k cost change or schedule change of < 2 weeks. • Level 3 & 4 Projects: < $40k cost change or schedule change of < 2 weeks.	**Low**	**Low**	**Low**	**Low**	**Medium**	**Medium**

Appendix 6 – Environmental Control Plans (ECPs)

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Water Quality, Erosion and Sediment Environmental Control Plan

Document No: IN.20036851-V-PLN-0002

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0002**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	Update to capture requirements of MCoA E6(a)(ii) post DPIE review of Rev 0	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Water Quality, Erosion and Sediment Environmental Control Plan are to:

- Minimise the risk of increased erosion and/or sediment deposition on the surrounding environment;
- Introduce appropriate measures to prevent surface and groundwater degradation;
- Ensure compliance with all contractual and legislative requirements; and
- Through all of the above, reduce the impact of construction activities on the environment.

3.0 Performance Criteria

3.1 General

1. Construction activities undertaken in accordance with this ECP.
2. All sites stable with no uncontrolled sediment leaving the worksite.
3. Compliance with relevant contractual requirements, legislation, standards and codes.
4. Watercourses protected to prevent deterioration, sedimentation and contamination.
5. Vegetation retained to the fullest extent possible – where vegetation is to be cleared, erosion controls are immediately implemented.
6. The Project embodies and promotes a positive, responsible image and practices to the Client and observing community.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection & Biodiversity Conservation Act 1999	• Protection of the Environment Operations Act 1997 • Water Management Act 2000 • Water Management (General) Regulation 2018 • Protection of the Environment Operations (General) Regulation 2009	• Best Practice Erosion and Sediment Control (IECA, 2008) • Managing Urban Stormwater: Soil and Construction (Landcom, 2004) (‘Blue Book’) • Managing Urban Stormwater: Soil and Construction Volume 2a Installation of Services (DECCW 2009) • Australia and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council, 2000)	• Sydney Water Guidance Standard Erosion and Sediment Control (ENV-GS-006 9.6) • D4C Global Mandatory Requirement No.09 Environment Management • Sydney Water Guidance Standard Environmental Restoration Management (ENV-GS-005 9.5) • Sydney Water Land Management procedure (SWEMS0147) • Sydney Water Discharge Protocol (WPIMS5021) • Sydney Water Water Quality Management During Operational Activities (D0001667)

		• AS/NZS 5667.1:1998 – Water quality – Sampling – Guidelines on the design of sampling programs, sampling techniques and the preservation and handling of samples • AS/NZS 5667.12:1998 – Water quality – Sampling – Guidance on sampling bottom sediments • AS/NZS 5667.11:1998 – Water quality – Sampling – Guidance of sampling of groundwaters	• Sydney Water Guidance Standards Excavation Dewatering (ENV-GS-001 9.1) • Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).

4.2 Definitions & Abbreviations

• SW – Sydney Water • D4C –Delivering for Customers • CL – Construction Lead • Sup – Supervisor • PEC – Project Environmental Coordinator • Eng – Engineer • Des - Designer	• JH – John Holland • SEP – Site Environmental Plan • EMP – Environmental Management Plan • ECP – Environmental Control Plan • EPA – Environmental Protection Authority • OEH – Office of Environment and Heritage • WQO – Water Quality Objectives • SDS – Safety Data Sheet

5.0 Water Quality, Erosion and Sediment Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Develop a Site (or area) specific SEP highlighting the construction limits of works and locations of site wide erosion and sediment controls as well as environmental constraints.	PEC	Workplace Planning
2.	Ensure the design and installation of erosion and sediment control devices is in accordance with the SEP, Civil Drawings and Landcom 'Blue Book' Managing Urban Stormwater - Soils and Construction Vols 1 (Landcom, 2004) and Sediment Control Guidelines.	PEC/Eng	Workplace Planning
3.	Ensure erosion and sediment control measures are determined through consideration of: • 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.	PEC/Eng	Workplace Planning
4.	Works will limit as far as practicable the disturbance of vegetation, waterways and drainage lines	PEC	Workplace Planning

5.	All crossings of Category 1 watercourses, dynamic watercourses, highly erodible soils and key fish habitats shall be under-bored unless otherwise agreed by the Director-General in consultation with the NOW and Fisheries NSW as appropriate	Des/Eng	Workplace Planning
6.	All watercourse crossings (vehicle access and pipeline crossings) shall be designed by a suitably qualified person and the design and measures shall generally be prepared and implemented in accordance with the *NOW's Guidelines for Controlled Activities, (NSW Fisheries, 2004)* and *Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2004)*);	Des/Eng	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for water quality and erosion & sediment management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Awareness of potential impacts to surface water and waterways • Protocols relating to stormwater, groundwater, construction water and spent hydrotest water management, including the requirement for water quality validation prior to recycling or re-use and prior to discharge from Site to the environment. • Description of the mechanisms by which erosion and sedimentation occur, and the associated environmental impacts • The use of erosion and sediment control devices to mitigate impacts, and ideal operation of these devices • The requirement for erosion and sediment control devices to be implemented and maintained in accordance with Site Environment Plans.	PEC	Project Delivery
2.	All personnel involved in discharge of surface water from site will be appropriately trained including in monitoring, treatment and discharge requirements.	PEC	Project Delivery
3.	Surface water and erosion & sediment control toolbox talks will be implemented as relevant and required to reinforce information provided during site inductions.	PEC	Project Delivery
No.	**Site Preparation/Clearing**		
1.	Clearing limits must be clearly identified and physically demarcated.	PEC/Eng/Sup	Workplace Planning
2.	Vegetation to be protected/retained shall be clearly marked and identifiable both on an SEP and physically.	PEC/Eng/Sup	Workplace Planning
3.	Clearing shall be planned in accordance with approved design documentation and further minimised – retaining grass and other vegetation to the fullest extent practicable.	PEC/Eng/Sup	Project Delivery
4.	A vegetation disturbance permit must be completed prior to any clearing works commencing	PEC/Eng/Sup	Prior to Clearing
5.	Stabilised construction access/egress points shall be installed.	PEC/Eng/Sup	Project Delivery

6.	The planning and staging of any clearing of vegetation shall be implemented so as to reduce the potential for erosion and sediment movement, reducing dependency on erosion and sediment controls.	PEC/Eng/Sup	Project Delivery
7.	Where practicable, clearing shall occur immediately prior to construction activities to minimise the potential for erosion.	PEC/Eng/Sup	Project Delivery
	Plant movement and access	**Staff Responsible**	**When**
1.	Should they be identified as being required: All watercourse crossings (vehicle access and pipeline crossings) shall be designed by a suitably qualified person and the design and measures shall generally be prepared and implemented in accordance with the *NOW's Guidelines for Controlled Activities, (NSW Fisheries, 2004)* and *Why Do Fish Cross Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2004)*);	PEC/Eng/Sup	Project Delivery
2.	D4C Mandatory Requirements 9 – Minimise dust, noise and vibration at all times and work within approved site working hours	PEC/Eng/Sup	Project Delivery
3.	Mobile plant and vehicles, including deliveries must use designated travel routes, site access routes, site access tracks and lay down areas.	All personnel	Project Delivery
4.	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	Project Delivery
5.	Access roads to be clearly sign posted. Location of access roads to be marked on SEP.	PEC/Eng/Sup	Project Delivery
6.	Whilst on site, vehicles to remain on the designated roadways and observe the site speed limits.	All personnel	Project Delivery
7.	No plant or machinery is to work in flowing waterways unless authorised by relevant government waterway or fisheries authority.	All personnel	Project Delivery
8.	During periods of wet or hot and dry conditions, suitable construction activities and plant movements to be considered such as to minimise the movement of vehicles on site during these periods.	All personnel	Project Delivery
9.	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.	PEC/Eng/Sup	Project Delivery
	General Requirements	**Staff Responsible**	**When**
1.	When working in or over water, within flood affected areas or intersecting groundwater, controls must be in place and maintained to prevent pollution.	PEC/Eng/Sup	Project Delivery
2.	Except as may be provided by an EPL, the project shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters.	PEC/Eng/Sup	Project Delivery
3.	Where practical, upslope water diversion controls must be in place to prevent water entering the work area to minimise erosion and prevent pollution.	PEC/Eng/Sup	Project Delivery

4.	D4C Mandatory Requirements 9 Implement all drainage, sediment, erosion, spill response and water quality controls prior to commencing work	PEC/Eng/Sup	Project Delivery
5.	D4C Mandatory Requirements 9 Maintain and review drainage, erosion and sediment controls as works progress.	PEC/Eng/Sup	Project Delivery
6.	Drain protection controls are to be removed prior to the onset of heavy rain or where there is a risk of flooding	PEC/Eng/Sup	Project Delivery
7.	Erosion and sediment controls shall be cleaned or replaced prior to accumulated sediments and obstructions reducing their effective operating capacity by 60%.	PEC/Eng/Sup	Project Delivery
8.	Removed sediment to be added to existing stockpiles, redistributed to land outside of overland flow paths or appropriately disposed form Site.	PEC/Eng/Sup	Project Delivery
9.	Sediment controls that are damaged or otherwise rendered ineffective shall be immediately replaced.	PEC/Eng/Sup	Project Delivery
10.	Prolonged 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.	PEC/Eng/Sup	Project Delivery
11.	Erosion and sediment control decisions shall be made to encompass reasonable and practical prevention, and will consider the receiving environment, water quality objectives, quality and quantity of water, location and accessibility, and other requirements.	PEC/Eng/Sup	Project Delivery
12.	The PEC will provide direction for the location, installation, maintenance and removal of erosion and sediment control devices in accordance with this ECP and other associated ECPs. Control devices shall remain in place until approval is given for their removal by the PEC.	PEC/Eng/Sup	Project Delivery
13.	All crossings of Category 1 watercourses, dynamic watercourses, highly erodible soils and key fish habitats shall be under-bored unless otherwise agreed by the Director-General in consultation with the NOW and Fisheries NSW as appropriate.	PEC/Eng/Sup	Project Delivery
	Stockpiling, Stabilisation, Rehabilitation and De-mobilisation	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9 Assess and, if required, classify spoil and waste prior to being lawfully removed and disposed.	PEC/Eng/Sup	Project Delivery
2.	No temporary construction stockpiles to be located within drainage lines	PEC/Eng/Sup	Project Delivery
3.	Topsoil is to be stripped, stockpiled and replaced immediately after backfilling has taken place.	Eng/Sup	Project Delivery
4.	Topsoil is not to be stockpiled higher than 2m nor covered in an impervious cover	Eng/Sup	Project Delivery
5.	Soils are to be excavated and stockpiled separately, this will aid with the rehabilitation and restoration on completion	Eng/Sup	Project Delivery
6.	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.	PEC/Eng/Sup	Project Delivery

7.	Long term stockpiles, batters and other erosion sensitive areas shall be adequately stabilised through velocity reduction covering, grassing, vegetation, soil binding, water diversion or other as appropriate.	PEC/Eng/Sup	Project Delivery
8.	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.	PEC/Eng/Sup	Project Delivery
9.	The project shall minimise impacts on riparian corridors to the greatest extent practicable. Where disturbance is unavoidable, these shall be rehabilitated to their pre-construction condition, including ground, shrub and canopy strata, where appropriate. All seed and plant material shall be sourced from species of local provenance where practicable	PEC/Eng/Sup	Project Delivery
10.	All watercourse beds and banks impacted during construction shall, as a minimum, be rehabilitated to their pre-construction condition, or, where it is consistent with the project objectives, improved to more closely reflect the pre-disturbance state.	PEC/Eng/Sup	Project Delivery
11.	Vegetation to be progressively re-established as soon as practicable to prevent erosion and slope degradation during construction.	PEC/Eng/Sup	Project Delivery
12.	Revegetation species shall be approved by the appropriate Client representative and be in accordance with offsetting requirements.	PEC/Eng/Sup	Project Delivery
13.	Erosion and sediment controls shall remain in place until 70% or more of natural ground cover has recovered.	PEC/Eng/Sup	Project Delivery
14.	All cleared areas to be stabilised/restored as soon as practicable following completion.	PEC/Eng/Sup	Project Delivery
	Materials Handling and Storage	**Staff Responsible**	**When**
1.	When planning the location of facilities, plant laydown areas, refuelling areas, stockpiles or chemical storage, areas that drain towards surface water or stormwater systems must be avoided in order to minimise risk of pollution.	PEC/Eng/Sup	Workplace Planning
2.	D4C Mandatory Requirements 9, Store, handle, use and dispose of waste and hazardous substances in a manner that minimises environmental impact.	All personnel	Project Delivery
3.	Spill kits and fire response equipment must be located where chemicals and fuelled plant or equipment is being stored, operated or maintained.	All personnel	Project Delivery
4.	Refuelling shall wherever practicable occur in designated hardstand areas or over appropriate bunds.	All personnel	Project Delivery
5.	Where refuelling of mobile plant in the field is required, it shall take place on level ground, an appropriate distance from watercourses and shall be accompanied by a spotter and suitable spill kit. Measures shall be taken to contain fuel drip during transfer.	All personnel	Project Delivery
	De-watering and Discharge	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9, Do not discharge water without a discharge permit.	PEC/Eng/Sup	Prior to water discharge

2.	All dewatering systems must be planned and monitored to avoid spills, overflows and pollution.	PEC/Eng/Sup	Project Delivery
3.	All runoff emanating from the site must be effectively filtered or otherwise treated so that the water quality meets water discharge limits.	PEC/Eng/Sup	Project Delivery
4.	All stormwater drainage inlets and other discharge points where there is potential for sedimentation to occur as a result of construction activity shall be protected by geofabric, sandbags or other effective means as appropriate.	PEC/Eng/Sup	Project Delivery
5.	Groundwater encountered during construction will be pumped out of the work area into a contained area, tested and if necessary, appropriately treated, prior to re-use, appropriate discharge or disposal.	PEC/Eng/Sup	Project Delivery
6.	No discharge of ponded water is to occur unless the water quality is within project WQO limits set out in the dewatering permit. Where compliance with WQOs is not met, water shall be treated as per detail in Section 6.0. Field testing by the PEC shall record compliance with project WQOs prior to discharge.	PEC/Eng/Sup	Project Delivery
	Groundwater	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9 Implement all drainage, sediment, erosion, spill response and water quality controls prior to commencing work.	Eng/Sup	Prior to Dewatering
2.	All Groundwater Pumping is to be conducted as per Dewatering ECP and the WSWA conditions of Approval.	Eng/Sup	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	General observations for the daily management of erosion and sediment controls shall be documented in site dairies.	PEC/Eng/Sup	Daily during Project Delivery
2.	Regular inspection of erosion and sediment controls shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow and/or SWDeliveryPortal.	PEC/Eng/Sup	Weekly and prior to forecast and after storm events >10mm
3.	Effectiveness of erosion and sediment controls shall be regularly reviewed for adequacy having regard for changing circumstances.	PEC/Eng/Sup	Regularly during Project Delivery
4.	Prior to any off-site discharge, water to be tested and adjusted as appropriate to meet WQO limits. Records to be maintained in ComplyFlow or InEight document portal	PEC/Eng/Sup	Prior to discharge
5.	Water quality monitoring results to be maintained in ComplyFlow and made available to relevant parties upon request.	PEC	As required
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery

2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incident details shall be entered into SW Delivery Portal and Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002).	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident

8.0 Ministers Conditions of Approval addressed in this plan	
No	**MCoA Conditions**
C5.	Except as may be provided by an EPL, the project shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters.
C6.	All crossings of Category 1 watercourses, dynamic watercourses, highly erodible soils and key fish habitats shall be under-bored unless otherwise agreed by the Director-General in consultation with the NOW and Fisheries NSW as appropriate.
C7.	All watercourse beds and banks impacted during construction shall, as a minimum, be rehabilitated to their pre-construction condition, or, where it is consistent with the project objectives, improved to more closely reflect the pre-disturbance state.
C8.	The project shall minimise impacts on riparian corridors to the greatest extent practicable. Where disturbance is unavoidable, these shall be rehabilitated to their pre-construction condition, including ground, shrub and canopy strata, where appropriate. All seed and plant material shall be sourced from species of local provenance where practicable.
C9.	Soil and water management measures consistent with Managing Urban Stormwater - Soils and Construction Vols 1 (Landcom, 2004) shall be employed during the construction to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters.
E6.	As well as the general requirements of an EMP as outlined in condition E5, the following shall be addressed: (a) Soil and Water (i) identification of management measures consistent with Managing Urban Stormwater - Soils and Construction Vols 1 (Landcom, 2004) to be employed during construction to minimise soil erosion, discharge of sediment and other pollutants to land and/or waters, spoil and fill material management; dewatering and disposal procedures; and measures to be implemented following rainfall (ii) all watercourse crossings (vehicle access and pipeline crossings) shall be designed by a suitably qualified person and the design and measures shall generally be prepared and implemented in accordance with the NOW's Guidelines for Controlled Activities, (NSW Fisheries, 2004) and Why Do Fish Cross Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2004));

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
1	Erosion and sedimentation control will be managed using measures developed in accordance with *Managing Urban Stormwater: Soils and Construction* (Volume 1, Landcom 2004 and Volume 2A, DECC 2008).
2	Groundwater encountered during construction will be pumped out of the work area into a contained area, tested and if necessary, appropriately treated, prior to re-use, appropriate discharge or disposal.
4	The Proposal will be designed and operated to meet wastewater system EPLs.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Contamination of surface water identified.	• Associated construction activities to cease immediately upon becoming aware of an environmental incident. • Manage the incident in accordance with Incident & Event Management Procedure (PROMGT-W-PRO-0002) • Revision of construction activities and further mitigation measures to be considered and implemented as appropriate to prevent further environmental harm from occurring.
Sustained exceedance of water quality criteria	• Investigate and identify potential sources causing the exceedance. • Control the source. • Clean up or rehabilitate any impacts. • Implement appropriate controls. • Review construction methods, control effectiveness and device design. • Report exceedances as necessary.
Poor quality of erosion and sediment controls	• Repair/reinstate controls. • Review maintenance, staff responsible and resources.
Spills or leaks of chemicals or hydrocarbons	• Spills/Leaks to be contained, cleaned up and reported. • Spill kits to be used as appropriate. • Review refuelling/plant maintenance practices and modify if appropriate.
Failure of erosion and sediment controls	• Repair or replace controls. • Clean up or rehabilitate any impacts. • Evaluate failure, investigate alternative controls, site, soils and required water quality levels.
pH levels outside WQO	• pH under WQO, need to increase the pH by adding a base such as agricultural lime. Note. Aglime can take time to become soluble. Other, more soluble products may be available, but ensure pH is not exceeded. • pH over WQO, need to lower the pH by adding hydrochloric acid. As a guide, 500mL hydrochloric acid lowers 7000L of water by a pH of approximately 1.5pH. To apply the acid safely all handling and PPE requirements specified in SDS must be followed (refer: Hazardous Chemicals Management Procedure PROMGT-W-PRO-0016). • When adjusting water levels any additive is to be be evenly dispersed throughout. Limit the amount of adjustments done as this may affect other water qualities. Determine the correct adjustment amounts first and apply accordingly and sparingly.
Turbidity outside WQO	• Refer to the Hazardous Chemicals Management Procedure PROMGT-W-PRO-0016 prior to procuring or handling chemicals. • Initially, wait for water to settle naturally or floc the water to speed up the process. Treating water with flocculent (e.g. gypsum, liquid alum or flocculent blocks) will cause sediments to descend to the bottom. • Gypsum: Can take 48hrs+ to act, dissolve into a slurry before dispersed into a holding tank/pond to increase its absorption/solubility. Dosing rates of 30kg per 100m3 (100,000L) can be used as a guide. Quantities are tested prior in a sample bucket or drum.

	• Liquid Alum: Faster acting, however the addition of Alum to acidic waters may cause environmental damage. Ensure pH is checked, it must be above 5.5 after treatment regardless of use. • Floc blocks: Can be situated in flow paths to ensure incoming water is dosed with flocculent upon entry to holding pond/tank, fine tuning of flocculent can then be completed on the pond/tank. Floc blocks are not be left permanently in a pond/tank, instead they are in a flow path leading to the pond/tank that is dry when no water is flowing into the system. • Synthetic flocculants: Many products are available for floccing purposes, when using other products, ensure they are suitable for your application and approved for site use. • Always re-test pH levels after you have allowed the flocculent to work and adjust accordingly. Most flocculants will lower the pH level, further lime application may be required. Avoid overfloccing.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Noise, Vibration and Light Escape Environmental Control Plan

Document No: IN.20036851-V-PLN-0003

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	Update to reflect changes to address DPE feedback	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-02

NOISE, VIBRATION, AND LIGHT ECP

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Noise, Vibration and Light Escape Environmental Control Plan are to:

- Minimise the impacts of construction noise, vibration and light escape on local communities (nearby sensitive receivers).
- Minimise impacts to neighbourhood amenity.
- Protect buildings from vibration impacts.

3.0 Performance Criteria

3.1 General

1. No verified complaints or community concerns regarding noise, vibration or light escape.
2. No regulatory action initiated against the Project due to noise, vibration or light escape

3.2 Targets

Approved site working hours:

Day	Time
Monday – Friday	7am – 6pm
Saturdays	8am-1pm
Sundays and Public Holidays	No works permitted

Noise Management Limits (NML)

The main construction technique for the project will be open trenching pipeline construction. Due to the progressive and ongoing nature of pipeline construction no individual receiver would be impacted by noise every shift from these activities. The NML for pipeline construction will vary depending on the environment with the pipeline from low to high background levels and would be taken as 10bb(A) above background. The EIS notes the RBL for the works to be 35bd(A).

Further as the distance between each receiver to the proposed works will vary along the alignment a conversative approach is taken in combination with Table 31 of the EIS Noise and Vibration Assessment as duplicated below and the ICNG where the nosiest plant is identified in combination with the distance to the receiver from the works.

As such residents within 25m of the works may be highly noise affected above 75db(A), and residents within 100m may be noise affected. Typical application of the mitigation measures in appendix B and subsequent reduction in noise levels would be applied as shown in Table 33 of the EIS noise and Vibration study duplicated below.

This open trenching pipeline construction is supported by mincotunneling in targeted area, detailed in EMP construction methodology as requiring construction of launch/ receival pit consistent with the open trench construction, and the approach to determining NML consistent with that above with noise predictions taken from the moistest plant reviewed against distance to receiver and application of additional mitigation measures incorporating the nature of this activity as being primarily undertaken from a boring lunch or receival pit.

The microtunneling is not anticipated to require 24/7 and hence OOHW approval, however, should this be required it would be managed in line with the OOWH protocol.

Additional Mitigation measures

In addition to the standard mitigation measures listed in section 5 of this ECP the suite of additional measures outlined in Appendix B as a list of reasonable and feasible mitigation measures will be considered for implementation in association with table 33 as taken from the EIS. In the instance that residual noise levels as forecast are above 10bd(A) additional measures such as monitoring and community consultation with direct affected receivers would be implemented.

Table 31 – Predicted Construction Noise Levels Along Pipeline Corridor

Plant Item	Plant Description	Predicted Noise Levels at Varying Distance from Source, dB(A)								
		10m	15m	20m	25m	30m	40m	50m	100m	150m
1	Rock Breaker	85	81	78	76	74	71	69	61	57
2	Concrete Saw	83	79	76	74	72	69	67	59	55
3	Chainsaw	82	78	75	73	71	68	66	58	54
4	Drilling Rig	79	75	72	70	68	65	63	55	51
5	Front End Loader	78	74	71	69	67	64	62	54	50
6	Crane	78	74	71	69	67	64	62	54	50
7	Grader	78	74	71	69	67	64	62	54	50
8	Pneumatic Hand Tools	78	74	71	69	67	64	62	54	50
9	Compactor	78	74	71	69	67	64	62	54	50
10	Tracked Excavator	75	71	68	66	64	61	59	51	47
11	Roller	74	70	67	65	63	60	58	50	46
12	Concrete Truck	74	70	67	65	63	60	58	50	46
13	Truck	71	67	64	62	60	57	55	47	43
14	Concrete Pump	70	66	63	61	59	56	54	46	42
15	Silenced Air Compressor	63	59	56	54	52	49	47	39	35
Typical Cumulative[1]		**89**	**85**	**83**	**81**	**79**	**76**	**73**	**66**	**62**

Notes: 1.Typical Cumulative noise level does not include chainsaw (since they tend to be used separately for clearing prior to the start of the main works) or drilling rig (as the rig will be used separately and only in specific locations where trenching is not feasible.

Table 33 presents noise control methods, practical examples and expected noise reductions according to AS2436 and according to Renzo Tonin & Associates' opinion based on experience with past projects.

Table 33 – Relative Effectiveness of Various Forms of Noise Control, dB(A)

Noise Control Method	Practical Examples	Typical noise reduction possible in practice		Maximum noise reduction possible in practice	
		AS 2436	Renzo Tonin & Assoc.	AS 2436	Renzo Tonin & Assoc.
Distance	Doubling of distance between source and receiver	6	6	6	6
Noise Control Kits	Residential class mufflers & engine silencing	5 to 10	5 to 10	20	20
Screening	Acoustic barriers such as earth mounds, temporary or permanent noise barriers	5 to 10	5 to 10	15	15
Acoustic Enclosures	Engine casing lagged with acoustic insulation and plywood	15 to 25	10 to 20	50	30
Substitution by alternative process	Use electric motors in preference to diesel or petrol	-	15 to 25	-	40

Out of Hours Work (OOHW)

Construction works outside of the standard construction hours identified in condition C21 may be undertaken in the following circumstances:
(a) construction works that generate noise that is:
(i) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009); and
(ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers; or
(b) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reason; or
(c) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm;
(d) works approved through an EPL, or
(e) works as approved through the out-of-hours work protocol outlined in condition E6(c).
See **Out of Hours Work Protocol** at the end of this Control Plan.

Structural damage: German DIN 4150: Part 3 – 1999 Effects of Vibration on Structure (DIN 1999)

Type of structure	Peak Components Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of the highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50Hz	50 Hz to 100 Hz	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	0.0050	0.0036	0.010	0.0072
Dwellings and buildings of similar design and/or use	0.010	0.0071	0.020	0.014
	0.007	0.005	0.014	0.010
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	0.020	0.014	0.040	0.028

Vibration Targets for Human Exposure: Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).

Location	Time Period	Preferred Values		Maximum Values	
		z-axis	X & y axes	z-axis	X & y axes
Vibration					
Critical Areas i.e hospitals precision labs	All times	0.0050	0.0036	0.010	0.0072
Residences	7am-10pm	0.010	0.0071	0.020	0.014
	10pm-7am	0.007	0.005	0.014	0.010
Offices/schools/educational institutions/ places of worship	All times	0.020	0.014	0.040	0.028
Workshops	All times	0.04	0.029	0.080	0.058

Impulsive Vibration					
Critical Areas/hospital	All times	0.0050	0.0036	0.010	0.0072
Residences	7am-10pm	0.30	0.21	0.60	0.42
	10pm-7am	0.10	0.071	0.20	0.14
Offices/educational institutes/ places of worship	All times	0.64	0.46	1.28	0.92
Workshops	All times	0.64	0.46	1.28	0.92

Recommended minimum working distances for Buildings and/or structures: British Standard BS 7385-1:1990 – Evaluation and measurement for vibration in buildings

Plant Item	Rating/ Description	Safe working distance	
		Cosmetic Damage (Structural)	Human Response
Vibratory Roller	< 50 kN - typically 1-2 tonnes	5 m	15 m to 20 m
	< 50 kN - typically 2-4 tonnes	6 m	20 m
	< 50 kN - typically 4-6 tonnes	12 m	40 m
	< 50 kN - typically 7-13 tonnes	15 m	100 m
	< 50 kN - typically 13-18 tonnes	20 m	100 m
	< 50 kN - typically > 18 tonnes	25 m	100 m
Small Hydraulic Hammer	300 kg 18 to 34t excavator	2 m	7 m
Medium Hydraulic Hammer	1600 kg 5 to 12t excavator	7 m	23 m
Large Hydraulic Hammer	1600 kg 12 to 18t excavator	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	< 800 mm	2 m (nominal)	N/A
Jackhammer	Handheld	1 m (nominal)	Avoid contact with structure

Impulsive or tonal noise emission hours:
Except as expressly permitted by an EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken:
(a) between the hours of 8:00 am to 5:00 pm Monday to Friday;
(b) between the hours of 8:00 am to 1:00 pm Saturday; and
(c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.
For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.

4.0 References

4.1 Legislation and Guidance Documentation			
Federal Legislation	**State legislation**	**Standards / Codes**	**Other Documentation**
	• Protection of the Environment Operations Act (1997) • Interim Construction Noise Guidelines INCG (DECC,2009) • Noise Policy for Industry (EPA, 2017) • NSW Industrial Noise Policy (EPA, 2000) • Draft EPA Guideline for Construction Noise	• Australian Standard AS 2436:2010 Guide to noise and vibration control on construction, maintenance and demolition sites. • Australian Standard AS1055:2018 Acoustics - Description and measurement of environmental noise • Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) • German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures • British Standard BS 7385-1:1990 – Evaluation and measurement for vibration in buildings • Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).	• Sydney Water Noise Management Procedure (SWEMS0056) • Sydney Water Noise Management Code of behaviour (SWEMS0056.01) • D4C Mandatory Requirements 9 Environmental Management • Sydney Water Out of Hours Works template (ENV-F-020) • Sydney Water Delivery Management Guidance Standard Noise Management (ENV-GS-005 9.4) • Roads and Maritime Services (RMS) - Construction Noise and Vibration Guideline (August 2016) • DEC Assessing Vibration: a technical guideline February 2006

4.2 Definitions & Abbreviations	
• SW – Sydney Water • D4C –Delivering for Customers • CL – Construction Lead • Sup – Supervisor • PEC – Project Environmental Coordinator • Eng – Engineer • Des – Designer • CEMP – Construction Environmental Management Plan • OOHW – Out Of Hours Work • RBL- relative background level • NML – noise management limit	• JH – John Holland • SEP – Site Environmental Plan • EMP – Environmental Management Plan • ECP – Environmental Control Plan • EPA – Environmental Protection Authority • OEH – Office of Environment and Heritage • EPL – Environmental Protection Licences • EIA – Environmental Impact Assessment • EA – Environmental Approval

5.0 Noise, Vibration and Light Management

5.1 Actions			
No.	**Design and Planning**	**Staff Responsible**	**When**
1.	There is no approval under the EA which permits blasting during construction or operation	PEC/Engineers	Planning and delivery
2.	Review, plan and conduct works as per the EA and within the Interim Construction Noise Guidelines (DECC,2009)	PEC/Engineers	Workplace Planning
3.	Develop a Noise and Vibration Management Sub-plan if required under the EIA (This Plan)	PEC/Engineers	Workplace Planning
4.	Mitigation measure will be used to reduce the construction noise impact on sensitive receivers including limiting noise work to less sensitive time periods, selecting low noise plant and equipment and using quieter construction methods where practicable.	PEC/Engineers	Workplace Planning
5.	The project shall be designed with the objective of minimising adverse changes to existing access arrangements and transport services, including school bus services. Any need to alter public transport services or their routes shall be discussed with the provider and suitable alternative arrangements agreed.	Des/Eng	Planning and delivery
6.	The Project shall be constructed with the aim of achieving the following construction vibration goals: (a) for structural damage to heritage structures, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures; (b) for damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-1:1990 – Evaluation and measurement for vibration in buildings. Guide for measurement of vibration and evaluation of their effects on buildings; and (c) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).	PEC/Eng	Planning and delivery
7.	Design worksite layout to minimise the effect of noise and vibration on sensitive receivers, including the reversing of vehicles	Eng	Workplace Planning
8.	Nearby sensitive receivers shall be identified in the SEPs, as will any locations where physical noise or vibration monitoring will be required	PEC	Workplace Planning
9.	Consider plant and equipment which emit less noise and vibration when purchasing or hiring equipment	Eng	At procurement stage
10.	Arrange work sites where possible to minimise noise (e.g. generators away from sensitive receivers, minimise use of vehicle reversing alarms).	Eng/Sup	Workplace Planning
11.	Surrounding residences and businesses will be given reasonable notice of the proposed works (including proposed start and finish date, work methods, respite periods and works duration) in accordance with Sydney Water's community liaison and notification policies.	Community	Workplace Planning

12.	Development of the detailed design will include industry standard noise treatments to control operational noise levels.	Design team	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for noise, vibration and light escape management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Noise, vibration and light escape sources during construction. • Potential impacts of excessive noise, vibration and/or light escape on sensitive receivers. • The importance of managing noise, vibration at the source. • Noise, vibration and/or light escape monitoring that will be carried out during the Project.	PEC, Safety Advisor	Workplace Planning
2.	All personnel involved in the monitoring and recording of Noise and Vibration shall be additionally trained in the operation of the monitoring equipment	PEC	Project Delivery
3.	Noise and Vibration control toolbox talks will be implemented as relevant and required to reinforce information provided during inductions.	PEC	Project Delivery
No.	**Site Access and Construction hours**		
1.	All audible works (including deliveries) will occur in accordance with the approved construction hours, noise targets and vibration limits.	PEC/Eng/Sup	Workplace Planning
2.	Where possible, schedule works and deliveries between the following times: • Monday to Friday 7am to 6pm, • Saturday 8am to 1pm as per Table 1 Section 3.2. **Hold Point:** No construction work or deliveries will occur on Sundays or public holidays, unless approval has been obtained in an OOHW Request form endorsed by the Environmental Representative and Sydney Water Project Manager and in conjunction with the OOHW Protocol – **Appendix A**	PEC/Eng/Sup	Workplace Planning
	Plant and Equipment	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9 – Minimise dust, noise and vibration at all times and work within approved site working hours	PEC/Eng/Sup	Project Delivery
2.	All vehicles, plant and equipment will undergo a Plant Hazard Assessment (PHA) prior to gaining access to the site.	Safety Advisor/Manager	Project Delivery
3.	Construction vehicles (including staff vehicles) associated with the project shall be managed to: (a) minimise parking or queuing on public roads; (b) minimise idling and queuing in local residential streets where practicable; and (c) minimise the use of local roads (through residential streets and town centres) to gain access to	PEC/Eng/Sup	Project Delivery

	construction sites and compounds		
4.	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	Project Delivery
5.	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	Project Delivery
6.	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 acoustic canopies shall be kept closed at all times while the equipment is in operation.	All personnel	Project Delivery
7.	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	Project Delivery
8.	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	Project Delivery
	General Requirements	**Staff Responsible**	**When**
1.	Where vibration from construction activities may impact on residents, the activities will be managed in accordance with the British Standard BS6472 – 1992 and AS 2436-1981.	PEC/Engineers	Project Delivery
2.	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385:Part 1 – 1993 Evaluation and Measurement for Vibration on Buildings.	PEC/Engineers	Project Delivery
3.	For historic buildings, which have a higher sensitivity to vibration, the guidelines within the German Standard DIN 4150 - Part 3 will be adhered to.	PEC/Engineers	Project Delivery
4.	Construction works which result in impulsive or tonal noise emission, can only be undertaken in reduce time periods as specified in section 3.2	PEC/Eng/Sup	Project Delivery
5.	Where practicable, temporary site buildings will be positioned to shield sensitive receivers from construction road and access points.	CL/Eng/Sup	Project Delivery
6.	Temporary haul roads will be designed to minimise the need for reversing.	Eng/Sup	Project Delivery
7.	Noise intensive activities will be scheduled for mid-morning or mid-afternoon and be conducted away from sensitive receivers.	PEC/Eng/Sup	Project Delivery
8.	Loud hailers or whistles shall not be used, except where necessary for emergency response or evacuation scenarios.	PEC/Eng/Sup	Project Delivery
9.	Noise and vibration intensive activities will consider nearby sensitive receivers and structures and implement appropriate mitigation strategies as required.	PEC/Eng/Sup	Project Delivery

10.	Impact piling is to be avoided as far as possible through the following mean. 1) Shoring of trenches as far as practicably possible 2) The use of vibratory piling 3) The use of bored piling	Eng/Sup	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	General observations for the daily management of noise and vibration controls shall be documented in site dairies.	PEC/Eng/Sup	Daily during Project Delivery
2.	Regular inspection of noise and vibration controls shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow and/or SW DeliveryPortal.	PEC/Eng/Sup	Weekly
3.	Effectiveness of noise and vibration controls shall be regularly reviewed for adequacy having regard for changing circumstances.	PEC/Eng/Sup	Regularly during Project Delivery
4.	Appropriate physical monitoring and surveillance will be undertaken upon receipt of any complaint or community concern.	PEC/Eng/Sup	On receipt of complaint or community concern
5.	Physical noise and vibration monitoring results to be maintained in Project Pack Web and made available to relevant parties upon request.	PEC	As required
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident
8.0 Ministers Conditions of Approval addressed in this plan			
No	**MCoA Conditions**		
C18.	Nothing in this approval permits blasting during construction or operation.		

C19.	Wherever practical, piling activities shall be undertaken using quieter alternative methods than impact or percussion piling, such as bored piles or vibrated piles.
C20	Where feasible and reasonable, operation noise mitigation measures shall be implemented at the start of construction (or at other times during construction) where they may be effective in managing construction noise impacts.
C21.	Construction activities associated with the project shall be undertaken during the following standard construction hours: (a) 7:00am to 6:00pm Mondays to Fridays, inclusive; and (b) 8:00am to 1:00pm Saturdays; and (c) at no time on Sundays or public holidays.
C22.	Construction works outside of the standard construction hours identified in condition C21 may be undertaken in the following circumstances: (a) construction works that generate noise that is: (i) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009); and (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers; or (b) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or (c) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; (d) works approved through an EPL, or (e) works as approved through the out-of-hours work protocol outlined in condition E6(c).
C23	Except as expressly permitted by an EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken: (a) between the hours of 8:00 am to 5:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1:00 pm Saturday; and (c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.
C24.	The Project shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the CEMP. Note: *The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5dB(A) to the predicted level before comparing to the construction NML.*
C25.	The Project shall be constructed with the aim of achieving the following construction vibration goals: (a) for structural damage to heritage structures, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures; (b) for damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-1:1990 – Evaluation and measurement for vibration in buildings. Guide for measurement of vibration and evaluation of their effects on buildings; and

	(c) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).
E6.	**(d) Noise and Vibration** (i) measures identified shall be developed and implemented in accordance with the Interim Construction Noise Guidelines (DECC, 2009); and (ii) include an out-of-hours work (OOHW) protocol for the assessment, management and approval of works outside of standard construction hours as defined in condition C21, including a risk assessment process under which the Environmental Representative may approve out-of-hour construction activities deemed to be of low environmental risk and refer high risk works for the Director General's approval. The OOHW protocol shall detail standard assessment, mitigation and notification requirements for high and low risk out-of-hour works, and detail a standard protocol for referring applications to the Director General.
E12.	During construction, affected education institutions shall be consulted and reasonable steps taken to ensure that noise generating construction works in the vicinity of affected buildings are not timetabled during examination periods where practicable, unless other reasonable arrangements to the affected institutions are made at no cost to the affected institution.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
20	Mitigation measure will be used to reduce the construction noise impact on sensitive receivers including limiting noise work to less sensitive time periods, selecting low noise plant and equipment and using quieter construction methods where practicable.
21	Where vibration from construction activities may impact on residents, the activities will be managed in accordance with the British Standard BS6472 – 1992 and AS 2436-1981.
22	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385: Part 1 – 1993 Evaluation and Measurement for Vibration on Buildings.
23	For historic buildings, which have a higher sensitivity to vibration, the guidelines within the German Standard DIN 4150 – Part 3 will be adhered to.
24	Development of the detailed design will include industry standard noise treatments to control operational noise levels.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Community concern regarding noise and/or vibration	• Review management plan • Conduct monitoring activities from sensitive receivers location • Reduce hours of operation or increase respite if required • Reduce the number of plant and or equipment which could impact receiver

ENVIRONMENTAL CONTROL PLAN ECP-02

NOISE, VIBRATION, AND LIGHT ECP

Appendix A - Out Of Hours Work Protocol

Objectives

This protocol outlines the project requirements for construction working hours and documents a process to be implemented when work outside of standard hours is required. The key objective of the procedure is to ensure that impacts to the local community are avoided and minimised and the requirements of the MCoA are met. Specific objectives include:

- minimising potential adverse noise impacts to the community;
- identify sensitive receivers and ensure appropriate noise control measures are implemented during construction activities;
- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in the EMP; and
- ensuring appropriate measures are implemented to meet the intent of the MCoA.

Project Requirements

Construction of the project would occur during standard construction hours as defined in MCoA C21, specifically:

- Monday to Friday 7 am to 6 pm;
- Saturday 8 am to 1 pm; and
- no work on Sunday or public holidays.

In accordance with MCoA C22, construction works outside of the standard construction hours may be undertaken in the following circumstances:

- any works which do not cause noise emissions to be more than 5 dBA higher than the rating background level (RBL) at any nearby residential property and/or other noise sensitive receivers.
- any works which would not exceed the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers;
- the delivery of plant, equipment and materials which is required outside these hours as requested by police or other authorities for safety reasons;
- Emergency Work to avoid the loss of lives, property and/or to prevent environmental harm; and
- any other work as approved via this out of hour works protocol.

Out of Hours Work Process

To enable the works listed above to occur outside of standard construction hours the following process will be implemented:

1. The Project Engineer is to consult with the PER and Community Representative six weeks in advance of proposed OOHW. The Project Engineer is to complete Part A of the Program Delivery Out of Hours Request Form (ENV-F-020) and submit to the PER to determine the predicted noise level and compliance with MCoA C22.

2. The PER will assess the request and determine:
a. if the proposed works are likely to exceed RBL (as defined in the Environmental Assessment as 35 dB(A) between 6 pm and 10 pm, and 30 dB(A) from 10 pm to 7 am) +5 dB(A) or management levels specified in Table 3 of the Interim Construction Noise Guideline;
b. if the works are for the delivery of materials required outside of standard hours by NSW Police or other authorities for safety reasons; or
c. where it is required in an emergency to avoid injury or the loss of life, property and/or to prevent environmental harm, or

3. If the PER determines, based on initial risk assessment, that the works will generate LAeq(15 minutes) noise levels that will be less than RBL + 5 dB(A) and meet the requirements of MCoA C22, the Delivery Management Out of Hours
Request will be completed by the PER and submitted to Sydney Water for endorsement by the Environmental Representative and approval by the Sydney Water Project Manager. Specific noise management measures, in accordance with this EMP will be included in the request application and noise monitoring undertaken during execution of the work (if warranted).

3. If proposed out of hour works do not comply with MCoA C22, or there is a risk that the noise levels will exceed RBL +5 dB(A) or management levels from the ICNG, an assessment will be undertaken as described below to assess compliance with MCoA C22.

Noise and Vibration Impact Assessment

Where the proposed OOHW do not comply with MCoA C22, or there is a risk that the noise levels will exceed RBL +5 dB(A) or management levels in Table 3 of the ICNG, a noise and vibration impact assessment for the works will be undertaken and include the following:

- details of the nature and scope of each activity and work, including details of times, vehicles, plant and equipment to be used to undertake that activity or work;
- detailed analysis to justify the scheduling and duration of each activity and work outside the standard construction hours, including:

a. the predicted impact on noise sensitive receivers of any activities and works undertaken outside the hours; and
b. the preference that high noise impact works be undertaken during the day;

- detailed analysis to justify use of the selected construction and work methods, plant and equipment compared to alternatives taking into consideration noise and vibration impacts;
- a table showing details of the noise and vibration mitigation measures for each activity and work, including respite periods, proposed to be adopted to minimise noise and vibration impacts on surrounding noise sensitive receivers in each locality;
- a table showing for each activity and work in each noise catchment:

a. the address of each of the most affected noise sensitive receiver;
b. the background noise level for each of the noise sensitive receivers listed in the table;
c. noise management levels as described in Section 4 of the ICNG (DECC, 2009);
d. the predicted LAeq (15 min) noise level, incorporating any 5 dB correction for particularly annoying activities as listed on page 16 of the ICNG (DECC, 2009); and
e. an assessment of sleep disturbance as set out in Section 4.3 of the ICNG (DECC, 2009), where works are planned to extend over more than two consecutive nights.

- details of the specific noise mitigation measures to be adopted in respect of any activity or work predicted to
generate noise levels at any noise sensitive receiver exceeding the noise affected LAeq(15minute) level of background plus 5 dB outside the standard hours;
- a diagram showing the location of noise and vibration monitoring locations in relation to each of the most affected noise sensitive receivers for each activity and work in each noise catchment; and
- community notification requirements as per the CSEP and as per the OOHW mitigation measures that are dependent on the predicted noise level.

Following the completion of the noise and vibration impact assessment, the PER will document the assessment required by this condition in a report, including the OOHW risk factor, see Table 2

All low risk factors may be endorsed by the Environmental Representative and approved by Sydney Water. The assessment will be included as part of the Delivery Management Out of Hours Request for endorsement by the Environmental Representative and for subsequent approval of OOHW by Sydney Water. The endorsement of the Environmental Representative will be required prior to approval being granted by Sydney Water.

Risk Factors	
Low risk factors: • Work predicted to generate air-borne noise levels 5dBA or less above RBL • no sleep disturbance likely • 6 pm - 10 pm weekdays • 10 pm – 7am weekday nights • 1 pm – 10 pm Saturdays • 10 pm – 8am Saturday nights • 8 am – 6 pm Sunday and Public Holiday nights	High risk factors: • Work predicted to generate air-borne noise levels more than 5dBA above RBL • 6 pm to 7am Sunday and Public Holiday nights • Sleep disturbance possible • Impulsive noise and vibration likely after 11 pm and prior to 8 am (e.g. vibratory rolling or rock breaking)

• Impulsive noise and vibration between 8 am – 11 pm weekdays	

All high risk factors must be approved by DPE Director General prior to commencement. This would be submitted via the major projects planning portal.

Noise and Vibration Monitoring

The PER will ensure that the following noise and vibration monitoring is undertaken for all OOHW where the noise management levels are predicted to be exceeded by at least 5 dB and/or where vibration levels are predicted to exceed human comfort criteria:

▪ Undertake attended noise and/or vibration monitoring at representative stages of the activity or work to confirm whether the noise and vibration predictions in the noise and vibration assessment were accurate.

▪ Where noise monitoring indicates that the activity, work or combination of simultaneous activities or works has caused or is causing noise or vibration levels higher than the predicted levels at any noise sensitive receiver (i.e. difference of greater than 3 dB), mitigation and management measures will be re-evaluated and re-assessed as part of future OOHW applications.

Monitoring will also be undertaken at any location where two or more complaints are received about the specific OOHW activity or works on the telephone complaints line.

Community Notification

The Community Representative will notify the community in accordance with the Community and Stakeholder Engagement Plan (CSEP) and in accordance with any additional OOHW mitigation measures. This notification will:

▪ Be made by targeted letterbox drop, door knock, phone call or email to noise sensitive receivers as detailed in the CSEP.

▪ Be made at least seven days prior to the commencement of any OOHW and include:

a. a diagram that clearly identifies the location of the proposed OOHW in relation to nearby cross streets and
local landmarks or geographical features;

b. details of the timing, nature, scope and duration of the proposed works and activities;

c. detail of why the proposed works and activities are being undertaken outside of standard construction hours;

d. details of the predicted noise and vibration impacts of the works on identified sensitive receivers;

e. details of all proposed mitigation measures, including respite periods and proposed scheduling;

f. details of the types of plant and equipment that will be used to undertake the work;

g. details of how complaints may be made and additional information obtained about the work;

h. contact details in community languages relevant to the locality; and include notification of any upcoming project community meetings.

Complaints

Any complaints received as a result of the OOHW are to be managed in accordance with the CSEP. On receipt of two or more complaints regarding OOHW in a particular area, the works will cease until noise monitoring can be undertaken to confirm compliance with the predicted noise levels. If compliant, the works will recommence. If the noise monitoring determines noise levels greater than predicted, the construction process will be reviewed and additional noise mitigation measures will be implemented where reasonable and feasible.

Appendix B Additional Mitigation measures

Construction Noise Management Measures	
Source Controls	
Time constraints	Limit work to daylight hours. Consider implementing respite periods with low noise-producing constriction activities.
Scheduling	Perform noisy work during less sensitive time periods.
Equipment restrictions	Select low-noise plant and equipment. Ensure equipment has quality mufflers installed.
Emission restrictions	Establish stringent noise emission limits for specified plant and equipment. Implement noise monitoring audit program to ensure equipment remains within specified Times.
Substitute methods	Use quieter construction methods where possible. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise reduction benefits
Limit equipment on site	Only have necessary equipment on site
Limit activity duration	Where possible. concentrate noisy activities at one location and move to another as quickly as possible. Any equipment not in use for extended periods during construction work shall be switched off.
Equipment Location	Noisy plant and equipment shall be located as far as possible from noise sensitive areas, optimising attenuation effects from topography, natural and purpose built barriers and materials stockpiles.
Site access	Vehicle movements outside construction hours, including loading and unloading operations, shall be minimised and avoided where possible.
Equipment maintenance	Ensure equipment is well maintained and fitted with adequately maintained silencers which meet the design specifications.
Reduced equipment power	Use only necessary size and power
Quieter work practices	For example, implement worksite induction training, educating staff on noise sensitive issues and the need to make as little noise as possible.
Reversing alarms	Consider alternatives, such as manually adjustable or ambient noise sensitive types ("smart" reversing alarms) and closed circuit TV systems. Alternative site management strategies can be developed, in accordance with the Occupational Health and Safety Plan, with the concurrence of the Occupational Health and Safety Officer.
Path controls	

Noise barriers	Locate equipment to take advantage of the noise barriers provided by existing site features and structures, such as embankments and storage sheds.
Project Planning	Construction shall be programmed so that noise barriers or mounding required to control noise are built as soon as possible.
Increased distance	Locate noisy plant as far away from noise-sensitive receptors as possible
Site access	Select and locate site access roads as far away as possible from noise-sensitive areas.
Receptor controls	
Architectural treatment	Install permanent at-dwelling treatments early to gain noise benefits during the construction phase as well as for operational noise.
Temporary relocation	In extreme cases
Community information and notification	Community information, notification and complaint responses are essential aspects of all construction noise management programs. They typically involve: • A community information program before construction and/or high risk activities are commenced. This usually involves a leaflet distribution and direct discussions and negotiations with affected residents, explaining the type, time and duration of expected noise emissions, and the reasonable and feasible mitigation measures proposed. • The involvement of affected residents in the development of acceptable noise management strategies. • A nominated community liaison officer with a contact telephone number. • A complaints hotline. • Timely responses to complaints, providing information on planned actions and progress towards the resolution of concerns.
Noise Monitoring	Conduct noise compliance monitoring in critical areas and/or in response to community complaints.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Biodiversity
Environmental Control Plan

Document No: IN.20036851-V-PLN-0004

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for Review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-03

BIODIVERSITY MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Biodiversity Management Environmental Control Plan are to:

- Minimise disturbance to fauna and flora; including habitation, reproductive cycles, and availability of selective food sources;
- Prevent negative impacts on Commonwealth or State listed endangered species or endangered ecological communities outside of the project scope;
- Prevent the introduction of new weed species to the Site and the spread of existing weed species within the Site
- Minimise the loss of flora and ecological communities within, and bordering on, the project area, during construction; and
- Ensure flora and fauna management practices meet all legislative and contractual requirements.

3.0 Performance Criteria

3.1 General

1. No fauna fatalities resulting from construction activities.
2. Minimise disturbance to onsite fauna by implementing recovery and rescue to any injured or orphaned species during construction.
3. No disturbance of native flora outside of the project scope.
4. No disturbance to native flora within the project scope which is outside of project approval conditions.
5. No disturbance to Illawarra Lowlands Grassy Woodland
6. No introduction or spread of new weeds or pests to Site
7. Effective management of existing weeds and pests
8. No verified complaints or community concerns relating to weed and pest management during the construction phase of the Project

3.2 Target

No Native Vegetation is proposed to be impacted by this proposal.

Table below indicates the allowable Native Vegetation removal, allowed for under the EA, and the total to date under the previous stages.

Vegetation Type	Potential Direct Impact Assessed Under the EIS (ha)			Area Impacted under Previous Stages	Area proposed to be impacted by Stage 3 (this project)	
	Wastewater line	Water Line	Reservoir	Wastewater line	Water Line	Reservoir
Illawarra Lowlands Grassy Woodlands	0.15	0.47	0.34	0.075	0	0
Other Native Vegetation	0.0	0.0	0.32	0.002	0	0
Total Native Vegetation	0.15	0.47	0.66	0.077	0	0

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection & Biodiversity Conservation Act 1999	▪ National Parks and Wildlife Act (NSW1974) ▪ Biosecurity Act (NSW 2015) ▪ Biosecurity Conservation Act (NSW 2016) ▪ State Environment Protection Policy No.19 – Bushland in Urban Areas ▪ Fisheries Management Act (NSW 1994) ▪ State Environmental Planning Policy (Coastal Management) 2018 ▪ Coastal Management Act (NSW 2016) ▪ Local Land Services Act 2013	• AS4970-2—9 Protection of trees on development sites • AS4373-2007 Pruning of amenity tree • Best Practice Erosion and Sediment Control (IECA, 2008) • NSW Weed Wise • Managing Urban Stormwater: Soil and Construction (Landcom, 2004) ('Blue Book') • Managing Urban Stormwater: Soil and Construction Volume 2a Installation of Services (DECCW 2009) • Australia and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council, 2000) • AS/NZS 5667.1:1998 – Water quality – Sampling – Guidelines on the design of sampling programs, sampling techniques and the preservation and handling of samples	• D4C Biodiversity Management Procedure (PROMGT-V-PRO-0001). • Sydney Water Weed Management Procedure (SWEMS0015) • Sydney Water Pesticide Use Procedure (SWEMS0017) • Sydney Water Guideline for managing native re-vegetation for construction projects (SWEMS0025.11) • Sydney Water Biodiversity Offset Guide (SWEMS0019.13) • Sydney Water Delivery Management Environmental Restoration Management Guidance Standard 9.5 (ENV-GS-005) • Sydney Water Delivery Management Biodiversity Management Guidance Standards 9.3 (ENV-GS-003)

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- CL – Construction Lead
- SM – Site Manager / Super Intendant
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- AMS – Activity Method Statement
- Des – Designer
- Eng - Engineer
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- WQO – Water Quality Objectives
- EIS - Environmental Impact Statement
- EA – Environmental Authority

5.0 Biodiversity Management

5.1 Actions			
No.	**Design and Planning**	**Staff Responsible**	**When**
1.	Develop a Site (or area) specific SEP highlighting the sensitive areas and clearly identifying construction boundaries	PEC	Workplace Planning
2.	Identify and protect heritage, flora or fauna and other sensitive areas and delineate using physical demarcation and/or signage	PEC/Eng	Workplace Planning
3.	Identify appropriate local vet or rescue organisation/wildlife carers/facilities. Contact details for this person/company must be available in the relevant Site Environmental Plan (SEP)	PEC	Workplace Planning
4.	Ensure all key actions of this ECP (e.g. clearing demarcation, erosion control measures and clearing permit requirements) are incorporated in relevant project HSEQ risk management documentation (AMS, ITPs and SEPs)	Des/Eng	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for biodiversity management: ▪ All Ministers Conditions of Approval and Statement of Commitments ▪ Existence and requirements of this plan ▪ Awareness of potential impacts to the surrounding environment ▪ Areas of Ecologically Endangered Community (EEC) and no-go zones ▪ Unexpected finds procedure ▪ Requirements for Fauna management ▪ The vehicle access tracks and laydown areas as per Site Environment Plans (SEPs) ▪ Identification 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	PEC	Project Delivery
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.	PEC, Safety Advisor	Project Delivery
3.	Surface water and erosion & sediment control toolbox talks will be implemented as relevant and required to reinforce information provided during site inductions.	PEC	Project Delivery
No.	**Site Preparation/Clearing**		
1.	No disturbance to any vegetation (native and non-native) shall occur outside of the clearing zones or the project boundary	All staff	Project Delivery
2.	Clearing limits must be clearly identified and physically demarcated.	PEC/Eng/Sup	Project Delivery

3.	Vegetation to be protected/retained shall be clearly marked and identifiable both on an SEP and physically.	PEC/Eng/Sup	Workplace Planning
4.	Clearing shall be planned in accordance with approved design documentation and further minimised by retaining grass and other vegetation to the fullest extent practicable.	PEC/Eng/Sup	Project Delivery
5.	A Vegetation Disturbance Permit must be completed prior to any clearing works commencing	PEC/Eng/Sup	Prior to Clearing
6.	Review project contract and consultant reports to determine whether an ecologist / fauna spotter/catcher is required to conduct pre-clearance surveys to identify individual trees to be retained and any hollow bearing trees and logs prior to clearing. • Where possible, clearance should avoid hollow bearing trees. • Where unavoidable, hollow bearing trees should be flagged and left standing as long as possible. • Where possible do not undertake clearing during breeding seasons, if unavoidable ensure fauna spotter/catcher is available. • Hollow bearing logs to be carefully repositioned into vegetation areas to be retained at the end of the project.	PEC/Eng/Sup	Project Delivery
7.	Minimise impacts on native flora and fauna by implementing the following; • Flora to be removed to be identified and clearly marked prior to removal. If not clearly marked, do not remove. • Ecologist / fauna spotter/catcher (or similar) to be present onside during clearing of hollow bearing trees to handle any displaced fauna or active nests. • In the event of injury to fauna, RSPCA or similar wildlife service to be contacted and suitable arrangements made. Injury to any native fauna must be reported to the PEC	PEC/Eng/Sup	Project Delivery
8.	Transport any injured animal to a licensed wildlife carer, Veterinary clinic or wildlife facility	PEC	Project Delivery
9.	Minimise areas of exposed earth by only stripping/clearing areas immediately prior to works and rehabilitating the area as soon as possible.	PEC/Eng/Sup	Project Delivery
10.	Removal of flora not previously identified requires additional approval and/or changes to permit conditions must be in place prior to clearing.	PEC/Eng/Sup	Project Delivery
11.	Damage to flora not pre-approved for clearing should be immediately reported to PEC and treated as an incident and as a non-conformance.	PEC/Eng/Sup	Project Delivery
12.	Minimise vegetation removal by trimming limbs rather than removing entire trees or bushes. Ensure any pruning complies with AS4373-2007 Pruning of amenity trees. Check with PEC for any permit requirements. Project team will tie back vegetation where practicable rather than remove	Eng/Sup	Project Delivery
13.	Leave rootstock in ground to stabilise the soil, where possible.	Eng/Sup	Project Delivery
14.	Retain all felled trees and hollows where possible for placement to provide further fauna habitat. Where hollows cannot be salvaged, nest boxes will be provided in retained vegetation.	Eng/Sup	Project Delivery

15.	Stockpile non-weed vegetative cuttings for respreading as mulch, erosion protection, and seed material.	Eng/Sup	Project Delivery
16.	No burning of cleared vegetation	Eng/Sup	Project Delivery
No.	**Plant movement and access**	**Staff Responsible**	**When**
1.	Demarcate construction areas and transport routes	PEC/Eng/Sup	Project Delivery
2.	Adhere to designated speed limit whilst on site.	All personnel	Project Delivery
3.	Limit movement of vehicles and personnel to designated working areas and access routes.	All personnel	Project Delivery
4.	Implement tree protection zones (TPZ) as outlined within AS4970 -2009 Protection of trees on development sites and follow the advice provided in the standard if any minor or major encroachment of the zone is required. Encroachments on a TPZ must first be discussed and planned with the project arborist. TPZ = DBH X 12. DBH = Trunk diameter measured at 1.4m above ground.	PEC/Eng/Sup	Project Delivery
5.	TPZ must be demarcated by: • Parawebbing – foot traffic • Demarcation / Fencing – vehicle traffic Padding/physical protection measures installed near excavators and other construction works	All personnel	Project Delivery
6.	No plant or machinery is to work in flowing waterways unless authorised by relevant government waterway or fisheries authority.	All personnel	Project Delivery
	General Requirements	**Staff Responsible**	**When**
1.	No construction employee on the project shall intentionally damage or injure native flora or fauna.	All Staff	Project Delivery
2.	No feeding of native fauna by project personnel. No domestic animals are to be brought to site.	All Staff	Project Delivery
3.	Cover, protect or ensure escape measures are installed in excavations to prevent fauna from becoming trapped	Supervisors	Project Delivery
4.	No plant/equipment/materials to be stored within the TPZ.	Eng/Sup	Project Delivery
5.	Orientate temporary construction lighting to prevent light overspill into fauna habitat areas (including aquatic habitat)	PEC/Eng/Sup	Project Delivery
6.	Re-use uncontaminated topsoil (including any stored seed bank) in any revegetation/landscaping activities.	PEC/Eng/Sup	Project Delivery
7.	Undertake revegetation during the appropriate planting season for the species being planted.	PEC/Eng/Sup	Project Delivery

8.	No dumping of soil or vegetative material on top of vegetation to be retained.	PEC/Eng/Sup	Project Delivery
9.	Known weed infested areas will be marked 'Quarantine/No-Go Areas'	PEC/Eng/Sup	Project Delivery
10.	Topsoil stripped from areas containing high densities of weed will be disposed of at an appropriately licensed waste management facility.	PEC/Eng/Sup	Project Delivery
11.	Where practicable, areas known to be infested with weeds will be cleared separately to non-infested areas to prevent cross contamination and reduce vehicle/plant/equipment cleaning requirements.	PEC/Eng/Sup	Project Delivery
12.	Any vegetation stockpiled after clearing will be managed to prevent the spread of weeds.	PEC/Eng/Sup	Project Delivery
13.	Vegetation debris, mulch or topsoil will not be stockpiled in areas where weed infestation is known to exist.	PEC/Eng/Sup	Project Delivery
No.	**Weed and Pest Treatment and Eradication**	**Staff Responsible**	**When**
1.	Any chemical weed/pest treatment and eradication will be undertaken by appropriately qualified and licensed personnel	PEC/Eng/Sup	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	General observations for the daily management of biodiversity controls shall be documented in site dairies.	PEC/Eng/Sup	Daily during Project Delivery
2.	Regular inspection shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow and/or SWDeliveryPortal. This will include any established No-go zones	PEC/Eng/Sup	Weekly and prior to forecast and after storm events >10mm
3.	Prior to any off-site discharge, water to be tested and adjusted as appropriate to meet WQO limits. Records to be maintained in ComplyFlow.	PEC/Eng/Sup	Prior to discharge
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	Record all fauna relocations that occur in a fauna relocation register.	PEC	Project Delivery
3.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
4.	All complaints / incidents regarding flora and fauna shall be reported immediately to the PEC.	All Staff	Following complaint/incident
5.	Incidents details shall be entered into SW Delivery Portal and Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
6.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident
8.0 Ministers Conditions of Approval addressed in this plan			

No	MCoA Conditions
C2.	No clearing of Illawarra Lowland Grassy Woodland is permitted at the Avondale Reservoir site without the written approval of the Director-General. If refinement of the reservoir design and construction methods indicates that clearing of Illawarra Lowland Grassy Woodland cannot be avoided, the proponent shall demonstrate, to the satisfaction of the Director-General, in consultation with the OEH, that all feasible and reasonable options to avoid clearing have been considered and that residual clearing has been minimised to the greatest extent practicable. Offset measures shall be identified and provided before any clearing of Illawarra Lowland Grassy Woodland occurs at this location. (**No portion of the project is located close to the Reservoir**)
C3.	The proponent shall include in the Rehabilitation and Landscape Plan, required by condition E7, measures to offset the impacts of clearing 0.15 ha of Illawarra Lowland Grassy Woodland resulting from the wastewater pipeline construction. Demonstration of how the measures meet the objective of maintain or improve shall be provided and consideration of the efficacy of the measures proposed. (**No Illawarra Lowland Grassy Woodland as part of Stage 3**)
C4.	The proponent shall continue to consult with Wollongong City Council with regards to the proposed road network along which the water pipeline will be located with the aim of encouraging vegetation avoidance wherever possible. Impacts of vegetation clearing shall be offset with measures to be undertaken included in the Rehabilitation and Landscape Plan required by condition E7 unless biodiversity certification of the WDURA and AGA is implemented, and the impacts accounted for through this process. Should biodiversity certification be implemented, the proponent shall demonstrate, to the satisfaction of the Director General, that the impacts have been appropriately addressed.
E3.	Following the completion of construction, the Proponent shall confirm the extent of vegetation impacts was commensurate with and not greater than that identified in Table C1. If clearing is greater than assess in Table C1 the Proponent shall consult with OEH and demonstrate how the offset package will be modified to offset the value of actual biodiversity loss.
E4.	Hollow-bearing trees shall be protected where feasible and reasonable. Where impacts cannot be avoided specialist advice from a qualified ecologist shall be sought prior to and during vegetation removal to mark any hollow-bearing trees, check for fauna prior to removal and undertake any necessary fauna rescue.
9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
5	Detailed design will consider how impacts to riparian and aquatic habitats can be avoided or minimised by: • placing pipeline alignments outside the 'top of the bank' • utilising existing and/or proposed road infrastructure to cross watercourses, • avoiding farm dams and freshwater lagoons, • applying pipeline construction methods for watercourse crossings in accordance with the objectives of the DIPNR (2004) Riparian Corridor Management Study.
6	Sydney Water will design and construct the Proposal's wastewater pipelines using techniques to minimise inflow/infiltration.
7	Detailed design will consider how impacts to native vegetation can be avoided or minimised by: • placing pipelines to have least impact to native vegetation and avoid EECs and significant hollow-bearing trees, • using construction methods that avoid and minimise impacts
8	Construction management measures will be developed and implemented to minimise impacts to flora and fauna.
9	Sydney Water will progressively rehabilitate work sites following completion of construction.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Over clearing of flora / Clearing outside of permitted clearing area	• Stop work • Re-establish boundaries • Notify the relevant parties, including JHG Regional HSEQ Team • Investigate possibility of rehabilitating the area • Review construction methods, control effectiveness and device design • Re-train staff/operator(s) with regards to keeping within site boundaries and not clearing flora without permission • Enter incident into JH Soteria
Animal injured or killed	• Stop work • Attempt to prevent further harm to animal and/or other animals in vicinity - establish a 10m radius no-go zone around injured animal • Engage WIRES or other suitable wildlife rescue organisation • Notify the relevant parties, including JHG Regional HSEQ Team • Investigate incident and implement controls to prevent reoccurrence • Enter incident into JH Soteria
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 Coordinator 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. • Enter incident into JH Soteria
Inappropriate methods of conducting works to remove flora or handle fauna	• Review Site Environmental Plan and implement the appropriate controls and methods. • Evaluate controls and procedures to minimise impact to flora and fauna, and implement the correct methods appropriately.
Insufficient maintenance of controls (eg no go zones)	• Repair/reinstate controls • Review maintenance schedule, staff responsible and resources.
Presence of weeds or pests identified	• Corrective actions to be determined in consultation with qualified personnel.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Aboriginal and Non-Aboriginal Heritage Management
Environmental Control Plan

Document No: IN.20036851-V-PLN-0005

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	Update post review for DPIE feedback	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-04

ABORIGINAL & NON-ABORIGINAL HERITAGE MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Aboriginal and Non-Aboriginal Environmental Control Plan are to:

- Ensure no harm to known heritage (unless in accordance with a Planning Approval and Permit);
- All documents developed for activities have a clear and concise Previously unidentified Heritage Item Discovery Protocol
- Ensure procedures and measures are implemented to identify, protect and preserve heritage;
- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts;
- Ensure appropriate measures are implemented to address the relevant environmental safeguards outlined within environmental assessments, planning approval and guideline and
- Ensure personnel are familiar with aspects of heritage and site management procedures, including education processes.

3.0 Performance Criteria

3.1 General

1. No loss of heritage value outside of the Project scope.
2. Unanticipated heritage discoveries are recorded, communicated and managed appropriately.
3. Appropriate stakeholders are engaged to advise on unanticipated discoveries.

3.2 Targets

No detrimental impact to heritage items, known or unknown.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
	• National Parks and Wildlife Act 1974 • NSW Heritage Act 1977	• Due Diligence Cod of Practice for all protection of Aboriginal Objects in NSW 2010 (DECCW) • Aboriginal Cultural Heritage Consultation requirements for proponent 2010 (DECCW	• D4C Mandatory Requirements 9 Environmental Management • Sydney Water Delivery Management Guidance Standards Heritage Management (EMV-GS-0011 9.11) • Sydney Water AHIP Checklist • Sydney Water Heritage Compliance Procedure (SWEMS0031) • Sydney Water Aboriginal Heritage Due Diligence Assessment (REF0450)

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng - Engineer
- Des – Designer
- Heritage Area – area of known historic or aboriginal heritage
- ER – Environmental Representative
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- DPE – NSW Department of Planning and Environment
- OEH – Office of Environment and Heritage
- EIA – Environmental Impact Assessment

5.0 Aboriginal & Non-Aboriginal Heritage Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Ensure all works are planned and in accordance with the Planning Approvals/EIA	PEC/Eng	Workplace Planning
2.	Prepare an SEP highlighting the locations of known Heritage areas in the vicinity of works and the protection measures to be put in place including marking these areas as environmentally sensitive 'No Go Zones'. See Attachment B	PEC/Eng	Workplace Planning
3.	All relevant approvals, licenses and permits must be in place prior to commencing works and monitored and complied with at all times.	PEC/Eng	Workplace Planning
4.	All works are to be planned, managed and monitored as per SWC Heritage Compliance Procedure SWEMS0031 and D4C Heritage Management Procedure	PEC/Eng	Workplace Planning and Delivery
5.	Pre and post construction dilapidation surveys are to be conducted on heritage items within the immediate vicinity of construction works	PEC/Eng	Workplace Planning and Delivery
6.	In the event of a heritage discovery Aboriginal or Non Aboriginal the design team is to be consulted in order to determine if a design change can be made to avoid impacting the area, through either directional change or underboring	PEC/Eng	Workplace Delivery
7.	Whilst not identified as a result of any impact to any known heritage item, If required a photographic record must be taken prior to alterations and throughout the construction process, to document changes. The photographic record must be forwarded to Sydney Water's Program Leader, Heritage	PEC/Eng	Workplace Planning
8.	Work compounds are to be located in areas with the greatest avoidance of heritage items and places	PEC/Eng	Workplace Planning
9.	Protected heritage items must be identified, physically demarcated (barricading) and clearly signed to prevent unauthorised access where there is a risk of direct or indirect impact.	Eng/Sup	Workplace Planning

10.	The heritage significance of the area must be communicated to staff and effective engagement with relevant stakeholders undertaken.	Eng/Sup	Workplace Planning
11.	Vibration assessment and monitoring if required, where vibration has the potential to damage heritage structures	Community	Workplace Planning
No.	**Consultation**	**Staff Responsible**	**When**
1.	Where identified under an approval and/or following consultation with the project Heritage specialist, the team may need to consult with a single group or groups of interested parties. This may include a Government Agency such as OEH, Registered Aboriginal Stakeholders	SW/PEC/Community	Workplace Planning
No.	**Inductions and Training**	**Staff Responsible**	**When**
1.	Site inductions will include the following specific components for cultural heritage: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Cultural heritage values in the Project area, and the importance of protecting and preserving these values; • The location of and Information on mitigation and control measures; • Any specific work methodologies to minimise risks • The requirements of this Heritage procedure, as well as any other legislative and contractual obligations; • The procedure in the event of a previously unidentified heritage discovery or accidental damage of a heritage item or place • Roles and responsibilities for heritage management; • No person is to work in or around the project area without completing the induction	PEC, Safety Advisor	Workplace Planning
2.	Heritage control toolbox talks will be implemented as relevant and required to reinforce information provided during inductions.	PEC	Project Delivery
3.	Specific training on what artefacts could potentially look like. Including the types of materials, shapes sizes, colours and what they were used for as well as the significance of these areas	PEC	Project Planning & Delivery
4	Additional training and toolbox talks shall be held in the event that there is any additional heritage finds	PEC	Project Delivery
	General Requirements	**Staff Responsible**	**When**
1.	Damage and disturbance to heritage items and places is to be avoided at all times unless approval to harm has been issued	All personnel	Project Delivery
2.	No Ground disturbance is to take place within Lot1 DP220843, Mt Kiera Osbourne Wallsend Tramway	All personnel	Project Delivery

3.	Vehicles, plant and equipment must remain within the construction boundaries and access tracks at all times	All personnel	Project Delivery
4.	Vehicles or plant shall not track across areas that could lead to damage of heritage items or places	All personnel	Project Delivery
5.	Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.	All personnel	Project Delivery
	Previously unidentified Heritage Item Discovery Protocol		
1.	If there is an unexpected discovery, or suspicion of a deposit, artefact, object or material that relates to historical settlement of an area by **Aboriginal or non-Aboriginal people (**excluding human remains**)**, the following steps are to be followed as per the procedure in Attachment A.	All personnel	On discovery
2.	If any skeletal / suspected human remains are encountered or suspected, all works must cease immediately and follow the above steps in the unidentified heritage item discovery protocol (attachment A) including contacting relevant stakeholders. Additionally, the D4C Environment Team will need to immediately inform NSW Police and DPE OEH	PEC/CL	On discovery
3.	If any non-Aboriginal moveable heritage items are found/discovered/uncovered, such as fittings or items of possible historic importance or significance, cease work and follow the above unidentified heritage discovery protocol. Sydney Water Senior Heritage Advisor is to be notified.	PEC/CL	On discovery

6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	General observations for the daily management of Heritage controls shall be documented in site dairies.	PEC/Eng/Sup	Daily during Project Delivery
2.	Regular inspection of Heritage controls shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow and/or SW DeliveryPortal.	PEC/Eng/Sup	Weekly
3.	Effectiveness of Heritage controls shall be regularly reviewed for adequacy having regard for changing circumstances.	PEC/Eng/Sup	Regularly during Project Delivery

4.	Appropriate physical monitoring and surveillance will be undertaken upon receipt of any complaint or community concern.	PEC/Eng/Sup	On receipt of complaint or community concern
5.	Physical vibration monitoring results to be maintained in Project Pack Web and made available to relevant parties upon request.	PEC	As required

7.0 Reporting

No	Reporting Required	Staff Responsible	When
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident

8.0 Ministers Conditions of Approval addressed in this plan

No	MCoA Conditions
C30.	This approval does not allow the Proponent to destroy, modify or otherwise physically affect human remains, with the exception of Item 2, Settler's Cemetery (Kembla Grange Cemetery) where the proponent is able to demonstrate, to the satisfaction of the Director General (under condition C35) that impacts to burials within the cemetery cannot be avoided.
C32	Impacts to Aboriginal heritage identified in Tables 25 and 26 of Appendix F in the document listed under condition B2(b) shall be minimised to the greatest extent practicable through both detailed design and construction. Where impacts are unavoidable, works shall be undertaken in accordance with condition C36 and the actions to manage construction Aboriginal heritage required by condition E6(b).
C33	Impacts to non-Aboriginal heritage identified in the document listed under condition B2(d) shall be minimised to the greatest extent practicable through both detailed design and construction. Where identified impacts are unavoidable, works shall be undertaken in accordance with condition C35 and the actions to manage construction non-Aboriginal Heritage required by condition E6 e)
C34	Undertake archival recording of the heritage items identified for archival recording in the document listed under condition B2(d) in accordance with the NSW Heritage Council guidelines.

C35	Prior to the commencement of pre-construction and construction activities affecting the non- Aboriginal archaeological items 2 (the Settler's Cemetery /Kembla Grange Cemetery) 20 (the chapel, West Dapto Catholic Cemetery),182, 183, 184, 185, 186 and 187 the Proponent must: (a) Undertake an Historic archaeological investigation program in accordance with the Heritage Council's Archaeological Assessments Guideline (1996) and Skeletal Remains (1998) using a methodology prepared, in consultation with the OEH (Heritage Branch), and to the satisfaction of the Director-General. This work should be undertaken by an archaeological heritage consultant approved by the Director-General. The nomination for the Excavation Director shall demonstrate ability to comply with the Heritage Council's Criteria for the Assessment of Excavation Directors (July 2011) (b) Report on the results of the non-Aboriginal archaeological investigation program, including recommendations (such as for further archaeological work), in consultation with the Heritage Branch OEH and to the satisfaction of the Director General and shall include, but not necessarily be limited to: (i) consideration of measures to avoid or minimise disturbance to archaeology, where archaeology of non-Aboriginal archaeological significance is found to be present; (ii) where it cannot be avoided, recommendations for any further investigations for archaeology of historical archaeological significance; and (iii) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities. (c) Undertake any further archaeological excavation works recommended by the results of the non-Aboriginal archaeological investigation program. Within twelve months of completing the above work, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the excavations, including artefact analysis, and the identification of a final repository for finds, prepared in consultation with the OEH (Heritage branch) and to the satisfaction of the Director-General. Note: other Acts/ regulations such as the Coroner's Act, the Public Health Act and Public Health Regulations may apply in relation to human remains.
C36	Prior to the commencement of pre-construction and construction activities affecting the Aboriginal archaeological sites identified in Table 25 and Table 26 of Appendix F in the document listed under condition B2(b), the Proponent must: (a) undertake an Aboriginal archaeological investigation program using a methodology prepared, in consultation with the OEH (Aboriginal heritage) and the Registered Aboriginal Stakeholders, and to the satisfaction of the Director-General. (b) report on the results of the Aboriginal archaeological investigation program, including recommendations (such as for further archaeological work), in consultation with the Registered Aboriginal Stakeholders, the OEH and to the satisfaction of the Director General, and shall include, but not necessarily be limited to: (i) consideration of measures to avoid or minimise disturbance to Aboriginal objects where objects of moderate to high significance are found to be present; (ii) where it cannot be avoided, recommendations for any further investigations; and (iii) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities. Undertake any further archaeological excavation works recommended by the results of the Aboriginal archaeological investigation program. Within twelve months of completing the above work, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the excavations, including artefact analysis, and the identification of final storage place for Aboriginal objects, prepared in consultation with the Registered Aboriginal Stakeholders, the OEH (Aboriginal objects) and to the satisfaction of the Director-General.

E6	As well as the general requirements of an EMP as outlined in condition E5, the following shall be addressed: (b) **Aboriginal Heritage** (i) actions to manage identified Aboriginal objects directly and indirectly impacted by construction, developed in consultation with registered Aboriginal stakeholders prior to any archaeological or salvage works commencing, including but not limited to: − management measures and strategies for protection, monitoring, salvage, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; − procedures for dealing with previously unidentified Aboriginal objects (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, involvement of a suitably qualified archaeologist and consultation with the Department and registered Aboriginal stakeholders, actions required to enable construction to recommence and notification to the OEH, in accordance with section 89A of the National Parks and Wildlife Act 1974, and the department; − procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH; − training and induction processes for construction personnel on site identification, protection and conservation of Aboriginal cultural heritage;. − procedures for ongoing stakeholder consultation and involvement for the duration of the project; and procedures for monitoring and reporting effectiveness of management measures, including reporting of non-compliance. (c) **Non-Aboriginal Heritage** (i) actions to manage identified non-Aboriginal items directly and indirectly impacted by construction, developed in consultation with the Heritage Branch, OEH prior to any archaeological works commencing, including but not limited to: - management measures and strategies for protection, excavation, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; - procedures for monitoring and reporting on effectiveness of management measures, including reporting of non-compliance; - procedures for dealing with previously unidentified heritage items (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, including involvement of a suitable qualified archaeologist and consultation with the Department and actions required to enable construction to recommence and notification of the Heritage Council of NSW, in accordance with Section 146 of the NSW Heritage Act 1977, and the department; - procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH; and - training and induction processes for construction personnel on site identification, protection and conservation of heritage.
E10	Prior to the commencement of pre-construction and/or construction activities that will impact the Aboriginal archaeological sites identified in Table 6-22 of the document listed under condition B2(b), the Proponent shall undertake an archaeological salvage program using a methodology prepared in consultation with the registered Aboriginal stakeholder, and to the satisfaction of the Director-General. This work shall be undertaken by an appropriately qualified archaeological heritage consultant. Within two years of completing the salvage, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the salvage, including artefacts and the identification of a final repository for any Aboriginal objects, prepared in consultation with the Aboriginal stakeholders and to the satisfaction of the Director-General.

E11	Prior to the commencement of pre-construction and/ or construction activities that will impact the non-Aboriginal archaeological sites identified in the document listed under condition B2(b) as items 182, 183, 184, 185, 186 and 186, the Proponent shall undertake an archaeological salvage program using a methodology prepared in consultation with the OEH (Heritage Branch) and to the satisfaction of the Director-General. This work shall be undertaken by an appropriately qualified archaeological heritage consultant. Within two years of completing the salvage, unless otherwise agreed by the Director General, the Proponent shall submit a report containing the findings of the salvage, including artefact analysis, prepared in consultation with the OEH (Heritage branch) and to the satisfaction of the Director-General.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
10	Sydney Water is committed to avoiding impacts on items of Aboriginal cultural heritage significance where practicable.
11	Where it is not practicable to avoid impacts, management measures will be implemented to mitigate impacts.
12	Sydney Water will undertake ongoing consultation with RAPs.
13	Procedures will be implemented to ensure planned maintenance activities are undertaken in a manner that minimises impact on the Aboriginal heritage items.
14	Where practicable, the pipelines will be relocated to avoid areas of non-Aboriginal heritage value.
15	Where impacts on unlisted items of possible non-Aboriginal heritage significance are unavoidable, specific mitigation measures will be followed for each item.
16	Relevant construction personnel will be inducted on actions to take if previously unrecorded non-Aboriginal heritage items are found.
17	Procedures will be implemented to ensure maintenance activities are undertaken in a manner that minimises impact on the non-Aboriginal items.

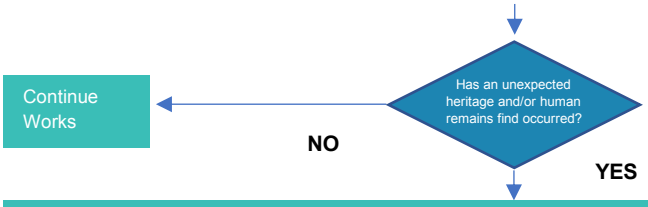
10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Unanticipated Aboriginal or indigenous heritage discovery	Adhere to the unexpected discovery protocol attached to this D4C Heritage Environmental. Control Plan and D4C Emergency Preparedness and Response procedures (PROMGT-W-PRO-0008). (as above)
Aboriginal or non-Aboriginal heritage Unanticipated heritage discovery (including human remains)	Adhere to the unexpected discovery protocol attached to this D4C Heritage Environmental. Control Plan and D4C Emergency Preparedness and Response procedures (PROMGT-W-PRO-0008). (as above)
Incident or events relating to the management of Aboriginal or non-Aboriginal heritage	Manage event in accordance with the D4C Event Reporting procedure (PROMGT-W-PRO-0002), D4C Emergency Preparedness and Response procedures (PROMGT-W-PRO-0008) and Sydney Water Responding to Incident with an environmental impact (SWEMS0009).
Exceedance of vibration criteria near heritage-built structures	Cease works. Review methodology and plant. Consider undertaking a condition survey.

Attachment A - Aboriginal or non-Aboriginal heritage Unanticipated heritage discovery (including human remains)

Unexpected/ previously unidentified Heritage Find and Human Remains Procedure

Scope: This Procedure has been prepared in accordance with Environmental Planning and Assessment Act 1979 (EP&A Act), Heritage Act 1977 (Heritage Act), Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977 (NSW Heritage Office 1998), Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997) and National Parks and Wildlife Act 1974 (NPW Act) for the management of unexpected heritage finds on the West Dapto Urban Release Area Stage 3 Project (WDURA).

KEY STEPS AND RESPONSIBILITIES	ROLE
INDUCTION AND TOOLBOX TALKS All WDURA personnel are to be inducted and receive ongoing training and awareness via toolbox talks and pre-start meetings regarding unexpected heritage and human remain finds. The Proejct Enviornmental Coordinator to provide relevant content for the induction and other relevant training and awareness material.	D4C Project Environment Coodinator



STOP WORK, PROTECT FIND AND INFORM DIRECTOR OF WORKS Notify the D4C Construction Team and D4C Environmental Leadr and advise all personnel to stay clear of the area. The JH Construction Team and Environment Manager to establish a 'no-go zone' around the item found. No work is to be undertaken within this zone until further investigations are complete and, if required, appropriate approvals are obtained.	D4C Site Supervisor D4C Project Environmental Coordinator
POTENTIAL HUMAN REMAIN FIND The D4C Environmental Lead is to notify NSW Police, Environmental Representative, Project Heritage Specalist and Sydney Water Porgram Delivery Environment Team. D4C not to move / impact the find without instruction from Project Heritage Specalist and Sydney Water. Works are not to commence until clearance is received from NSW Police – if remains are historic or Aboriginal follow the procedure adjacent for '*potential Aboriginal or historic heritage find*'.	D4C Environment Lead Environmental Representative D4C Community Engagement Manager SW PD Environment Team NSW Police Archaeologist
POTENTIAL ABORIGINAL OR HISTORIC HERITAGE FIND The D4C Environmental Lead is to notify NSW Police, Environmental Representative, Project Heritage Specalist and Sydney Water Program Delivery Environment Team. D4C not to move / impact the find without instruction from Project Heritage Specalist and Sydney Water. D4C Environmental Lead and Community Engagement Manager, in consultation with the Project Heritage specialist SW Environment and Community Teams. If deemed applicable Proejct Heritage specialist would be engaged to assess and confirm the significance of item.	
NOTIFICATION AND CONSULTATION Upon confirmation the heritage find is genuine, the D4C construction lead is to consult with the Sydney Water Porgram Delivery Environment Team regarding notification and consultation with relevant authorities (e.g., NSW Department of Planning and Environment (DPE), National Parks and Wildlife Services and NSW Department of Premier and Cabinet (Heritage NSW)). If findings are consistent with Aboriginal heritage, D4C Construction lead er and the D4C Community Engagement Manager to consult with relevant Registered Aboriginal Stakeholders/ Parties (RAPs), in consultation with Sydney Water Major Projects Environment and Community Teams.	D4C Environment Lead D4C Community Engagement Manager SW PDs Environment Team RAPs
RECOMMENCE WORKS Works are not to recommence until written consent is given by the Sydney Water PD Environment Team and if required, Heritage NSW and DPE.	Proejct Heritage Specialist
ASSESSMENT OF SIGNIFICANCE & MANAGEMENT The Project Heritage specialist is to undertake recording and assessment of confirmed heritage finds and determine appropriate mitigation measures.	SW PD Environment Team Heritage NSW and DPE (if required) D4C Construction Lead D4C Environment Lead

Unexpected/ previously unidentified Heritage Find and Human Remains Procedure

Scope: This Procedure has been prepared in accordance with Environmental Planning and Assessment Act 1979 (EP&A Act), Heritage Act 1977 (Heritage Act), Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977 (NSW Heritage Office 1998), Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997) and National Parks and Wildlife Act 1974 (NPW Act) for the management of unexpected heritage finds on the West Dapto Urban Release Area Stage 3 Project (WDURA).

Over page

CLOSE-OUT AND FINALISE REPORTING

Reporting of findings and assessment to be finalised and submitted to Heritage NSW, RAPs and relevant Councils in consultation with the Sydney Water Projects Environment Team, including registering the new Aboriginal heritage sites in Aboriginal Heritage Information Management System (AHIMS) register.

SW PD Environment and Community Teams

D4C Environment Lead

Table 1: Relevant Conditions of Approval

Condition	Condition Requirement	How Addressed
E6b(i)	The following points in blue as relevant from Condition E6b(i) shall be addressed: (b) **Aboriginal Heritage** (i) actions to manage identified Aboriginal objects directly and indirectly impacted by construction, developed in consultation with registered Aboriginal stakeholders prior to any archaeological or salvage works commencing, including but not limited to: − management measures and strategies for protection, monitoring, salvage, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; *− procedures for dealing with previously unidentified Aboriginal objects (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, involvement of a suitably qualified archaeologist and consultation with the Department and registered Aboriginal stakeholders, actions required to enable construction to recommence and notification to the OEH, in accordance with section 89A of the National Parks and Wildlife Act 1974, and the department;* *− procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH;* − training and induction processes for construction personnel on site identification, protection and conservation of Aboriginal cultural heritage;. − procedures for ongoing stakeholder consultation and involvement for the duration of the project; and procedures for monitoring and reporting effectiveness of management measures, including reporting of non-compliance.	This procedure has been prepared to addressed the requirements of MCoA E6b(i) in that It has been prepared to deal with any previously unidentified Aboriginal objects or Non Aboriginal items including human remains in accordance with the guidelines and standards stated within the Environmental Control Plan ECP-04 – Aboriginal and Non Aborigianl Heritage Management Plan. It has been submitted to the Planning Secretary for information before commencement of Work under the Approval and will be appended to the Environmental Control Plan ECP-04 – Aboriginal and Non Aboriginal Heritage Management Plan.

Unexpected/ previously unidentified Heritage Find and Human Remains Procedure

Scope: This Procedure has been prepared in accordance with Environmental Planning and Assessment Act 1979 (EP&A Act), Heritage Act 1977 (Heritage Act), Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977 (NSW Heritage Office 1998), Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997) and National Parks and Wildlife Act 1974 (NPW Act) for the management of unexpected heritage finds on the West Dapto Urban Release Area Stage 3 Project (WDURA).

E6c(i)	The following points in blue as relevant from Condition E6c(i) shall be addressed: c) **Non-Aboriginal Heritage** (i) actions to manage identified non-Aboriginal items directly and indirectly impacted by construction, developed in consultation with the Heritage Branch, OEH prior to any archaeological works commencing, including but not limited to: - management measures and strategies for protection, excavation, archival recording and/or conservation of sites and items that will be directly or indirectly impacted during construction; - procedures for monitoring and reporting on effectiveness of management measures, including reporting of non-compliance; *- procedures for dealing with previously unidentified heritage items (excluding human remains) including cessation of works, assessment of significance and determination of appropriate management measures, including involvement of a suitable qualified archaeologist and consultation with the Department and actions required to enable construction to recommence and notification of the Heritage Council of NSW, in accordance with Section 146 of the NSW Heritage Act 1977, and the department;* *- procedures for dealing with human remains, including cessation of works in the vicinity of the remains and notification of relevant stakeholders, including NSW Police, the department and the OEH;* and - training and induction processes for construction personnel on site identification, protection and conservation of heritage.	This procedure has been prepared to addressed the requirements of MCoA E6c(i), in that It has been prepared to deal with any previously unidentified Non Aboriginal items including human remains in accordance with the guidelines and standards stated within the Environmental Control Plan ECP-04 – Aboriginal and Non Aborigianl Heritage Management Plan. It has been submitted to the Planning Secretary for information before commencement of Work under the Approval and will be appended to the Environmental Control Plan ECP-04 – Aboriginal and Non Aboriginal Heritage Management Plan.

ENVIRONMENTAL CONTROL PLAN ECP-04

ABORIGINAL & NON-ABORIGINAL HERITAGE MANAGEMENT PLAN

Attachment B – Impact area and identified aboriginal archaeological sites

Figure 31. WD3 Part 3A impact area and identified Aboriginal archaeological sites

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Dewatering Management Environmental Control Plan

Document No: IN.20036851-V-PLN-0006

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	**Nicholas** [redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	Simon [redacted]	
13/12/2023	1	for review	All	Simon [redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	Simon [redacted]	[redacted] Nicholas [redacted]
19/01/2024	A	Approved by DCCEEW	All	Simon [redacted]	[redacted] c o as [redacted]

ENVIRONMENTAL CONTROL PLAN ECP-05

DEWATERING MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Dewatering Management ECP is to:

- Prevent adverse environmental impacts from the discharge of Groundwater, Surface water and Chlorinated water.
- Be compliant with the Water Supply Works Approval (WSWA) and Water Access Licence (WAL)

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of dewatering.
2. All personnel subject to a workplace induction.
3.

LICENCES/APPROVALS

License / Approval / Permit & Agency	Responsibility
Water Supply Works Approval (WSWA) [10WA124958] (Required when extracting any groundwater)	D4C project Team
Water Access Licence (WAL) [44923] (Required when extracting >3ML of groundwater)	D4C project Team
D4C dewatering permit – surface water/ground water	Site supervisor
D4C dewatering permit – chlorinated water	Site supervisor

3.2 Water Quality Objectives (WQO)

Two types of water discharge and their associated objectives are considered here.
They are; Excavation Dewatering (surface water/ groundwater) and Dewatering of Potable Water i.e. Chlorinated Water
The water quality guidelines for Excavation Dewatering can be found in Table 1 and for Dewatering of Potable Water see Table 2.

Note: Should further testing of additional analytes be required, they shall be tested against the criteria set out in the ANZECC2000 guidelines.

Table 1: Discharge from an Excavation

Discharge to Stormwater / Watercourse		
Water Parameter	Objective	Units
pH	6.5 – 8.5	pH
Turbidity	< 50	NTU
Hydrocarbons	No hydrocarbon sheens observed	N/A
Appearance	Free from unusual odours, colour, slime or foamy	N/A

Table 2: Discharge of Chlorinated Water (Drinking Water)

Discharge of Chlorinated Water		
Water Parameter	Objective	Units
pH	6.5 – 8.5	pH
Turbidity	< 50	NTU
Total chlorine residual	Refer to 4 key principles below	N/A
Fluoride	1.5	mg/L
Hydrocarbons	No hydrocarbon sheens observed	N/A
Appearance	Free from unusual odours, colour, slime or foamy	N/A

Sydney Water has reached agreement with the EPA on the following four Key Principles (and D4C will also adopt):
1) No discharge from water maintenance activities. Sydney Water will utilise practical measures to prevent any discharge.
2) If it is not practical to prevent a discharge completely then the objective is to minimise the level of chlorine in any discharge.
3) It is acknowledged that chlorine can have adverse impacts on aquatic ecosystems at levels as low as 0.01 mg/L. It is not possible to measure chlorine at levels this low.
4) Sydney Water will adopt best practice, acknowledging the environmental impacts of chlorine and taking specific receiving environments into account.

All super-chlorinated water shall be dechlorinated during discharge, irrespective of volume.
Dechlorination is also required for discharges of drinking water volumes greater than 1ML, such as from dewatering trunk mains or reservoirs, or when the discharge point is near sensitive receiver or waterway.
The site supervisor shall forward a brief description of the works and photos to D4C Environment and Sustainability Team for a site-specific discharge assessment.
The following table indicates pipe lengths equivalent to a 1ML discharge, for various pipe sizes.

Pipe dimensions equivalent to 1 ML	
pipe diameter (mm)	pipe length (m)
375	9,059
450	6,291
500	5,096
600	3,539
750	2,265
900	1,573
1200	885
1800	393
2100	289
3000	142

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection & Biodiversity Conservation Act 1999	• Protection of the Environment Operations Act 1997 • Water Management Act 2000 • Water Management (General) Regulation 2018 • Protection of the Environment Operations (General) Regulation 2009	• Best Practice Erosion and Sediment Control (IECA, 2008) • Managing Urban Stormwater: Soil and Construction (Landcom, 2004) ('Blue Book') • Managing Urban Stormwater: Soil and Construction Volume 2a Installation of Services (DECCW 2009) • Australia and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council, 2000)	• Sydney Water Guidance Standard Erosion and Sediment Control (ENV-GS-006 9.6) • D4C Global Mandatory Requirement No.09 Environment Management • Sydney Water Guidance Standard Environmental Restoration Management (ENV-GS-005 9.5) • Sydney Water Land Management procedure (SWEMS0147) • Sydney Water Discharge Protocol (WPIMS5021) • Sydney Water, Water Quality Management During Operational Activities (D0001667) • Sydney Water Guidance Standards Excavation Dewatering (ENV-GS-001 9.1)

		• AS/NZS 5667.1:1998 – Water quality – Sampling – Guidelines on the design of sampling programs, sampling techniques and the preservation and handling of samples • AS/NZS 5667.12:1998 – Water quality – Sampling – Guidance on sampling bottom sediments AS/NZS 5667.11:1998 – Water quality – Sampling – Guidance of sampling of groundwaters	• Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998). • Dewatering Permit PROMGT-V-TEM-0024

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- CL – Construction Lead
- SM – Site Manager / Super Intendant
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng – Engineer
- WQO – Water Quality Objectives
- SDS – Safety Data Sheet
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- PPE – Personal Protective Equipment

5.0 Water Quality, Erosion and Sediment Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Determine contamination and groundwater risks that need to be mitigated to ensure appropriate soil and water quality testing is undertaken prior to commencement of construction.	PEC/Eng	Workplace Planning
2.	Develop a SEP for the works which clearly defines the planned erosion and sediment controls and their locations. This plan will include the locations of any waterways, drains or sensitive areas, and the slope direction / flow path of water. The SEP will be updated, and approval sought prior to changes in site conditions.	PEC/Eng	Workplace Planning
3.	On site reuse of retained water (either stormwater or groundwater) in excavations should be considered as a priority for all dewatering activities. Consider on-site reuse for dust suppression. The reuse of water from dewatering must not cause further ponding or result in surface runoff leaving the work site, which would be considered an unauthorised discharge from site.	PEC/Eng	Workplace Planning
4.	Trade Waste Water may only be discharged to sewer under a Trade Waste Agreement permit from the relevant	PEC/Eng	Workplace Planning

	Sydney Water Networks / Production Branch. Where a Trade Waste Agreement is in place for an activity or Project, all conditions of the agreement shall be communicated to the workers and complied-with at all times.		
5.	Any dewatering infrastructure such as sediment tanks, dechlorination units etc, must be stored within the construction corridor and not within the driplines of trees. Locations must be marked up on the SEP	PEC/Eng	Workplace Planning
6.	When planning the location of facilities, plant laydown areas, refuelling areas, stockpiles or chemical storage, areas that drain towards surface water or stormwater systems must be avoided in order to minimise risk of pollution.	PEC/Eng	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Inductions will include the following specific components for dewatering management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Awareness of potential impacts to surface water • Protocols relating to stormwater, dewatering, construction water and spent test water (such as hydrotest water) management, including the requirement for water quality validation prior to recycling or re-use and prior to discharge from site to the environment. • The use of erosion and sediment control devices to mitigate impacts, and ideal operation of these devices when considering dewatering activities. • The requirement for erosion and sediment control devices to be implemented and maintained in accordance with SEPs • Requirements under the Soil and Water Management Procedure	PEC/Safety Advisor	Workplace Planning
2.	All personnel involved in discharge of surface and groundwater from site will be additionally trained in monitoring, treatment, discharge requirements and discharge permit. This D4C Dewatering Management ECP will be communicated during the training.	PEC/Eng	Workplace Planning
3.	Surface water management, dewatering (water quality) and erosion and sediment control toolbox talks will be implemented as relevant and required to reinforce information provided during inductions.	All personnel	Project Delivery
No.	**Dewatering and discharge Operation**	**Staff Responsible**	**When**
1.	All dewatering and discharge must be planned and monitored to avoid spills, overflows and pollution.	PEC/Eng	Workplace Planning
2.	All dewatering is to be undertaken as per Sydney Water “Water Quality Management During Operational Activities (D0001667)” and Sydney Water Guidance Standards Excavation Dewatering (ENV-GS-001 9.1).	PEC/Eng/Sup	Workplace Planning
3.	Additional water quality testing may be required for other pollutants if water has encountered or likely to have encountered the following activities: • Works within known contamination soil or site (i.e. acid sulphate soil, salinity, etc.);	PEC/Eng	Project Delivery

	• Works within known area where hydrocarbon spills has occurred; • Newly poured concrete works Newly install spray seal (asphalt works)		
4.	No dewatering or discharge of surface water is to occur unless the water quality is within project Water Quality Objectives (WQO) set out in the D4C Soil and Water Management Procedure (also mentioned above). Where compliance with WQOs is not met, water shall be treated as per detail in Section 8.0 of the D4C Soil and Water Management Procedure. Field testing by the Environment and Sustainability team shall record compliance with project WQOs prior to discharge.	PEC/Eng/Sup	Project Delivery
5.	All dewatering or discharge is to be conducted under a Permit to Discharge approved by the D4C Environment and Sustainability team	PEC/Eng/Sup	Workplace Planning
6.	All stormwater drainage inlets and other discharge points where there is potential for scouring or erosion as a result of dewatering or discharge activity shall be protected by geofabric, sandbags or other effective means as appropriate.	PEC, Safety Advisor/Manager	Workplace Planning
7.	Where possible discharge water over a grassed area which is in an unsaturated state or install appropriate controls measures (e.g. silt bags, sediment fencing etc) to help scouring or sediment washout.	PEC/Eng/Sup	Workplace Planning
8.	The pump inlet must be suspended above ground and not come direct contact with soil/mud. Any other practical method which minimises the disturbance to bottom sediments and keeps the pump head out of the mud should be investigate and implemented.	PEC/Eng/Sup	Project Delivery
9.	Where using filtering device (e.g. filter bag, cartridge filter etc.) to manage sediment dispersion, the size and fitment should be correctly considered to manage the volume and flow rate in accordance with the manufacturers specifications.	PEC/Eng/Sup	Project Delivery
10.	Ensure all hose and pipe connections are correctly connected, secured and leak proof before dewatering commence.	PEC/Eng/Sup	Project Delivery
11.	Dewatering or discharge activity must be supervised by trained personnel, retained at all times the Permit to Discharge and all discharges meet the water quality objective and in accordance with Sydney Water Water Quality Management During Operational Activities (D0001667). Dewatering to cease if water quality observed has changed and testing confirmed WQO cannot be complied.	Trained Personnel	Project Delivery
12.	Water which does not meet the WQO may need to be flocculated with gypsum to address suspended solids or have its pH adjusted using hydrated lime (for acidic waters) or hydrochloric acid (for alkaline waters), refer to Section 8 of the D4C Soil and Water Management Procedure. Visible oil and grease may be skimmed using a boom or other suitable methods.	PEC/Eng/Sup	Workplace Planning
13.	Where test results indicate that the WQO cannot be complied with, or there is a concern that the water may pollute the receiving environment, the water may be tankered off site and disposed of at a licence liquid waste facility.	PEC/Eng/Sup	Project Delivery
14.	Marine Spill kits must be located in areas where Groundwater is being pumped	Eng/Sup	Project Delivery

No.	Discharge of Chlorinated Drinking water	Staff Responsible	When
1.	Chlorinated drinking water greater than 1 ML (which is to be discharged) is to de-chlorinated prior to discharge	Eng/Sup	Project Delivery
2.	Consult with the D4C Environment and Sustainability Team for certain planned activities where discharges have not been assessed as part of an EIA	Eng/Sup	Project Delivery
3.	Where discharge measures set out in the Sydney Water Water Quality Management During Operational Activities (D0001667) cannot be met, the D4C Environment and Sustainability Team shall be consulted.	Eng/Sup	Project Delivery
4.	Discharge all water in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure (WPIMS5021), including erosion controls, discharge rate, dechlorination, monitoring.	Eng/Sup	Project Delivery
5.	All chlorinated water discharges of more than 1ML, all super chlorinated discharges irrespective of volume, and discharges in a sensitive environment (refer to the EIA) are to be dechlorinated as per Appendix 2 below. The site supervisor shall forward a brief description of the works and photos to the Environment and Sustainability Team along with the “Dewatering Permit”	Eng/Sup	Project Delivery
6.	Completed Dewatering Permits to be uploaded to Ineight upon completion of dewatering activities.	Eng/Sup	Project Delivery
7.	Prior to heavy forecasted rainfall, ensure any dewatering or discharge basins are lowered to accommodate additional inflow, if required.	Eng/Sup	Project Delivery
No.	**Specific WSWA conditions**	**Staff Responsible**	**When**
1.	***Awaiting approvals***		

6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Discharge points must be monitored daily to check Erosion and sediment controls are still viable and that any maintenance works can be completed	PEC/Eng/Sup	Daily during Project Delivery
2.	Daily internet check must be conducted, to ensure a ‘cease to take’ order has not been issued. This must be recorded in the logbook	PEC/Eng	Weekly

7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding dewatering shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident

5.	Once a breach of the WSWA conditions has occurred the Minister must be notified as soon as practicable	CL / PEC	Following incident

8.0 Ministers Conditions of Approval addressed in this plan	
No	**MCoA Conditions**
	No Conditions relevant to this Environmental Control Plan

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
	No Commitments relating to this Environmental control plan

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Contamination of surface water identified.	• Associated construction activities to cease immediately upon becoming aware of an environmental event. • Manage the event in accordance with D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response procedure. • Review construction methodology and provide alternative or improve management measures to be implemented as appropriate to prevent reoccurrence.
Sustained exceedance of water quality objectives	• Investigate and identify potential sources causing the exceedance. • Control the source. • Clean up or rehabilitate any impacts. • Implement appropriate controls. • Review construction methodology, control effectiveness and device design. • Report exceedances as necessary, if environmental event has occurred.
Poor quality of erosion and sediment controls	• Investigate deficient erosion and sediment controls and determine cause. • Repair, reinstate or improve existing controls. • Review maintenance, staff responsible and resources.
Spills or leaks of chemicals or hydrocarbons	• Spills/Leaks to be controlled, contained, cleaned up and reported as per D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response procedure. • Spill kits to be available, stocked and used as appropriate. • Review refuelling/plant maintenance practices and modify if appropriate.
Failure of erosion and sediment controls	• Repair or replace controls. • Clean up or rehabilitate any impacts. • Evaluate failure, investigate alternative controls, site, soils and required water quality levels.
pH levels outside WQO	• pH under WQO, need to increase the pH by adding a base such as agricultural lime. Note. Aglime can take time to become soluble. Other, more soluble products may be available, but ensure pH is not exceeded.

	• pH over WQO, need to lower the pH by adding hydrochloric acid. As a guide, 500mL hydrochloric acid lowers 7000L of water by a pH of approximately 1.5pH. For more guidance review to Appendix C below. To apply the acid safely all handling and PPE requirements specified in SDS must be followed refer to Hazardous Chemicals Management Procedure. • When adjusting water levels any additive is to be evenly dispersed throughout. Limit the amount of adjustments done as this may affect other water qualities. Determine the correct adjustment amounts first and apply accordingly and sparingly.
Turbidity outside WQO	• Refer to the Chemicals Management Procedure prior to procuring or handling chemicals. • Initially, wait for water to settle naturally or floc the water to speed up the process. Treating water with flocculent (e.g. gypsum, liquid alum or flocculent blocks) will cause sediments to descend to the bottom. • Gypsum: Can take 48hrs+ to act, dissolve into a slurry before dispersed into a holding tank/pond to increase its absorption/solubility. Dosing rates of 30kg per 100m3 (100,000L) can be used as a guide. Quantities are tested prior in a sample bucket or drum. • Liquid Alum: Faster acting, however the addition of Alum to acidic waters may cause environmental damage. Ensure pH is checked, it must be above 5.5 after treatment regardless of use. Alum is a higher-risk treatment option, as excessive use can introduce aluminium pollutants to the environment which can be toxic to marine life. Alum only to be used under consultation with the PEC. • Floc blocks: Can be situated in flow paths to ensure incoming water is dosed with flocculent upon entry to holding pond/tank, fine tuning of flocculent can then be completed on the pond/tank. Floc blocks are not to be left permanently in a pond/tank, instead they are in a flow path leading to the pond/tank that is dry when no water is flowing into the system. • Synthetic flocculants: Many products are available for floccing purposes, when using other products, ensure they are suitable for your application and approved for site use. Always re-test pH levels after you have allowed the flocculent to work and adjust accordingly. Most flocculants will lower the pH level, further lime application may be required. Avoid overfloccing.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Air Quality
Environmental Control Plan

Document No: IN.20036851-V-PLN-0007

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
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Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

Parent Document: Environment Planning Procedure

ENVIRONMENTAL CONTROL PLAN ECP-06

DUST & AIR QUALITY MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Dust and Air Quality Environmental Control Plan are to:

- 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

1. Construction activities undertaken in accordance with this ECP.
2. No verified complaints or community concerns relating to dust generation during the construction phase of the Project.
3. No significant visible dust outside of the Project area boundary.
4. All workforce personnel (including subcontractors) to complete a Project induction, which will include an overview of dust management practices.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection & Biodiversity Conservation Act 1999	• Protection of the Environment Operations Act 1999 • Protection of the Environment Operations (clean air) Regulation 2010	• Sydney Water Delivery Management Guidance Standard Atmospheric Emissions (ENV-GS-010, 9.10)	• D4C Air Quality Management Procedure (PROMGT-V-PRO-0005) • D4C Global Mandatory Requirement No.09 Environment Management • D4C Air Quality Management Procedure (PROMGT-V-PRO-0005)

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C – Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- AMS – Activity Method Statement
- Eng – Engineer
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- WQO – Water Quality Objectives

5.0 Dust and Air Quality Management

5.1 Actions			
No.	**Inductions and Training**	**Staff Responsible**	**When**
1.	Site inductions will include the following specific components for dust and air quality management: • All Ministers Conditions of Approval and Statement of Commitments. • Existence and requirements of this plan. • Dust and air quality management objectives, including the avoidance of dust generation during works. • Key dust and air quality management measures.	PEC	Project Delivery
No.	**Avoidance and Suppression**	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9 – Identify environmental risks in the planning phase and allocate appropriate controls and resources to manage these risks.	All personnel	Project Delivery
2.	D4C Mandatory Requirements 9 – Minimise dust, noise and vibration at all times and work within approved construction site working hours.	All personnel	Project Delivery
3.	The project shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of causal works, as appropriate, such that visible dust emissions cease.	PEC/Eng/Sup	Workplace Planning
4.	Where the avoidance of dust-generating activities is not practicable, dust-suppression techniques to protect vegetation, worker health and amenity must be applied. Techniques may include spraying surfaces with water trucks, Street Sweepers on hard stands, irrigation and stabilisation, and controls such as temporary enclosures. Dust suppressant additives may be used to increase effectiveness and to reduce the volume of water required.	PEC/Eng/Sup	Project Delivery
5.	Where available, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources shall be used in preference to potable water for construction activities, including concrete mixing and dust control.	PEC/Eng/Sup	Workplace Planning and Delivery
6.	Dust management and suppression will be undertaken during and following vegetation clearing activities.	PEC/Eng/Sup	Project Delivery
No.	**Haul/Access Road Management**	Staff Responsible	When
1.	Where practicable, heavy use haul roads will be sealed during the construction phase of the project.	PEC/Eng/Sup	Project Delivery

2.	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. Further measures for high-volume traffic areas, such as temporary gravel cover, 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).	PEC/Eng/Sup	Project Delivery
3.	Site access will be via designated access points only. These points will be stabilised through gravel pad or similar means.	PEC/Eng/Sup	Project Delivery
No	**Materials Handling and Management**	**Staff Responsible**	**When**
1.	Dust from open sources will be minimised by implementing control measures such as, 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 Water Quality, Erosion and Sediment Environmental Control Plan (ECP-01).	PEC/Eng/Sup	Project Delivery
No	**Vehicle, Equipment, Machinery and Vessel Emissions**	**Staff Responsible**	**When**
1.	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	Project Delivery
2.	Where practicable, low-sulfur fuel will be used to minimise emissions from vehicles, equipment and vessel operations.	PEC/Eng/Sup	Project Delivery
3.	All vehicles and equipment will be adequately maintained and operated in a manner to ensure efficient operation to minimise energy use and greenhouse gas emissions.	PEC/Eng/Sup	Project Delivery

No	Atmospheric Emissions	Staff Responsible	When
1.	Construction activities will be managed to minimise the generation of air emissions, if practicable. Measures may include: • Efficient use of fuel and electricity • Establishing plant and machinery maximum idling times • Turning plant and vehicles off when not in use • 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 for automatic starting and stopping of power generating sets with demand • Inspections and preventative maintenance • Visual monitoring	All personnel	Project Delivery
2.	The project will be implemented in accordance with Sydney Water's policy on energy efficiency and greenhouse gas mitigation.	All personnel	Project Delivery
3.	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 / scrubbers.	All personnel	Project Delivery
No	**Odorous Emissions**	**Staff Responsible**	**When**
1.	Switch off plant, vehicles and equipment when not in use.	All personnel	Project Delivery
2.	Minimise the working surface area of high odorous materials.	Eng/Sup	Project Delivery
3.	Cap/cover odorous materials as soon as possible with clean fill or other covering.	Eng/Sup	Project Delivery
4.	Odour mitigation measures such as deodorisers and enclosures to be applied as required.	PEC/Eng/Sup	Project Delivery
5.	No burning of materials on site.	Supervisors	Project Delivery
6.	Cover open access chambers and manholes that expose sewage when not in use.	All personnel	Project Delivery
7.	Odour management will be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Elimination, engineering	PEC/Eng/Sup	Project Delivery

	operational, and other odour reduction controls will be implemented where verified odour complaints are received about odours from the wastewater system.		
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	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.	PEC/Eng/Sup	Daily during Project Delivery
2.	Vehicles, plant, equipment and machinery shall be regularly inspected daily to ensure good working order.	PEC/Eng/Sup	Weekly and prior to forcast and after storm events >10mm
3.	Visual inspection of airborne dust and dust deposition shall be undertaken as part of the weekly environmental inspection, with observations and any necessary actions entered into ComplyFlow and/or SW Delivery Portal.	PEC/Eng/Sup	Regularly during Project Delivery
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding dust and/or air quality shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident
8.0 Ministers Conditions of Approval addressed in this plan			
No	**MCoA Conditions**		
C1.	The project shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of causal works, as appropriate, such that visible dust emissions cease.		
C10.	The Project shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.		

C14.	Where available, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources shall be used in preference to potable water for construction activities, including concrete mixing and dust control.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
18	Potential impacts from dust generation will be managed through standard industry suppression measures.
19	Odour management will be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational, and other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.
33	All vehicles and equipment will be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.
34	The project will be implemented in accordance with Sydney Water's policy on energy efficiency and greenhouse gas mitigation.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Excessive dust from excavation	• Increase frequency of water truck spraying • Avoid excavation during dry and windy conditions, particularly if wind direction is likely to impact on any sensitive receivers. • Erect temporary dust screens, particularly between dust sources and sensitive receivers.
Excessive dust creation from hauling operations	• Spray haul roads with water, use soil stabilisation binder, apply crushed rock or a combination of these measures. • Reduce vehicle speeds. • Cover loads causing dust impacts. • Consider relocation of haul roads to less sensitive areas. • Clean dirty road surfaces, increase frequency of spraying/chemical application. • Install shakedown devices at entry and exit points.
Excessive dust from stockpiles	• Utilise suitable water suppression on stockpiles • Hydromulch/seed or stabilise stockpiles, cover stockpiles with geofabric (or similar) where appropriate. • Locate stockpiles away from sensitive receivers. • Leave larger buffer zones. • Erect temporary dust screens, particularly between the source and sensitive receivers.
Creation of excessive vehicle emissions	• Repair or undertake maintenance on equipment, plant and vehicles where necessary. • 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.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Hazardous Chemicals Environmental Control Plan

Document No: IN.20036851-V-PLN-0008

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-07

HAZARDOUS CHEMICALS MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Hazardous Substances & Dangerous Goods ECP is to:

Prevent adverse environmental impacts from hazardous substances and dangerous goods.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of hazardous substances and/or dangerous goods.
2. All personnel subject to a workplace induction.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
	• Protection of the Environment Operations Act (1997) • Protection of the Environment Operations Act (Waste) Regulation 2005 • Waste Avoidance and Recovery Act 2001NSW Industrial Noise Policy (EPA, 2000) • Draft EPA Guideline for Construction Noise	• Australian Standard AS 1940-2017 Flammable Liquid Storage and handling • Australian Dangerous Goods Code, Edition 7.8 2023	• D4C Hazardous Chemical Management Procedure (PROMGT-W-PRO-0016) • D4C Mandatory Requirements 9 Environmental Management • GHS and Dangerous Goods Segregation Chart • Sydney Water Delivery Management Guidance Standard

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng - Engineer
- WRA – Workplace Risk Assessment
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- SDS – Safety Data Sheet
- PPE – Person Protective Equipment

5.0 Hazardous Chemical Management			
5.1 Actions			
No.	**Design and Planning**	**Staff Responsible**	**When**
1.	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian standards; (b) for liquids, a minimum bund volume requirement of 110 per cent of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorized Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirements shall prevail to the extent of the inconsistency.	PEC/Eng	Workplace Planning and Delivery
2.	Fuel and chemical storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily AS 1940: Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes.	PEC/Eng	Workplace Planning and Delivery
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for hazardous chemicals: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Summary of hazardous chemicals that are likely to be present on Site. • Key requirements for handling, transportation and storage, including segregation of incompatible of materials. • 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.	PEC	Workplace Planning
2.	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.	PEC, Safety Advisor First Aiders	Project Delivery
3.	All personnel who store or handle hazardous chemicals must be aware of actions to be taken in the event of a spill or other incidents involving hazardous chemicals.	All personnel	Project Delivery
4.	All persons working with hazardous chemicals must be adequately trained in the TRA and correct use of controls.	Sup	Project Delivery
5.	All personnel who may be exposed to hazardous chemicals, including persons who are not directly involved in the storage and handling of hazardous chemicals but who may be affected by them, e.g. workers in the vicinity, must be adequately briefed on the risks and the actions to be taken in the event of an emergency.	PEC/Safety Advisor/ Sup	Project Delivery

No.	**Hazardous Chemicals/Dangerous Goods Selection and Risk Management**	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9. Confirm all approvals, licences, permits and environmental investigations are completed and communicated prior to commencing work.	All personnel	Workplace Planning
2.	The requirements to use, handle and/or store a hazardous chemical at a workplace must be initially identified and planned in the WRA and relevant AMS for the Workplace. As part of these assessments, consideration is given to whether a similar, less hazardous product can be used to substitute the hazardous chemical. Refer: Hazardous Chemical Risk Management (refer to Hazardous Chemicals Management Procedure).	PEC/Safety Advisor/ Sup	Workplace Planning
3.	If a substance cannot be eliminated or substituted, a TRA and Hazardous Chemical Risk Assessment must be developed. The Hazardous Chemical Risk Assessment is to assess only the chemical being used. This does not replace the TRA but sits alongside it to ensure specific requirements around the chemical's storage, health surveillance and PPE requirements are adequately addressed.	PEC/Safety Advisor/ Sup	Project Delivery
4.	During development of the TRA – verify that the hazardous chemicals have been approved for use in the AMS and consider the relevant information that has been included in the Hazardous Chemicals Risk Assessment	PEC/Safety Advisor/ Sup	Project Delivery
5.	Ensure that potential incidents or emergencies involving hazardous chemicals are identified. Ensure that appropriate procedures are implemented to respond to and fully mitigate incidents and emergencies practicable.	PEC/Safety Advisor	Workplace Planning
6.	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; • Proper disposal of contaminated spill response materials; • Protection of persons involved in the clean-up operations.	PEC/Safety Advisor	Workplace Planning
7.	The Workplace Emergency Response Plan will reflect possible emergencies arising from the full range of hazardous chemicals on the site, including spills.	PEC/Safety Advisor	Workplace Planning
No.	**Receipt**	**Staff Responsible**	**When**
1.	Ensure that any hazardous chemical proposed to be brought to Site complies with site-specific approval conditions	All personnel	Project Delivery
2.	The PEC and Safety Advisor/Manager must ensure that a valid (<5yr old) 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	Project Delivery
3.	A Register of all chemicals in the workplace must be established and maintained	PEC/Safety Advisor	Project Delivery
4.	Before accepting any hazardous chemicals on Site ensure that a Hazardous Chemical Risk Assessment has been completed and that the Chemicals Register has been updated to include the chemical.	All personnel	Project Delivery

	Hazardous Chemical Storage and Labelling	Staff Responsible	When
1.	D4C Mandatory Requirements, Store, handle, use and dispose of waste and hazardous substances in a manner that minimises environmental impact	All personnel	Workplace Planning
2.	Chemicals and fuel must be labelled and stored in bunded areas in accordance with the safety data sheet (SDS)	All personnel	Project Delivery
3.	Spill kit and fire response equipment must be readily accessible and located where chemicals and fuelled plant or equipment is being stored, operated or maintained.	PEC/Safety Advisor/Sup	Project Delivery
4.	Marine Spill kits must be located in areas where groundwater is being pumped, or potential spills could impact waterways or other marine environments as specified in the SEP	PEC, Sup	Project Delivery
5.	All chemical storage containers will display the appropriate placarding, labelling and markings. When decanting a hazardous chemical into a temporary container, the product name will be clearly marked and other relevant information will be included on labels accordingly.	All personnel	Project Delivery
6.	Storage areas and containers are to be checked regularly to ensure they comply with Australian Standard AS 1940.	PEC/Safety Advisor	Project Delivery
7.	All chemicals will be stored with the appropriate SDS sheet available.	All personnel	Project Delivery
8.	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	Project Delivery
No.	**Bulk Hazardous Chemical Storage**	**Staff Responsible**	**When**
1.	Quantities of chemicals are to be monitored against the placard and manifest requirements under the Model Work Health and Safety Regulations. Refer: Storage and Control of Hazardous Chemicals (refer to Hazardous Chemicals Management Procedure) for further information on Manifest, Placarding and notification requirements.	PEC/Safety Advisor	Project Delivery
2.	Bulk containers and bulk storage units will comply with the requirements of AS 1940 – *The storage of flammable and combustible liquids.*	PEC/Safety Advisor	Project Delivery
3.	Bulk containers/tanks: Hoses, nozzles and connectors will be appropriate for the application and free of damage.	PEC/Safety Advisor	Project Delivery
4.	Integral spill containment will be provided with truck, skid and trailer mounted bulk storage tanks/bowsers. In the absence of integral spill containment, sufficient spill containment equipment and material will be available.	PEC/Safety Advisor	Project Delivery
5.	For bulk storage of portable containers at work sites and depots, dangerous goods approved storage cabinets with spill containment will be used. Ventilated freight containers will also be acceptable. Portable containers in bulk storage units will be stored upright, separated and protected from other items in the same storage unit.	PEC/Safety Advisor	Project Delivery
6.	All bulk containers will be appropriately bunded. The bunded area must have a minimum capacity equal to the capacity of the bulk container. If more than one bulk container is held within a single	PEC/Eng/Sup	Project Delivery

	bunded area, the bund must have a minimum capacity equal to 110% of largest stored volume within bunded area		
7.	Incompatible hazardous chemicals will not be contained within the same bund. Refer: GHS & Dangerous Goods Segregation Chart (refer to Hazardous Chemicals Management Procedure).	PEC/Safety Advisor	Project Delivery
No.	**Fuel Handling, Transport and Storage**	**Staff Responsible**	**When**
1.	Fuel handling, transport and storage will be managed in accordance with Fuel Handling, Transport and Storage (refer to Hazardous Chemicals Management Procedure).	PEC/Safety Advisor	Project Delivery
2.	The appropriate SDS will be available wherever fuels are being transported, stored or handled.	All personnel	Project Delivery
3.	Refueling areas will be positioned > 20m from any waterway edge/entry point (drain).	All personnel	Project Delivery
4.	Fuel storage will be outside of overland water flow paths.	All personnel	Project Delivery
5.	Refuelling will occur in designated hardstand areas or over appropriate bund/spill tray.	All personnel	Project Delivery
6.	Hydrocarbon spill kit and appropriate fire extinguisher will be positioned near all refuelling or storage locations.	PEC/Safety Advisor	Project Delivery
No.	**Disposal of Contaminated Materials**	**Staff Responsible**	**When**
1.	The transport and disposal of hazardous chemicals is to be undertaken in accordance with relevant Manufacturer SDS disposal requirements and relevant State or Territory legislation. Refer: Hazardous Chemical Disposal Requirements (refer to Hazardous Chemicals Management Procedure).	PEC/Safety Advisor	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Hazardous chemicals management and storage are to be monitored daily, with observations entered into daily diaries where necessary.	PEC/Safety Advisor	Daily during Project Delivery
2.	Hazardous chemicals management and storage are to be inspected as part of a weekly environment or HSE site inspection. The Hazardous Chemicals Storage Audit may be used for this purpose.	PEC/Safety Advisor	Weekly
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery

3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident

8.0 Ministers Conditions of Approval addressed in this plan	
No	**MCoA Conditions**
C11.	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian standards; (b) for liquids, a minimum bund volume requirement of 110 per cent of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirements shall prevail to the extent of the inconsistency

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
25	Fuel and chemical storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily AS 1940: Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Inappropriate storage	• Upgrade facility. • Clean-up, rectify facility. • Notify and train personnel
Inappropriate transport/handling	• Notify / train staff through toolbox meetings on the appropriate handling and transport techniques / methods
Inadequate clean-up materials	• Order more materials. • Investigate types of chemicals on site and consult a supplier for appropriate equipment. • Develop or revise spill material ordering system.
Leaks and spillage to ground/soils, ground or surface water	• Isolate source and contain spill. • Determine extent and degree of contamination. • Remediate as required by EPA / Local Government / Management requirements. • Transport and dispose of in accordance with EPA/ Local Government requirements. • Determine reasons why spill and future preventative action.

Inappropriate disposal	• Identify appropriate disposal facilities/service providers. • Notify / train staff.
Inaccurate records	• Update records, advise personnel

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Drill Fluid Management Environmental Control Plan

Document No: IN.20036851-V-PLN-0009

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision A, B, C etc. Upon initial issue (generally Contract Award) this shall be changed to a sequential number commencing at Revision 0. Revision numbers shall commence at Rev. 1, 2 etc.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-08

DRILL FLUID MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Drill Fluid Management ECP is to:

- appropriately protect physical features, surface stability and to control erosion.
- protect water quality.
- minimise noise and air pollution.
- minimise disturbance, or to avoid where possible, sites of cultural heritage value.
- manage and dispose of waste appropriately.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of drill fluids.
2. All personnel subject to a workplace induction.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection & Biodiversity Conservation Act 1999 • National Environment Protection Measures	• Protection of the Environment Operations Act 1997 • Water Management Act 2000 • Water Management (General) Regulation 2018 • Protection of the Environment Operations (General) Regulation 2009 • POEO Waste regulation, 2005	• Best Practice Erosion and Sediment Control (IECA, 2008) • Managing Urban Stormwater: Soil and Construction (Landcom, 2004) ('Blue Book') • Managing Urban Stormwater: Soil and Construction Volume 2a Installation of Services (DECCW 2009) • Australia and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council, 2000) • AS/NZS 5667.1:1998 – Water quality – Sampling – Guidelines on the design of sampling programs, sampling	• Sydney Water Guidance Standard Erosion and Sediment Control (ENV-GS-006 9.6) • D4C Global Mandatory Requirement No.9 Environment Management • Sydney Water Guidance Standard Environmental Restoration Management (ENV-GS-005 9.5) • Sydney Water Land Management procedure (SWEMS0147) • Sydney Water Discharge Protocol (WPIMS5021) • Sydney Water Water Quality Management During Operational Activities (D0001667)

		techniques and the preservation and handling of samples • AS/NZS 5667.12:1998 – Water quality – Sampling – Guidance on sampling bottom sediments AS/NZS 5667.11:1998 – Water quality – Sampling – Guidance of sampling of groundwaters	

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng – Engineer
- HSE – Health Safety Environment
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- SDS – Safety Data Sheet
- NGER – National Greenhouse and Energy Reporting

5.0 Drill Fluid Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Develop a Site (or area) specific SEP highlighting the construction limits of works and locations of site wide erosion and sediment controls as well as environmental constraints.	PEC	Workplace Planning
2.	Ensure the design and installation of erosion and sediment control devices is in accordance with the SEP, Civil Drawings and Landcom 'Blue Book' Managing Urban Stormwater - Soils and Construction Vol 1 (Landcom, 2004) and Sediment Control Guidelines.	PEC/Eng	Workplace Planning
3.	Launch and receival pits are to be designed so that clean water diversion is in place and water is not able to run into the pits	PEC/Engineers	Planning and construction
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for drill fluid management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Frac-out protocol	PEC/ Safety Advisor	Workplace Planning

	• Awareness of potential impacts to surface water • Key requirements for handling, transportation and storage, including segregation of wastes. • Waste storage facilities on the Site. • Description of the mechanisms by which erosion and sedimentation occur, and the associated environmental impacts. • The use of erosion and sediment control devices to mitigate impacts, and ideal operation of these devices. • The requirement for erosion and sediment control devices to be implemented and maintained in accordance with Site Environment Plans		
2.	Drill fluid management toolbox talks will be implemented as relevant and required to reinforce information provided during site inductions.	PEC/ Safety Advisor	Project Delivery
3.	All subcontractors that will produce waste will be provided with an NGER Data Letter and Subcontractor Energy, Water and Waste Report prior to commencing on site. Refer: PROMGT-V-RPT-0001	PEC	Workplace Planning
No.	**General**	**Staff Responsible**	**When**
1.	Launch and receival pits are to be constructed; • in locations specified on SEPs • away from riparian zones where possible • outside of heritage areas unless approvals in place	PEC/Eng	Prior to drilling works
2.	All drill fluid chemicals are to be stored in bunded areas when not in use. Valid SDS's must be available onsite for all chemical products being used.	PEC/Eng	Prior to drilling works
3.	Plant prestart is to be conducted on the drill rig daily prior to being used.	Drilling contractor	Daily
4.	Marine spill kits must be in place and accessible during drilling under or in close proximity to waterways	Drilling contractor	Daily
5.	All drilling fluid is to be disposed of to an appropriately facility, licensed to receive drill waste.	Sup/Drilling contractor	Project Delivery
6.	Drill fluid and or mud shall be disposed of via sucker truck or is to be stockpiled, tested, classified and disposed of to an appropriate facility.	PEC, Safety Advisor	Workplace Planning
	Drill Fluid Levels	**Staff Responsible**	**When**
1.	Fluid pressures are to be continually monitored through the Drill rig pressure gauges. If pressures drop significantly follow frac-out protocol	Drilling contractor	Project Delivery

2.	Fluid levels are to be continually monitored through the mud tank. If levels drop significantly follow frac-out protocol	Drilling contractor	Project Delivery
No.	**Frac-out Protocol**	**Staff Responsible**	**When**
1.	Following identification of a **frac-out** event, the following actions will occur: • All work to cease, including mud recycling activities. • D4C Supervisor is to be informed immediately, who in turn will report to the PEC, CL and ER • Workers to search drilling alignment for signs for frac-out • Frac-out to be isolated with sand and silt bags to contain drilling fluid, or alternatively marine spill kit and booms for a waterway. • Removal of drilling mud (by standby vacuum truck where required) • Any ground subsidence to be made safe, including via temporary restoration if required. • Ensure the frac-out area restored according to project restoration requirements.	Drilling contractor	Upon Frac-out
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Pull back pressures, fluid returns and down hole pressure will be monitored and recorded.	Drilling contractor	Project Delivery
2.	Regular inspection of erosion and sediment controls shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow and/or SWDeliveryPortal.	PEC/Eng/Sup	Project Delivery
3.	Hazardous chemicals management and storage are to be inspected as part of a weekly environment or HSE site inspection. The Hazardous Chemicals Storage Audit may be used for this purpose.	PEC, Safety Advisor/Eng/Sup	Weekly
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding directional drilling shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
5.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident Notification and Reporting Matrix (refer to Incident and Event Management Procedure).	CL / PEC	Following incident

8.0 Ministers Conditions of Approval addressed in this plan	
No	**MCoA Conditions**
E2.	The Proponent must address management of drilling slurry for all directional drilling sites as part of the Construction Environmental Management Plan (CEMP) required by condition E5 including monitoring of cutting fluid returns and actions to be taken in the event of losses in drilling fluid.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
	No Commitments relating to this Environmental control plan

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Frac-out	• Review pressure level records and drill at a reduced pace • Inspect machine for faults and repairs requiring attention
Incorrect disposal	• Confirm suitability of waste removal contractor. • Confirm/inspect disposal facilities for suitability. • Notify/train personnel.
Contamination of site	• Review frequency of mud bins suck out.
Poor quality of erosion and sediment controls	• Repair/reinstate controls. • Review maintenance, staff responsible and resources.
Spills or leaks of chemicals or hydrocarbons	• Spills/Leaks to be contained, cleaned up and reported. • Spill kits to be used as appropriate. • Review refuelling/plant maintenance practices and modify if appropriate.
Failure of erosion and sediment controls	• Repair or replace controls. • Clean up or rehabilitate any impacts. • Evaluate failure, investigate alternative controls, site, soils and required water quality levels.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Traffic and Access Environmental Control Plan

Document No: IN.20036851-V-PLN-0010

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision A, B, C etc. Upon initial issue (generally Contract Award) this shall be changed to a sequential number commencing at Revision 0. Revision numbers shall commence at Rev. 1, 2 etc.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	Update post review for DPIE feedback	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-09

TRAFFIC AND ACCESS MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Traffic and Access ECP is to:

- Minimise disruption to private property and local roads.
- Maintain access to private properties at all times.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of hazardous substances and/or dangerous goods.
2. All personnel subject to a workplace induction.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
	• Workplace Health and Safety Act (2011) • Workplace Health and Safety Regulations (2017) • Road Transport Act (2013) • Road Transport Regulation (2021)	• Traffic management for construction or maintenance work (2008) • Australian Standard 1742.3 – Manual of Uniform Traffic Control Devices (2009)	• Traffic control at work sites Technical Manual (2022) • D4C Mandatory Requirements 1 Traffic, Plant and People •

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng - Engineer
- Des - Designer
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- RMS – Roads and Maritime Service

5.0 Traffic and Access

5.1 Actions

ENVIRONMENTAL CONTROL PLAN ECP-09

TRAFFIC AND ACCESS MANAGEMENT PLAN

No.	Design and Planning	Staff Responsible	When
1.	Design compounds and laydown areas so that they will have a minimal impact on surrounding community and road users.	PEC/Eng	Workplace Planning
2.	Ensure compounds have adequate parking for workers to avoid unnecessary street parking	PEC/Eng	Workplace Planning
3.	The project shall be designed with the objective of minimising adverse changes to existing access arrangements and transport services, including school bus services. Any need to alter public transport services or their routes shall be discussed with the provider and suitable alternative arrangements agreed upon.	Des/Eng	Workplace Planning
4.	Upon determining the haulage route(s) for construction vehicles associated with the project, and prior to construction, an independent and qualified person or team shall undertake a Road Dilapidation Report. The report shall assess the current condition of the road. The Report shall be submitted to the relevant road authority for review and comment prior to the commencement of haulage.	Qualified Assessor	Workplace Planning
5.	Design appropriate construction methodologies for road crossings to be developed and implemented in consultation with the relevant council and/or RMS.	Des/Eng/Community	Workplace Planning
6.	Temporary access arrangements will be negotiated with property owners and recorded in the Community Stakeholder Action Plan (CSAP).	Community	Workplace Planning
7.	Develop a Traffic Management Plan which; (i) identification of construction traffic routes and construction traffic volumes (including heavy vehicle/ spoil haulage) on these routes; (ii) details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points; (iii) identification of construction activities that could disrupt traffic, public transport, pedestrian, cycle and property access; (iv) management measures to minimise traffic impacts, including temporary road work traffic control measures, onsite vehicle queuing and parking areas and management measures to minimise peak time congestion and measures to ensure safe pedestrian and cycle access; (v) a response plan which sets out a proposed response to any traffic, construction or other incident; and (vi) mechanisms for the monitoring, review and amendment of this plan.	Qualified Traffic consultant	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for traffic and access: • All Ministers Conditions of Approval and Statement of Commitments • The Emergency Event Procedure • Existence and requirements of this plan • Always parking in a site compound • How to interact with the community	PEC/Safety Advisor	Workplace Planning

	• Avoid blocking access to private driveways or blocking public walkways		
2.	Regular toolbox and prestart meetings will be held to discuss general access issues including the agreements in the CSAPs for access onto private property.	PEC/Sup	Project Delivery
No.	**General**	**Staff Responsible**	**When**
1.	Construction vehicles (including staff vehicles) associated with the project shall be managed to: (a) minimise parking or queuing on public roads; (b) minimise idling and queuing in local residential streets where practicable; and (c) minimise the use of local roads (through residential streets and town centres) to gain access to construction sites and compounds.	All personnel	Workplace Planning
2.	All landowners or residents whose access will be affected during construction shall be notified a minimum of 48 hours in advance. Access to a property that is physically affected by the project shall be reinstated to an equivalent standard, in consultation with the property owner.	Community	Workplace Planning
3.	Road closures will be developed and implemented in consultation with the relevant road authorities (council and/or RMS).	Eng/Traffic Consultant	Project Delivery
No.	**Project completion**	**Staff Responsible**	**When**
1.	Following completion of construction, a subsequent (Dilapidation) report shall be prepared to identify any damage that can be attributed to the construction of the project and describe measures to restore any damage caused by construction of the project. The Report shall be submitted to the relevant road authority for review and comment.	Qualified assessor	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Local roads and access through private properties are to be monitored daily, with observations entered into daily diaries where necessary.	PEC, Engineers, Supervisors	Daily during Project Delivery
2.	All construction access ways are to be inspected as part of a weekly environment or HSE site inspection.	PEC, Engineers, Supervisors	Weekly
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding local roads and private property access ways shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
8.0 Ministers Conditions of Approval addressed in this plan			

No	MCoA Conditions
C26.	Construction vehicles (including staff vehicles) associated with the project shall be managed to: (a) minimise parking or queuing on public roads; (b) minimise idling and queuing in local residential streets where practicable; and (c) minimise the use of local roads (through residential streets and town centres) to gain access to construction sites and compounds.
C27.	The project shall be designed with the objective of minimising adverse changes to existing access arrangements and transport services, including school bus services. Any need to alter public transport services or their routes shall be discussed with the provider and suitable alternative arrangements agreed.
C28.	All landowners or residents whose access will be affected during construction shall be notified a minimum of 48 hours in advance. Access to a property that is physically affected by the project shall be reinstated to an equivalent standard, in consultation with the property owner.
C29.	Upon determining the haulage route(s) for construction vehicles associated with the project, and prior to construction, an independent and qualified person or team shall undertake a Road Dilapidation Report. The report shall assess the current condition of the road. The Report shall be submitted to the relevant road authority for review and comment prior to the commencement of haulage. Following completion of construction, a subsequent report shall be prepared to identify any damage that can be attributed to the construction of the project and describe measures to restore any damage caused by construction of the project. The Report shall be submitted to the relevant road authority for review and comment. Measures proposed to restore or reinstate roads affected by the project shall be implemented in a timely manner, in accordance with the reasonable requirements of the relevant road authority, and at the full expense of the Proponent.
E6.	As well as the general requirements of an EMP as outlined in condition E5, the following shall be addressed: (e) Traffic and Access (i) identification of construction traffic routes and construction traffic volumes (including heavy vehicle/ spoil haulage) on these routes; (ii) details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points; (iii) identification of construction activities that could disrupt traffic, public transport, pedestrian, cycle and property access; (iv) management measures to minimise traffic impacts, including temporary road work traffic control measures, onsite vehicle queuing and parking areas and management measures to minimise peak time congestion and measures to ensure safe pedestrian and cycle access; (v) a response plan which sets out a proposed response to any traffic, construction or other incident; and (vi) mechanisms for the monitoring, review and amendment of this plan.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
27.	Road closures will be developed and implemented in consultation with the relevant road authorities (council and/or RMS).
28.	Appropriate construction methodologies for road crossings will be developed and implemented in consultation with the relevant council and/or RMS.
29	Where there is a potential to impact on access to private property or pedestrian pathways, property owners, the local community and councils will be informed appropriately. Mitigation measures may include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Contaminated Land Management Environmental Control Plan

Document No: IN.20036851-V-PLN-0011

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

Parent Document: Environment Planning Procedure

ENVIRONMENTAL CONTROL PLAN ECP-10

CONTAMINATED LAND MANAGEMENT CONTROL PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Contaminated Land Management ECP is to:

- Minimise the potential for adverse health and environmental risks from contaminated soils.
- Minimise the potential for soil erosion and stormwater runoff of contaminants from contaminated soil areas.
- Characterise the contamination status of previously uncharacterised soils.
- Installation of controls in accordance with this ECP and Guideline Requirements.

3.0 Performance Criteria

3.1 General

1. Construction activities undertaken in accordance with this ECP.
2. No adverse health and environmental risks from contaminated soils.
3. All known contaminated soils contained as per Guideline Requirements.
4. Identification of unknown contaminated soils and containment of these soils as per Guideline Requirements.

3.2 Locations

Contaminated sites:
No contaminated sites have been identified through the Contaminated Land Management -Public Register;
Or through geotechnical investigations

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999	• Contaminated Land Management Act 1997 • Protection of the Environment Operations Act 1997 (PoEO Act) • Protection of the Environment Operations (Waste) Regulation (2016	• Acid Sulfate Soils Assessment Guidelines (Acid Sulfate Soils Management Advisory Committee (ASSMAC), 1998) • Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000). • Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ, 2000) (the ANZECC guidelines) • National Acid Sulfate Soils Guidance (DAWE 2018)	• D4C Hazardous Chemical Management Procedure (PROMGT-W-PRO-0016) • D4C Mandatory Requirements 9 Environmental Management • D4C Contamination and Hazardous Building Material Management Procedure (PROMGT-V-PRO-0010)

		• Managing Asbestos in or on Soil (SafeWork NSW, 2014) • Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004	

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C – Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Eng – Engineer
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage

5.0 Contaminated Land Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Develop a Site (or area) specific SEP highlighting the known locations of contaminated soils on the Site.	PEC/Eng	Workplace Planning
2.	Appropriate studies and assessments shall be undertaken prior to construction to identify and manage any localised contaminated soils. Soils shall be analysed for a broad range of potential contaminants to provide an indication of potential waste classification against the Waste Classification Guidelines – Part 1 (DECCW 2009) for off-site disposal purposes and to determine mitigation measures required. Should contaminated soil be encountered, consideration of the provisions of SEPP 55 – Remediation of Land and any relevant guidelines made or approved under the Contaminated Land Management Act 1997 is required.	Geotechnical Engineers	Workplace Planning
3.	Ensure the management of contaminated soils is in accordance with the appropriate guidelines and National Environment Protection (Assessment of Site Contamination) Measure (NEPM).	PEC/Eng/Sup	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for contamination management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • Location of known contaminated soil locations on Site. • Awareness of potential impacts from contaminated soil • Protocols relating to stop work procedure regarding contaminated soils, identification movement and treatment. • The actions required if a suspected contaminated site is identified.	PEC	Project Delivery
2.	All personnel involved in contaminated soil management will be appropriately trained including in	PEC	Project Delivery

	monitoring, treatment and disposal/containment requirements.		
3.	Contaminated soil toolbox talks will be implemented as relevant and required to reinforce information provided during site inductions.	PEC	Project Delivery
No.	**General Requirements**	**Staff Responsible**	**When**
1.	Contaminated soils must be identified, remediated, validated, and managed within the Site and land utilised for ancillary works, which are impacted.	PEC/Eng/Sup	Project Delivery
2.	If applicable construction works shall limit the disturbance known contaminated sites.	PEC/Eng/Sup	Project Delivery
3.	All vehicle and equipment movements are to be limited to access tracks and working areas including assigned speed limits. Unauthorised movement outside these perimeters is prohibited.	PEC/Eng/Sup	Project Delivery
4.	In the event of discovering contaminated land implement the Unexpected Finds Protocol in the Contamination and Hazardous Building Material Management Procedure (PROMGT-V-PRO-0010)	PEC/Eng/Sup	If contamination discovered
5.	Contaminated soil locations and stockpiles should be adequately sealed using an appropriate liner and bunded sufficiently to collect any runoff that may occur.	PEC/Eng/Sup	Project Delivery
6.	Contaminated soil locations and stockpiling areas are to be clearly marked with signage and vehicular movement in these areas is to be restricted.	PEC/Eng/Sup	Project Delivery
7.	Stockpiled soils and materials shall be positioned, and physical controls used where necessary, to minimise potential for erosion, loss of material and run off does not enter stormwater drains.	PEC/Eng/Sup	Project Delivery
8.	Stockpiled material shall be segregated by type to mitigate cross contamination and maximise reuse.	PEC/Eng/Sup	Project Delivery
9.	Contaminated stockpiles shall be maintained regularly, and controls replaced immediately when damaged.	PEC/Eng/Sup	Project Delivery
10.	All storm water must be diverted around contaminated soil locations and stockpiles so that no storm water runoff can contact contaminated stockpiles and release contaminants to any waters, roadside gutter or storm water drain.	PEC/Eng/Sup	Project Delivery
11.	Contaminated soil controls shall not be removed without the prior consent of the PEC.	PEC/Eng/Sup	Project Delivery
12.	Contaminated soils will be stockpiled for up to three weeks or until soils have been appropriately characterised for disposal/treatment.	PEC/Eng/Sup	Project Delivery
13.	Contaminated soil classification will be undertaken in accordance with the relevant guidelines and NEPM.	PEC/Eng/Sup	Project Delivery
14.	Remediation options are identified and selected using a sustainability hierarchy. 1. On-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level.	PEC/Eng/Sup	Project Delivery

	2. Off-site treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level. 3. Consolidation and isolation of the soil on site by containment within a properly designed barrier. 4. Removal of contaminated material to a site or facility licensed to accept the contaminated material, followed, where necessary, by replacement with appropriate material.		
15.	Haul roads will be utilised where practicable for cartage of contaminated soil.	PEC/Eng/Sup	Project Delivery
16.	Contaminated soil hygiene methods shall be used to prevent the spread of contaminated soil outside of identified area of contamination.	PEC/Eng/Sup	Project Delivery
17.	The primary method for controlling dust in areas known to contain contaminated soils and haul roads will be water sprayed by water tankers.	PEC/Eng/Sup	Project Delivery
18.	Minimise steepness and length of slope of contaminated soil stockpiles, where practicable.	PEC/Eng/Sup	Project Delivery

6.0 Monitoring

No	Monitoring Required	Staff Responsible	When
1.	General observations for the daily management of contaminated soil controls shall be documented in site dairies.	PEC/Safety Advisor/Eng/Sup	Daily during Project Delivery
2.	Regular inspection of contaminated soil controls shall be undertaken using the Weekly Environmental Management Inspection Checklist within ComplyFlow.	PEC	Weekly during Project Delivery
3.	Contaminated soil monitoring results to be maintained in InEight.	PEC/Eng	Project Delivery

7.0 Reporting

No	Reporting Required	Staff Responsible	When
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002).	PEC	Following Incident

8.0 Ministers Conditions of Approval addressed in this plan

No	MCoA Conditions
E1.	Appropriate studies and assessments shall be undertaken prior to construction to identify and manage any localised contaminated soils. Soils shall be analysed for a broad range of potential contaminants to provide an indication of potential waste classification against the Waste Classification Guidelines – Part 1 (DECCW 2009) for off-site disposal purposes and to determine mitigation measures required. Should contaminated soil be encountered,

	consideration of the provisions of SEPP 55 – Remediation of Land and any relevant guidelines made or approved under the Contaminated Land Management Act 1997 is required.

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
	No Commitments relating to this Environmental control plan

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Contamination of surface water identified.	• Associated construction activities to cease immediately upon becoming aware of an environmental incident. • Manage the incident in accordance with JH Incident Management and Investigation Procedure. • Revision of construction activities and further mitigation measures to be considered and implemented as appropriate to prevent further environmental harm from occurring.
Sustained exceedance of water quality criteria	• Investigate and identify potential sources causing the exceedance. • Control the source. • Clean up or rehabilitate any impacts. • Implement appropriate controls. • Review construction methods, control effectiveness and device design. • Report exceedance to EPA.
Poor quality of erosion and sediment controls	• Repair/reinstate controls. • Review maintenance schedule, staff responsible and resources.
Spills or leaks of chemicals or hydrocarbons	• Spills/leaks to be controlled, contained, cleaned up and reported. • Spill kits to be used as appropriate. • Review refuelling/plant maintenance practices and modify if appropriate.
Failure of erosion and sediment controls	• Repair or replace controls. • Clean up or rehabilitate any impacts. • Evaluate failure, investigate alternative controls, site, soils and required water quality levels.

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Visual Amenity
Environmental Control Plan

Document No: IN.20036851-V-PLN-0012

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-11

VISUAL AMENITY MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Visual Amenity ECP is to:

- Prevent adverse environmental impacts from construction works.
- Prevent adverse impacts on visual amenity to the surrounding community.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of visual amenity.
2. All personnel subject to a workplace induction.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
			• Community Stakeholder Action Plan

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- PEC – Project Environmental Coordinator
- Des - Designer
- CSAP – Community Stakeholder Action plan
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan
- EPA – Environmental Protection Authority
- OEH – Office of Environment and Heritage
- HSE – Health Safety Environement

5.0 Visual Amenity Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Community Stakeholder Actions Plans (CSAPs) are to be completed prior to entering properties. These plans will discuss the impacts due to construction and the rehabilitation to be conducted progressively.	Community	Workplace Planning

2.	Visual structures such as Vent stacks and Maintenance Holes shall also be documented in the CSAP	Community Manager	Workplace Planning
3.	Visual impacts of ventilation shafts will be minimised through painting the structures a dark 'bush green' colour, which has been chosen as the colour most compatible with the surrounding environment.	PEC/Eng	Workplace Planning
4.	Compounds and laydown areas will be designed to reduce the visual amenity on the community	PEC/Eng	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for visual amenity: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • What a CSAP is and how we manage them • The importance of reducing our visual amenity in the community • Being respectful and considerate whilst working within the community	PEC/Safety Advisor/Community	Workplace Planning
2.	When specific visual amenity requirements are laid out in the CSAP, specific training will be conducted for all workforce entering this property.	PEC/ Community/Sup	Workplace Planning
No.	**General**	**Staff Responsible**	**When**
1.	Visual impacts will be reduced through progressive rehabilitation of the alignment.	Eng/Sup	Project Delivery
2.	Local community and private property owners will be kept informed of works being undertaken, works coming up, contact details for enquiries and methods of registering complaints.	Community	Project Delivery
3.	When security lighting is required, it will be installed to minimise light spill to the surrounding community and local environment.	PEC/Eng/Sup	Project Delivery
4.	Work sites will be kept in a clean and organised condition.	Sup	Project Delivery
5.	Where possible crib sheds and office blocks shall be positioned to screen compound sites. Purpose built screens will also be used where practical.	PEC/Eng/Sup	Workplace Planning

6.0 Monitoring

No	Monitoring Required	Staff Responsible	When
1.	Work sites, compound and laydown areas are to be monitored daily, with observations entered into daily diaries where necessary.	PEC/Safety Advisor/Eng/Sup	Daily during Project Delivery
2.	Work sites, compound and laydown areas are to be inspected as part of a weekly environment or HSE site inspection. The Hazardous Chemicals Storage Audit may be used for this purpose.	PEC/Eng/Sup	Weekly

7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002).	PEC	Following Incident

8.0 Ministers Conditions of Approval addressed in this plan	
No	**MCoA Conditions**
	No Conditions relevant to this Environmental Control Plan

9.0 Statement of Commitments addressed in this plan	
No	**Commitment**
35	Areas to be disturbed by pipeline construction will be progressively rehabilitated.
36	Visual impacts of ventilation shafts will be minimised through painting the structures a dark ‘bush green’ colour, which has been chosen as the colour most compatible with the surrounding environment.

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Inappropriate storage of materials	• Upgrade facility • Clean-up, rectify facility • Notify and train personnel • Ensure waste bins are suitably sized and covered
Complaints concerning visual amenity	• Investigate complaint • Rearrange materials and storage if appropriate

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Waste Management
Environmental Control Plan

Document No: IN.20036851-V-PLN-0013

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	**Nicholas** [redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	Simon Orchard	
13/12/2023	1	for review	All	Simon Orchard	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	Simon Orchard	[redacted] Nicholas
19/01/2024	A	Approved by DCCEEW	All	Simon Orchard	[redacted] Nicholas

ENVIRONMENTAL CONTROL PLAN ECP-12

WASTE MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Waste ECP is to:

- Prevent environmental impacts from waste generated during all phases of the Project.
- Maximise waste reuse and recycling.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from waste management.
2. Recycling and re-use of waste wherever practicable.
3. Quantity of waste delivered to landfill minimised wherever practicable.
4. 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.

4.0 References

4. 1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Australian Dangerous Goods Code Edition 7.5 • National Environment Protection Measures • National Greenhouse and Energy Reporting Act 2007	• EPA Waste Classification Guidelines Parts 1-4 • EPA Contaminated sites sampling design guidelines (1995) • EPA Recovery Orders and Exemptions • Protection of the Environment Operations Act 1997 • Section 143 notice (Protection of the Environment Operations Act 1997) • POEO Waste regulation, 2005	• Sydney Water Technical Specification – Civil (CPDMS0023 9.0)	• D4C Waste and Resource Management Procedure (PROMGT-V-PRO-0008) • D4C Mandatory Requirements 9 Environmental Management • Subcontractor Energy, Water and Waste Report prior to commencing on site (PROMGT-V-RPT-0001).

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan

• CL – Construction Lead • Sup – Supervisor • PEC – Project Environmental Coordinator • WRA – Workplace Risk Assessment • HSE – Health Safety Environment	• EMP – Environmental Management Plan • ECP – Environmental Control Plan • EPA – Environmental Protection Authority • OEH – Office of Environment and Heritage • EPL – Environmental Protection License • NGER – Nation Greenhouse and Energy Reporting

5.0 Waste Management

5.1 Actions

No.	Planning	Staff Responsible	When
1.	All waste material removed during construction of the project shall only be directed to waste management facilities or premises lawfully permitted to accept the materials.	PEC/Eng/Sup	Workplace Planning
2.	Waste generated outside the project area shall not be received at the project area for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by an Environment Protection Licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	PEC/Eng/Sup	Workplace Planning and Delivery
3.	All liquid and/or non-liquid waste generated by the project shall be assessed and classified in accordance with Waste Classification Guidelines (EPA, 2014), or any superseding document.	PEC/Eng/Sup	Workplace Planning
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for waste management: • All Ministers Conditions of Approval and Statement of Commitments • Existence and requirements of this plan • 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.	PEC/Eng/Sup	Project Delivery
2.	Personnel who routinely handle hazardous chemicals or hazardous or Listed/Controlled/Regulated waste (e.g. refuelling personnel, pump operators, mechanics and stores personnel) will receive training in handling, transporting and storing hazardous chemicals or hazardous Listed/Controlled/Regulated wastes; in reporting and documentation requirements; and in spill clean-up techniques and practice.	PEC/Safety Advisor/First Aider	Project Delivery
3.	All subcontractors that will produce waste will be provided with an NGER Data Letter and Subcontractor Energy, Water and Waste Report prior to commencing on site. Refer: PROMGT-V-RPT-0001	PEC	Workplace Planning
No.	**Waste Avoidance and Reduction**	**Staff Responsible**	**When**
1.	Waste minimisation measures will be included in tendering, subcontracting and procurement processes wherever practicable.	PEC/Eng/Sup	Workplace Planning

2.	Existing items will be re-used wherever practicable to reduce wastage wherever practicable to reduce the need for additional purchases.	PEC/Eng/Sup	Project Delivery
3.	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 • Timber / wood products • Paper, cardboard etc. • Plastics • Glass • Hazardous wastes	PEC/Eng/Sup	Project Delivery
4.	Recycling bins will be provided in office and crib rooms.	PEC/Eng/Sup	Project Delivery
5.	Recycling skips (co-mingled or otherwise) will be provided within the vicinity of on-site works and compounds.	PEC/Eng/Sup	Project Delivery
No.	**General Waste Handling, Housekeeping and Storage**	**Staff Responsible**	**When**
1.	D4C Mandatory Requirements 9 – Spoil and inert waste to be reused off-site must be risk assessed and meet legal requirements prior to transportation.	PEC/Safety Advisor/Sup	Project Delivery
2.	D4C Mandatory Requirements 9 – Spoil and waste for disposal must be classified and transported by appropriately licensed contractors to licensed or approved facilities.	PEC/Safety Advisor/Sup	Project Delivery
3.	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	Project Delivery
4.	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.	PEC/Safety Advisor/Sup	Project Delivery
5.	Sanitary waste facilities will be provided for all female ablutions.	PEC/Eng/Sup	Project Delivery
6.	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.	PEC/Safety Advisor	Project Delivery

	• 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. Refer: JH-MPR-ENV-002 Resource Use Reporting		
7.	No waste is to be burned or buried on Site.	All personnel	Project Delivery
No.	**Listed/Controlled/Regulated Waste Management**	**Staff Responsible**	**When**
1.	Listed/Controlled/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 • Asbestos • Tyres • Sanitary and clinical waste • Sewage	PEC/Eng/Sup	Project Delivery
2.	Dedicated waste receptacles suitable for storage and segregation of Listed/Controlled/Regulated wastes will be provided as necessary. Containers and storage areas will comply with storage requirements as per the 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).	PEC/Safety Advisor	Project Delivery
3.	All Listed/Controlled/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 Listed/Controlled/Regulated waste (in the form of a Waste Transport Certificate or equivalent)	PEC/Safety Advisor	Project Delivery
4.	Soil contaminated with hydrocarbons will be managed as Listed/Controlled/Regulated waste. Depending on the size of contamination appropriate protection, storage, testing and remediation are to occur.	PEC/Safety Advisor	Project Delivery

6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Waste management will be monitored daily, with observations entered into daily diaries where necessary.	PEC/Eng/Sup	Daily during Project Delivery
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 ComplyFlow/InEight	PEC/Eng/Sup	Weekly
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	Records of waste quantities generated (including that reported by subcontractors) and any associated waste transport certificate documentation will be entered into Project Pack Web in accordance with D4C Waste and Resource Management Procedure (PROMGT-V-PRO-0008).	PER	Project Delivery
3.	Details of field observations will be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC/Safety Advisor	Project Delivery
4.	All inspection records are to be maintained in ComplyFlow/SWDelivery Portal.	PEC/Safety Advisor	Project Delivery
5.	All complaints / incidents regarding water quality, erosion and sediment control shall be reported immediately to the PEC.	All Staff	Following complaint/incident
6.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	PEC	Following Incident
7.	Incidents shall be reported to Regional, Group and External Agencies in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002)	CL / PEC	Following incident
10.0 Ministers Conditions of Approval addressed in this plan			
No	**MCoA Conditions**		
C15.	All waste material removed during construction of the project shall only be directed to waste management facilities or premises lawfully permitted to accept the materials.		
C16.	Waste generated outside the project area shall not be received at the project area for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by an Environment Protection Licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.		
C17.	All liquid and/or non-liquid waste generated by the project shall be assessed and classified in accordance with Waste Classification Guidelines (EPA, 2014), or any superseding document.		
9.0 Statement of Commitments addressed in this plan			
No	**Commitment**		
30	Excavated spoil will be reused on site for backfilling, landscaping and other uses. Where spoil is unsuitable for reuse, spoil would be classified according to the DECCW Waste Classification Guidelines (DECCW 2009a) and disposed of at an appropriately licensed facility.		

31	Where relevant, soil contamination studies will be carried out prior to construction. Soils will be analysed for a broad range of potential contaminants to provide an indication of potential waste classification Waste Classification Guidelines (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.
32	All wastes generated by the construction and operation of the Proposal will be classified and disposed in accordance with Waste Classification Guidelines (DECCW 2009a).

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Wastes incorrectly separated/segregated	• Inspect facilities for adequacy. • Notify and train personnel.
No/inadequate collection	• Arrange for collection by approved/licensed waste contractor. • Segregate and reuse or recycle wastes wherever practicable.
Reuse or recycling opportunity not recognised	• Train/re-train personnel. • Arrange for recycling collection by approved/licensed waste contractor.
Unlicensed operator	• Confirm operator license/s are appropriate for the required service.
Incorrect disposal	• Confirm suitability of waste removal contractor. • Confirm/inspect disposal facilities for suitability. • Notify/train personnel.
Contamination of the Site	• Notify client, assess degree and real extent of contamination. • Prevent access to the area. • Cover contamination to prevent exposure to rain. • Remove contaminated material and remediate in accordance with Regulator/Client requirements.
Inaccurate records management	• Update records. • Improve reporting system. • Train personnel.

11.0 Waste Estimation Record

INSTRUCTIONS

- Use this form to identify project waste sources, waste volume and waste disposal options including locations.
- All relevant fields are mandatory, unless otherwise indicated or not applicable.
- For further information on Waste Management, refer Waste and Resource Management Procedure (PROMGT-V-PRO-0008)
- To complete section *2 -Waste Estimation Details* refer to the example given and the following table.

Waste Classification/ Type	VENM Virgin Excavated Natural Material	ENM Excavated Natural Material	General Solid (P)	General Solid (Non-Putrescible) (Non-P)	Restricted Solid	Hazardous Liquid
	Special Waste e.g. Asbestos, Acid Sulphate Soils (ASS)	PASS Potential Acid Sulphate Soils	ASS Acid Sulphate Soils	Green/ Recyclable	Regulated Waste	
Waste Monitoring Activity	Visual inspection, chemical analysis					
Disposal Location	Provide the name and location of the Receiving Compound, Landfill/ Waste Facility, Transfer Station, or Development Approved (DA) Premises. Regulated waste disposal must list (and attach) the current licence for the transporter, disposal facility and accredited/ approved agent. Link back to relevant documents saved onto InEight.					

SECTION 1 – GENERAL DETAILS

Project Name:	West Dapto Package 3			Project Number:	20036851
Location:	Cleveland Rd, Horsley Bong Bong Rd, Horsley Cleveland Rd, Dapto	Contractor:	D4C	Date:	02/10/2023

SECTION 2 – WASTE ESTIMATION *Copy extra rows as required (to ensure that drop down selections are available). First line is an example.*

Waste Description	Waste Classification/ Type)	Method of Storage	Estimated Amount of Waste Produced *(Tonnes)*	Treatment/ Actions	Waste Monitoring Activity	Disposal Methodology *(Based on the waste hierarchy)*	Disposal Location *(name, EPL number, address, DA/S143 details)*

General Waste	General Solid (Non-Putrescible)	Skip	100	Nil	Nil	Disposal	Benedicts Unanderra – EPL number 20870
Spoil/ Fill Material	ENM	Stockpile	35000	Nil	Nil	Re-use	Nil
Spoil/ Fill Material	ENM	Stockpile	15000	Nil	Nil	Disposal	Benedicts Unanderra – EPL number 20870
Road Materials	ENM	Stockpile	100	Nil	Nil	Recycle	Benedicts Unanderra – EPL number 20870
Vegetation	Green or Recyclable	Skip	45	Nil	Nil	Recycle	Benedicts Unanderra – EPL number 20870
Drilling Mud/ Pothole waste	Special Waste Liquid waste	NA – Vacuum truck	500	Nil	Nil	Disposal	Soilco Kembla Grange – EPL number 21174
Co-mingled	Recyclable	Skip	5	Nil	Nil	Recycle	Benedicts Unanderra – EPL number 20870

WEST DAPTO URBAN RELEASE AREA
(Stage 3) Horsley & Cleveland Precincts

Acid Sulfate Soil Management Environmental Control Plan

Document No: IN.20036851-V-PLN-0014

Recommend Documents to be Read in Conjunction
This management plan it to be read in conjunction with the Environmental Management Plan **IN.20036851-V-PLN-0001**

Distribution
There are no restrictions on the distribution or circulation of this ECP within D4C.

	Uncontrolled Copy
Approved By:	[redacted] Construction Lead
Date:	19/01/2024

Revisions
Draft issues of this document shall be identified as Revision 0, 1, 2 etc. Upon initial DPE approval this shall be changed to an alphabetic sequence beginning at Revision A.

DATE	REV	DETAILS OF CHANGE	SECTION	PREPARED BY	REVIEWED & APPROVED BY
01/09/2023	0	Draft for review	All	[redacted]	
13/12/2023	1	for review	All	[redacted]	
12/01/2024	2	Update to reflect changes to address DPE feedback	All	[redacted]	[redacted]
19/01/2024	A	Approved by DCCEEW	All	[redacted]	[redacted]

ENVIRONMENTAL CONTROL PLAN ECP-13

ACID SULFATE SOIL MANAGEMENT PLAN

1.0 Scope

This Environmental Control Plan is applicable to all construction phase works associated with the West Dapto Stage 3 Project (D4C and its subcontractors).

2.0 Objectives

The objectives of this Acid Sulfate Soil Management ECP is to:

- Identify the nature and location of likely disturbance.
- Minimise and control potential disturbance of ASS/PASS.
- Protect the health and wellbeing of all staff onsite.
- Develop and implement adequate management measures to prevent impacts to the surrounding environment.
- Minimise and control effects of ASS/PASS leachate, groundwater and surface runoff.

3.0 Performance Criteria

3.1 General

1. No environmental incidents resulting from mismanagement of Acid Sulfate Soils.
2. All personnel subject to an Acid Sulfate Soil workplace induction.

3.2 Target

ASS risk maps (SEED 1997) indicate that only the northern most 1.9kms of Lot B have a low potential for Acid Sulfate Soils. The remaining sections have not been mapped as areas at risk of discovering ASS/PASS.

4.0 References

4.1 Legislation and Guidance Documentation

Federal Legislation	State legislation	Standards / Codes	Other Documentation
• Environmental Protection and Biodiversity Act 1999	• Contaminated Land Management Act 1997 • Protection of the Environment and Operations Act 1997	• Acid Sulphate Soils Remediation Guidelines for Coastal Floodplains in New South Wales (DECC 2007) • Acid Sulfate Soils Manual (Acid Sulphate Soil Management Advisory Committee, 1998).	• D4C Mandatory Requirements 9 Environmental Management • D4C Contamination and Hazardous Building Material Management Procedure (PROMGT-V-PRO-0010)

4.2 Definitions & Abbreviations

- SW – Sydney Water
- D4C –Delivering for Customers
- JH – John Holland
- CL – Construction Lead
- Sup – Supervisor
- AMS – Activity Method Statement
- TRA – Task Risk Assessment
- SEP – Site Environmental Plan
- EMP – Environmental Management Plan
- ECP – Environmental Control Plan

• PEC – Project Environmental Coordinator • Eng – Engineer • Des – Designer • SDS – Safety Data Sheet • SPOCAS – Suspension Peroxide Oxidation Combined Acidity and Sulfate methods	• EPA – Environmental Protection Authority • OEH – Office of Environment and Heritage • ASS – Acid Sulfate Soils • PASS – Potential Acid Sulfate Soils • POEO – Protection of Environmental Operations

5.0 Acid Sulfate Soils Management

5.1 Actions

No.	Design and Planning	Staff Responsible	When
1.	Review existing information available on ASS / PASS within the project works area.	PEC/Eng	Workplace Planning
2.	ASS will be managed in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).	PEC/Eng/Sup	Workplace Planning and Delivery
3.	Nominate an area where an ASS pad could be established if required. Include in SEP if required.	PEC/Eng	Workplace Planning and Delivery
No.	**Inductions and Training**		**When**
1.	Site inductions will include the following specific components for ASS: • All Ministers Conditions of Approval and Statement of Commitments. • Existence and requirements of this plan. • How to identify ASS. • Any areas of known ASS. • Key requirements for handling, transportation and storage. • Unexpected finds protocol.	PEC/Safety Advisor	Workplace Planning
No.	**Unexpected finds**	**Staff Responsible**	**When**
1.	In the unlikely event that ASS is discovered • Stop works and advise the supervisor. • Contact the Environmental Coordinator for advice. • Any excavated material is to be placed within a sealed and covered skip bin. • Field test material for pH.	All personnel	Workplace Planning
No.	**Treatment of ASS**	**Staff Responsible**	**When**
1.	The treatment area will be designed • to ensure acid leachate is collected in an impervious leachate/ runoff collection system capable of containing all the leachate runoff. • to ensure the pad is graded to a collection point.	Eng/Sup/Des	Workplace Planning
2.	Stockpile and store Lime as per the SDS.	Eng/Sup	Project Delivery

3.	Test ASS to determine appropriate liming rates.	Eng/Sup	Project Delivery
4.	Treat ASS until neutralisation has been confirm through SPOCAS testing.	Eng/Sup	Project Delivery
5.	Once neutralised, complete waste classification as per POEO Act and disposed of at an appropriately licenced facility.	Eng/Sup	Project Delivery
6.0 Monitoring			
No	**Monitoring Required**	**Staff Responsible**	**When**
1.	Water quality monitoring (pH) shall be conducted at the excavation and treatment / hardstand areas during and after storm events. If it is necessary to discharge water off site, water quality shall comply with the water quality objectives.	PEC/Eng/Sup	Daily during Project Delivery
2.	Daily visual inspections shall be carried out during excavation, treatment, transport and disposal of ASS materials.	Eng/Sup	Weekly
7.0 Reporting			
No	**Reporting Required**	**Staff Responsible**	**When**
1.	Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	PEC	Project Delivery
2.	All monitoring results are to be maintained in ComplyFlow.	PEC	Project Delivery
3.	All complaints / incidents regarding ASS management shall be reported immediately to the PEC.	All Staff	Following complaint/incident
4.	Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002).	PEC	Following Incident
8.0 Ministers Conditions of Approval addressed in this plan			
No	**MCoA Conditions**		
	No Conditions relevant to this Environmental Control Plan		
9.0 Statement of Commitments addressed in this plan			
No	**Commitment**		
3	ASS will be managed in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).		

10.0 Suggested Corrective Actions	
Problem	**Suggested Corrective Action**
Non-identification prior to disturbance	• Investigate potential environmental risk and implement ASS procedures accordingly.
Inappropriate disposal of untreated ASS soils	• Stop activity and communicate with PEC. • Dispose of ASS material in accordance with standards. • Notify CL. • Complete relevant forms (initial investigation report, detailed investigation report)
Spillage of untreated ASS material onto roads	• Promptly remove material from road. • Report to PEC and or CL. • Complete relevant forms (initial investigation report, detailed investigation report). • Determine reason for spill and future preventative actions.
Leakage from treatment area to ground and surface water and soil	• Contain leakage. • Communicate and report to PEC. • Immediately notify the Director-General and the Principal of any incident with actual or potential off-site impacts. • Notify EPA (where required). • Complete relevant forms (initial investigation report, detailed investigation report). • Ensure treatment pad design is in accordance with this procedure. • Determine reason for leakage and future preventative actions.
Contingency for incident management	• Contain the release of acid leachate, runoff or sediment occurring. • Implement hydraulic control measures. • Treat and monitor affected area prior to further disturbance. • Complete relevant forms (initial investigation report, detailed investigation). • Immediately notify the Director-General and the Principal of any incident with actual or potential off-site impacts. • Provide full written details of the incident to the principal within 12 hours of any incident or potential incident occurring. • The detailed report after the investigation is to be submitted to Sydney Water no later than 7 days after the incident or potential incident. • Communicate corrective actions to reduce the likelihood of incident reoccurrence.

Appendix 7 – Traffic Management Sub-Plan

1300 001 599
info@traffic-logistics.com.au
accounts@traffic-logistics.com.au
www.traffic-logistics.com.au
ABN 70 123 127 337

TRAFFIC MANAGEMENT PLAN

Traffic Management Works and Services provided to
Delivering For Customers under Traffic Logistics Pty Ltd

Sydney WATER | In partnership with D4C

Site Location: Cleveland Road to Darkes Road, West Dapto

Approved By:	[redacted] Construction Lead	[redacted]
Date:	19/01/2024	

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Contents

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1. Purpose

The purpose of this Traffic Management Plan is to ensure the commitment to safety of the traffic management team and the contractor's team, and that the safety processes, procedures, reporting and reviewing processes of each entity are met during the life of this project. This will be accomplished with the effective preparation, implementation and reviewal of the scope of works, development of traffic control strategies, vehicle routing and movement strategies, development of Traffic Guidance Schemes, assessment of on-site traffic controlling conditions, usage and effectiveness of traffic control devices implemented, emergency vehicle requirements and access routes, and the continual training and assessment of accredited Traffic Controllers.

This plan aims to identify the risks to all workers undertaking any works on or adjacent to a road. It shall ensure that appropriate control measures for any identified hazard are assessed, controlled, implemented, monitored and reviewed using the strategies and processes outlined in the Hierarchy of Control.
The legislative and reference documents used in conjunction with this plan include, but are not limited to:

- WH&S Act and Regulations (New South Wales).
- Transport Operations (Road Use Management) Act and Regulations (New South Wales).
- Risk Management Code of Practice (2007).
- Traffic Management for Construction or Maintenance Work Code of Practice (2008).
- Traffic Control at Worksites (TCaWS) Manual (2022).
- Australian Standard 1742.3- Manual of Uniform Traffic Control Devices (2009).
- Minimum statements of commitment include the following:
- Road closures will be developed and implemented in consultation with the relevant road authorities (council and/or the RMS).
- Appropriate construction methodologies for road crossings will be developed and implemented in consultation with the relevant council and/or the RMS.
- Where there is a potential to impact on access to private property or pedestrian pathways, property owners, the local community and councils will be informed appropriately. Mitigation measures may include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.

All contractors, subcontractors, employers, workers and other persons on-site shall be held to the standards set out in this Traffic Management Plan.
Risk assessments will be conducted before Traffic Guidance Schemes are implemented and prior to erecting any traffic control devices on site. This will assist in achieving a zero-harm working environment for all people within and around the work area.

2. Project Summary

2.1. Scope of Works

Delivering for Customers (D4C) is a sub-contracting company who is partnered up with Sydney Water. Their job is mainly to do with water utility works. The main work for this project is trenching of water and wastewater mains and upgrades to the existing waste water network.

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The project conditions of approval include a requirement detailed in MCoA E6(e) regarding traffic and access. A Traffic Management Plan be prepared to address this condition which includes -

(i) identification of construction traffic routes and construction traffic volumes (including heavy vehicle/spoil haulage) on these routes;
(ii) details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points;
(iii) identification of construction activities that could disrupt traffic, public transport, pedestrian, cycle and property access;
(iv) management measures to minimise traffic impacts, including temporary road work traffic control measures, onsite vehicle queuing and parking areas and management measures to minimise peak time congestion and measures to ensure safe pedestrian and cycle access;
(v) a response plan which sets out a proposed response to any traffic, construction or other incident; and
(vi) mechanisms for the monitoring, review and amendment of this plan.

This plan acts in coordination with the **Traffic and Access Management Plan ECP 09** as developed to address requirements Minimise disruption to private property and local roads, and maintain access to private properties at all times as detailed in conditions C26, C27, C28 C29 and E6(e)(i) to (vi).

This Traffic Management Plan has been prepared in accordance with these requirements and provides the required details. This Traffic Management Plan will require approval of the NSW Government

Snapshot of project is shown on Appendix A.

2.2. Location and Dates of Works

Location of works is from Cleveland Road (south) to Darkes Road (north), West Dapto. The main site compound is located on Cleveland Road (refer Appendix A).
The Ancillary site compounds are located along the alignment as derailed in Appendix A.

The works are expected to commence in January of 2024.

2.3. Road Configuration and Heavy Vehicles

Princes Highway between Cleveland Road and Darkes Road is four lane two way. Northbound from Cleveland Road there is a right turn lane to Fowlers Road, a roundabout at Unara Road and Yalunga Street intersection and a roundabout at Darkes Road and Kanahooka Road intersection. Southbound from Darkes Road has a roundabout at Darkes Road and Kanahooka Road intersection, a roundabout at Unara Road and Yalunga Street intersection, a right turn lane onto Maccabe Street and a right turn lane onto Fowlers Road.

Project traffic routes are detailed on Appendix A. Green shows heavy vehicle access around and within site and blue is coming and going from site for spoil haulage and plant deliveries, etc. There will be regular movements of ten trucks and twenty light vehicles around the green lines and approximately ten truck and dogs travelling in and out along the blue lines only.

Princes Highway is not a heavy vehicle route (vehicles between 19m to 26m not permitted).

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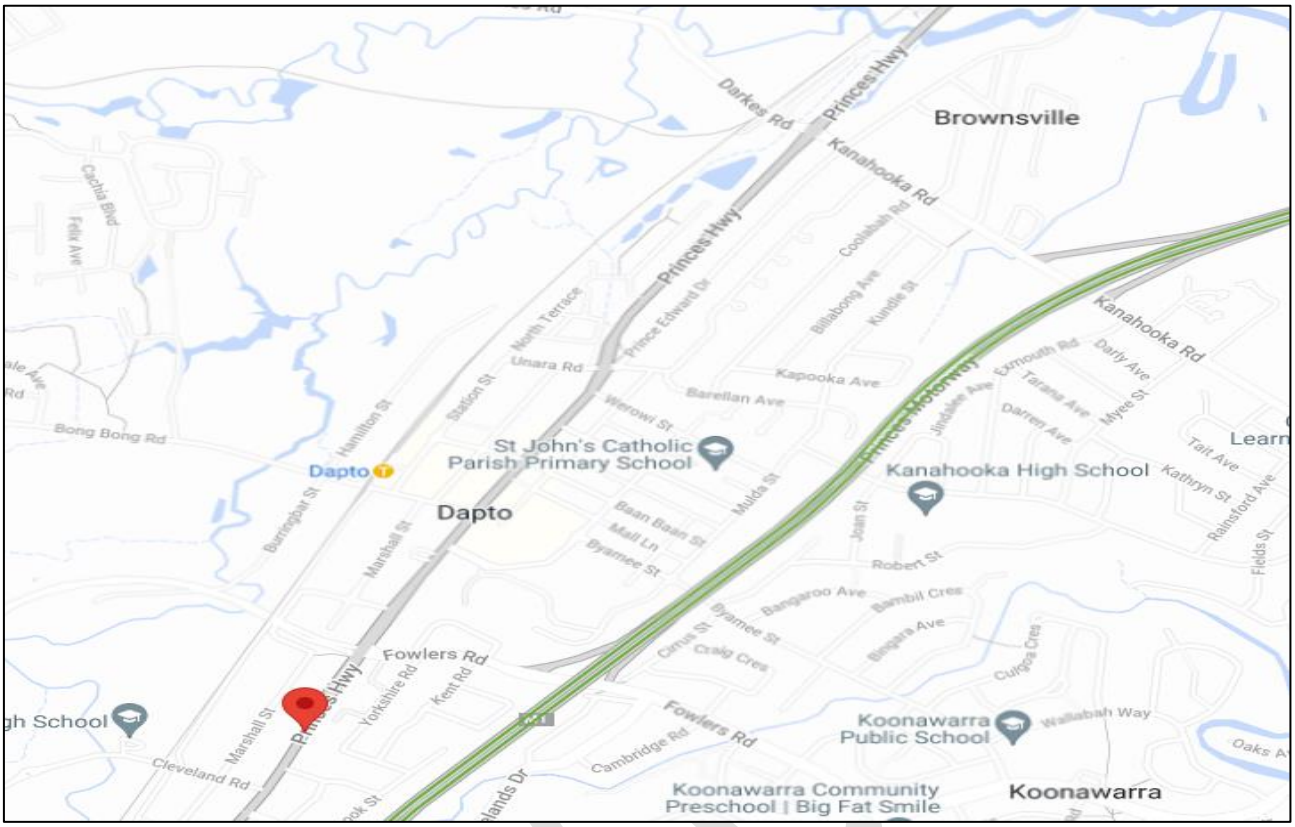

Image: TfNSW RAV map

2.4. Work Areas

Construction works will impact local roads including Galway Circuit and Ashton Vale Grove (in road), Bong Bong Road (opposite 354-400), Cleveland Road (in southern verge), Fairwater Drive from 20 Riverpark Way to the rear of 4 Pinnibar Circuit (southern verge), and Daisy Bank Drive (western verge) – refer **Appendix A** (general trenching alongside of road is shown on yellow marked sections). Traffic Guidance Schemes to be developed for these sections as construction is approached.
Other major roads will be subject to microtunneling construction under the road to avoid impact.

2.5. Site Inspection/Community Landmarks

A site inspection was completed. The inspection did not identify community landmarks. Northbound from Cleveland Street there is residential, Tyrepower, Conveyancing Choice, car yard, vet, Jetts 24 Hour Fitness, Coles Express, Kenda, KFC, Dapto Uniting Church, medical centre, Dapto Hotel, shops including but not limited to PRD, Crust, Subway, Kitchen 42, Highway Centre Mowers, Pizza Hut, X-Rays, Moto, Bike Hub and May's Restaurant and vegetation. Southbound from Darkes Road there is a pedestrian/cycle way, Salvos, D&N Car Sales, Iconic, residential, shops including but not limited to Thai Massage, MMJ Real Estate, Supercheap, Priceline, Brooklyn's Café and Grill, Baby and the Beanstalk, Pawn Stars, Adaptive Health Co, Companion Animal Veterinary Hospital, Dapto Mall, McDonalds, Dapto Ribbonwood Centre and Library, Massage Therapy, 7-Eleven, vegetation and more residential.

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3. Management of the Traffic Management Plan

Private driveways and side roads to be monitored by traffic control and advance warning signs placed where required. Traffic Controllers must assist and divert local traffic around closures where required.

Speed zones may vary. Adjust signs distances to suit speed zones as per Table 6.2 Recommended Taper Lengths in the Traffic Control at Work Sites Manual 6.1.

Table 6-2. Required maximum spacing of cones and bollards

Purpose and usage	Speed zone of device location km/h	Maximum spacing m
On approach to a traffic controller position (centreline or edge line)	All cases	4
Merge tapers	55 to 75 greater than 76	9 12
Lateral shift tapers	55 to 75 greater than 76	12 18
Protecting freshly painted lines	56 to 75 greater than 75	24 60*
All other purposes	less than or equal to 55 56 to 75 greater than 76	4 12 18

Note to Table 6-2: This spacing should be:*

- *Reduced on curves or crests or if the row of cones is not clearly defined at night.*
- *Extended to 60 m where the length of the line of cones or bollards exceeds 1 km but is not adjacent to locations where there are workers on foot.*

Traffic control cones and bollards must be placed up to a maximum spacing of –

- 12m in areas where approach speeds are above 56 km/h; and
- 4m in areas where approach speeds are less than or equal to 55 km/h.

3m lane widths and 1.5m clearance from passing traffic must be maintained for workers on foot and mobile plant.

Safe clearance zones between Traffic Controller and working plant and equipment shall be maintained at all times.

Little impact is foreseen to the community in the area with most of the work being undertaken in the shoulder or via microtunneling. Where stop slow is utilised, end of queue lengths will be monitored, and traffic control will ensure traffic delays are minimal.

3.1. Exclusion Zones

Exclusion zones shall be defined at the discretion of the Team Leader/Supervisor whilst on-site. This provides the safest and most practical exclusion zones for workers and non-workers to navigate to desired destinations. These exclusion zones shall take into consideration any Traffic Logistics Pty Ltd and D4C policies and procedures when defining the area.

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3.2. Shared Areas

Vehicles, plant and workers shall work harmoniously within the designated work area with the use of effective communication strategies. These strategies will inform all workers when there are any foreseeable conditions or events that may be dangerous to everyone within the work area, and may include verbal communication, positive gestures, sign language and any additional endorsed communication strategies discussed during a pre-start toolbox. Exclusion zones and safe clearance limits shall be observed at all times.

HAZARDS PRESENT

Consequences	Possible Hazards	Possible Causes
• Injury to worker • Injury to vehicle occupants or motorcyclists • Injury to pedestrians or cyclists • Damage to vehicles or equipment • Damage to infrastructure	• Penetration of worksite by a vehicle • Worker straying onto roadway or clear zone • Collision with obstacles on worksite • Failure to navigate through the worksite • End-of-queue collision • Works vehicle impacting with motorists or motorcyclists • Obstacles on worksite • Vehicle approach speed too high • Driver loss of control of the vehicle • Collision between machinery / plant on worksite • Abuse / harassment of workers by the public • Pedestrians entering workspace or attempting to cross road through "hot" works and active mobile plant items.	• Failure to observe work signs • Failure to navigate through the worksite • Inadequate controls • Failure to comply with controls • Inadequate delineation • Inadequate clearance • Inadequate procedures • Untidy worksite • Worksite left unattended • Improper attention given to motorists or motorcyclists • Poor signing • Inappropriate signing • Heavy traffic or delays • Inadequate sight distance • Long traffic queues • Inadequate signing • Inadequate instructions for workers • Improper attention given to the needs of pedestrians / cyclists • Inappropriate route through or past worksite • Inadequate separation from other traffic • Insufficient number of PTCD/traffic controllers • Poor visibility

The following control measures are considered to be applicable to this project:

Around	☐	Past	☒	Through	☐

Control Measure	Details of Measure
• Lane closures adjacent to the work area	Stop/Slow traffic management required
• Speed reduction for traffic travelling through the worksite;	Reduce speed to 40 km/h. Where 1.5m clearances for workers on foot and plant cannot be maintained; implement 30 km/h else initiate other control measures to reduce speed of traffic.
• Use of TfNSW approved Portable Traffic Control Devices (Type 2 automatic portable traffic signals - e-Stop, Porta-Boom, Type 1 manual portable traffic signal etc.)	PTCD's required for Stop/Slow traffic management. Manually controlled Type 1 approved Portable traffic signals
• Use of advanced warning signs;	Traffic control to install required Advance Warning Signs to inform approaching drivers of the roadworks activity as shown in the traffic guidance schemes.
• Use of electronic Variable Message Signs (VMS);	VMS Boards to be strategically positioned around the approaching network providing advanced warning messages to motorists. *Refer to VMS Strategy Plan in Part G*
• High visibility clothing for all workers; and	Mandatory for all personnel
• Various other measures. ○ Lead and/or tail vehicles ○ Pilot vehicles ○ Look out person ○ Traffic cones and temporary bollards	• Spotters to be used to observe traffic flow past workers on foot. • Traffic cones to delineate work zone from vehicle travel path • Use of escort vehicles for traffic under stop/slow management to be assessed prior to and during shifts to manage compliance with posted roadwork speed limits – especially in the proximity of workers on foot and mobile plant.

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3.3. No-Go-Zones

At no stage shall any worker engage in any behaviour that will impact any area that is within 1.5 metres of the edge of any road within work scope. This includes workers-on-foot, as well as workers conducting any elevated works within the designated work area. The no-go-zones provided on-site shall be listed during the pre-start, along with any additional no-go-zones in compliance with D4C and Traffic Logistics Pty Ltd policies.

3.4. Traffic Signal Operations

Traffic signal operations within scope of works at the intersections of Princes Highway and Fowlers Road, Princes Highway and Moombara Street, Princes Highway and Bong Bong Road and Princes Highway and Baan Baan Street will not be affected unless indicated on Traffic Guidance Schemes on **Appendix B.**

3.5. Trafficable Lane Restrictions

The only trafficable lane restriction will be the closed shoulder and a parking lane if necessary. Private driveways and side roads to be monitored by traffic control and advance warning signs placed where required. Traffic Controllers will assist and divert local traffic around restrictions and closures where required.

3.6. Bus Routes and Stops

Where bus routes and/or stops may be affected by these works, bus stops will be maintained or relocated as required and as indicated on Traffic Guidance Schemes (refer **Appendix B)**.

3.7. Existing Parking

Community Parking is available in carparks near Moombara Street, Baan Baan Street and side streets within scope of works.

Site parking and vehicle turnouts are confined to the site compound locations. No turnouts required on the local roads (refer **Appendix A**). The main site compound contains parking for up to 40 and the ancillary site compound for up to 15.

3.8. Project traffic routes

Project traffic routes to and from the site, around and within the site are detailed in Appendix A4. It is expected will be looking at regular movements of 10 trucks and 20 light vehicles around the green lines and approximately 10 truck and dogs travelling in and out along the blue lines daily.

3.9. Construction works impacting local roads

Works are expected to include generally trenching alongside of road for yellow marked sections as outlined in Appendix A5. Traffic Guidance Schemes will be developed for these sections prior to the works commencing.

3.10. Pedestrians/Cycle Way

A number of activities may impact on pedestrian, cycle and property access. These include -

- construction of water main works on Bong Bong Road and Cleveland Road;
- rising sewer main construction on Fairwater Drive, Galway Circuit and Ashton Vale Grove; and
- gravity sewer main construction on or near Riverpark Way, Bridgewater Drive, Fowlers Road and Daisy Bank Drive.

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Refer **Appendix A** for further details. Traffic Guidance Schemes will be developed to provide further details as to traffic controls to be implemented during these works.
Traffic Controllers will be responsible for monitoring pedestrian and cyclist activity to assist and divert pedestrians and cyclists where required.

3.11. Controls for Site Inspection Items and Community Landmarks

There are no community landmarks in the area. Businesses open during works to be monitored and access maintained.

3.12. Emergency Event Procedure and Emergency Vehicle Movement

All emergency service vehicles shall be given priority in an event where their vehicles are required to travel through the site. At least one open trafficable lane shall at all times be kept open to ensure that the emergency service vehicles are not impeded on approach to an emergency event.

Traffic Logistics to contact D4C Supervisor in the event of an emergency. D4C supervisor and all onsite personnel are to follow the Emergency Event Procedure found in **Appendix D.**
This procedure is to form part of the site induction process.

3.13. Traffic Guidance Scheme

The Traffic Guidance Scheme/s has/have been developed in accordance with the Traffic Control at Work Sites Manual (TCaWS, version 6.1, 2022). Traffic Guidance Scheme/s must also comply with the national requirements within the Australian Standard (1742.3) and shall only be implemented by accredited Traffic Controllers. If there is a requirement for Traffic Guidance Scheme/s to be modified, the implementer shall consult the Traffic Guidance Scheme developer and discuss the adjustments required with the proposed changes reflected in a risk assessment (in compliance with TCaWS requirements). Any adjustments are to be completed by the developer. Refer Traffic Guidance Schemes in **Appendix B.**

3.14. Vehicle Movement Plan

Details of vehicle movements for construction sites and site compounds including parking, dedicated vehicle turning areas, and ingress and egress points are detailed in **Appendix A**.

3.15. Approvals Required before Implementation

Before any delineation devices are implemented on Princes Highway, evidence of an approved Road Occupancy Licence and activation of said licence is required to begin the traffic management process. A copy of the Road Occupancy Licence, along with additional licences/permits as required by D4C shall be on-site at all times and shall be able to be produced at any point in the shift for review of significant stakeholders.

3.15.1. Hold Point: Certificates of Approval

Process Held: Works involving the implementation of traffic control devices on an RMS road that requires a Road Occupancy Licence and/or additional licences/permits.
Submission Details: Evidence of documentation approving the works to be completed, ie Road Occupancy Licence, council permits (if required), accompanied licencing requirements for works.
Release of Hold Point: Activating approved Road Occupancy Licence, along with the compliance of any terms or conditions that accompany the licence.

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3.16. Implementation of Traffic Management Plan and Traffic Guidance Scheme

The implementation of the Traffic Management Plan and Traffic Guidance Scheme shall, in accordance with local requirements (TCaWS v6.1, 2022), be undertaken by those fully qualified and accredited in the implementation of traffic management devices. No works shall begin prior to the review of all Traffic Controllers on-site displaying copies of accreditation.

3.16.1. Hold Point: Certification of Workers

Process Held: Works involving the implementation of traffic control devices.
Submission Details: Evidence of qualifications held by all traffic controlling parties on the work site.
Release of Hold Point: Documenting the qualification numbers of all workers intending to implement traffic control devices.

3.17. Monitoring, review, and reporting

D4C Construction Lead and Construction Engineers shall monitor construction activities and review this Traffic Management Plan. Details of field observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate. All monitoring results are to be maintained in ComplyFlow.
in the event of any changes to construction work which affect the validity of the plan D4C Construction Engineers shall contact Traffic Logistics to arrange changes. Similarly, should Traffic Logistics personnel become aware of any changes to the work environment which impact the validity of the plan, they shall consult D4C's project team and trigger a review of the plan.

All complaints / incidents regarding traffic control, main roads and local roads and private property access ways shall be reported immediately to the Project Environmental Coordinator. Incidents details shall be entered into SW Delivery Portal and JH Soteria in accordance with the Incident & Event Management Procedure (PROMGT-W-PRO-0002).

3.18. Responsibilities

3.18.1. Team Leader

In accordance with TCaWS Manual, the works supervisor or equivalent qualified person shall:

- Ensure that all signs and devices required by the Traffic Guidance Scheme are available, are the correct size and are in good condition.
- Ensure that the locations and types of devices are recorded in the diary.
- Ensure that authorisations have been given for the use of any roadwork speed zones or portable traffic signals.
- Ensure that, where flashing arrow signs are specified, only type–approved equipment complying with Specification TSI-SP-060 is used in accordance with Section 11, illuminated flashing arrow signs.
- Ensure that the Traffic Guidance Scheme is implemented as approved and a copy is available on site.

3.18.2. Traffic Controller

In accordance with TCaWS Manual, the person/s qualified in "Implement Traffic Control Plans" shall implement the approved Traffic Guidance Scheme before physical work commences and ensure that a copy of the Traffic Guidance Scheme is kept on site. The implementer shall also drive through the site before

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work begins to ensure that the Traffic Guidance Scheme has been implemented correctly and that it will warn, instruct and guide road users as designed. This drive through should also be completed at night if the traffic management will be in place after hours. Any variations made to the plan must be marked on the Traffic Guidance Scheme and initialled by the team leader.

The implementer shall ensure that, in conforming to the approved Traffic Guidance Scheme, by way of initial and regular inspections:

- There are no contradictory signs.
- There are no surplus, obstructing or distracting signs.
- The Traffic Guidance Scheme fits with other traffic control in the area which may or may not be under the control of the one organisation.
- Signs are suitably placed, by considering:
    - Line of sight and sight distances
    - Road user approach speeds
    - Expected queue lengths
    - Visibility, shady or high glare areas
    - The effects of sunrise and sunset
    - Lateral offset to travel lanes
    - Height of signs
- Only trained, certified and authorised Traffic Controllers are used and are suitably positioned.
- Signs and devices are in place at appropriate times, and removed or covered when not needed.
- Covered signs are inspected during windy periods to ensure that the covering has not been disturbed.
- Damaged or defective signs are replaced or repaired as soon as practicable.
- A trafficable travel path for vehicles is maintained and clearly defined.

The team leader shall also report any anomalies or inconsistencies found in the Traffic Guidance Scheme/s being used.

3.19. Plant and Equipment

All vehicles used in traffic control operations will be equipped with the appropriate vehicle mounted warning devices in accordance with the RMS TCaWS Manual and G10. During poor light conditions or at night, an additional Traffic Controller with an illuminated red wand will direct traffic around such plant and equipment.

During night time, where traffic is permitted to use the whole or portion of the existing road, all plant items and similar obstructions will be removed from the normal path of vehicles to provide a lateral clearance of at least 6m where practical, with a minimum clearance of 1.5m. Plant and equipment, within 6m of the normal path of vehicles, will be lit by not less than two yellow steady lamps suspended vertically from the point of the obstruction nearest to the traffic lane, and one yellow steady lamp at each end of the obstruction on the side furthest away from the traffic lane.

3.20. Portable Traffic Control Device (PTCD) (E-STOP)

A PTCD is a device designed to manually control traffic. A PTCD is designed to reduce risk to traffic control personnel by enabling use and control of the device remotely so that the operator can be located outside of the live lane of traffic. PTCD's may include but are not limited to PTS and boom barriers.

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For the works being conducted by Traffic Logistics for D4C, an E-STOP setup to control the traffic around the work area will be used. Approval from Transport of NSW to operate Type-1 Portable Traffic Signals (Certificate No: ITS-TAN000122) is attached in **Appendix C**.

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3.21. Communication and Consultation

3.21.1. Time Management

Traffic Logistics Pty Ltd and/or D4C must meet all time management requirements including:

- Notifying emergency services and relevant transport industry of significant traffic disruption.
- Notifying residents and businesses affected by any disruption (ie VMS board, letterbox drop).
- An additional letterbox drop/s to residents at least five business days before the proposed commencement date.
- Ensuring works are only carried out during the times and days permitted.
- Lodgement, no less than ten business days before the work, of a Road Occupancy Licence.
- Advise TMC of delays to traffic which are, or are anticipated to be, longer than 15 minutes.

3.21.2. Public Notification

Identified stakeholders (not being limited to residents, public transport services and emergency services) will be consulted and advised by D4C of impending works and any traffic impacts.

Stakeholder	Basis of Engagement
Police	Email
Fire	Email
Ambulance	Email
Residents	Door knock, letter drop, Live Traffic, social media
Business	Door knock, letter drop, Live Traffic, social media
Public Transport	Email

VMS Strategy

VMS strategy to be developed for these works.

Traffic Volumes

No traffic volume data is available.

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Disclaimer and Review

To the knowledge of the developer of this Traffic Management Plan, the details within are accurate reflections of the proposed work area. Any changes made to this work area prior to the commencement of work shall be reported to the developer, to which appropriate adjustments shall be made.

Traffic Logistics Pty Ltd does not hold any responsibility in the on-site implementation of the Traffic Management Plan or Traffic Control Plans if these plans are implemented by any organisation other than Traffic Logistics Pty Ltd. These plans are provided for Traffic Management Service Providers, that take ownership of all traffic management events during the initial implementation of the work site, through to the conclusion of the project.

This Traffic Management Plan requires reviewal prior to the acceptance and implementation by the direct customer, Traffic Logistics Pty Ltd, and any additional notes to be provided with an authoritative signature, confirming the acceptance of the product provided.

Roles, Responsibilities and Approvals

Functional Role	Name/Company	Accreditation	Signed
TMP Designed By	XXXXXX Traffic Logistics	IMP PWZ TCR TCT0075439	[redacted]
TMP Reviewed and Approved By	XXXXXXXX Traffic Logistics	IMP PWZ TCR TCT0036977	[redacted]
TMP Accepted By			
Road Authority Approval (TfNSW CJM or similar as applicable)			

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Appendix A - Vehicle Movement Plan

A1 - Scope of works - whole of project snapshot

A2 - Site compound ancillary locations

Note: parking and vehicle turn outs are confined to the site compound locations - no turn outs required on the local roads.

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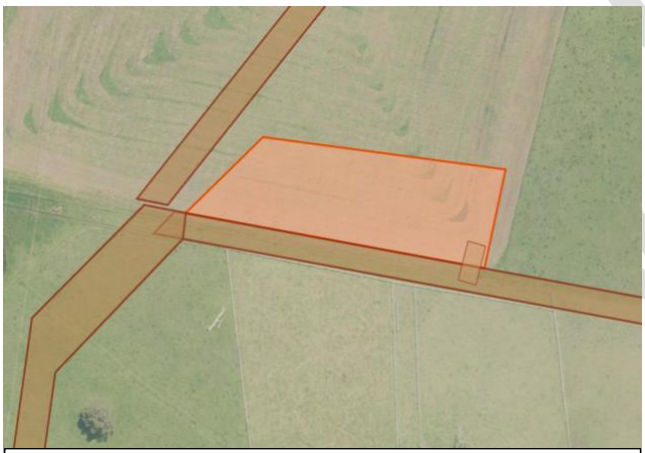
A3 - Site compound ancillary locations

Note: egress/ingress points in brown, location 2 is identified as the main site compound

Compound 1 – Bong Bong Road

Main Compound 2 – Intersection of Cleveland rd and Daisy bank drive



Compound 3 – 148 Cleveland Road

Compound 4 – 1 Hamilton Street

Compound 5 – 1 Public reserve, fairwater drive

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A4 - Project traffic routes

Note: green is heavy vehicle access around and within site, blue is coming and going from site for spoil haulage and plant deliveries, etc. We will be looking at regular movements of 10 trucks and 20 light vehicles around the green lines and approximately 10 truck and dogs travelling in and out along the blue lines daily.

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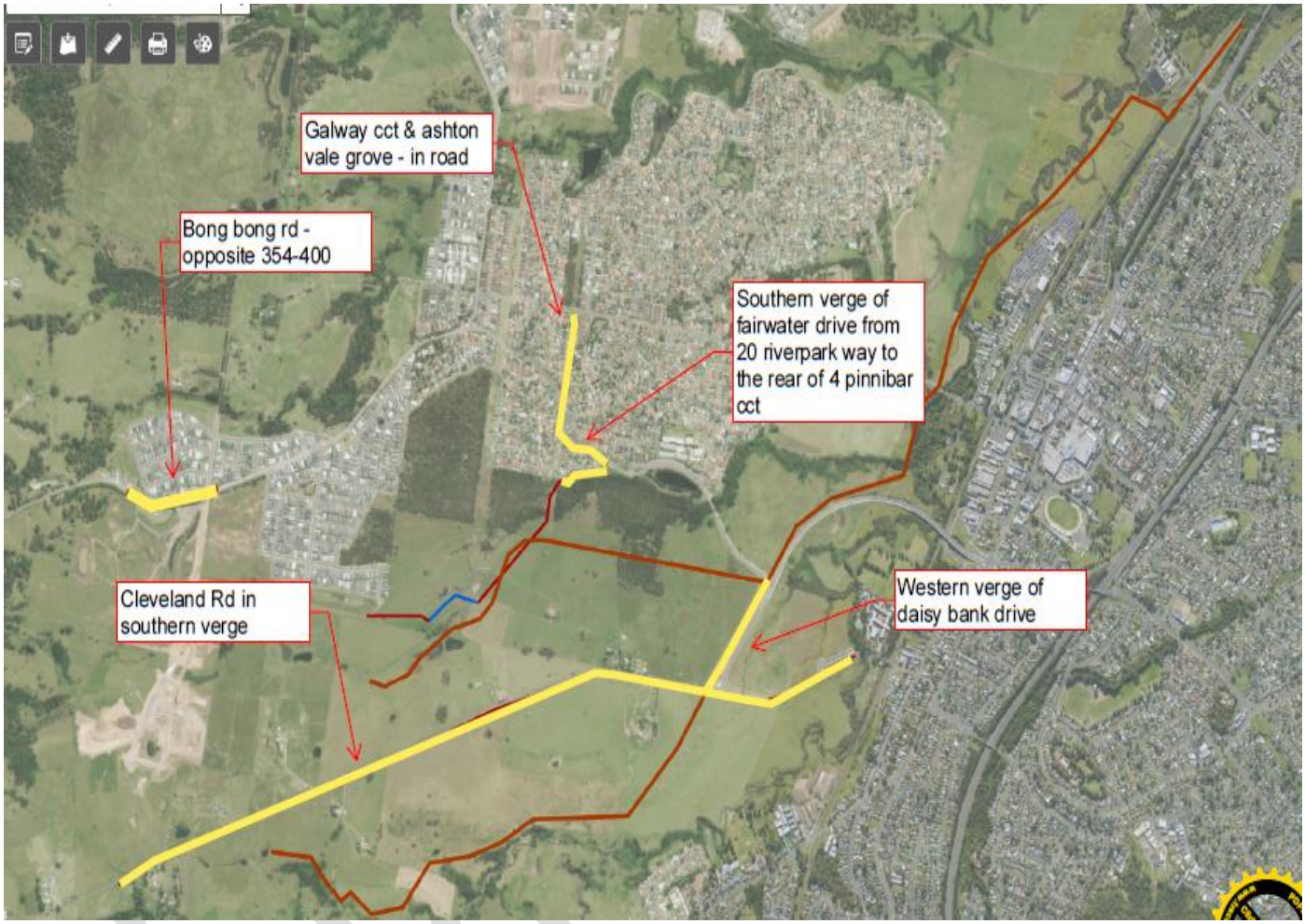
A5 - Construction works impacting local roads

Note: generally trenching alongside of road for yellow marked sections - we will need to develop Traffic Guidance Schemes for these sections as we approach construction



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Appendix B - Traffic Guidance Schemes and Risk Assessment

Traffic Guidance Schemes and Risk Assessment will be in the form of Traffic Control Plans.
These plans will be produced once Road Occupancy Licences have been provided by either Transport for NSW or Local councils

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Appendix C - Transport for NSW Type-1 Portable Traffic Signals Approval

NSW GOVERNMENT | Transport for NSW

Intelligent Transport Systems

Type Approval

Certificate No:	ITS-TAN000122

Issued to:

Outsource1 Pty Ltd

For:

Type-1 Portable Traffic Signals			
TfNSW Specification:	TSI-SP-059	Version:	1.0

Summary Scope:

Model: **TL-PTSS-G1**
PTU Controller: **LC-1-02**
PTU Software: **LCFW0.166**
HRC Model: **TriLight HRC**
HRC Software: **HRCFW 0.166**

Note: Conditions of approval are on the reverse side of this certificate.

Evaluation Reference:	ITS-EV0281	Approver:	Manager TSI
Approver Signature:	[redacted]	Date:	3rd August 2021

Certificate No: ITS-TAN000122 Page 1 of 2 Form: TSI-FM-001 v1.0

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ABN 70 123 127 337

Appendix D – Emergency Event Procedure

Emergency Event Procedure

1. When occurrence of an incident, the person will:
- If persons are injured notify the emergency services – call 000 – Ambulance & Police
- Provide assistance to the injured person/persons
- If trained and it is safe to do so, secure the affected area(s) to restrict access with available equipment

2. Notify the Site Supervisor

3. The Site Supervisor will ascertain the location, extent and nature of the emergency and determine if an evacuation is required. The Supervisor will also notify Emergency Services and contact First Aid Officers as required

4. Where Emergency Services are requested, the Site Supervisor should nominate a person to meet Emergency Services and direct them to the emergency

5. If the emergency has the potential to affect other area(s) within the area, the Site Supervisor will notify affected parties of the situation or delegate this responsibility to another person

6. Where required, Site Supervisor is to allocate Traffic Controllers to divert and redirect vehicular and pedestrian traffic to allow emergency services to access the incident

7. Traffic controllers that are deployed to manage incoming emergency services and other traffic will also monitor the conditions on site to ensure that the management procedures implemented do not introduce additional hazards for public road users.

8. If an evacuation is required, the site evacuation procedure will be followed and all personnel shall meet at the closet emergency muster point. All personnel are to remain at muster point until a roll call has been established and supervisor provides further instructions

9. On arrival of the attending Emergency Services, the Site Supervisor will:
- Hand over control to the Emergency Service Controller
- Brief the Emergency Service Controller of the emergency (i.e. type and location)
- Provide the status on the evacuation (if evacuation required), details of any unaccounted-for personnel/visitors, and any other relevant information.

10. When the Emergency Service Controller terminates the emergency, then:
- The Emergency Service Controller will return control to the Site Supervisor
- The Site Supervisor will advise personnel that the emergency has been terminated and the all clear has been given.

11. The Site Supervisor will direct personnel to return to the main compound for a debrief.

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Traffic Management Plan Recommendations and Changes

This Traffic Management Plan has been reviewed by: [redacted] on 11th of September 2023.

Changes to be made are listed below:

Authorised approver of changes: _____, current PWZTMP licence holder.

PWZTMP Licence Number: _____

Signature: _____ Date: _____/_____/_____

Appendix 8 – Rehabilitation and Landscape Management Plan

WEST DAPTO (Stage 3) Horsley & Cleveland Precincts

Rehabilitation and Landscape Management Plan

D4C Document Number: IN.20036851-V-PLN-0015
Revision: A

Rev	Date	Prepared By [Name & Signature]	Reviewed By [Name & Signature]	Approved By	Remarks
0	01/09/2023	[redacted]			Initial Draft
1	13/12/2023	[redacted]			Review for DPE
2	09/12/2023	[redacted]		[redacted]	Update to reflect changes to address DPE feedback
A	19/12/2024	[redacted]		[redacted]	Approved by DCCEEW

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1. Introduction

1.1. Project background

The West Dapto Urban Release Area (WDURA) is anticipated to provide approximately 19,400 new residential dwellings and 175 ha of non-residential land to cater for housing supply, continuing population and job growth in the Illawarra region. This is divided into five stages and Sydney Water has gradually been delivering trunk water and wastewater assets to service development needs.

The West Dapto Stage 3 – Cleveland precinct will provide approximately 4,500 new residential dwellings with upgraded capacity as existing water and wastewater trunk assets have currently insufficient capacity to serve the proposed development in the area.

This project will be delivered by the South Regional Delivery Consortia (RDC), Delivering 4 Customers (D4C) in collaboration with Sydney Water as part of the Partnering for Success initiative.

1.2. Project context

The project includes the design and construction of the 'West Dapto Urban Release Area Stage 3', which comprises approximately 5.5 kms of gravity sewer main and associated maintenance hole construction and approximately 4 kms of water mains within the Horsley and Cleveland areas.

The gravity main will be installed using a combination of micro-tunnelling and conventional open excavation (trenching). Bore shafts would also need to be constructed prior to the commencement of micro-tunnelling. The selection of micro-tunnelling methodology was selected as a preferred design for the project in order to minimise surface disturbance to areas of environmental sensitivity such as endangered ecological communities, Category 1 watercourse crossings, areas of Aboriginal archaeological potential as well as public infrastructure such as, main roads and train lines.

1.3. Purpose

This Rehabilitation and Landscape Management Plan (RLMP) has been prepared to address the Minister's Conditions of Approval (MCoA) and the Statement of Commitments for the project, specifically MCoA E7, E8 and E9 and SOC 35. Table 1.3 below, outlines the requirements of MCoA E7, E8, and E9 and where these requirements are addressed in this RLMP

MCoA	Needs and Expectations	Section
E7	A Rehabilitation and Landscape Plan shall be prepared and implemented for the project to manage rehabilitation/revegetation of disturbed areas and landscaping or screening of built features. The Plan shall be prepared by an appropriately qualified person(s) in consultation with the relevant landowner(s) or Council. The Plan shall include, but not necessarily be limited to:	This Plan
	(**a**) identification of principles, standards and objectives for rehabilitation and landscaping;	Section 1.2
	(**b**) the location of vegetation to be cleared, high risk areas experiencing erosion and waterway crossings that have been identified as sensitive and prone to erode if disturbed;	Section 3.2.4
	(**c**) proposed rehabilitation or landscaping (including use of indigenous and native species where possible);	Chapter 4
	(**d**) monitoring and maintenance procedures for the rehabilitated or revegetated areas and landscaping including performance indicators, responsibilities, timing and duration and contingencies where rehabilitation of vegetation and landscaping measures fail; and	Chapter 5

	(**e**) provisions for the rectification of any damage caused to property as a result of the construction of the project.	Section 5.4
E8	The Proponent shall ensure that all rehabilitation measures are implemented progressively where possible and in all cases within one month of the cessation of construction activities at the relevant area unless otherwise agreed with the local council or other stakeholders.	Section4.1 Section 5.4
E9	All Ancillary construction facilities sites shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the landowner, where relevant.	Section 5.4
SOC		
35	Areas disturbed by pipeline construction will be progressively rehabilitated.	This Plan

Table 1.3: Ministers Conditions of Approval and Statement of Commitments relevant to this RLMP

1.4. Objectives

The primary objective of rehabilitation will be to revegetate areas disturbed during construction to at least or better than their pre-construction condition, thereby minimising the potential for adverse impacts including dust generation and visual impact.

Revegetation will be conducted in a manner that will maximise biodiversity values and minimise undesirable outcomes such as invasion of weed species.

This RLMP aims to be consistent with the accepted best practice techniques outlined in various industry guidelines including *Recovering Bushland on the Cumberland Plain: Best Practice guidelines for the Management and Restoration of Bushland* (DEC 2005), *Restoring Native Vegetation: Guidelines for assisted regeneration and revegetation* (BCT 2019) and the *Guidelines for vegetation management plans on waterfront land* (NOW, 2012).

The RLMP also adopts the relevant principles of Volume 1 and 2A of *Managing Urban Stormwater: Soils and Construction* (Landcom 2004 and DECC 2008), hereafter referred to as the 'Blue Book', in regard to stabilisation and restoration of exposed soils.

In order to achieve this, D4C shall:

- Promptly and progressively carry out rehabilitation activities to encourage vegetation regrowth in disturbed areas, to be equal to or better than existing;
- monitor rehabilitated areas in consultation with the landowner;
- prevent the introduction and dispersal of weed species; and
- maintain rehabilitated areas for a minimum of three months (unless otherwise agreed with the landowner) following revegetation to ensure that rehabilitated areas achieve the relevant completion criteria.

2. Consultation

In accordance with MCoA E7, this RLMP must be prepared in consultation with the relevant landowners. For stage 3 of the WDURA project this includes multiple private landowners, Transport for NSW and their agistment lease holders and Wollongong City Council.

D4C have consulted with all relevant landowners and will have , Pre-Construction Customer Agreements, hence forth referred to as Home Plans, in place prior to entering or constructing on their property. The Home Plan template can be found in Appendix 1.

These Home Plans are made with the landowners, prior to construction to inform them of the project, scope of works, what works will be completed on their property and any restoration

requirements. These plans will take into consideration the landowners requests, needs and advice.

Consultation with Wollongong City Council, regarding Stage 3 construction, has been ongoing since February 2023.

2.1. Existing Heritage

Wollongong City Council has raised concerns regarding the Mt Kiera Osbourne Wallsend Tramway. This heritage item is currently in the process of being listed on the Wollongong Local Environmental Plan (Wollongong LEP).

After consultation with council, D4C has been able to successfully redesign the pipeline to sit outside of the heritage Lot boundary to accommodate councils requests.

3. Site Description

3.1. Location

The Lot A watermain runs southwest along Cleveland Road from Dapto High School for approximately 3.5kms and along Bong Bong Road from the intersection of Hayes Lane westerly for 0.5kms. All watermain infrastructure is within the road reserve.

Lot B line 1 gravity main travels south from the Grange Golf Club for approximately 3.3kms, predominantly through industrial and pastural land, alongside Mullet creek.

Lot B line 2 gravity main begins at the intersection of Fowlers Road and Fairwater Drive It runs Westerly for approximately 2kms, through pastural land.

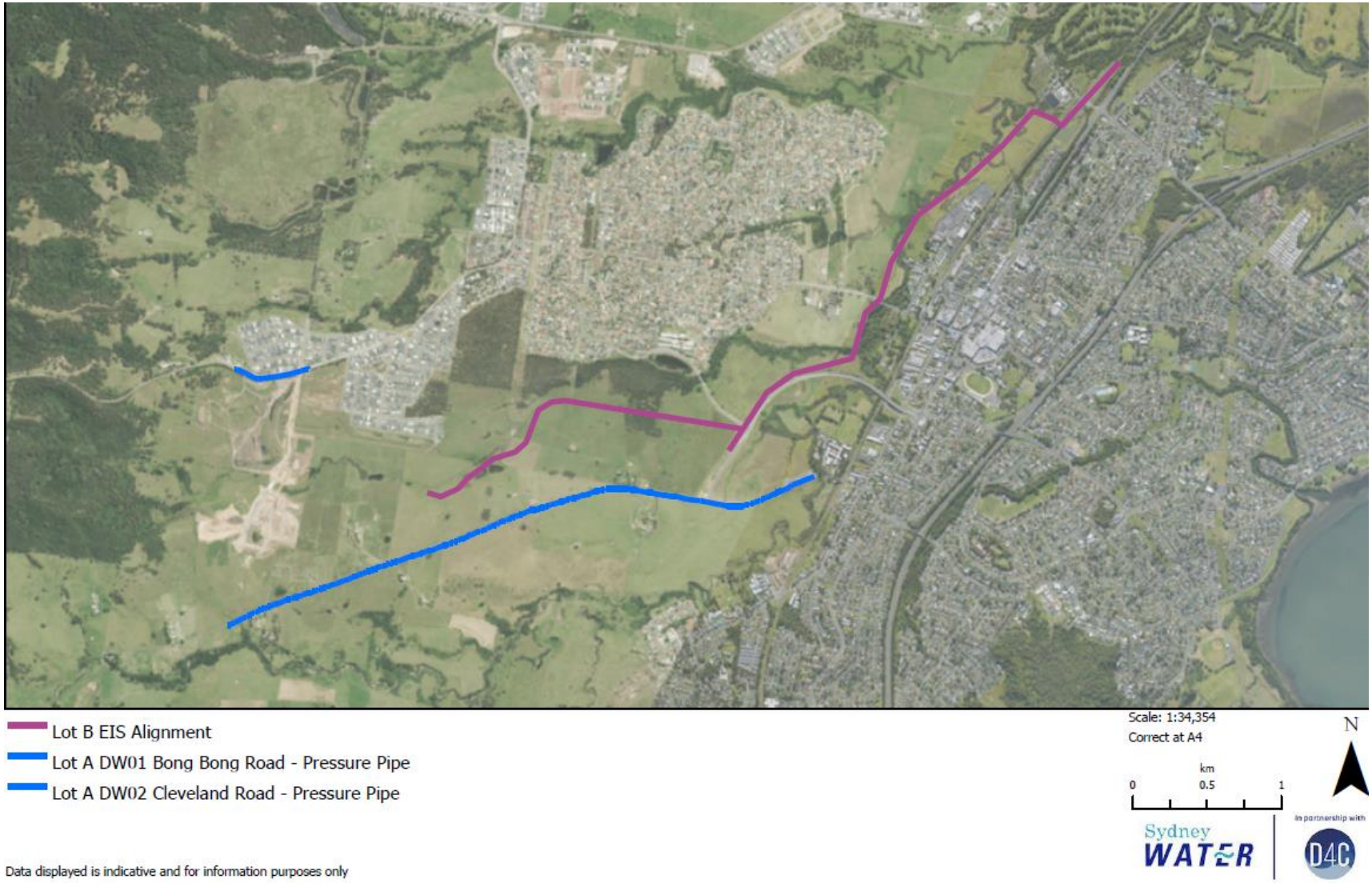


Figure 3.1: Location of pipeline alignment

3.2. Existing Vegetation

Existing vegetation adjacent to the project alignment consists of:

- Illawarra Lowland Grassy Woodlands
- Planted natives and landscape trees
- Exotic pastural grasslands.

3.2.1. Illawarra Lowland Grassy Woodlands

The Illawarra Lowlands Grassy Woodlands (ILGW) is located adjacent to Lot B Line 1. This community comprises Forest Red Gum *Eucalyptus tereticornis*, Thin-leaved Stringybark *Eucalyptus eugenioides*, Woollybutt *Eucalyptus longifolia*, Coast Grey Box *Eucalyptus bosistoana* and White Feather Honey-myrtle *Melaleuca decora*. Shrub species include *Acacia mearnsii* and *Dodonaea viscosa* subsp. *angustifolia*. This particular example of ILGW covers over 10 hectares of intact community.

The ILGW is listed as Endangered Ecological Community and as such D4C have designed the pipeline alignment to be under bored at this location. As such there will be no clearing and there will be no impact on the community.

3.2.2. Natives and Landscaped Vegetation

A large portion of the northern alignment travels along road reserves and through park and recreational areas, which are maintained by Wollongong City Council.

The planted natives and exotic vegetation community consists of mown groundcover with clusters of planted mid storey and/or canopy trees. Planted native species include Narrow-leaved Ironbark Eucalyptus crebra), Swamp Mahogany (Eucalyptus robusta), Forest Oak (Allocasuarina torulosa) and other identified Eucalypt species.
The understorey primarily consists of exotic grasses and invasive weed species.

3.2.3. Exotic Grasses and Weeds

Most of the Lot B alignment runs through improved pastural grassland. Within the project, this grassland area consists of dense groundcover of improved grasses supporting a large number of cattle. This grassland is almost exclusively exotic. It is also interspersed with exotic weed species including Cobbler's Pegs (Bidens Pilosa), Flaxleaf Fleabane (Conyza bonariensis), Crofton Weed (Ageratina adenophora), Spear Thistle (Cirsium vulgare) and Fireweed (Chamaenerion angustifolium).

3.2.4. Disturbance

The project has been designed to minimise disturbance as far as practicably possible. At this stage only trimming of native vegetation is envisaged.

Where earthworks associated with construction and installation of both wastewater and mains water infrastructure are required, along with establishment of access roads and ancillary facilities, existing groundcover vegetation would be suppressed, removed or stockpiled for later use. Such areas shall be rehabilitated as soon as practically possible. Methods of rehabilitation shall be agreed upon and documented within the individual Home Plans.

The topography of the project alignment is largely flat or slightly undulating and disturbance of areas with high risk of erosion (such as steep slopes or watercourse crossings) would not be required.

Site Environmental Plans (SEP's) shall be prepared for each section of the works. These plans shall include the location of any clearing, no-go zones, slope and direction, waterbodies etc.

4. Restoration and Rehabilitation

The following rehabilitation methodology has adopted the general principles outlined in Sydney Water Environmental Guidance Standard 9.5: Environmental restoration management and D4C Mandatory requirements 9: Environmental Management

4.1. Home Plans and Planning

A survey of the work site shall be carried out by the Project prior to commencing any works, including photographs of the project alignment and surrounding environment showing the condition of vegetation (trees, shrubs and groundcover) along and adjacent to the alignment. These photographs shall form the basis of the Home Plan agreed upon by the landowner and the project team.
The project should be designed, planned and constructed to minimise soil and vegetation disturbance as far as practical. Revegetation of disturbed areas should be carried out progressively during construction to minimise the potential for soil erosion and dust generation. It is anticipated that as the gravity main installation proceeds, MHs behind the active work front would be suitable for progressive rehabilitation. The subsoils of each MH site would be prepared and subsoils stabilised against erosion utilising erosion control products such as jute matting until such time that re-spreading of topsoil and revegetation can be arranged. Prior to the spreading of topsoils, the erosion control products would be removed and re-used where feasible.

4.2. Topsoils and Groundcover

Where topsoil is present, excavate a minimum of 150 mm (greater where available) of topsoil from across the work site and stockpile for re-use in restoration of disturbed areas. Topsoil will require careful management during stripping to ensure the maximum amount of quality topsoil is available for revegetation.

It is recommended that topsoils are stripped and groundcover removed, progressively ahead of the active area of excavation to minimise the potential for soil erosion and dust generation.

The stripping of topsoils and removal of groundcover would be carried out by D4C personnel as directed by the Site Supervisor, Project Environmental Coordinator, and only in areas nominated under the SEP.

The stockpiling of topsoil is critical to ensuring that physical, chemical and biological characteristics of the soil are maintained. Such characteristics are vital to successful germination after revegetation. The key measures pertaining to stockpiling of topsoils include:

- Place stockpiles more than five metres from existing vegetation, drainage lines, access roads and hazard areas.
- Construct stockpiles as low flat elongated mounds
- Topsoil stockpiles shall be less than two metres in height.
- Temporary topsoil stockpiles should be covered to prevent erosion and where stockpiles are in place for more than 10 days, they are to be stabilised in accordance with the Blue Book requirements. Options for stabilisation may include use of soil binders, cover crops of sterilised grasses at nominated application rates or geofabric covers.
- Where required upslope water diversion shall be implanted

Locations and methods of controlling stockpiles shall be listed in the SEP.

Groundcovers will be removed and saved, where practicable, alongside the topsoil. This cover shall be watered as required and if viable shall be replanted and monitored.

4.3. Subsoils

Once excavation works have been completed and disturbed areas are ready for revegetation, rip the compacted sub-soils of disturbed areas to a depth of 200 mm. Ripping should be undertaken perpendicular to the direction water will flow and when the soil is dry.

The key benefits of preparing subsoils prior to application of topsoil include:

- Increases soil moisture content, as it allows water to infiltrate into the soil profile which is critical in a low rainfall environment. This also reduces run-off which can cause damage to work areas.
- Assists with binding the topsoil once placed and prevents topsoil from slumping when exposed to rainfall.
- Allows the roots of vegetation to penetrate past the topsoil layer and reach the moisture stored below, which improves growth and stability of the plant as it grows. This helps with survival through the dry summer months.

4.4. Spreading of Topsoils

Where retained topsoil stockpiles are of insufficient volume, additional topsoil should be sourced from a licensed landscape supplier and imported to site.
If topsoil is imported to site, the topsoil should ideally consist of a loam textured material (sand/silt/clay/organic material) and be suitable for the culture of all plant material, in particular exotic and native grasses. It should be friable and porous, contain no materials toxic to plant growth, contain no stumps, roots, clay lumps or stones larger than 50 mm, have an organic content of at least 5% by mass, have a pH in the range of 5 - 6.5, be suitable for phosphorus sensitive plants and be free of weed and weed refuse material. The landscape supplier should validate all material imported to site is contamination and weed free.
Topsoil should be spread to a depth of 50 – 200 mm (50 mm as an absolute minimum). This should provide an adequate depth for the seed to germinate and helps retain moisture. The suitable depth shall be confirmed with a specialist/local agronomist prior to spreading.
After the topsoil is applied, the area should be furrowed horizontally, or perpendicular to the flow of water, using a suitable method such as:

- Diamond harrows which create regular horizontal furrows in the placed topsoil. The harrows can be dragged by a bobcat or similar, or attached to the arm of an excavator for steep batters where access is difficult; and/or
- Prickle chain, where a chain with a weight of 25 kg/metre can be attached to an implement and dragged to create horizontal furrows.

Furrowing of topsoil reduces scouring, provides a loose surface for seed germination and catches seed that may be washed away during rain. It also helps to retain rainwater as soil moisture for plant growth and allows roots to penetrate past the topsoil layer and reach the moisture stored below which improves plant growth and stability.
Erosion control products such as jute matting may also be implemented in areas at high risk of erosion such as areas adjacent to drainage lines. The erosion control products would assist with stabilisation of soils to satisfy Blue Book requirements whilst revegetation efforts progress.

4.5. Revegetation

The revegetation of disturbed areas would be carried out utilising one of the following methods (or a combination of methods):

- Hand seeding - suitable for areas that are inaccessible to machinery. Adding sand to the seed will help achieve an even spread. It should be noted that where grasses are being established, topsoils should be harrowed immediately after the seed and any additives have been applied;
- Direct seeding - conventional implements including direct drilling or sod seeding to a depth of 10 - 15 mm. This is usually the most cost-effective method of establishing plants from seed. Apply to a scarified surface to assist with water absorption;
- Hydro-mulching - seed applied with mulch which can improve germination and establishment while protecting the soil surface;
- Hydro-seeding – seed applied in conjunction with water; and
- Turfing - Kikuyu turf (or Buffalo Grass turf where adjacent to riparian corridors) may be imported to site and installed over areas disturbed for the works. Turf provides the key benefit of immediate revegetation and stabilisation of soils against erosion.

The selection of revegetation method would be suited to the location of rehabilitation, soil conditions and scheduling requirements. It is likely that the preferred method of revegetation for the project would be hydro-mulching.

4.6. Cover Crop

Vegetation used to provide temporary soil stabilisation is referred to as a 'cover crop'. The use of fast growing cover crops is often an essential step in soil stabilisation irrespective of the final revegetation outcome. The purpose of the cover crop is to provide surface cover to protect the soil from erosion, anchor the soil with their roots, increase soil carbon (from sloughing of roots), restart the biological processes in the soil and suppress weeds (RMS 2015).

Cover crops are seasonal and should be selected considering the time of year that they will be used. Japanese Millet is a warm season grass and Rye Grass is a cool season grass. As such, it is important to include both grasses in the transition between cool and warm seasons (RMS 2015).

Vegetation used for the stabilisation of exposed soils can broadly be divided into two categories, namely temporary and permanent.

Often a number of different species of cover crop are required due to their varying characteristics. Common cover crop species include Japanese Millet (*Echinochlora esculenta*), Rye Corn (*Secale cereale*), Red Clover (*Trifolium pratense*) and Rye Grass (*Lolium multiflorum*). These make up temporary stabilisation, as they are fast growing but sterile and die out at the end of the season.

Permanent vegetation commonly consists of native species that are suited to the local environment and specific site conditions and will be successful with minimal intervention or maintenance (RMS 2015).

Table 4.1 specifies the seed mix to be utilised in revegetation of disturbed areas and the indicative application rates (RMS 2018). The application of organic fertiliser to the seed mix is also recommended.

Seed Type	Application rate (kg/Ha)
Japanese Millet	35
Rye Corn	35
Annual or Short-term Rye	25
Common Couch	7
Red Clover	5
Native seed mix (various)	10

Organic fertiliser	250

Table 4.1: Indicative cover crop and native seed application rates

It should be noted that white, strawberry and subterranean clovers should not be used in revegetation as these are aggressive spreading clovers that would prevent germination of native seeds.
It is recommended that the above seed mix and application rates are confirmed with a specialist/local agronomist prior to the commencement of revegetation. If required, the seed mix and application rates would be altered to suit site conditions.
The selection of native seed should be appropriate to the surrounding native vegetation communities, climate, proposed method of application and commercial availability. The factors affecting performance and the quantity of seed include the season of application, weather conditions directly after seeding, quality of topsoils and subsoils and subsequent maintenance including watering, weed suppression and control of cover crop (RMS 2018).
The final list of native seeds would be confirmed with a specialist/local agronomist and subject to availability of supply and season.
All seed mixes are to be documented and agreed upon be the landowner prior to there application.

4.7. Protection of Rehabilitated areas

Once revegetation efforts are completed, delineate the restoration area and exclude from access using temporary fencing and signage, where applicable. In areas where revegetation has taken place in pastoral lands, the project team shall work with the landowner/farmer to keep cattle and other animals off the rehabilitated grasses.
A single designated access route through the restoration area should be implemented for any ongoing watering or maintenance to minimise disruption to restoration efforts. Once rehabilitation has been completed, revegetation of the access route would likely be carried out via hydro-mulching, by working from the point furthest from the access point to public roadways and working back towards the roadway, or via hand seeding to avoid the requirement for vehicular access.

5. Monitoring and Maintenance

5.1. Maintenance Regime

A suitable watering regime would be implemented to ensure successful germination of groundcover vegetation. Watering of revegetated areas will be necessary in the initial weeks after seeding and the level of watering required will be determined by rainfall and temperature. Additional watering will be required in hot, dry conditions to ensure seedlings do not perish once germinated.

The following measures would be implemented:

- Preferably water using a temporary irrigation system or by handheld hose which may be connected to the potable water network. To prevent washing away seed, soil binder, topsoil and mulch, avoid using an automated water cart, where feasible;
- Water during the cooler parts of the day (i.e. early morning or late in the afternoon) to minimise evaporation;
- Keep vehicles used to supply water outside of the restoration area, or where this is not possible, water supply vehicles may utilise a dedicated access track to minimise disturbance of restored areas. All access tracks are to be restored following use; and

- Once seed has germinated, continue watering and maintenance until 60% ground cover is established.

It is highly likely that weeds will re-establish within the rehabilitated areas due to the dispersal of propagules or invasion of weed species from adjoining exotic grassland.
Weed control is often a major factor in the success or failure of a revegetation. The rehabilitated area should be maintained to minimise the occurrence of weed species, which would reduce competition for resources and encourage establishment of desired groundcover vegetation.
Weed control would be undertaken by suitably qualified and/or experienced, licenced subcontractors in accordance with contemporary bush regeneration practices, and the following guidance:

- NSW Department of Primary Industries' Noxious and Environmental Weed Control Handbook (2011).
- Sydney Water EMS (SWEMS0017) Recording of Pesticides and Herbicides Procedure. SWEMS0115 Weed Management Procedure.

Weed control may include:

- manual weed removal in preference to herbicides:
- replacing non-target species removed/killed as a result of weed control activities;
- protecting non-target species from spray drift;
- using only herbicides registered for use within or near waterways for the specific target weed;
- not applying herbicide if it is raining or if rain is expected; and
- mixing and loading herbicides, and cleaning equipment away from waterways and drains.

Any weeds removed from the site would be placed within sealed bags and disposed to an appropriately licenced waste management facility.

5.2. Monitoring

Regular inspections would be carried out to monitor the progress of rehabilitation activities, and proactively identify any problems with the revegetation process. Any required actions to rectify restoration issues (including additional seeding, watering or weeding) would be implemented immediately.
Weekly inspections shall be carried out by the Project Engineer and the Project Environmental Coordinator during the initial stage of rehabilitation in order to closely monitor the progress and success of rehabilitation. Once rehabilitation has established, the frequency of inspections would be reduced to fortnightly and/or monthly until the completion criteria are achieved, or otherwise agreed with the landowner.

5.3. Performance

All areas of revegetation would be monitored and maintained as outlined in **Section 5.1** and **5.2**.
Indicative performance indicators for rehabilitation may include:

- All completed construction activities have been progressively revegetated.
- High survival rate of seedlings in revegetation areas (>80%).
- Erosion and sediment controls are secure, effective and damaged controls repaired or replaced.
- The rehabilitation area is free from erosion. Where subsoil and topsoil has been eroded, the Project shall repair and prepare subsoils, re-apply topsoil to the affected area and complete further revegetation.
- All environmental and noxious weeds treated and/or removed from the rehabilitation area.

The above performance criteria would be monitored during scheduled inspections by the

Project Engineer and Project Environmental Coordinator. Where performance indicators are lagging, the project shall implement additional measures to rectify or improve performance of rehabilitation.

5.4. Completion of Restoration

All disturbed areas would be revegetated within one month following the completion of construction, unless otherwise agreed with Council or other stakeholders.

All ancillary facilities would be restored to pre-existing condition, unless otherwise agreed with the landowner in writing.
All disturbed areas would be restored to achieve a minimum of:

- 60% grass coverage per square metre work site within 20 days post construction;
- 70% grass coverage per square metre within 60 days post construction; and
- Compliance with the performance indicators specified in **Section 5.3**.

This would form the completion criteria for rehabilitation and once the above criteria are satisfied, the site may be handed back to the landowner and the Projects obligation would be met.
If the landowner is not satisfied with the condition of revegetation, or damage is incurred to the property, the Construction Lead would negotiate on remedial actions to the satisfaction of the landowner. Any accidental damage to property incurred by the works must be repaired in consultation with the affected property owner. All costs associated with repairs would be incurred by the project and/or Sydney Water and all repairs completed within reasonable timeframe as agreed with the landowner.
It is envisaged that the monitoring and maintenance of rehabilitated areas would be required for a minimum of three months, unless otherwise agreed with Sydney Water and the landowner.

Where restoration has not achieved the required completion criteria, the Project will implement additional applications or alternative methods to achieve desired rehabilitation outcomes and ensure compliance with the Blue Book.
Replacement seeding/planting or alternative revegetation methods (inclusive of use of alternative watering methodology, seed mix and/or amelioration treatments) may be required where seedlings do not successfully establish in the revegetation area. The need for alternative revegetation methods would be discussed and confirmed with a qualified restoration contractor and/or soil scientist where required.
All sediment controls would be maintained until compliance with the Blue Book is achieved (i.e. minimum of 60% grass coverage per square metre).

6. Conclusion

This RLMP has been prepared to guide rehabilitation and revegetation of areas disturbed for construction of the project and to address MCoA E7, E8 and E9.
The RLMP has been designed to enhance the condition of vegetation in the disturbed construction corridor through revegetation, thereby stabilising exposed soils against erosion and minimising the potential for long term adverse impacts including dust generation and visual impact.
The methodology and principles outlined in this RLMP will be implemented to achieve desirable outcomes for relevant landowners and ensure that the Project fulfills its commitment to rehabilitating areas disturbed for the project.

Appendix 1 Home Plan Template

Home Plan

Sydney Water needs to work on, or construct new, assets on your property. This Home Plan explains to you how we will go about our works including whether these works may impact you or your property.

Sydney Water will minimise any impact to you or your property and is committed to make good any area of your property that happens to be impacted by our work. Project Team members will discuss these details with you.

Your details

Name:			
Property address:			
Lot and DP:			
Current land use:			
Mailing address (if different):			
Phone:			
Email:			
Best contact method:			
Sydney Water property ID: 1234567		**Contact date:** date	
Customer present? Yes / No		**Home Plan revision:** 1	
Notice of Entry issued? Yes (included)		**If yes, indicate date issued:** date	

Tenant details

Name:			
Phone:			
Email:			
Best contact method:			
Tenant present? Yes / No		**Contact date:** date	

Our details

Community Engagement Advisor	name 1800 006 113 option X Delivering4Customers@sydneywater.com.au
Construction Supervisor	name – email mobile

Work on your property

Description	We need to: • xxx • xxx • xxx • xxx.
Location	Map showing work just on property
Timing and duration	We currently plan start on date and finish by date, weather permitting. We'll contact you before we come onto your property.

Understanding the impacts to your property and our restoration

Property feature	Existing?	Impacted?	Notes
Swimming pool	Yes / No	Yes / No	Describe type, location, how it will be impacted, what temporary arrangements will be in place, and how it will be restored
Garden sheds	Yes / No	Yes / No	
Paving	Yes / No	Yes / No	
Garden beds or landscaping	Yes / No	Yes / No	
Significant trees or plants	Yes / No	Yes / No	
Retaining walls	Yes / No	Yes / No	
Grassed area	Yes / No	Yes / No	
Structures present	Yes / No	Yes / No	
Boundary fencing present (note if has gates and usually locked)	Yes / No	Yes / No	
Internal fencing present (note if has gates and usually locked)	Yes / No	Yes / No	
Existing driveway	Yes / No	Yes / No	
Carport	Yes / No	Yes / No	
Dam	Yes / No	Yes / No	
Water / irrigation	Yes / No	Yes / No	

Design requirements

Item	Required	Notes
Vent shaft	Yes / No	Sydney Water does not provide compensation for gravity wastewater pipes, however we do provide a one-time compensation payment when above ground infrastructure for assets such as vent shafts are constructed on your property Compensation amounts have been calculated based on the median value of property in the general Sydney Metropolitan Area and you will receive $850 for each vent shaft installed on your property

Item	Required	Notes
		Compensation will be paid when all construction, restoration and commissioning has been completed Sydney Water will contact all property owners eligible for compensation to discuss payment options
Maintenance hole / access chamber	Yes / No	Sydney Water does not provide compensation for gravity wastewater pipes, however we do provide a one-time compensation payment when above ground infrastructure for assets such as maintenance holes / access chambers are constructed on your property Compensation amounts have been calculated based on the median value of property in the general Sydney Metropolitan Area and you will receive $400 for each maintenance hole / access chamber installed on your property Compensation will be paid when all construction, restoration and commissioning has been completed Sydney Water will contact all property owners eligible for compensation to discuss payment options
Non Return / Reflux Valve	Yes / No	Sydney Water has arranged for the installation of a Non Return Valve (NRV - also known as a reflux valve) on your private wastewater (sewerage) service This comes with a 12 month workmanship guarantee All new wastewater pipes and associated fittings are manufactured to meet AS/NZS 1260 standard The NRV will form part of your private wastewater service and owned by the property owner(s)
Entry / exit pit for bore hole	Yes / No	
Structural condition survey	Yes	Pre construction photos of work area, including machine access paths, and all surrounding structures (including but not limited to fences, walls, windows, clothes lines, garden beds, parked vehicles etc) will be required
Drainage culvert	Yes / No	
Divert existing / provide alternative temporary services	Yes / No	
Easements / property acquisition	Yes / No	An easement will be taken over the new water / wastewater gravity / pressure main that is installed on your property Refer to our factsheet in Attachment 1 – Property acquisition for the process that will be followed to determine the amount that will be paid for the easement

Construction considerations

Item	Present	Notes
Overhead services	Yes / No	
Underground services	Yes / No	
Services crossing construction corridor	Yes / No	
Imported fill present	Yes / No	
Spoil to be generated (note if will be removed from property)	Yes / No	You consent to the removal of excavated material from your property if required
Rock areas	Yes / No	

Other considerations

Item	Yes/No	Notes
Flood prone areas	Yes / No	
Property required for accessing other sites	Yes / No	
Livestock on premises	Yes / No	
Children on premises	Yes / No	
Pets on premises	Yes / No	
Anything buried	Yes / No	
Health / safety issues	Yes / No	
Other: eg snakes, bull ants and ticks	Yes / No	
Other special notes / issues	Yes / No	

Notice of Entry under the Sydney Water Act (1994)

This Home Plan seeks to obtain your permission for us to enter your property to carry out the works we have explained and make good any impacted areas on your property. While it is our preference to obtain your agreement and consent for entry at a time that suits you, ultimately Sydney Water must ensure it has access to your property so that we can carry out works on our assets.

Accordingly, Sydney Water has rights of entry under the Sydney Water Act 1994 (NSW) that it can exercise on written notice to you without requiring your consent. Information on the Notice of Entry process can be found by contacting Sydney Water directly.

Your acknowledgement and consent

Sydney Water has explained to my satisfaction the details of the works, including how these works may impact me or my property, and accordingly has explained the plan to make good any area of my property that is impacted by the works. I understand that while Sydney Water does not need my consent to enter my property (because of Sydney Water's rights stated above), I am comfortable with the details of this Home Plan and provide my consent for entry on the date or dates identified in this Home Plan. I also consent to the removal of any excavated material that needs to be removed from my property.

Property owner acknowledgement	Sydney Water sign off
Name:	**Name and role:**
Signed:	**Signed:**
Date:	**Date:**

Tenant acknowledgement (if applicable)
Name:
Signed:
Date:

Sydney Water Hydraview

Current Nearmap aerial view

Before and after photos

We'll take photos of the work area and surrounding location, including the access route to and from the work location, before and after the work takes place. This is to help make sure restoration is done properly.

Before construction dd/mm/yyyy	After construction dd/mm/yyyy

Appendix 9 – Site Environmental Plans (SEPs)

SITE ENVIRONMENT PLAN – West Dapto Urban Release Area Stage 3

Project Name:	**West Dapto Urban Release Area Stage 3**	D4C Environment Coordinator:	[redacted]
Project Number:	**IN.20036851**	D4C Construction Lead	[redacted]
		D4C Supervisor:	[redacted]

REPORT ALL INCIDENTS TO D4C ENVIRONMENT TEAM

DELIVERING 4 CUSTOMERS

1. PURPOSE OF A SITE ENVIRONMENT PLAN (SEP)

To identify the environmental conditions and controls required to manage the risks related to site activities and communicate them to project staff, subcontractors and consultants.

2. SEP REQUIREMENTS

- Below requirements provide guidance to ensure appropriate information is illustrated and detail within the following pages.
- SEP to be reviewed and updated progressively to reflect onsite conditions and ensure to communicate to personnel
- SEP should be informed by the MCoA, the Activity Method Statement and the EMP.
- Use the safeguard measures detailed within the EMP and EIA, where applicable
- The EMP includes supporting Environmental Management Documents which should be reviewed to support the SEP, where applicable.

3. SITE SPECIFIC REQUIREMENTS – EIA

This Site Environmental Plan has been developed in accordance with The Ministers Conditions of Approval. The following aspect have been addressed in each section, where applicable.

- Topography, geology and soils:
- Water and Drainage:
- Flora and Fauna:
- Noise and Vibration:
- Air Quality and Energy:
- Traffic and access:
- Heritage:
- Visual Environment:
- Land use and services:
- Waste:

4. EVENT RESPONSE (Refer to Management Measures attached for further details)

- **Topography, geology and soils:**
  - Prevent sediment moving offsite in accordance with Blue Book controls.
  - Stop work during heavy rainfall or in waterlogged conditions.
  - Minimise ground disturbance and stabilise disturbed areas progressively.
  - Minimise disturbance to riparian corridor.
- **Water and Drainage:**
  - All soil and water will be managed in accordance as per Managing Urban Stormwater – “the Blue book”
  - No wash down of equipment permitted onsite.
  - Sweep up any sediment/soil transferred off site at least daily, or before rainfall.
  - Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak- free item
- **Flora and Fauna:**
  - If any threatened or native fauna species is discovered during the works, stop construction work and allow the fauna to move away un-harassed. Engage a licensed ecologist if assistance is required to move the fauna. All construction work will stop immediately and the Environmental Coordinator will be notified.
  - There is to be no clearing of Illawarra Lowland Grassy Woodland community.
  - All clearing must be conducted under a permit produced and approved in consultation with the PEC.
  - Hollow bearing trees are to be protected as much as possible.
- **Noise and Vibration:**
  - All construction, including laydown areas, is to operate during standard construction hours only
  - All construction is to be undertaken as per the Interim Construction Noise Guidelines
  - Vibration is to be managed as per the DIN 4150-3: Structural Vibration and BS 7385-1:1990.
- Air Quality and Energy:
  - Wind and traffic generated dust to be managed through the use of watercarts and mist sprayers.
  - Groundwater is to be utilised as much as possible for dust suppression.
- **Chemical management**
  - Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets.
  - Record stored chemicals on site register.
  - Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills
  - Marina spill kits are required under the WSWA condition when dewatering is being conducted
  - Keep the spill kits stocked and located for easy access, either beside Drilling locations or within the field support trucks during excavation activities
  - Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, conduct as per the refuelling procedure.
  - Regular spill training and mock drills are to be conducted.
- **Heritage:**
  - Should human remains be discovered, notify Supervisor immediately who will contact the PEC.
  - If any heritage item is discovered, follow the unexpected finds-Heritage, procedure.
  - The Mt Kiera Osbourne Wallsend Tramway is being listed by Wollongong City Council. This is a no-go zone.
- **Waste**
  - Waste is to be removed from site at the end of each day.
  - Waste bins are to be provided for all waste streams including recyclables.
  - All waste is to be classified, as per the Waste Classification Guidelines, prior to disposal.
  - Drilling mud is to be stored in lined Turkeys nests or Mud bins until suitably solid for disposal.
- **Visual Environment:**
  - Worksites are to be kept clean and tidy and free of windblown rubbish.
- **Land use and services:**
  - Rehabilitation is to be completed progressively and in accordance with the agreed “Home Plans.”
- **Traffic and Access**
  - All vehicles are to stay on the nominated access tracks at all times.
  - Construction vehicles are not to idle or que on local roads.

General:

- All personnel are to be trained on this Site Environmental Plan during the project induction.
- Should the plan change a toolbox is to be conducted to retrain staff of the changes
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify D4C Environment team of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

5. COMMUNITY

All community enquiries and complaints related to the D4C Program of works will be referred to the 24-hour community information line number 13 20 90 or the Delivering4Customers@sydneywater.com.au

6. ACCESS TRACKS

Access tracks have been considered along the length of the alignment. Controls and management of these tracks have been indicated on these Site Environmental Plan maps.
It must be noted that these tracks shall only be installed in the advent of rain, unusually boggy ground, untraversable terrain, etc.
Just because the maps indicate an access track construction does not mean that one will be constructed.
Generally open paddock tracks within the construction corridor shall be used.

7. APPROVED CONSTRUCTION HOURS

Standard Hours

Monday - Friday	7am – 6pm
Saturday	8am – 1pm
Sunday and Public Holidays	No works permissible

8. SYDNEY WATER REQUIREMENTS

1	Location of the project footprint, work fronts and elements such as parking areas, offices and chemical storage;	
2	Location of site access points and roads;	
3	Stockpiles (including waste skips and stockpiles for recycling);	
4	Location of areas/vegetation to be cleared/trimmed;	
5	Pre-construction vegetation types and adjoining areas of environmental sensitivity, threatened species and habitat areas and vegetation communities;	
6	Location of sensitive receivers;	
7	Topographic features including slopes, watercourses and drainage lines;	
8	Location of 'no-go' zones Noise sensitive receivers e.g. residential dwellings, educational institutions. Flora features, including threatened species and endangered ecological communities. Aboriginal and non-Aboriginal heritage sites, including items, places, objects and sites. Waterways Contamination	
9	Location of environmental controls, including sediment and erosion controls;	

9. D4C SIGN OFF

D4C Position	Initials	Date
Construction Lead		
Engineer		
Project Environmental Coordinator (PEC)		

10. MINISTERS CONDITIONS of APPROVAL (MCoA)

The MCoA applicable to this plan

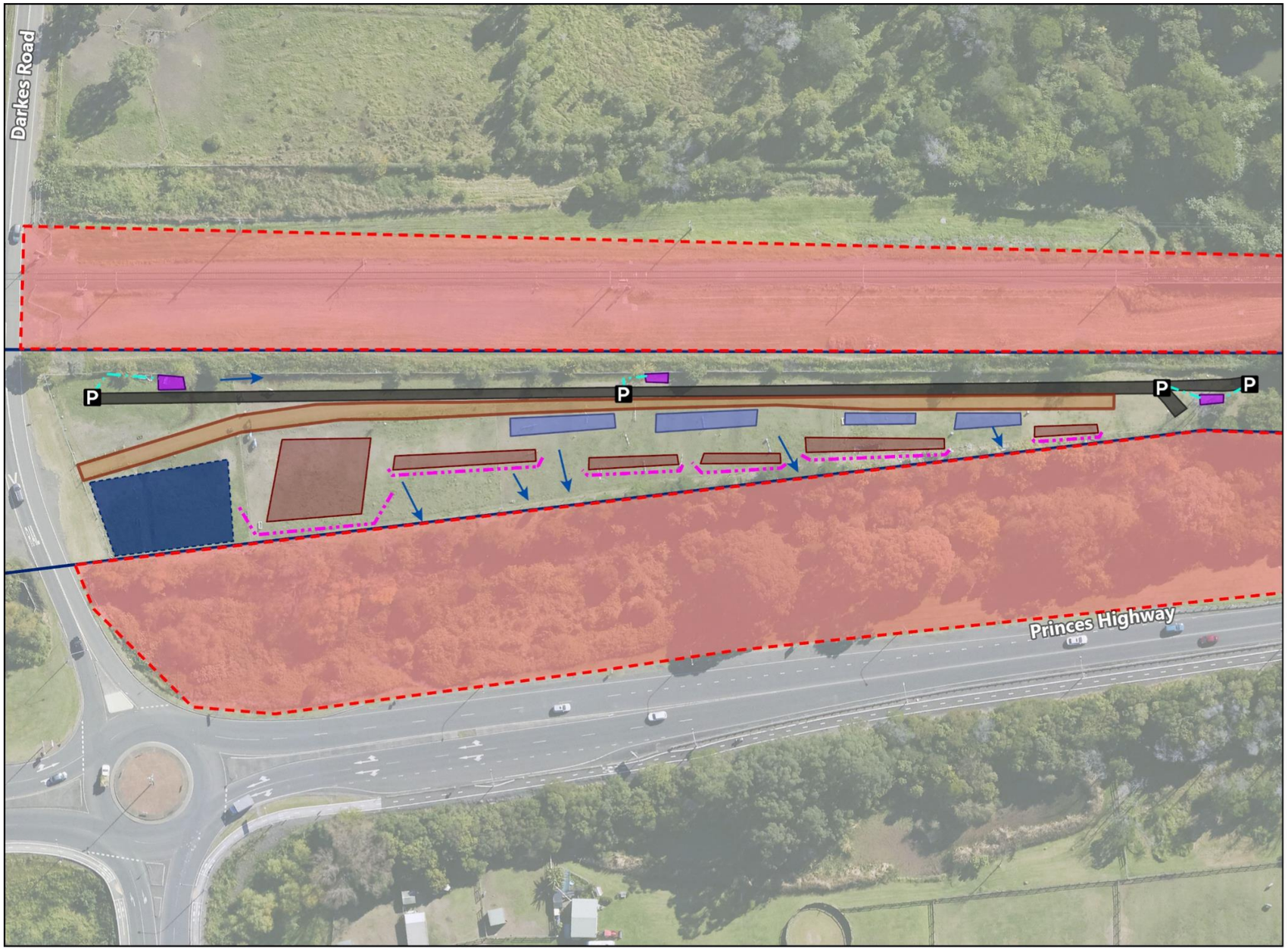
Condition #	
C12.	Unless otherwise approved by the Director General, the location of Ancillary Construction Facilities shall: (a) be located more than 50 metres from a waterway; (b) be located within or adjacent to land where the project is being carried out; c) have ready access to the road network; (d) be located to minimise the need for heavy vehicles to travel through residential areas; (e) be sited on relatively level land; (f) be separated from nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant); (g) not require vegetation clearing beyond that already required by the project; (h) not impact on heritage items (including areas of archaeological sensitivity) beyond those already impacted by the project; (i) not unreasonably affect the land use of adjacent properties; (j) be above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented; and (k) provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours. Where any of the criteria cannot be met for any proposed ancillary construction facility, the Proponent shall demonstrate to the satisfaction of the Director General that there will be no significant adverse impact from the facility(ies)'s construction or operation. The location of and proposed measures to manage the ancillary construction facilities shall be identified in the CEMP required by condition E5.
C.13	The Director General's approval is not required for minor ancillary construction facilities (e.g. lunch sheds, office sheds, and portable toilet facilities, etc.) that do not comply with the criteria set out in condition C12 of this approval and which: (a) are located within an active construction zone within the approved project footprint; and (b) have been assessed by the Environmental Representative to have:
	(i) minimal amenity impacts to surrounding residences, with consideration to matters such as noise and vibration impacts, traffic and access impacts, dust and odour impacts, and visual (including light spill) impacts, and (ii) minimal environmental impact in respect to waste management, and no impacts on flora and fauna, soil and water, and heritage beyond those approved for the project; and c) have environmental and amenity impacts that can be managed through the implementation of environmental measures detailed in a Construction Environment Management Plan for the project. All Ancillary Construction Facilities shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the landowner where relevant.

11. TRACK LOG CHANGES

Change Management Log	
Rev 0	Chainage 0 – 3419 Lot B Line 1 only
Rev A	No changes made – Approved by DCCEEW

APPENDIX 1 – TYPICAL ENVIRONMENTAL

DELIVERING 4 CUSTOMERS



- Pump
- Flow of water
- Silt fence
- Dewatering hose
- Pipe laydown
- Access track
- Excavation
- No Go Zone
- Sediment bag
- Stockpile
- Temporary stockpile
- Construction corridor

Scale: 1:1,300

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 6/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 1 Chainage 0-280

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- All personnel and equipment must stay outside of the marked No-Go zone.
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Darkes Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Worksite is to be left clean and tidy at the end of each shift

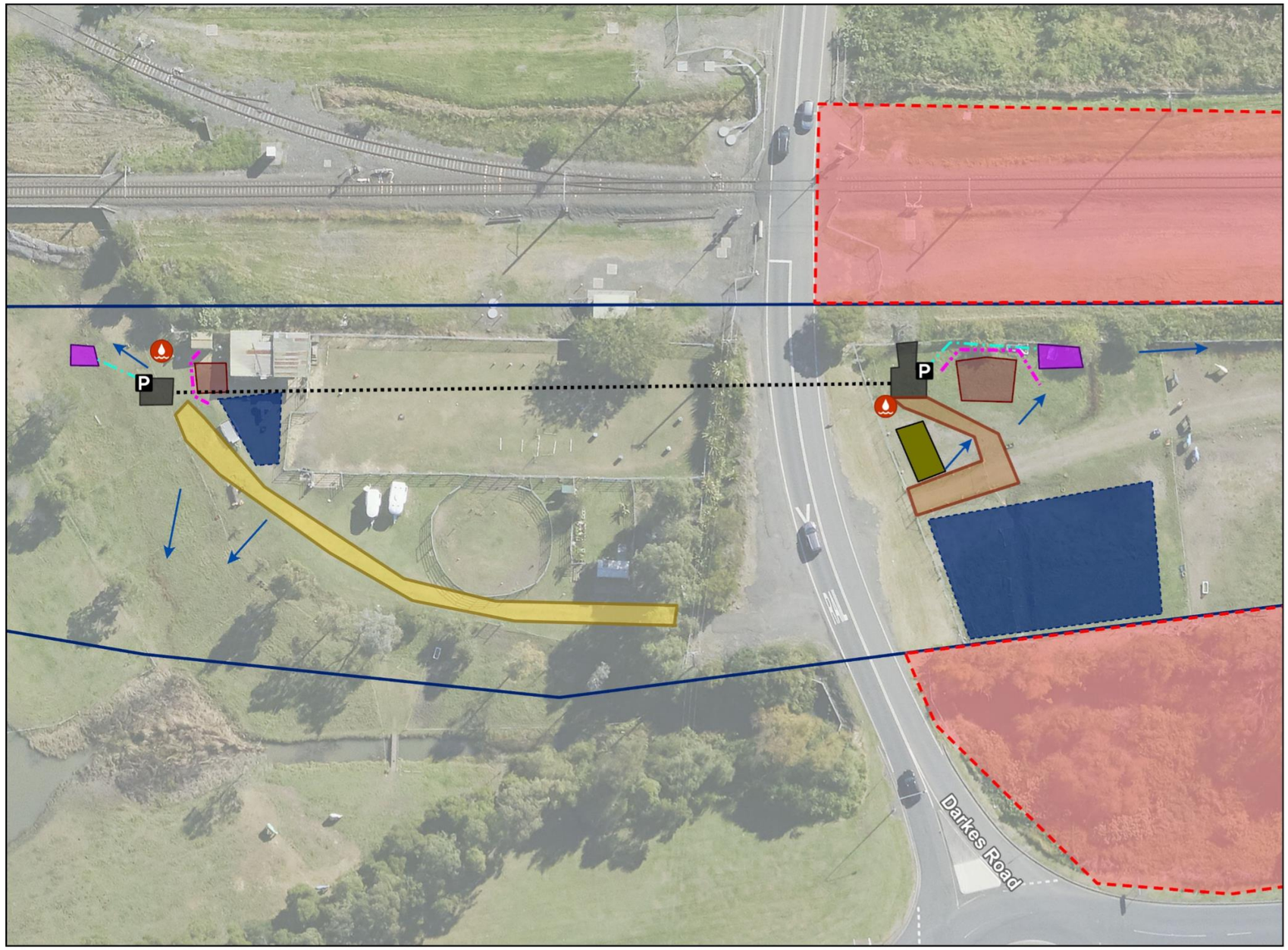
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



Pump
Spill kit
Flow of water
Silt fence
Underbore

Dewatering hose
Drill mud container
Pipe laydown
Existing access track
Access track

Excavation
No Go Zone
Sediment bag
Stockpile
Construction corridor

Scale: 1:800

Meters 0 25 50

Data displayed is indicative and for information purposes only.
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AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 1 Chainage 280 - 418

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- All personnel and equipment must stay outside of the marked No-Go zone.
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Darkes Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- All waste is to be appropriately classified and disposed of
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

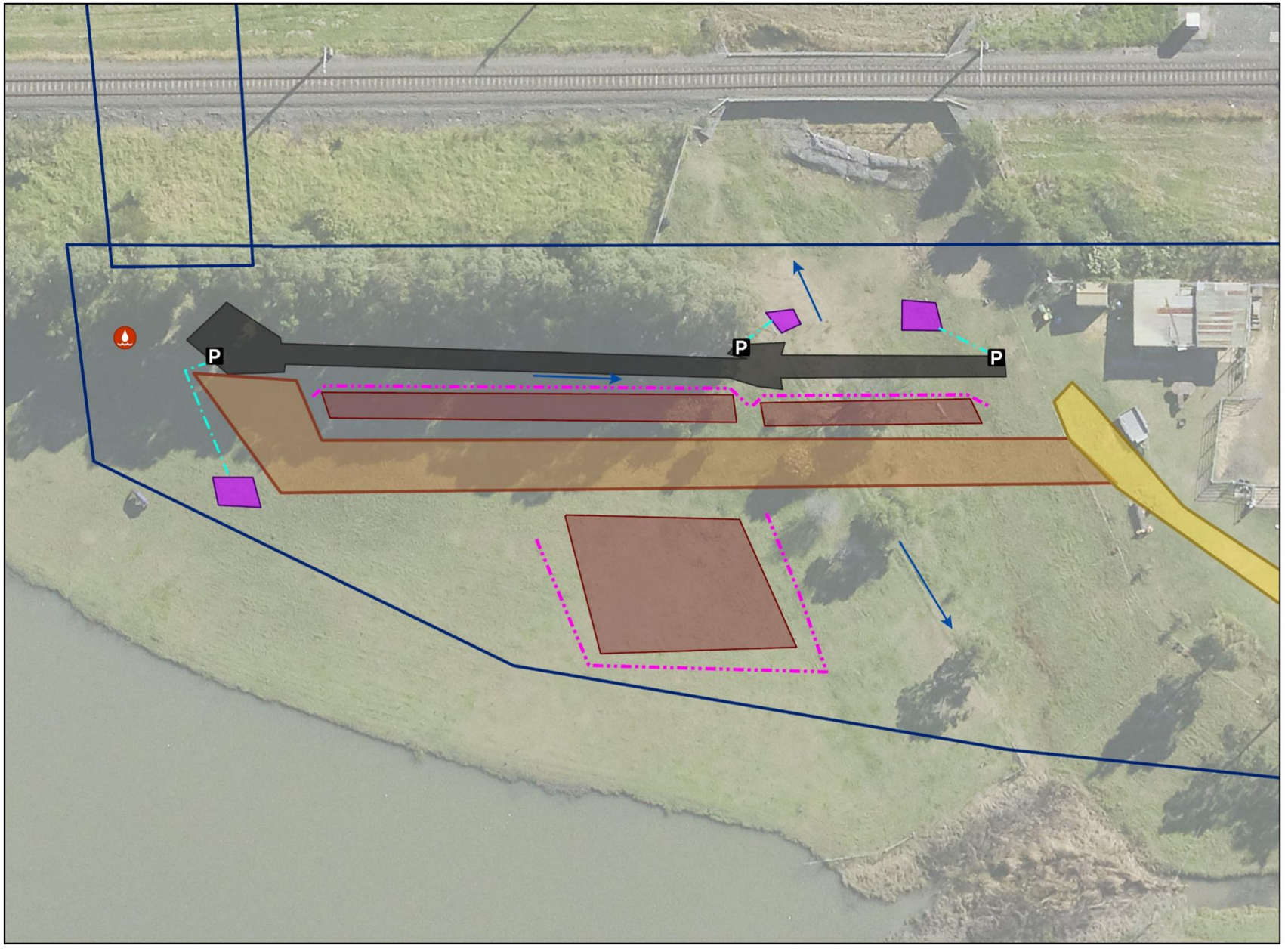
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



Pump
Spill kit
Flow of water
Silt fence
Dewatering hose
Existing access track
Access track
Excavation
Sediment bag
Stockpile
Construction corridor

Scale: 1:550

Meters 0 25 50

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Exported: 3/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 2 Chainage 418-476

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Darkes Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Worksite is to be left clean and tidy at the end of each shift

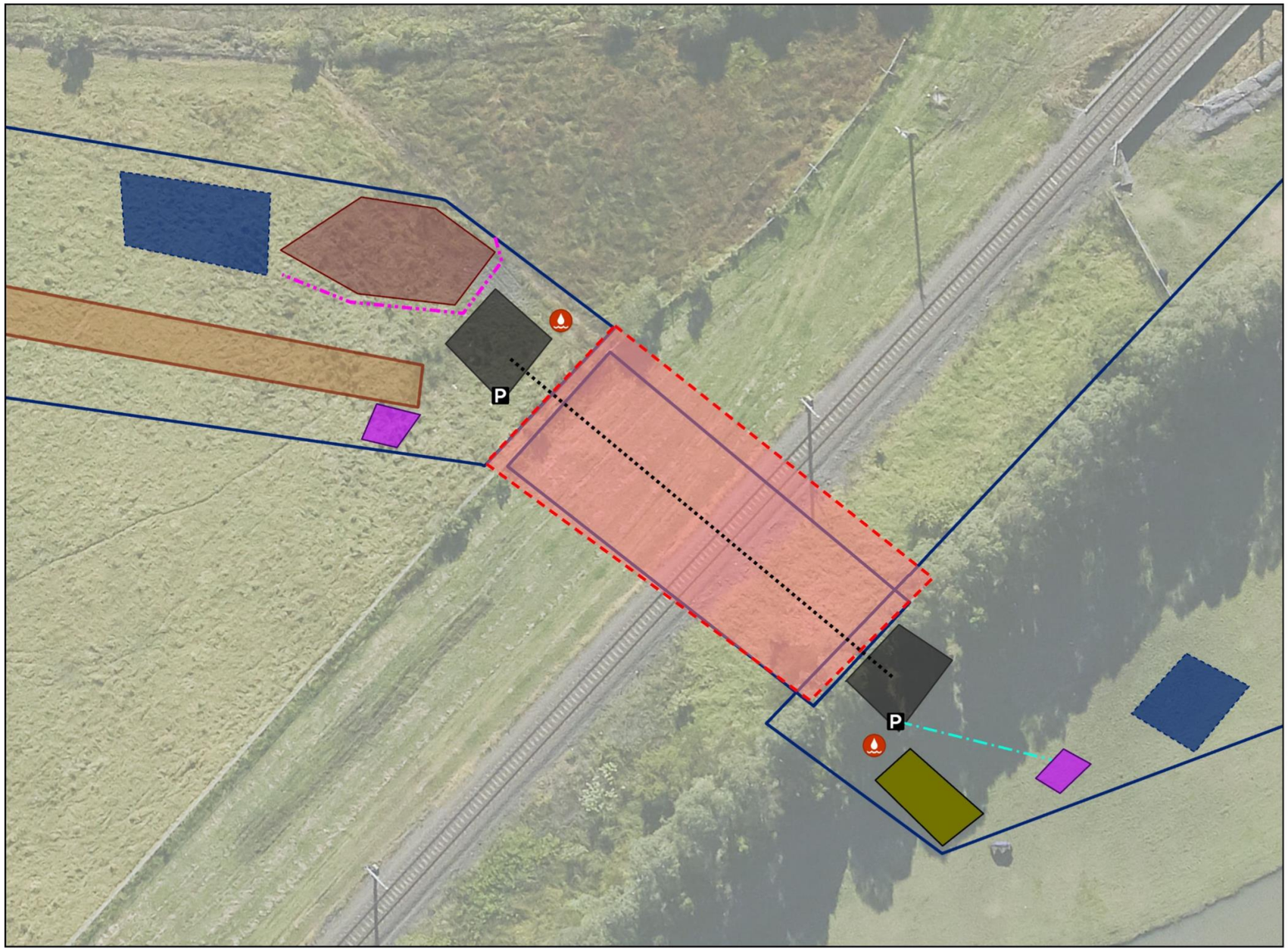
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general-purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Spill kit
Silt fence
Underbore
Dewatering hose
Drill mud container
Pipe laydown
Access track
Excavation
No Go Zone
Sediment bag
Stockpile
Construction corridor

Scale: 1:550

Meters 0 25 50

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Exported: 6/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 2 Chainage 476-534

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- All personnel and equipment must stay outside of the marked No-Go zone.
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Darkes Road or Clarke Street
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- All waste is to be appropriately classified and disposed of
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

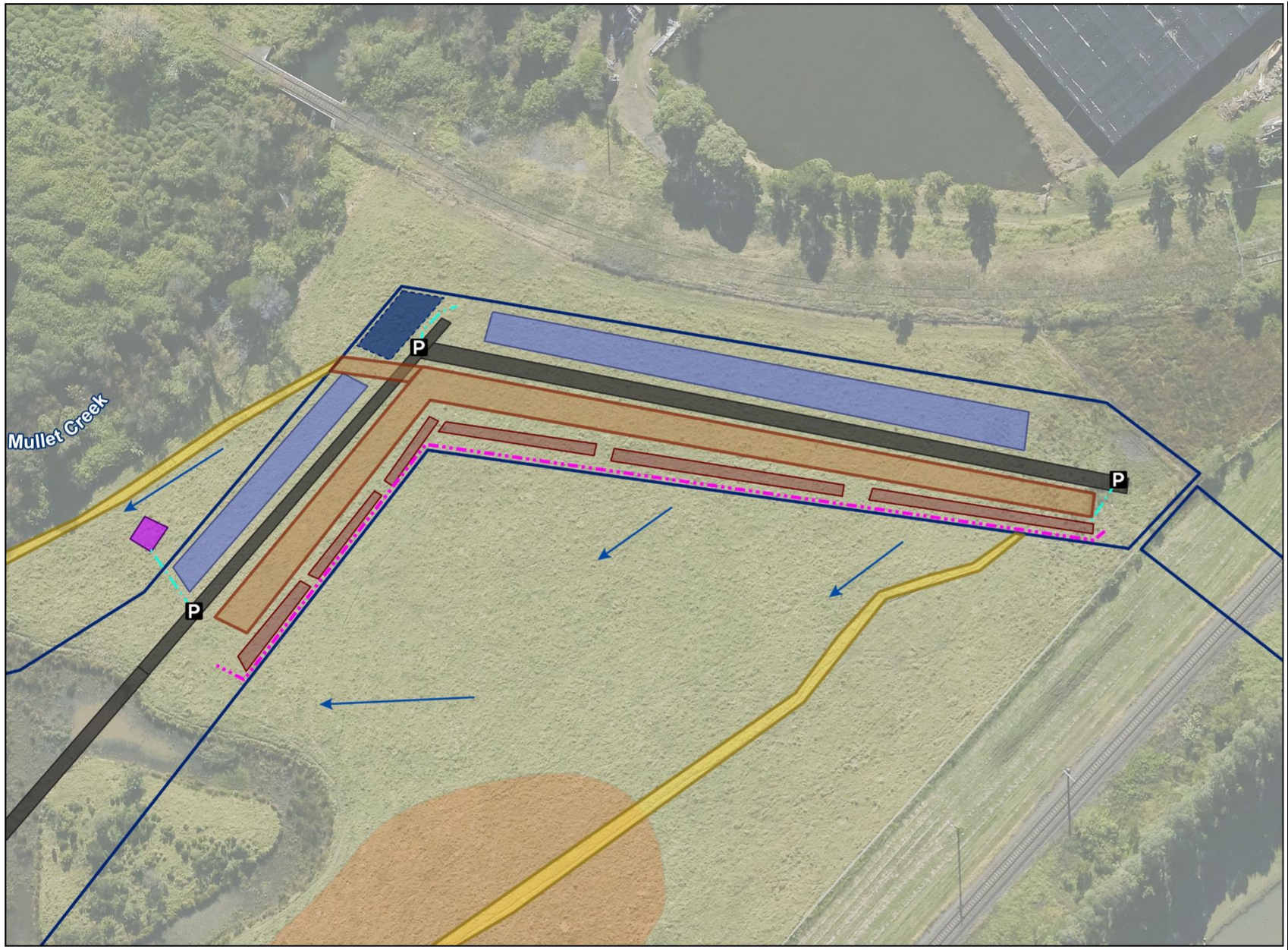
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- No Worker is to enter the rail corridor without being licenced or without a protection officer in place
- Construction work can only take place within the nominated construction corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Pipe laydown

Existing access track
Access track
Excavation
Sediment bag
Stockpile

Temporary stockpile
Construction corridor
Area of PAD

Scale: 1:1,000

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 3 – 1 Chainage 534-750

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Clarke Street
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Worksite is to be left clean and tidy at the end of each shift

AIR QUALITY:

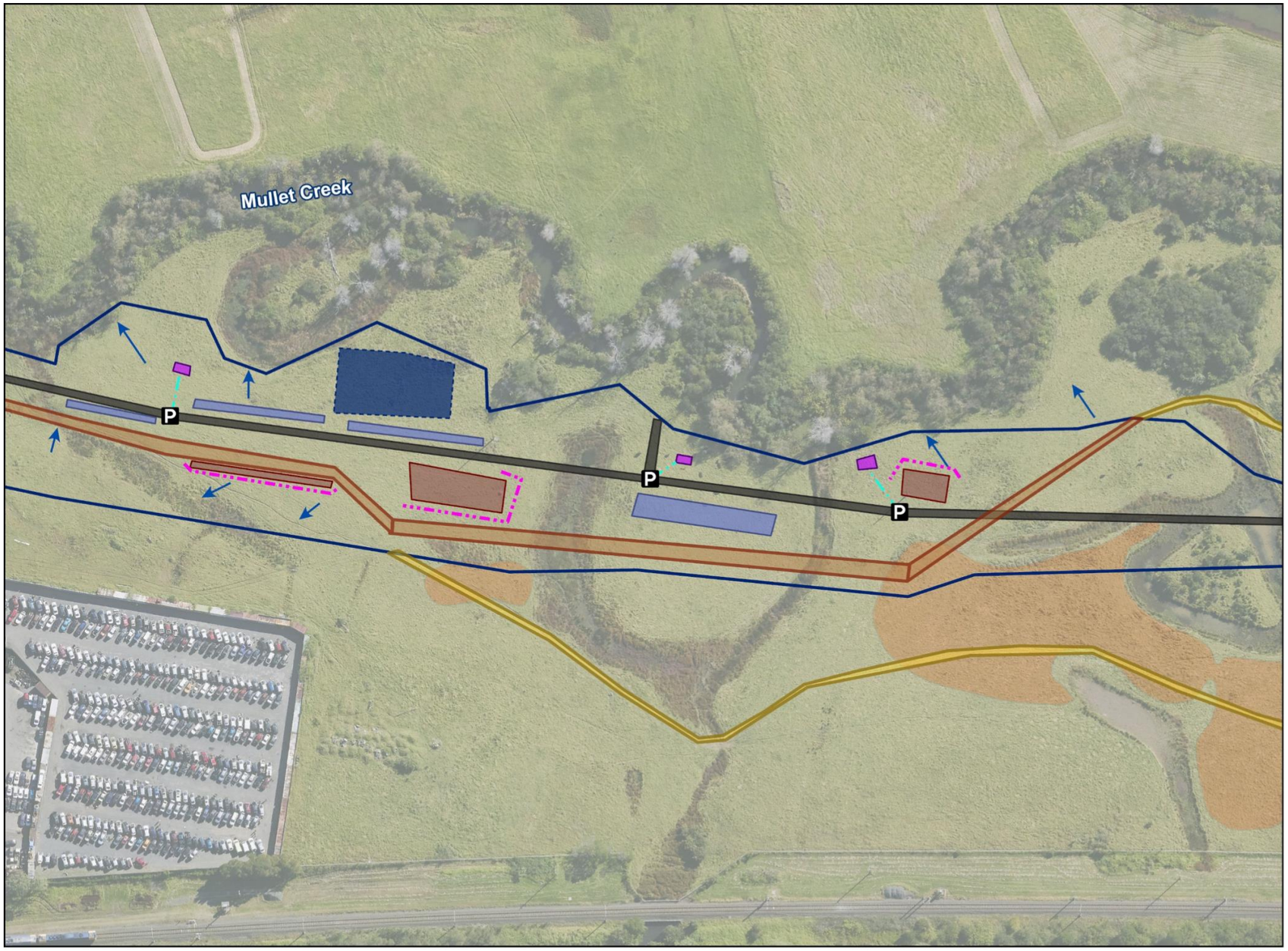
- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

REVISION - A

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Pipe laydown
Existing access track
Access track
Excavation
Sediment bag
Stockpile
Temporary stockpile
Construction corridor
Area of PAD

Scale: 1:2,000

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 3 – 2 Chainage 750-1200

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Clarke Street
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Worksite is to be left clean and tidy at the end of each shift

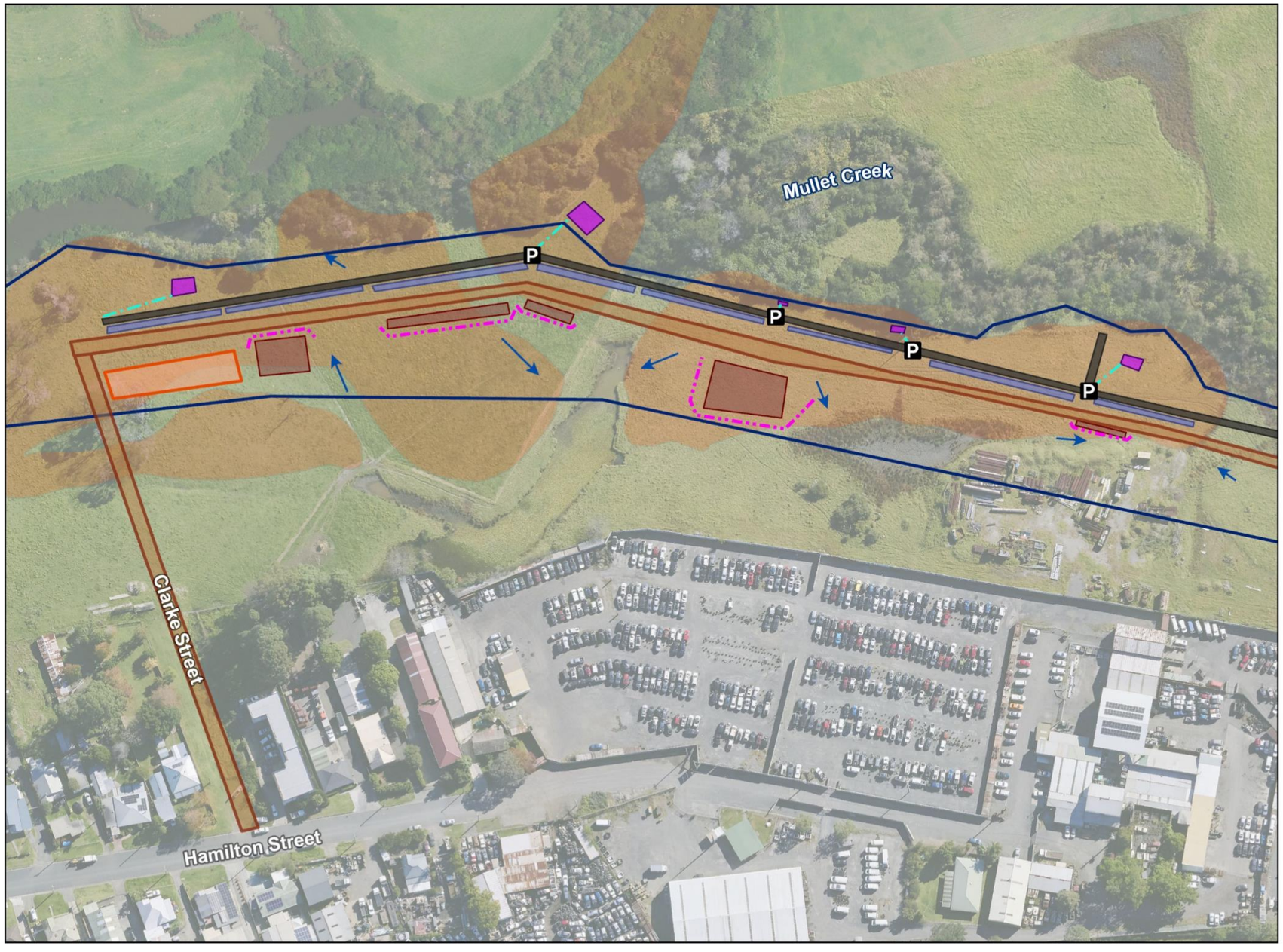
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Access track
Excavation
Office compound
Sediment bag
Stockpile
Temporary stockpile
Construction corridor
Area of PAD

Scale: 1:2,000

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 3 – 3 Chainage 1200-1665

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Clarke Street
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Worksite is to be left clean and tidy at the end of each shift

AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL

P Pump
Spill kit
Flow of water
Silt fence
Underbore
Dewatering hose
Drill mud container
Pipe laydown
Access track
Excavation
Sediment bag
Stockpile
No Go Zone
Construction corridor
Area of PAD

Scale: 1:700

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 3 Chainage 1665-1762

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- All personnel and equipment must stay outside of the marked No-Go zone.
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Clarke Street or Bong Bong Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- Other than established stockpiles there is to be no waste stored onsite.
- All waste is to be appropriately classified and disposed of
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

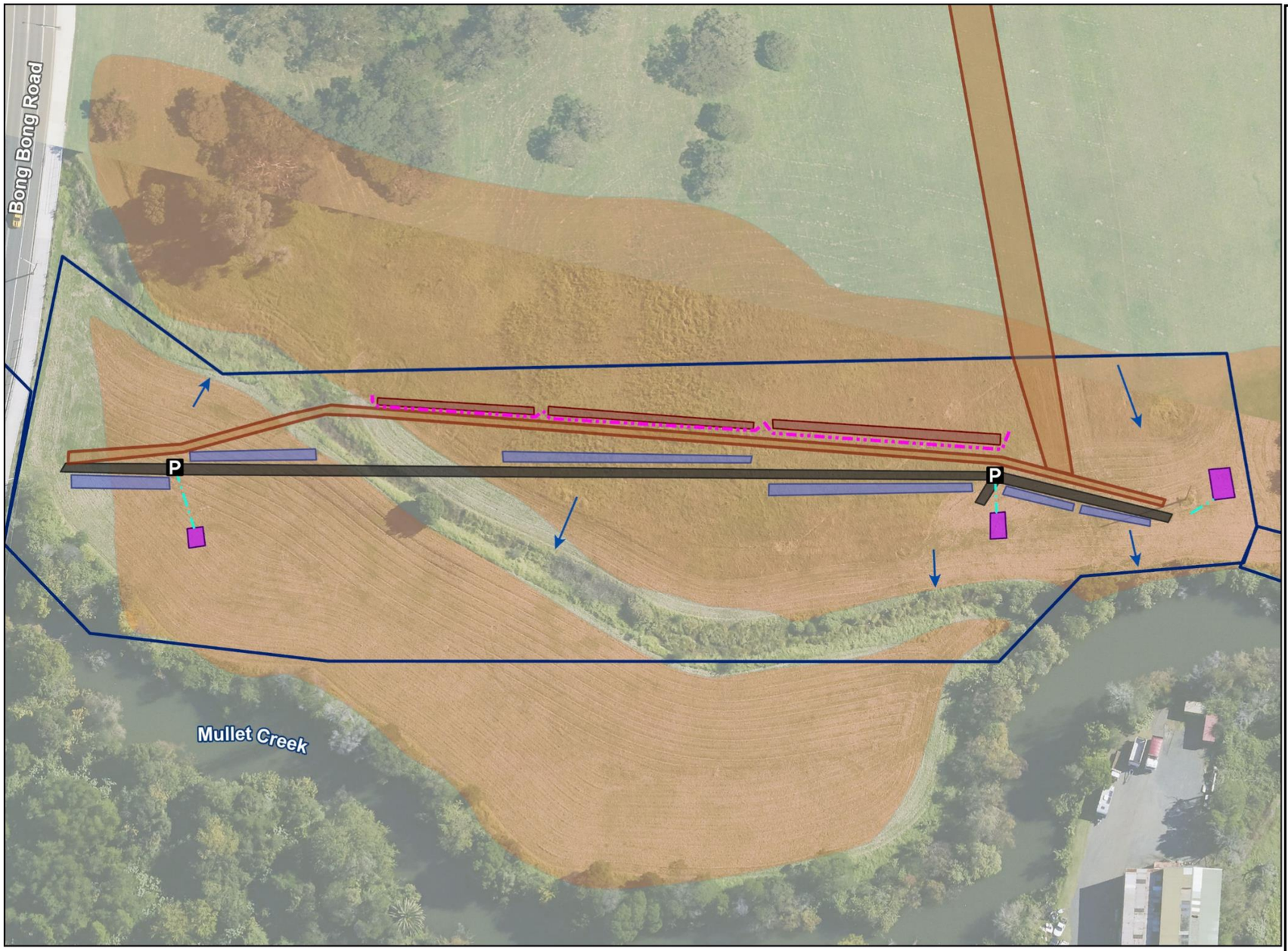
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Access track
Excavation
Sediment bag
Stockpile
Temporary stockpile
Construction corridor
Area of PAD

Scale: 1:1,200

Meters 0 25 50

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Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 4 Chainage 1665-2017

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Bong Bong Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Worksite is to be left clean and tidy at the end of each shift

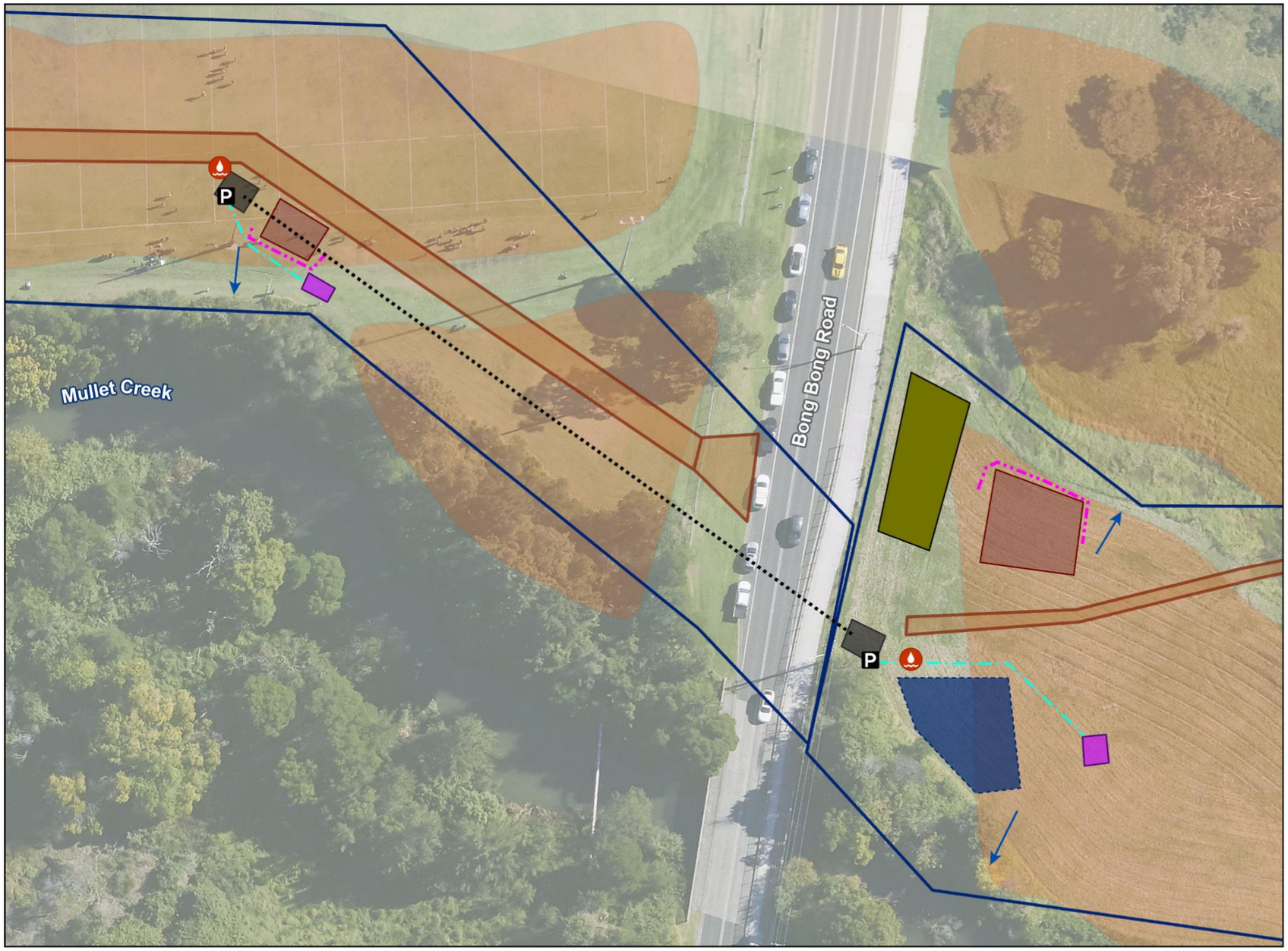
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



Pump
Spill kit
Flow of water
Silt fence
Underbore
Dewatering hose
Drill mud container
Pipe laydown
Access track
Excavation
Sediment bag
Stockpile
Construction corridor
Area of PAD

Scale: 1:800

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 4 Chainage 2017-2131

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Bong Bong Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

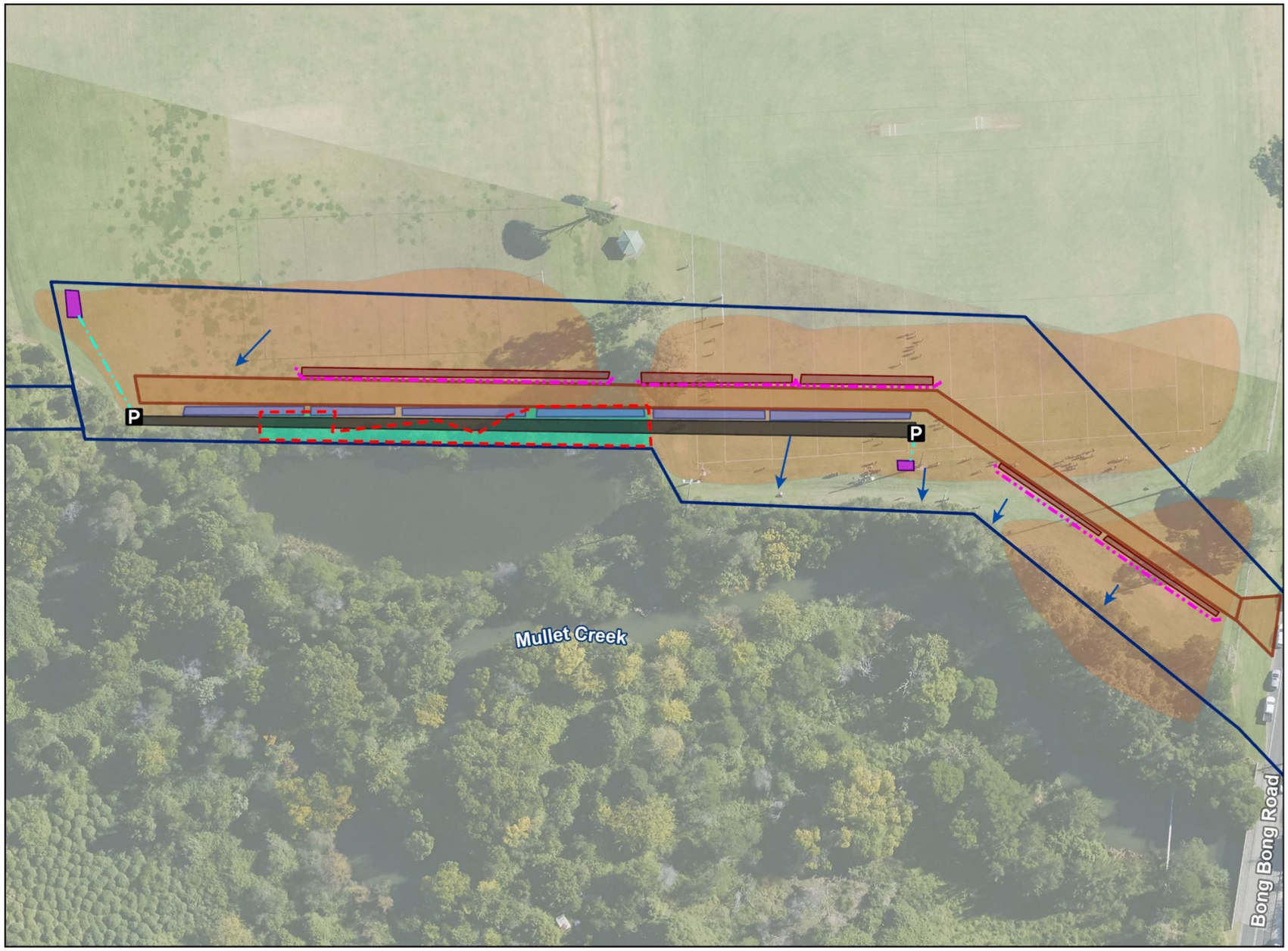
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Access track
Excavation
Sediment bag
Stockpile
Temporary stockpile
Vegetation to be cleared/trimmed
Construction corridor
Area of PAD

Scale: 1:1,170

Meters 0 25 50

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Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 5 Chainage 2131- 2305

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- Trees are to be inspected for hollows prior to trimming works commencing.
- An approved Vegetation clearing permit must be issued prior to any works
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Bong Bong Road
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Worksite is to be left clean and tidy at the end of each shift

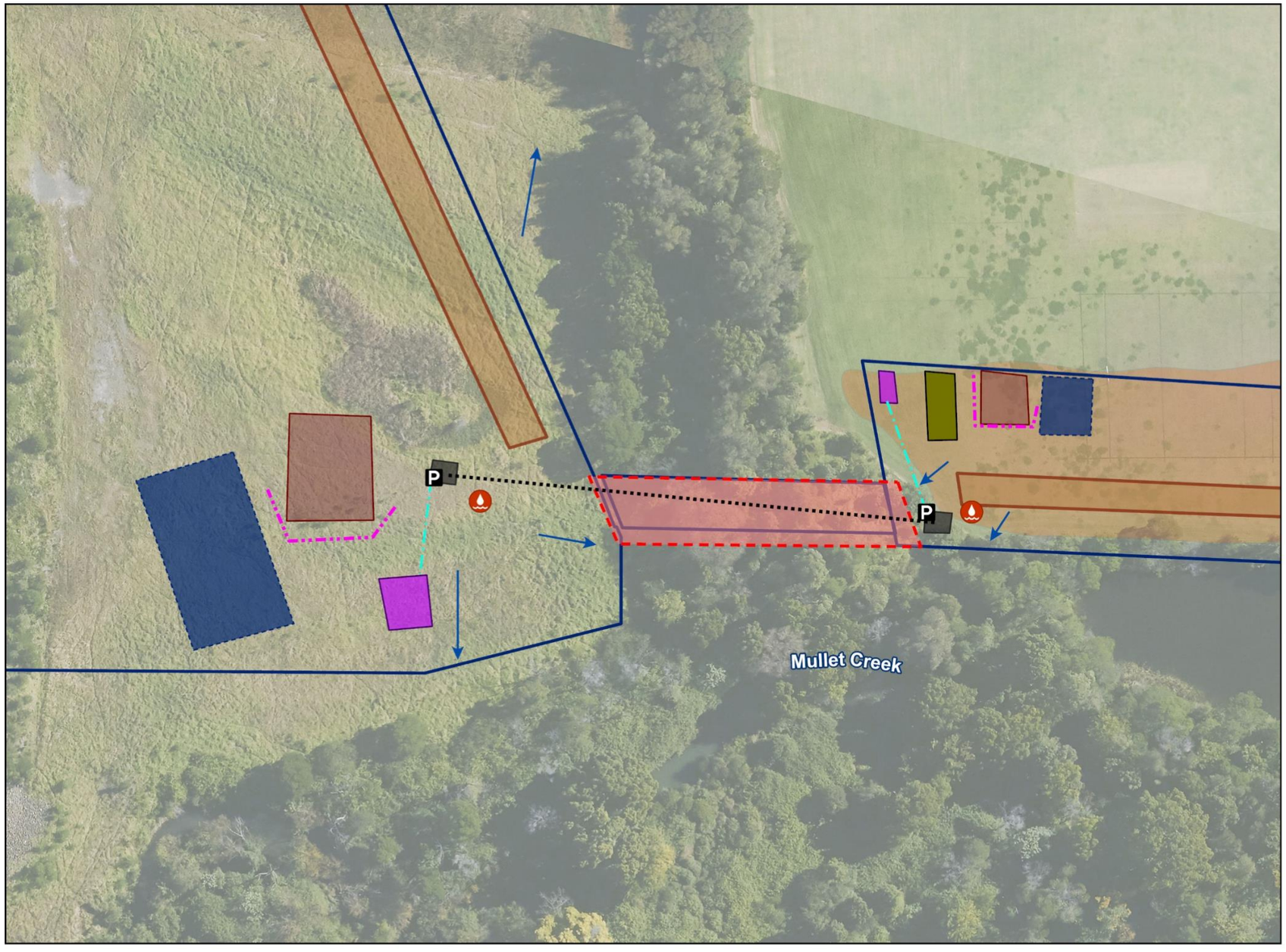
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



Pump
Spill kit
Flow of water
Silt fence
Underbore

Dewatering hose
Drill mud container
Pipe laydown
Access track
Excavation

Sediment bag
Stockpile
No Go Zone
Construction corridor
Area of PAD

Scale: 1:1,000

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 5 Chainage 2305-2397

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- All personnel and equipment must stay outside of the marked No-Go zone.
- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access only via Bong Bong Road or Fairwater Drive
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

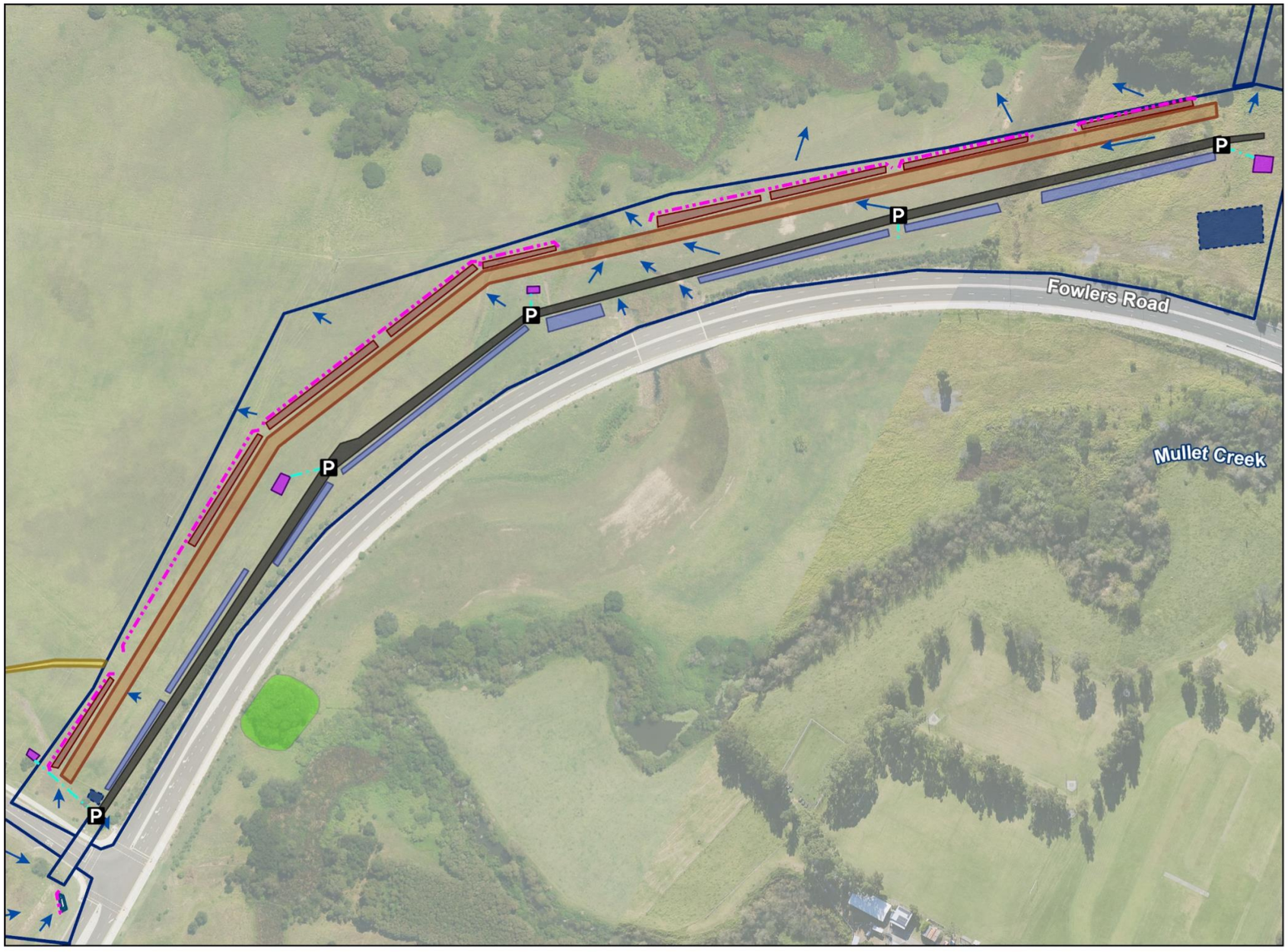
GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

REVISION - A

APPENDIX 1 – TYPICAL ENVIRONMENTAL

DELIVERING 4 CUSTOMERS



- P Pump
- Flow of water
- Silt fence
- Dewatering hose
- Pipe laydown
- Existing access track
- Access track
- Excavation
- Sediment bag
- Stockpile
- Temporary stockpile
- Stormwater drain
- Construction corridor
- Aboriginal Ceremony and Dreaming Area

Scale: 1:2,800

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 6 Chainage 2397-3120

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access via Fairwater Drive
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Worksite is to be left clean and tidy at the end of each shift

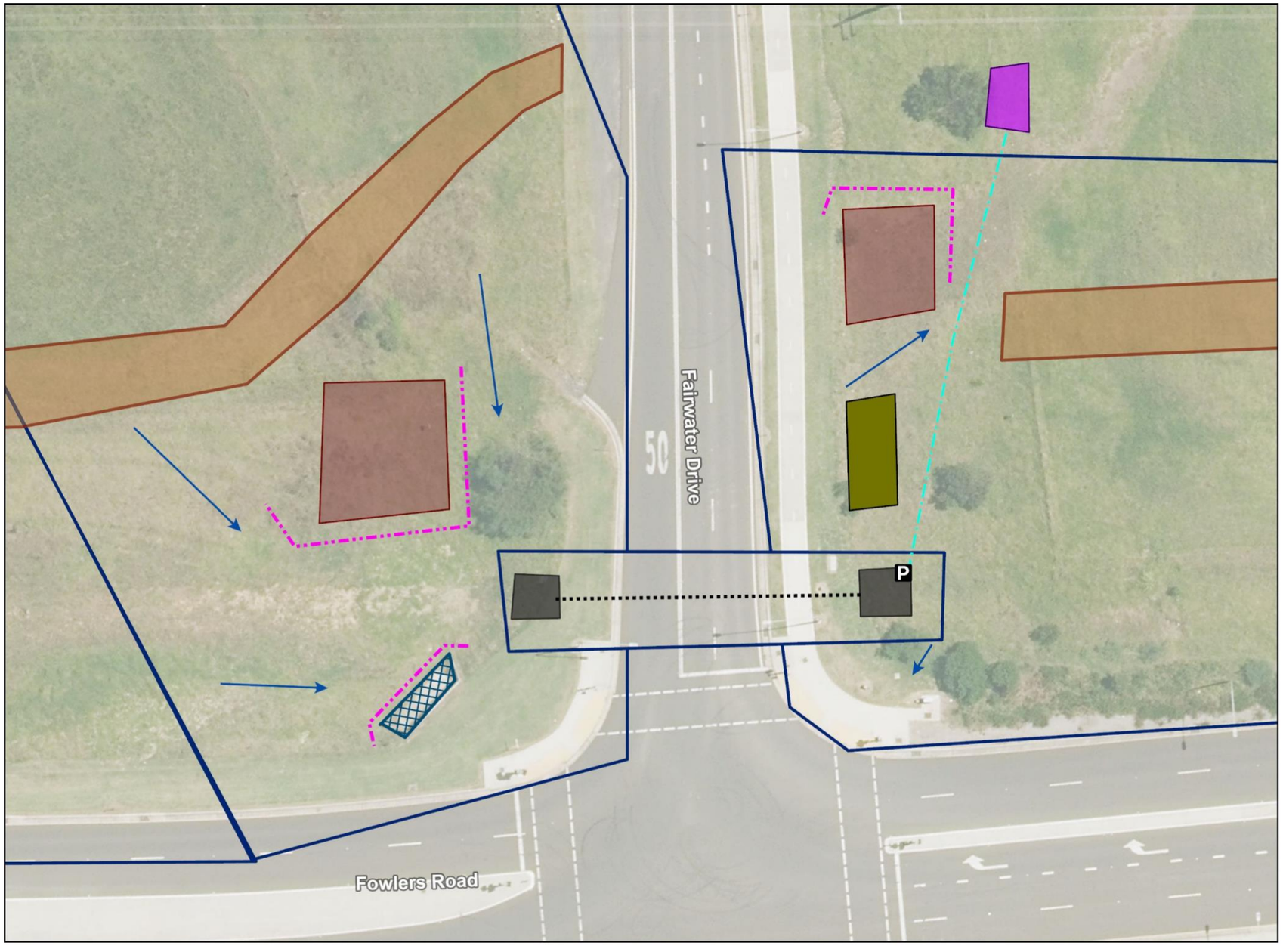
AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Underbore
Dewatering hose
Drill mud container
Access track
Excavation
Sediment bag
Stockpile
Stormwater drain
Construction corridor

Scale: 1:500

Meters 0 25 50

Data displayed is indicative and for information purposes only.
Exported: 4/10/2023
AUJG501607

KEY ENVIRONMENTAL RISKS AND CONTROLS

Under Bore 6 Chainage 3120-3153

TOPOGRAPHY, GEOLOGY AND SOILS:

- Sediment controls are to be established on the downside of all stockpiles.
- Sediment controls must be placed infront of Stormwater drain prior to works commencing

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access via Fairwater Drive
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Drill Mud is to be stored in sealed skips and disposed of at appropriately licenced facility.
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- Worksite is to be left clean and tidy at the end of each shift

AIR QUALITY:

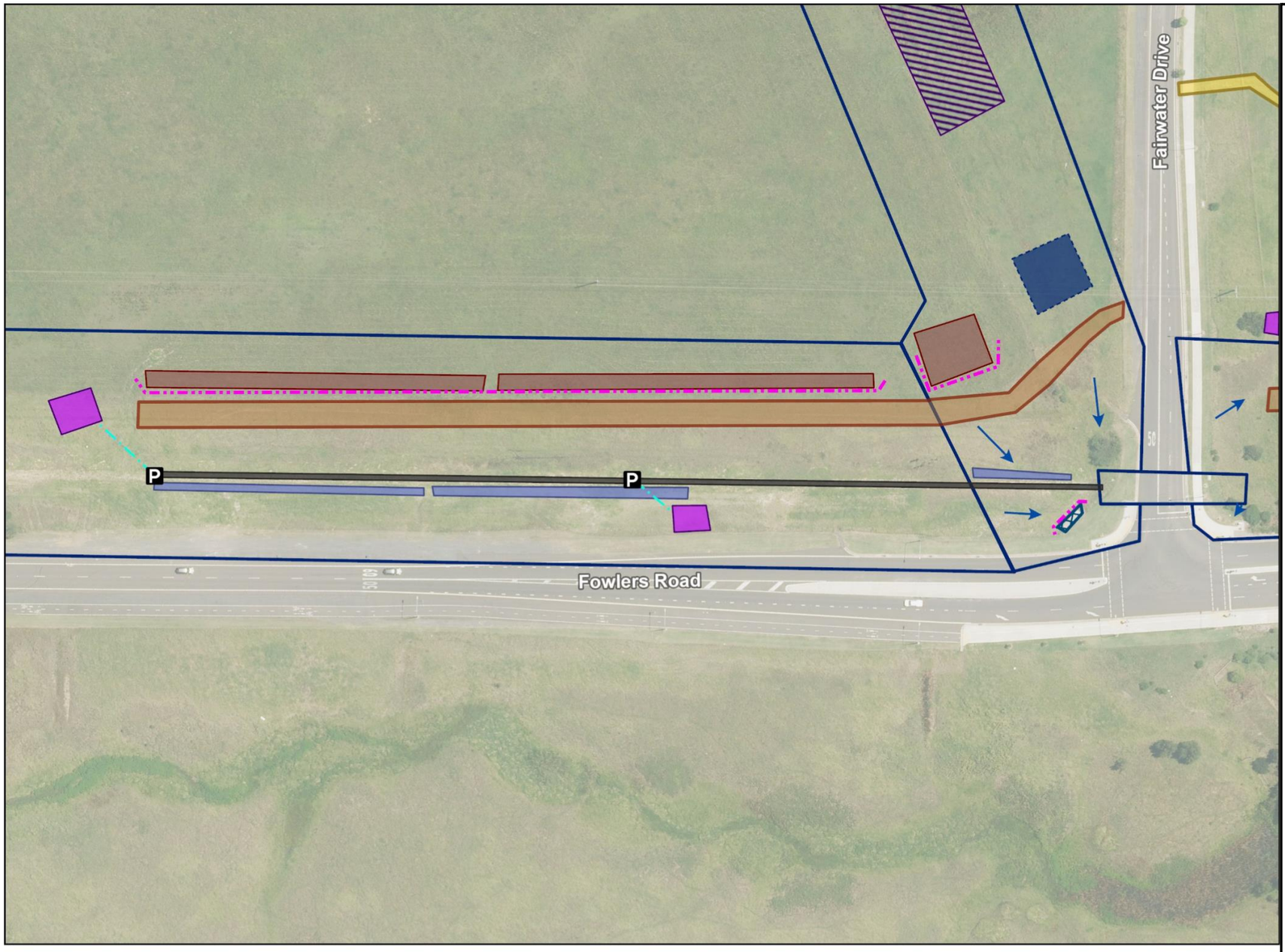
- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

REVISION - A

APPENDIX 1 – TYPICAL ENVIRONMENTAL



P Pump
Flow of water
Silt fence
Dewatering hose
Pipe laydown
Existing access track
Access track

Excavation
Sediment bag
Stockpile
Temporary stockpile
Stormwater drain
Non-Aboriginal heritage item/place
Construction corridor

Scale: 1:1,500

Meters 0 25 50

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Exported: 4/10/2023
AUJG501607

REVISION - A

KEY ENVIRONMENTAL RISKS AND CONTROLS

Section 7 Chainage 3153-3419

TOPOGRAPHY, GEOLOGY AND SOILS:

- Temporary stockpiles are for the storage of material being excavated daily. This material is to be backfilled at the end of each day. Additional material is to be placed in permanent stockpiles.
- Sediment controls are to be established on the downside of all stockpiles.
- Sediment controls must be placed in front of Stormwater drain prior to works commencing

WATER AND DRAINAGE:

- All dewatering of ground and surface water is to be released through a sediment/filter bag.
- All discharged water must meet discharge requirements as per the permit.
- A dewatering permit is required for any dewatering activity.
- The volumes of discharged Groundwater must be metered and logged daily.

FLORA AND FAUNA:

- **NO** equipment, materials or stockpiles are to be stored under the drip line of trees.

NOISE AND VIBRATION:

- All works are to be completed during standard construction hours.
- An OoHW permit is required for any works outside normal construction hours

TRAFFIC AND ACCESS:

- Access via fairwater Drive
- Vehicles and equipment must not block residential driveways or roads.
- Access tracks are to be established in boggy areas or if required.
- Topsoil is to be removed from access track locations and suitably stockpiled and protected with sediment fencing or other ERSED control.
- All vehicles must travel along established or existing access tracks.
- Mud tracking shall be swept up at end of day or before the onset of a rain event

HERITAGE

- All workers must have completed the Heritage and Site Inductions
- Follow the Unexpected finds procedure and notify Project Environmental Coordinator if anything is discovered.

LAND USE AND SERVICES:

- Land is to be rehabilitated as per the customers home plan agreement

WASTE:

- Excavated spoil is to be reused as much as possible. Any spoil disposed of is to classified and disposed of at an appropriately licenced facility
- All waste is to be appropriately classified and disposed of
- Other than established stockpiles there is to be no waste stored onsite.
- Worksite is to be left clean and tidy at the end of each shift

AIR QUALITY:

- Plant and Equipment is not to be left idling when not in use.
- Stockpiles and access tracks are to be sprayed with water during dry windy conditions

GENERAL:

- Construction work can only take place within the nominated corridor.
- Place all spill kits in locations where it is accessible, as per this SEP.
- Marine and general purpose spill kits are required as per the WSWA approvals
- Spills: Control source, contains spill, clean up, dispose of waste, Restock spill kits
- Report all incidents to supervisor immediately who will notify D4C Environment team. Follow D4C HSE Event Reporting procedure and D4C Emergency Preparedness and Response
- Notify Project Environment Coordinator of any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)