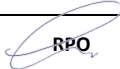




Jemena Port Kembla Pipeline Project **BIODIVERSITY MANAGEMENT SUBPLAN**

Document No.: GAS-599-PA-EV-006 | Revision 3

Rev	Description	By	Checked	QA	Nacap Approved	Date
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LIST OF EMERGENCY AND KEY CONTACTS

Organisation/Position	Contact Details
Environment Line (EPA Pollution Hotline)	131 555 The Environment Line handles general inquiries about environmental issues and takes reports of pollution for which the EPA has regulatory responsibilities. Environment Line is a one-stop pollution and environmental incident reporting service provided by Environment and Heritage Group (EEG) and EPA.
Fire and Rescue NSW	000 (for pollution incidents that present an immediate threat to human health or property) 1300 729 579 (for pollution incidents that do not present an immediate threat to human health or property)
Wollongong Council	General Enquiries (02) 4227 7111
NSW Ports	General Enquiries 1300 922 524
Port Authority of NSW	24-hour community enquiries and complaints line: (02) 9296 4962 enquiries@portauthoritynsw.com.au
Port Kembla Coal Terminal	Administration (02) 4228 0288
Bluescope	Laura Davis Laura.davis@bluescopesteel.com +61 467728547
Transport for NSW	General Enquiries (02) 8202 2200
GrainCorp	Dylan Clarkson +61 409 739 697 dclarkson@graincorp.com.au

Organisation/Position	Contact Details
AIE	Andrew Petch +61 401 175 917 Andrew.petch@ausindenergy.com
Jemena	Community Feedback - 1300 081 989 Justin Anderson 0435 092 889 justin.anderson@zinfra.com.au
Nacap	Jason Heard Nacap Project Manager j.heard@nacap.com.au +61 488 087 393

ACRONYMS

Term	Meaning
AIE	Australian Industrial Energy
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Port Kembla Lateral Looping Project Biodiversity Development Assessment Report (Biosis, 23 September 2020)
BMP	Biodiversity Management Plan (this plan)
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CROW	Construction Right-of-Way
CWTH	Commonwealth
DLP	Defects Liability Period
DPI	Department of Primary Industries
DPE	Department of Planning and Environment
EA	Environmental Assessment

Term	Meaning
ECI	Early Contractor Involvement
EEC	Endangered Ecological Community
EGP	Eastern Gas Pipeline
EIS	Environmental Impact Statement
EMM	Environmental Management Measures
EOL	End of Line
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPA	Environment Protection Agency
EPBC	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ESCP	Erosion and Sediment Control Plan
FSRU	Floating Storage and Regasification Unit
Ha	Hectare
HBT	Hollow Bearing Tree
HDD	Horizontal Directional Drilling
ISO	International Standards Organisation
KGMS	Kembla Grange Meter Station
IBRA	Interim Biogeographic Regionalisation of Australia
LECH	Land, Environment and Cultural Heritage
LEP	Local Environment Plan
LGA	Local Government Area
LLS	Local Land Services
LNG	Liquid Natural Gas
MIJ	Monolithic Insulating Joint

Term	Meaning
NATA	National Association of Testing Authorities
NDT	Non Destructive Testing
NSW	New South Wales
PCT	Plant Community Type
PKGT	Port Kembla Gas Terminal
PKL	Port Kembla Lateral
PKPP	Port Kembla Pipeline Project
Principal	Jemena
SEPP	NSW State Environmental Planning Policy
SOW	Scope of Work
SSI	State Significant Infrastructure
SWMS	Safe Work Method Statements
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TPZ	Tree Protection Zonw

GLOSSARY

Term	Meaning
Company/Principal	Jemena
Contractor	Nacap
Environmental Assessment	Includes the following EIS and Modification Reports: > Port Kembla Gas Terminal EIS and Modifications 1, 2 and 3, and > Eastern Gas Pipeline EIS and Modifications 1 and 2.

Term	Meaning
Feasible and reasonable	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Hazard	A source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination.
HAZID	Hazard Identification risk assessment
Incident	A set of circumstances that: <ul style="list-style-type: none"> > causes or threatens to cause material harm to the environment; and/or > breaches or exceeds the limits or performance measures/criteria in this approval.
Project	Port Kembla Pipeline
Regulatory Requirements	Government acts and regulations that are environment specific which prescribe legal obligations encompassing the employer and contractor.
Risk	Effect of uncertainty on objectives. Often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence [ISO Guide 73:2009, definition 1.1]
Stakeholder	Party with vested interest in the works
Third Party	Any party external to the works that has been identified as a stakeholder

1 INTRODUCTION

1.1 Background

Australian Industrial Energy (AIE) have approval to build a new Liquid Natural Gas (LNG) import terminal at the Port Kembla inner harbour with the aim to sell gas to the east coast market. The gas is planned to be processed on a Floating Storage and Regasification Unit (FSRU) and imported into the existing gas networks through a new pipeline that will connect the AIE Port Kembla Gas Terminal (PKGT) with the Jemena owned gas transmission network via the Eastern Gas Pipeline (EGP).

In February 2021, Jemena and AIE entered into a Project Development Agreement to enable Jemena to build, own and operate a segment of the pipeline that is approved as part of AIE’s SSI 9471 Infrastructure Approval for the PKGT, and build and operate the remainder of the pipeline approved under the same Infrastructure Approval, SSI 9471.

The Port Kembla Pipeline Project (PKPP) involves the construction of an approximately 12.1 kilometres long, 18” (DN450) buried steel gas transmission pipeline and a new End of Line (EOL) facility in the vicinity of the Jemena’s existing Kembla Grange Metering Station (KGMS). The proposed PKPP Project is comprised of three sections (refer to Figure 1):

- > Segment 1.1 – 4.3 km pipeline from PKGT to Springhill Road to be built by Jemena; owned by AIE with some services provided in operation by Jemena.
- > Segment 1.2 – 2.2 km pipeline from Spring Hill Road to Five Islands Road to be built, owned, and operated by Jemena, and
- > Segment 2 – 5.6 km pipeline from proposed Lateral from Five Islands Road to KGMS which includes the Kembla Grange Tie-in Facility to be built, owned and operated by Jemena.

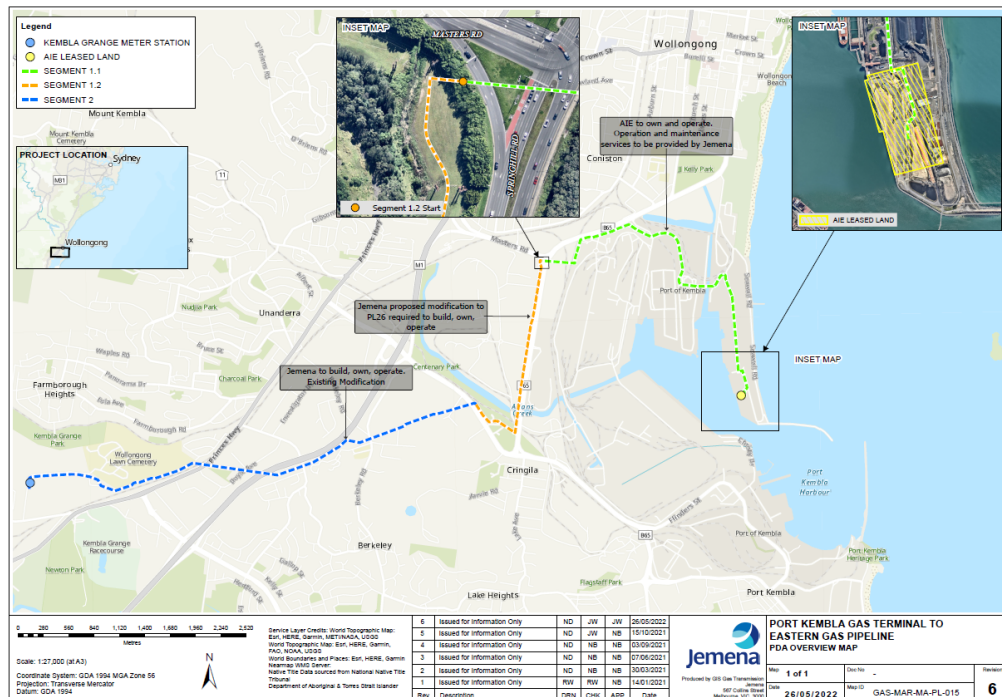


Figure 1 - Project Layout

The project is approved by the Department of Planning and Environment (DPE) under a number of Infrastructure Approvals:

- > SSI-9471 Port Kembla Gas Terminal Infrastructure Approval under Section 5.19 of the Environmental Planning and Assessment Act 1979 which incorporates Segment 1.1 and 1.2.
- > SSI-9973 Eastern Gas Pipeline Modification 1 - Port Kembla Lateral Looping Pipeline Infrastructure Approval under section 5.25 of the Environmental Planning and Assessment Act 1979 pertains to Segment 2.
- > SSI-9973 Eastern Gas Pipeline Modification 2 - Transfer of Pipeline Segment to transfer Segment 1.2 from AIE SSI-9471 PKGT Infrastructure Approval.
- > Proposed Modification to the AIE SSI-9471 Port Kembla Gas Terminal to remove segment 1.2 from the Infrastructure Approval in Q2 2022.
- > Staging Plan approved by DPE for SSI-9471
 - Stage 1: Early Enabling Works commenced in May 2021
 - Stage 2a: Marine Berth Construction – Land Based commenced January 2022
 - Stage 2b: Marine Berth Construction and Dredging – Land and Marine based commenced March 2022, and
 - Stage 3: Pipeline installation including ties ins, proposed to commence in December 2022.
- > Staging Plan approved by DPE for SSI-9973
 - Stage 1: Pipeline installation, and
 - Stage 2: Construction of the tie in facilities including Kembla Grange Metering Station (KGMS).

1.2 Purpose and Scope

This Biodiversity Management Plan (BMP) has been prepared to ensure construction activities are carried out in accordance with the Conditions of Approval (CoA), relevant regulatory requirements, standards, procedures and current best practice to ensure that all reasonable and practical measures are implemented to minimise the potential for biodiversity related impacts.

This BMP adopts an integrated approach, considering and identifying management measures overarching the sequencing of construction related activities. All works are to be implemented in accordance with the management measures and strategies contained within this plan.

This BMP has been prepared to satisfy the requirements of both SSI 9471 and SSI 9973, the Project EIS and subsequent modification reports to include the staging of works as described above in Section 1.1 and as presented in the table below. This BMP applies to the Construction phase of the works only and in accordance with the CoA will be implemented during construction.

Table 1 - BMP scope relevant to SS1-9471 and SSI-9973

Infrastructure Approval	Post Consent Stage	Description of Works	Segment of Works As detailed in Sect 1.4 and Figure 1
SSI-9471	Stage 3	Pipeline construction from PKGT to KGMS	Segment 1.1
SSI-9973	Stage 1		Segment 1.2 Segment 2

1.3 Project Description

A detailed project description is provided in Section 1.4 of the Construction Environment Management Plan (CEMP) (GAS-599-EV-001)

1.4 References

The following are principal documents referenced in this document:

Table 2 – Reference Documents

Document No.	Title of Document
GAS-554-AC-PM-001	SSI 9471 - Port Kembla Gas Terminal - Infrastructure Approval
GAS-556-AC-PM-001	SSI 9973 Modification 1 - Port Kembla Lateral Looping Pipeline – Infrastructure Approval
GAS-556-SP-PL-007	Construction Specification
GAS-551-SW-PL-001	Pipeline Construction Scope of Work
GAS-599-HSE-004	Environmental Management Plan
GAS-599-PA-RA-001	Joint Post-Approval Strategy - AIE's Port Kembla Gas Terminal to Jemena's Eastern Gas Pipeline
GAS-599-RP-RA-007	Eastern Gas Pipeline - Port Kembla Lateral Looping Modification Report
GAS-599-RP-RA-008	Eastern Gas Pipeline Modification 2 - Modification Report
	Port Kembla Gas Terminal Environmental Impact Statement
	AIE PKGT Biodiversity Development Assessment Report (BDAR) GHD November 2018
	Jemena Port Kembla Lateral Looping Project Biodiversity Development Assessment Report Biosis March 2020
	Jemena Port Kembla Lateral Looping Project Biodiversity Development Assessment Report Biosis July 2020
	Jemena Port Kembla Lateral Looping Project Biodiversity Development Assessment Report Biosis September 2020

1.5 Principal Contractor Details

Table 3 – Principal Contractor Details

Nacap Details	
Business name:	Nacap Pty Ltd
Address:	Ground Floor, 599 Doncaster Road, Doncaster Victoria 3108
ABN:	33 006 306 994
Main phone number:	03 8848 1888
Contact person:	Jason Heard Nacap Project Manager
Contact mobile:	+61 488 087 393
Contact email:	j.heard@nacap.com.au

1.6 Environmental Management System Overview

The environmental management system overview is described in Section 4.1 of the Construction Environmental Management Plan (CEMP) (GAD-599-PA-EV-001). This BMP used together with the

CEMP, and subordinate project documents, procedures, resources, and practices will inform and guide Nacap personnel and subcontractors to ensure that all reasonable and practical measures are taken to manage the environmental risks for the Project.

1.7 CEMP Structure and relationship with sub plans

The CEMP comprises three sections:

PART A: Provides background information and the overarching systems approach to environmental management and mitigation controls for the project

PART B: Comprising Appendices in support of PART A, and

PART C: Comprising the required series of environmental management sub-plans outlined in the CoA including:

- (a) Noise Management Plan (GAS-599-PA-EV-004)
- (b) Air Quality Management Plan (GAS-599-PA-EV-005)
- (c) Biodiversity Management Plan (GAS-599-PA-EV-006) (this Plan)**
- (d) Soil and Water Management Plan (GAS-599-PA-EV-007)
- (e) Traffic Management Plan (GAS-599-PA-CN-002), and
- (f) Waste Management Plan (GAS-599-PA-EV-008).

The sub plans are structured to incorporate mitigation and control measures in meeting the project's environmental risk assessment and includes, construction Activity Specific Environmental Management Measures and Aspect Specific Environmental Management Measures, each of which identifies the following:

- > Environmental aspects
- > Environmental performance objectives and standards
- > Measurement criteria
- > Management measures and responsibilities
- > Compliance monitoring, and
- > Records.

1.8 Objectives and Targets

The objectives and targets for the PKPP Project to be undertaken in relation to Biodiversity are listed in Table 4 Objectives and Targets.

Table 4 – Objectives and Targets

Objective	Target
Minimise harm to biodiversity as a result of construction activities.	Zero harm to biodiversity.
Ensure all personnel, subcontractors and visitors are inducted, consulted and receive regular updates and information on project biodiversity aspects and impacts for the duration of works.	100% completion of Inductions, Daily Pre-Start Inputs by Environment Team, and Monthly toolbox inputs by Environment Team.
Ensure that personnel and subcontractors are aware of environmental hazards and risks associated with construction activities and relevant scope of work under the contract.	100% attendance recorded at SWMS workshops, and 100% Project Induction.
To conduct construction activities in compliance with all relevant approvals and environmental legislation.	100% compliance No regulatory infringements, including Provisional improvement notices and prosecutions.
Promote a positive reporting culture. To minimise the occurrence and severity of environmental incidents during construction activities.	All environmental incidents to be reported within 2 hours and investigated appropriately.
Ensure all corrective actions are closed out by the nominated due dates	No corrective actions outstanding past due date >7 days

1.9 Consultation

Consultation on this BMP is required to be undertaken with the following stakeholders:

Wollongong City Council (under Jemena approval)

Comments and feedback received during consultation will be incorporated into the Plan where relevant before being submitted to the DPE for approval.

Details of the Consultation associated with this Plan will be presented in Appendix A.

1.10 Certification and Approval

This BMP is required to be submitted for approval by the Secretary of the DPE prior to commencement of construction or as otherwise agreed by the Secretary.

1.11 Distribution

A controlled hard copy of this BMP and supporting documentation will be maintained and reside at the Project construction site office. Registered copies of this BMP and supporting documentation will be distributed to the Project team, the DPE, all relevant personnel and interested third parties as required. It will also be available to view on the Project website.

<https://jemena.com.au/pipelines/eastern-gas-pipeline>

2 ENVIRONMENTAL PLANNING AND GOVERNANCE

2.1 Legislation

The following legislation provide the primary context for construction biodiversity management in NSW:

- > Environment Protection and Biodiversity Conservation Act 1999 (CWTH).
- > Environmental Planning and Assessment Act 1979 (EP&A Act),
- > Biodiversity Conservation Act 2016
- > Biosecurity Act 2015
- > State Environmental Planning Policy (Koala Habitat Protection) 2019
- > Wollongong City Council Local Environmental Plan 2009 (LEP), and
- > Protection of the Environment Operations Act 1997 (POEO Act).

2.2 Conditions of Approval (CoA) requirements for BMP

This Plan has been prepared to comply with the Joint Post Approval Strategy for SSI-9471 (GAS-554-AC-PM-001) and SSI-9973 (GAS-556-AC-PM-001), associated consent documents and supporting information and the and associated consolidated conditions of approval as listed in Table 5 Conditions of Approval requirements BMP.

Table 5 – Conditions of Approval requirements BMP

CoA	Condition	Refer to Section within This Plan
SSI 9471 - Port Kembla Gas Terminal – Stage 3 Works		
No specific conditions require preparation and approval of a Biodiversity Management Plan		
SSI 9973 Modification 2 - Port Kembla Lateral Looping Pipeline		
B15	Construction impacts must be restricted to areas for which biodiversity impacts were assessed in the biodiversity development assessment report (BDAR) and must not encroach into other areas of retained native vegetation and habitat	Section 4.3
C1	<p>Prior to commencing construction, the Applicant must prepare a Construction Environmental Management Plan (CEMP) for the Port Kembla Lateral Looping Pipeline to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with Council, Sydney Trains and TfNSW;</p> <p>(b) identify the statutory approvals that apply to the construction and commissioning of the Port Kembla Lateral Looping Pipeline;</p> <p>(c) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Port Kembla Lateral Looping Pipeline;</p> <p>(d) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> keep the local community and relevant agencies informed about the construction and commissioning of the Port Kembla Lateral Looping Pipeline; receive, handle, respond to, and record complaints; resolve any disputes that may arise; respond to any non-compliance; and respond to emergencies; and <p>e)include:</p> <p>the following sub-plans:</p> <ul style="list-style-type: none"> • noise, including an out-of-hours work protocol; • air quality; • biodiversity; • soil and water management; • water management; • traffic management; and • waste 	This Plan

CoA	Condition	Refer to Section within This Plan
	a clear plan depicting monitoring to be carried out in relation to the Port Kembla Lateral Looping Pipeline	
C2	The CEMP sub-plans must state how: (a) the mitigation measures identified in the Modification Report will be implemented; and (b) the relevant terms of this Schedule will be complied with.	This Plan
C3	The Biodiversity CEMP sub-plan must: (a) identify areas of land that are to be retained as outlined in the BDAR; and (b) identify all measures in the BDAR to mitigate and manage impacts on biodiversity, including performance measures for each measure	Section 4.3 Appendix B
C5	The Proponent must implement the approved CEMP	This Plan
C6	The Proponent must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 4.3
C7	Within seven days of becoming aware of a non-compliance, the Proponent must notify the Department of the non-compliance. The notification must set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	Section 4.3

2.3 Environmental Management Measures

Environmental Management Measures (EMM) derived from the Project Environmental Assessment relevant to this BMP Plan are listed in Table 6.

Table 6 – Environmental Management Measures

EMM	Management Measure category	Commitment	Refer to Section within This Plan
SSI 9471 - Port Kembla Gas Terminal – Stage 3 Works			
W11	Water quality, chemical and fuel impacts on flora and fauna	A site specific emergency spill plan will be developed, and will include spill management measures in accordance relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA officers)	Section 4.3
W12	Water quality, chemical and fuel impacts on flora and fauna	An emergency spill kit will be kept on site at all times. All staff will be made aware of the location of the spill kit and trained in its use.	Section 4.3
TB2	Loss of native vegetation and fauna habitat	Staff will be inducted and informed of the limits of clearing and the areas of vegetation to be retained.	Section 4.2 Section 4.3
TB3	Fauna protection	A trained ecologist is to be present for construction activities that may impact frog habitat which includes dewatering / removal of detention basins and trenching immediately adjacent to Typha drainage line (west of Springhill Road) Temporary frog-proof fencing should be installed around drill sites, road side drains and detention ponds near the project site to be retained to prevent frogs from being injured or killed by equipment The trench is to be covered at night to prevent fauna from falling in An inspection is to be conducted each morning to check the trench for frogs Any frogs identified will only be handled by an ecologist or wildlife rescue representative Any Green and Golden Bell Frogs or other resident frogs are to be handled in accordance with the Chytrid fungus hygiene protocols (DECC 2008c) and released into the most appropriate nearby habitat area	Section 4.3
TB4	Spread of weeds	Priority weed control measures will be implemented as part of the CEMP to prevent their spread in the study area.	Section 4.3

EMM	Management Measure category	Commitment	Refer to Section within This Plan
TB5	Spread of weeds	Declared priority weeds will be managed according to requirements of the NSW Biosecurity Act 2015 Soil material and stripped groundcover vegetation with the potential to contain priority weeds will not be removed from the project site Soil disturbance will be avoided as much as possible to minimise the potential for spreading weeds.	Section 4.3
TB6	Sedimentation	A site specific erosion and sediment control plan will be prepared as part of the CEMP. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with relevant sections of 'Managing Urban Stormwater: Soil and Construction Volume 1' (Landcom 2004) ('the Blue Book') (particularly section 2.2) and 'Managing Urban Stormwater: Soil and Construction Volume 2A – Installation of Services' (DECC 2008b). The erosion and sediment control plan will include stockpiles, stormwater runoff, trees, site boundaries, site access and storage areas.	Section 4.3
TB7	Sedimentation	Areas disturbed during the works will be rehabilitated, including stabilising disturbed soils to resist erosion and weed invasion via establishment of with a suitable turf species such as a native Couch or repaving roads and sealed surfaces. Stabilisation activities will be carried out progressively to limit the time disturbed areas are exposed to erosion processes Activities with a risk of soil erosion such as earthworks will not be undertaken immediately before or during high rainfall or wind events.	Section 4.3
TB8	Water quality, chemical and fuel impacts on flora and fauna	A site specific emergency spill plan will be developed, and will include spill management measures in accordance relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA officers).	Section 4.3
TB9	Water quality, chemical and fuel impacts on flora and fauna	An emergency spill kit will be kept on site at all times. All staff will be made aware of the location of the spill kit and trained in its use.	Section 4.3
TB10	Water quality, chemical and fuel impacts on flora and fauna	Any herbicides used for weed control will be applied to the manufacturer's specifications and as outlined in the manufacturer's Material Safety Data Sheet.	Section 4.3
SSI 9973 Modification 2 - Port Kembla Lateral Looping Pipeline			
BDAR 01	Exclusion Zones	Installation of appropriate exclusion fencing around trees and vegetation to be retained in the study area. This would include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'. – The radius of the tree protection zone (TPZ) is calculated for each tree by multiplying its diameter at breast height (DBH) by 12. (TPZ = DBH x 12) in accordance with the Standards Australia Committee (2009). – A TPZ should not be less than 2 metres nor greater than 15 metres, except where crown protection is required (Commonwealth of Australia 2009).	Section 4.3
BDAR 02	Stockpiles	All material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained.	Section 4.3
BDAR 03	Habitat Trees	Any habitat trees inclusive of large nesting material to be removed is inspected prior to clearing by an appropriately qualified ecologist to avoid and minimise the potential for injuries to fauna that may be occupying hollows. – Habitat trees with nests require a pre-clearance assessment 24 hours prior to felling.	Section 4.3
BDAR 04	Clearing	Where appropriate native vegetation cleared from the study area should be mulched for re-use on the site, to stabilise bare ground.	Section 4.3

EMM	Management Measure category	Commitment	Refer to Section within This Plan
BDAR 05	Dust Management	Wet down areas to reduce dust generation during construction.	Section 4.3
BDAR 06	ESC	Sedimentation and erosion control measures including silt fencing, sediment traps, etc. to prevent sediment-laden stormwater exiting the construction areas and to prevent scouring and erosion of land beyond the development footprint. All erosion and sediment control measures are to be constructed and installed in accordance with relevant guidelines, are to be regularly maintained for the duration of the construction period and are to be carefully removed at completion of works. – Implementation of temporary stormwater controls during construction and to ensure that discharges to the drainage channels are consistent with existing conditions.	Section 4.3
BDAR 07	Weed Management	Weed and pathogen management including weed hygiene protocols for personnel, machinery and construction materials entering and exiting construction areas to minimise risk of weed and pathogen introduction and spread.	Section 4.3
BDAR 08	Waste Management	Waste management to ensure food scraps and other organic waste that may attract introduced predators (e.g. fox, cats) or other pests (e.g. rats) is not stored for prolonged periods within the construction site.	Section 4.3
BDAR 09	Rock	If bush rock or boulders are encountered during site preparation, these should be moved into adjacent habitats within the study area, and should not be removed from the site.	Section 4.3

3 EXISTING ENVIRONMENT

The following sections summarise existing biodiversity aspects and impacts within and adjacent to the Project area including species, communities and habitats.

3.1 Site Description and Existing Land use

As stated in Section 1.1 the pipeline will be constructed in three discrete segments:

- > Segment 1.1 – 4.3 km section from PKGT to Springhill Road.
- > Segment 1.2 – 2.2 km pipeline from Spring Hill Road to Five Islands Road, and
- > Segment 2 – 5.6 km pipeline from Five Islands Road to Kembla Grange Metering Station.

The zoned land use across the pipeline alignment includes special use and industrial use at Port Kembla and a mix of primarily residential and commercial uses at the surrounding localities. Major infrastructure in the region of Port Kembla includes the Princes Highway, which is a major state and regional highway connecting Sydney and Wollongong and regional areas further south. Princes Highway provides access to Port Kembla through turnoffs at Masters Road, Five Islands Road and Northcliffe Drive and is broadly utilised including by heavy vehicles from the port.

The South Coast railway line runs along the periphery of Port Kembla including the stations Port Kembla, Port Kembla North, Cringila and Kembla Grange. The rail line services commuters and is also used to transport bulk solid goods like coal, grain, copper, and steel from Port Kembla.

The subject land is located in the Wollongong City Council Local Government Area (LGA) and the South East Local Land Services (LLS) Region. The study area covers multiple land use zones under the Wollongong Local Environmental Plan 2009 (LEP) due to its lineal extent, these consist of IN2 – Light Industrial, IN3 – Heavy Industrial, RE1 – Public Recreation, SP1 – Special Activities and SP2 – Infrastructure. The current land use consists of industrial lands, road easements, farmlands and large

infrastructure. The terrain is undulating covering multiple landscapes these consist of; alluvial plains, flood plains, terraces and valley flats.

The environmental features of Port Kembla and the surrounding region are limited given the extensive industrial, commercial, and residential development. Waterways in the region include the Gurungaty Waterway, Allans Creek, American Creek and Byarong Creek.

3.2 Landscape Features

3.2.1 Bioregions

The project will be constructed within the Sydney Basin IBRA bioregion and the Illawarra IBRA subregion. This bioregion extends from just north of Batemans Bay to Nelson Bay on the central coast, and almost as far west as Mudgee. This bioregion is bordered to the north by the Brigalow Belt South and North Coast bioregions, to the south by the South East Corner Bioregion and to the west by the South Eastern Highlands and South Western Slopes bioregions.

3.2.2 NSW (Mitchell) Landscapes

The project will be constructed within the Lake Illawarra Barrier, Kiama Coastal Slopes and Lake Illawarra Alluvial Plains Mitchell Landscapes.

The Lake Illawarra Barrier landscape is substantially altered by urban and industrial development but would originally have a very similar structure and composition to the Seven Mile Barrier Landscape containing Eel grass (*Zostera capricorni*) on the lake floor, common reed (*Phragmites australis*) in fresh swamps and lakes margins, limited grey mangrove (*Avicennia marina*) and saltmarsh near lagoon mouths and in more open estuaries (GHD 2018).

Vegetation of the Seven Mile Barrier Landscape comprises coastal spinifex (*Spinifex hirsutus*), coast tea-tree (*Leptospermum laevigatum*), and coast wattle (*Acacia longifolia* ssp. *sophorae*) dominating a high, steep dune with little soil development. Across the lower, inner ridges a tall forest of blackbutt (*Eucalyptus pilularis*), southern mahogany (*Eucalyptus botryoides*), red bloodwood (*Corymbia gummifera*), old man banksia (*Banksia serrata*) smooth-barked apple (*Angophora costata*) with occasional macrozamia (*Macrozamia* sp.) and thick bracken (*Pteridium esculentum*) cover on soils with characteristic podsol profiles that increase in degree of development inland (GHD 2018).

The Kiama Coastal Slopes is comparable to the Dapto-Wollongong slopes but with higher relief, steep slopes and higher rainfall. Well-structured red-brown loam with gradational profiles is widespread on the Gerringong volcanics of trachyte, latite and tuff. Sandstone is less common but tends to form steep slopes with texture-contrast soils marginal to the adjacent escarpment (Biosis 2020).

The project area has been extensively cleared but originally had a wide distribution of rainforest, evident though remnant plants such as; Cabbage Palm *Livistona australis*, Scentless Rosewood *Synoum glandulosum*, Brush Cherry *Syzygium australe*, Black Apple *Planchonella australis*, Plum Pine *Podocarpus elatus* amongst Turpentine *Syncarpia glomulifera*, Grey Ironbark *Eucalyptus paniculata* and River Oak *Casuarina cunninghamiana* along the streams (Biosis 2020).

The Lake Illawarra Alluvial Plains have also been highly cleared with a general elevation of up to 40 metres. The soils differ dependant on sediment type and elevation however, sandy loam with high organic content and humic podsoles occur, noting that these soils are highly variable. Vegetation communities within the landscape originally had Forest Red Gum *Eucalyptus tereticornis*, Woollybutt *Eucalyptus longifolia*, White Stringybark *Eucalyptus globoidea*, Thin-leaved Stringybark *Eucalyptus eugenoides*, Cabbage Gum *Eucalyptus amplifolia* where low hills and rises occur. Extensive stands of Swamp Oak *Casuarina glauca*, Prickly Paperbark *Melaleuca styphelioides* and decorative paperbark *Melaleuca* spp. occur on brackish ground near creeks (Biosis 2020).

3.3 Soils and Geology

Segment 1.1 (refer Figure 1) of the project is located entirely within lands identified as Disturbed Terrain, within which soils have been removed, greatly disturbed or buried. Landfill in areas of Disturbed Terrain may include soil, rock, building and waste material. Vegetated areas on BlueScope-owned land to the north of the steelworks and west of Springhill Road comprise revegetation upon substrates of dumped and formed steel slag. Port Kembla has a long history of industrial use, including land reclamation and filling, which has resulted in legacy contamination within the project footprint with the Port (GHD 2018).

The remaining works, Segment 1.2 and 2 (refer Figure 1) will be constructed within Disturbed Terrain and the Gwynneville and Fairy Meadow soil landscapes. The Gwynneville soil landscape is characterised as foot slopes of the Illawarra Escarpment and isolated rises of the Wollongong Plain. Soils within this landscape consist of shallow brown podzolic soils and xanthozems on upper slopes, lithosols on simple slopes and shallow brown earths on midslopes and lower slopes. Some of the ridges or steeper slopes allow for structural benches and occasional rock outcrops to occur. Limitations of the landscapes include extreme erosion hazards large land slips and local flooding (Biosis 2020).

The Fairy Meadow soil landscape is characterised by alluvial plains, floodplains, valley flats and terraces below the Illawarra Escarpment with minimal slop predominately cleared with low forest and woodland regions. The landscape is made up of gently undulating alluvial plains including floodplains, valley flats and minor terraces. Floodplains and terraces contain pockets of sandy loams and alluvial loam soils. Whilst valley flats consist of sandy clay loams which can be highly variable (Biosis 2020).

3.4 Hydrology and Aquatic Habitat

Segment 1.1 (refer Figure 1) will be constructed from a berth of the inner harbor which is previously Tom Thumb Lagoon where existing water quality has been impacted by historical and ongoing port operations. The pipeline will continue and cross the Gurungaty Waterway around KP1.5 in the north-east using trenchless construction methodology to avoid and minimise impacts to water quality, aquatic habitat and geomorphology. Gurungaty Waterway is highly modified due to its location in an industrial area and is crossed by various roads and rail lines before entering the Inner Harbour.

The pipeline (Segment 1.2) will also cross Allans Creek around KP5.8 also using trenchless methodology to avoid and minimise impacts to water quality, aquatic habitat and geomorphology at that location. Allans Creek has modified banks along much of the reach within the construction footprint. A number of pipelines are located alongside the creek which is also crossed by various bridges. Limited riparian vegetation is present. A number of planted figs are located on the banks near Springhill Road.

Both waterways flow through highly disturbed land, with the Allans Creek catchment including natural areas of the Illawarra Escarpment. Allans Creek, Gurungaty Waterway and the Inner Harbour are mapped as key fish habitat by DPI (GHD 2018).

3.5 Wetlands

The environmental assessment determined that there are no Coastal Management SEPP wetlands or proximity area, nationally important wetlands or internationally important wetlands within the construction footprint. A small swamp is located between the rail corridor and Springhill Road in the 'horse paddock', located to the east of the project. Swamps are also located near Allans Creek further to the south. Various constructed sediment ponds are located around the Port Kembla Coal Terminal,

Graincorp Terminal and Bluescope Steelworks. The Inner Harbour was previously Tom Thumb Lagoon, however much of the lagoon has been reclaimed for industrial use.

The Port Kembla Key Population of the Green and Golden Bell Frog (*Litoria aurea*) occurs in the general area which consists of four main sub-populations at wetlands in the following locations:

- > North Port Kembla
- > Boiler's Point
- > Coomaditchy Lagoon, and
- > Korrongulla Wetland.

Green and Golden Bell Frogs have also been recorded in unnatural habitats in the area including detention ponds and residential ponds with the environmental assessment determining the project area is likely to contain dispersal habitat for the species. It is likely that the species would only use these habitats temporarily while moving between areas of better condition habitat. The environmental assessment also identified that no native vegetation associated with the species would be removed (GHD 2018).

Constructed habitat for Green and Golden Bell Frog is located to the north of the construction footprint in the south-east corner of Greenhouse Park. This habitat was constructed, in the event of individuals, which are occasionally observed at the inner harbour, moving northwards. No individuals of Green and Golden Bell Frog have been recorded at the Greenhouse Park habitat over the last five years and the numbers recorded in the inner harbour have also decreased significantly in recent years. However, Bluescope Steel noted that a number of individuals were observed in constructed habitat in March 2017, after there being no significant sightings of the species for about seven years at this location (GHD 2018).

3.6 Native Vegetation

3.6.1 Remnant Native Vegetation

There are no areas of remnant native vegetation within the construction footprint for Segment 1.1.

Segment 1.2 of the pipeline alignment includes a small area of dense revegetation which has been assigned to a Plant Community Type (PCT) under the BDAR based on the classification of surrounding remnant vegetation. This portion of native (revegetation) has been assigned PCT 1326 - Woollybutt – White Stringybark – Forest Red Gum grassy woodland, with works likely to impact an area of approximately 0.25 hectares (ha).

Segment 2 of the pipeline alignment impacts two remnant sections of native vegetation reported in the BDAR as being:

PCT 781 – Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion, impacting approximately 0.04 ha, and

PCT 838 – Forest Red Gum – Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion, impacting approximately 0.33 ha.

The BDAR assessed both PCTs as being of low condition but were found to represent Threatened Ecological Communities (TECs) under the NSW Biodiversity Conservation Act 2016 (BC Act). Further, the BDAR determined that the limited impact to these patches of native vegetation did not meet the minimum condition thresholds specified under the Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act).

3.6.2 Planted Native Vegetation

The BDAR identified three patches of planted native vegetation communities likely to be impacted by Segment 2 as being:

- > PCT 1232 - Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion, impacting approximately 0.19 ha
- > PCT 1326 - Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion, impacting approximately 0.01 ha, and
- > PCT 838 - Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion

Whilst the patches were assessed as PCT, they have been planted in the road reserve of major roads where soils are highly disturbed, current condition includes exotic and weedy ground covers and understory. There is limited habitat to support threatened species and the assessment at the time did not identify hollow – bearing trees or abundance of forage resources.

A summary of native vegetation classification is presented in Table 7. The location of the PCTs is presented in Appendix B.

3.7 Non Native Vegetation

There are a range of planted trees and shrubs along the pipeline alignment. Plantings are predominantly narrow linear plantings alongside the access road to the berth, planted trees in the northern portion of BlueScope Steel land, and planted eucalypts and figs along Springhill Road.

Elsewhere along the alignment there are individual trees and patches of vegetation within areas of public open space as well as the patches of planted eucalypts and exotic trees and understory shrubs and groundcovers planted in the road reserves along the Princes Motorway, the railway corridor and Wylie Road near the Sir Ian McLennan Oval.

No hollow-bearing trees were observed in this habitat type, although some small hollows may occur. Planted Eucalyptus and Ficus species provide foraging and shelter resources for a range of birds and mammals of urban environments that are tolerant of regular disturbance from traffic and noise impacts.

Table 7 – Vegetation Classification

Pipeline Segment	PCT	Description	TEC Status	Condition	Area of Impact (ha)
1.1	Non-Native	Range of species including eucalypts, ficus and native and exotic mixture of understory shrubs and groundcovers	N/A	N/A	8.6
1.2	1326	Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion	N/A	Planted	0.25
1.2	Non-Native	Range of species including eucalypts, and native and exotic mixture of understory shrubs and groundcovers	N/A	N/A	4.15
2.0	781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	Endangered Ecological Community (EEC) BC Act	Low	0.04
2.0	838	Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion	EEC – BC Act	Low	0.33

Pipeline Segment	PCT	Description	TEC Status	Condition	Area of Impact (ha)
2.0	838	Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion	N/A	Planted	0.93
2.0	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	N/A	Planted	0.19
2.0	1326	Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion	N/A	Planted	0.01
2.0	Non-Native	Range of species including eucalypts and native and exotic mixture of understory shrubs and groundcovers	N/A	N/A	9.70

3.8 Weeds

Weeds are prevalent throughout the alignment, particularly within and around the hardstand and adjacent areas within the Port, road reserves and railway corridors. A total of four high priority weeds were identified during the BDAR and are presented in Table 8.

Table 8 – Priority Weed Species

Scientific Name	Common Name	General biosecurity duty
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush	General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold Biosecurity zone – applicable to all land within NSW except for land within 10 kilometres of the mean high water mark between Cape Byron in the north and Point Perpendicular in the south. The study area falls within the excepted land, therefore immediate eradication of the weed is not required.
<i>Lantana camara</i>	Lantana	General biosecurity duty Regional Recommended Measure: Land managers should mitigate the risk of new weeds establishing
<i>Lycium ferocissimum</i>	African Boxthorn	General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold
<i>Rubus fruticosus</i> agg. <i>species</i>	Blackberry	Prohibition on dealings - Must not be imported into the State or sold.

3.9 Fauna Habitat

Fauna habitat assessments were completed as part of the BDAR. As identified in Section 3.5 areas adjacent to the pipeline alignment as well as built areas within the alignment present dispersal and temporary habitat for Green and Golden Bell Frogs. Targeted surveys undertaken during the BDAR did not record any individuals.

Targeted surveys for other predicted and candidate fauna species including migratory birds were not undertaken on the assumption that these species occur across the alignment. The limited removal of vegetation comprising of breeding and foraging habitat is negligible and no hollow bearing trees or nests were reported during the BDAR assessment.

3.10 Environmental Impacts

3.10.1 Construction Activities

The construction methodology for the works will generally involve but not be limited to:

- > Early access works comprising:
 - Environmental investigations, monitoring and works to prepare the site ahead of construction
 - Areas of work where access is available and approved prior to full site access dates, and
 - Establishment of pipe yard, laydowns, site offices and ablutions.

- > Site survey and set out including demarcation of environmentally sensitive areas and establishment of 'No Go' zones.
- > Construction ROW (CROW) preparation
 - Development and maintenance of project access points, tracks and roads
 - Location and non-destructive confirmation of all foreign services
 - Property management works to enable CROW access and construction
 - Installation of temporary construction gateways where specified,
 - Installation of temporary erosion and sediment controls
 - Installation of erosion temporary drainage, erosion and sediment controls, and
 - Clear and grade of the CROW as specified.
- > Transport of pipe to the CROW including stringing and bending operations
- > Trenching works
- > Trenchless crossing works
 - Horizontal directional drilling (HDD), and
 - Thrust bore.
- > Welding and Non-Destructive Testing (NDT)
- > Field joint coating works
- > Lowering in of pipe and backfill
- > Facility tie in works
- > Mainline valve works and tie ins
- > Cathodic Protection Works
- > Hydrostatic testing
- > Other pipeline works as specified:
 - Property Management Works
 - Permanent fencing and gateways
 - Watercourse rehabilitation
 - Trench breakers
 - Pipeline marker posts, and
 - Miscellaneous works required to satisfactorily complete the works
- > Inspections, monitoring and auditing of construction works
- > Waste management
- > Decommissioning and removal of temporary works and facilities including offices and ablutions
- > Removal of temporary drainage, erosion and sediment controls
- > Installation of permanent drainage, erosion and sediment controls, and
- > Reinstatement and restoration of land to pre-disturbance condition, rehabilitation, and

- > Monitoring (including Defects Liability Period DLP).

Construction is expected to commence in December 2022 for a duration of approximately 11 months with practical completion forecast for September 2023. Refer to Contractors Program (GAS-599-SH-CN-001) for Execute Phase schedule.

The proposed construction activities and the associated biodiversity impacts that have been highlighted in the Project environmental assessment are considered manageable and will be confined to the approved construction right of way and extra works areas and managed through the application of the management measures presented in Section 4.

3.10.2 Removal of vegetation and threatened flora

Removal of vegetation will occur to establish the construction right of way (CROW) to enable the conduct of safe and efficient construction works. Disturbance and removal of vegetation will be minimised where reasonably feasible for the safe conduct of works. The removal of native vegetation will be manageable and not exceed the limits of the Project approvals and will be confined to the construction boundary and in accordance with the management measures detailed in Section 4.

3.10.3 Impacts to fauna

Impacts to fauna could occur during construction of the Project as a result of interaction with vehicles, plant and equipment within the construction boundary as a result of the clearing of native and non-native vegetation and associated ground disturbance including entrapment arising from fauna entering excavations. Fauna management and interactions will be conducted in accordance with the management measures detailed in Section 4.

3.10.4 Impacts to aquatic biodiversity

Potential impacts to wetlands and aquatic habitat will largely be avoided using trenchless construction methodologies. There may be temporary loss of shading, riparian vegetation, and disturbance to aquatic fauna due to construction activities. As described in the Project environmental assessment, potential impacts to aquatic biodiversity associated with construction and associated disturbances to waterways are considered to be manageable and would be confined to the construction boundary with application of the proposed management measures outlined in Section 4.

3.10.5 Spread of weeds

Given the prevalence of weeds across the pipeline alignment, it is expected that weeds will be removed during the vegetation clearing phase with additional exposure of weed seed bank during ground disturbance and excavation. There is potential for this disturbance to result in the spread and /or emergence of new infestation and intensification of existing infestations. The management of weeds and associated impacts is manageable with application of the proposed management measures outlined in Section 4.

4 CONSTRUCTION CONTROLS

4.1 Roles and Responsibilities

An Organisation Chart will be developed prior to the commencement of construction. Refer to Appendix A of Project Management Plan (GAS-599-PA-PM-015) for Organisation Chart for ECI Phase. Position descriptions describe the responsibilities specific to positions on the Project.

Table 9 provides a summary of Nacap environmental management responsibilities for relevant roles.

Table 9 – Nacap Environmental Management Responsibilities

Role	Responsibilities
Project Director (Management Representative)	The Project Director provides environmental leadership and ensures that adequate, competent and experienced resources are provided and supported in the implementation of this BMP.
Project Manager	<ul style="list-style-type: none"> > Provide support and guide in the implementation of this BMP and associated controls > Provide management and leadership in the implementation of this BMP > Ensure adequate resources are provided for implementing and maintaining environmental controls and mitigation measures in relation to biodiversity. > Take action including the stopping of work in response to natural events and activities which may impact on the environment or compromise the performance objectives, standards and commitments contained in this BMP > Take action in the event of an environmental emergency and allocate the required resources to minimise environmental impact and harm.
Lands, Environment and Cultural Heritage (LECH) Manager	<ul style="list-style-type: none"> > Provide support and guide the implementation of this BMP and associated controls > Provide environmental input and support to construction and associated methodologies > Support and guide site environmental incident investigation and reporting > Review internal and external project audits and coordinate the implementation of audit recommendations, and > Develop and update this BMP and subordinate procedures and protocols.
Environment Advisor	<ul style="list-style-type: none"> > Provide and coordinate monitoring, inspections and audits of works > Provide and coordinate site-based training preparation and delivery > Routine record keeping and reporting in support of commitments in this BMP > Reporting of hazards and incidents and implementing any rectification measures > Provide site based environmental incident investigation and reporting and corrective action management.
Project Supervisors	<ul style="list-style-type: none"> > Provide leadership for the implementation of commitments contained in this BMP > Reporting of hazards and incidents and implementing any rectification measures.
Subcontractors	<ul style="list-style-type: none"> > Subcontractors engaged to perform works on behalf of Nacap will operate in accordance with all applicable legislation, Nacap procedures and this BMP. > Subcontractors are required to report all incidents to their Nacap Supervisor immediately.
All Project Personnel and Visitors	<ul style="list-style-type: none"> > All Project personnel and visitors will uphold a general environmental duty to take all reasonable and practical measures to ensure that the activities on the whole site do not pollute the environment in a way which causes or may cause environmental harm.

4.2 Training and Awareness

All personnel and subcontractors working on site will undergo the project induction detailed in the CEMP Section 6.1.

- > Requirements of this Plan

- > Applicable and relevant legislative requirements
- > Roles and responsibilities for biodiversity management
- > Typical construction activities that may impact biodiversity and the associated environmental mitigation and management measures, and
- > Incident response procedure.

Targeted training undertaken as part of SWMS workshops, toolbox talks, and site specific and / or activity specific training will also be provided to personnel with a key role relating to works in proximity to areas of environmental sensitivity, particularly in relation to the operation of plant and equipment.

Topics will include but not be limited to:

- > Location of areas of environmental sensitivity
- > Limits of disturbance, clearing controls, protection and avoidance and no go zones
- > Information to identify targeted species and biodiversity zones, and
- > Management measures to minimise harm as detailed below.

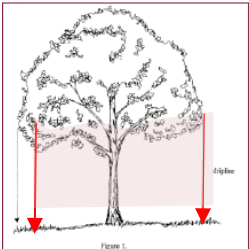
For further details with regards to environmental training and awareness, refer to Section 6 of the CEMP.

4.3 Construction Biodiversity Management Measures

In accordance with CoA C1-3 measures to manage the impacts on Biodiversity are outlined in Table 10.

Table 10 – Construction Biodiversity Management Measures

No	Management Measure	Implementation	Responsibility
B01	<p>The preferred management approach for impacts to biodiversity is avoidance.</p> <p>The process for avoidance will be achieved as follows:</p> <ul style="list-style-type: none"> > Pipeline alignment and extra work areas will be designed and marked out to ensure all known listed species and habitat can be avoided or have sufficient buffer to enable the implementation adequate delineation and protection from all aspects of the works > Development of a Project culture in which the importance of listed flora and fauna species is recognised and respected, and > Identification and protection of listed species and vulnerable habitat areas during works set out and establishment. <p>The following direct impacts have been identified in the BDAR</p> <ul style="list-style-type: none"> > Removal of 0.33 hectares of low condition Illawarra Lowlands Grassy Woodlands (PCT 838). > Partial removal of 0.04 hectares of low condition Freshwater Coastal Wetlands (PCT 781). > Removal of 0.56 hectares planted native vegetation <p>Environmental Control Plans will be developed to identify and manage the limits of approved clearing.</p>	Pre-Construction	Principal Contractor/ Subcontractors
B02	<p>All construction personnel and subcontractors are required to undertake a Project Environmental induction which will incorporate information on flora and fauna management specific to the project and field of operations and shall include the following:</p> <ul style="list-style-type: none"> Legislation and penalties for the protection of flora and fauna Roles and Responsibilities for flora and fauna management Information on the location of existing flora and fauna sensitivities (Environmental Control Plans) Information threatened and listed species that may be encountered within the project area and field of operations Mitigation management measures Protocols for responding to unexpected finds of threatened species, and Incident reporting and record keeping. <p>A register attendance at all inductions will be maintained</p>	Pre-Construction	Principal Contractor/ Subcontractors

No	Management Measure	Implementation	Responsibility
B03	All construction personnel and subcontractors will participate in Safe Work Method Statement (SWMS) development that will include information on flora and fauna sensitivities and specific management measures for specific construction activities.	Per Event	Principal Contractor/ Subcontractors
B04	Develop Environmental Control Plans informed by the BDAR that identify environmental sensitivities and location management measures for: <ul style="list-style-type: none"> > Protecting EEC/TEC not approved for removal > Establishment of No Go Zones Watercourses and drainage lines, watercourse crossing structures and barriers to fish passage, and sensitive receptors including frogs.	Construction	Principal Contractor
B05	Environmental Control Plans with locations of all environmental sensitivities within the Project activity area is to be located at site notice board(s) and attached to the authority to commence construction (Pre-Commencement Form 2). Environmental Control Plans will also be communicated at daily pre-starts and weekly toolboxes as required or when works are planned in proximity to known sensitivities.	Construction	Principal Contractor
B06	Prior to any disturbance works: <ul style="list-style-type: none"> > Verify disturbance boundaries of all sites of known or potential flora and fauna significance > Ensure completion of delineation and establishment of the approved work areas and No Go Zones etc. by using flagging/markers/fencing and signage > Undertake any additional micrositing of works to avoid environmental sensitivities to ensure compliance with EEC/TEC clearing limits > Ensure notification of specific access or approval conditions, environmental sensitivities and all identified No Go Zones and other significant information is contained in the authority to commence works (Pre-commencement Form 2) > Provide notification and awareness of environmental sensitivities at daily pre-starts and weekly toolboxes, and > Ensure establishment of photo points and capture pre-disturbance photo records of all environmental sensitivity zones. 	Construction	Principal Contractor/ Subcontractors
B07	The approved disturbance area and /or site boundaries, approved accesses and flora and fauna “No Go” zones as detailed in Environmental Control Maps, will be surveyed and clearly marked on-ground or through the use of tape or barrier fencing and signposting to define the works area and prevent the inadvertent disturbance or access to unauthorised areas beyond the approved boundaries. Surveys and peg-out will be based on digital data as per the Project survey and EA/BDAR mapping. Habitat features to be avoided will be clearly marked. ‘No Go’ exclusion zones shall extend to the dripline of trees or established tree protection zone (TPZ) (where required) in accordance with AS4970 and/or as far from the trunk as safe and practicable to do so. 	Construction	Principal Contractor/ Subcontractors
B08	Make use of existing disturbance for project layout as far as practicable, including access routes and other ancillary workspaces; negotiate with third parties for use of existing disturbed areas where necessary.	Construction	Principal Contractor/ Subcontractors
B09	All construction activities will be confined to the established and delineated approved works area and construction access tracks / roads to avoid unnecessary disturbance.	Construction	Principal Contractor/ Subcontractors
B10	Where appropriate native vegetation cleared from the study area should be mulched for re-use on the site to aid erosion and sediment control, rehabilitation and stabilisation of land.	Construction	Principal Contractor
B11	Undertake dust suppression of the site during works.	Construction	Principal Contractor
B12	All personnel will be made aware that Biosecurity is a shared responsibility, and everybody has a role to play in protecting NSW from these biosecurity risks. Under the <i>Biosecurity Act 2015</i> ,	Construction	Principal Contractor/ Subcontractors

No	Management Measure	Implementation	Responsibility															
	<p>everyone has a general biosecurity duty – this means anyone who deals with biosecurity matter is required to prevent, eliminate or minimise any biosecurity risks they encounter.</p> <p>Workforce compliance with biosecurity requirements will be promoted through the project induction, supervisor training, and ongoing awareness training through regularly addressing at weekly toolbox talks and daily pre-starts.</p>																	
B13	<p>The Environmental Control Plans Nacap Pre-Commencement Form 2 will document site specific weed, pest and pathogen threats identified in</p> <ul style="list-style-type: none"> > Project/site specific approvals/documentation/landowner access agreements > Publicly available information on weed and pest threats relevant to the project area/site, and Species information obtained during pre-construction assessment and inspections. 	Construction	Principal Contractor															
B14	<ul style="list-style-type: none"> > All project vehicles, plant and equipment will be clear of significant soil/vegetation matter etc and will be declared weed free at project commencement (i.e. at first entry). > All vehicle and plant weed free declarations will be recorded in the Weed Hygiene Register. > All vehicles, plant and equipment will remain on approved work areas and approved access tracks / roads at all times > Ensure all vehicles, plant and equipment entering confirmed weed infested areas are clear of significant soil/vegetative matter when moving from one property to the next, reinspect vehicles, plant and equipment following clean downs when required, and > Undertake additional biosecurity measures as identified during landholder consultation or as directed by PKPP Representative. 	Construction	Principal Contractor															
B15	Where clearing of weeds is undertaken within approved works areas, ensure weeds with viable seeds are managed to prevent dispersal. Report all new weed infestations identified within approved works areas and adjacent properties and prepare site specific weed management plans as required.	Construction	Principal Contractor/ Subcontractors															
B16	Any imported materials will be sourced from certified weed free sites. Any imported material will be inspected and approved for use by the Environmental Coordinator.	Construction	Principal Contractor/ Subcontractors															
B17	<p>Monitor work areas following disturbance to ensure construction activities do not exacerbate the extent of existing weed infestations and to prevent the spreading to new locations within property boundaries.</p> <p>Post construction assessment of weed infestations should inform the development of Operational Environmental Management Plans and subsequent operational weed management strategies and procedures.</p> <p>The following priority weeds have been observed within the Project area and should be suppressed and prevented from spread or establishment beyond existing infestations in accordance with the <i>Biosecurity Act 2015</i>:</p> <table border="1"> <thead> <tr> <th>Scientific Name</th> <th>Common name</th> <th>General biosecurity duty</th> </tr> </thead> <tbody> <tr> <td><i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i></td> <td>Bitou Bush</td> <td>General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold Biosecurity zone – applicable to all land within NSW except for land within 10 kilometres of the mean highwater mark between Cape Byron in the north and Point Perpendicular in the south. The study area falls within the excepted land, therefore immediate eradication of the weed is not required.</td> </tr> <tr> <td><i>Lantana camara</i></td> <td>Lantana</td> <td>General biosecurity duty Regional Recommended Measure: Land managers should mitigate the risk of new weedsestablishing</td> </tr> <tr> <td><i>Lycium ferocissimum</i></td> <td>African Boxthorn</td> <td>General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold</td> </tr> <tr> <td><i>Rubus fruticosus</i> agg. species</td> <td>Blackberry</td> <td>Prohibition on dealings - Must not be imported into the State or sold</td> </tr> </tbody> </table>	Scientific Name	Common name	General biosecurity duty	<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush	General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold Biosecurity zone – applicable to all land within NSW except for land within 10 kilometres of the mean highwater mark between Cape Byron in the north and Point Perpendicular in the south. The study area falls within the excepted land, therefore immediate eradication of the weed is not required.	<i>Lantana camara</i>	Lantana	General biosecurity duty Regional Recommended Measure: Land managers should mitigate the risk of new weedsestablishing	<i>Lycium ferocissimum</i>	African Boxthorn	General biosecurity duty Prohibition on dealings - Must not be imported into the State or sold	<i>Rubus fruticosus</i> agg. species	Blackberry	Prohibition on dealings - Must not be imported into the State or sold	Construction	Principal Contractor/ Subcontractors
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No	Management Measure	Implementation	Responsibility
B18	Any herbicides used for weed control will be applied to the manufacturer's specifications and as outlined in the manufacturer's Material Safety Data Sheet.		
B19	All vehicles, plant and personnel shall travel and remain on approved access tracks and approved work areas at all times. All materials shall be stored within approved works areas and be prevented from overhanging or entering the boundaries of works areas and environmental "No Go" zones.	Construction	Principal Contractor/ Subcontractors
B20	Appropriate care should be taken when moving along all access tracks and roads, particularly at dawn or dusk to avoid potential impacts to fauna. Construction access speed limits will be enforced to reduce risk of fauna strike.	Construction	Principal Contractor/ Subcontractors
B21	During construction works, implement any additional protective measures as required to ensure the specific works activities, plant equipment, personnel, materials or construction waste including excavation materials and spoil do not encroach, enter or overhang areas of environmental sensitivity.	Construction	Principal Contractor/ Subcontractors
B22	Vegetation and HBTs within works areas shall be avoided where practicable and safe. If removal is unavoidable, standing trees approved for removal will be examined for the presence or suspected presence of hollows or potential nesting sites for native fauna. Fauna in readily accessible sites will be relocated prior to tree felling. A Fauna Handler will also recheck hollows/nest sites during the process of progressively felling the tree and remove any fauna present. Locate any salvaged habitat structures to edge of the works area. Any fauna identified during the above procedure will be relocated to the nearest suitable habitat or, if injured or a dependent juvenile, to a recognised wildlife carer group or veterinarian.	Construction	Principal Contractor/ Subcontractors
B23	The felling / removal of trees will be undertaken in a manner that avoids or minimises damage to any adjacent vegetation to be retained.	Construction	Principal Contractor/ Subcontractors
B24	The fauna handler will also be present for any activities that may impact frog habitat including dispersal habitat which includes removal of riparian vegetation, excavation and dewatering of drainage, excavations and surface water elements.	Construction	Principal Contractor/ Subcontractors
B25	Temporary frog-proof fencing will be installed, monitored by the fauna handler and maintained around trenchless crossing sites roadside drains and detention ponds near the CROW for works in Segment 1.1.	Construction	Principal Contractor/ Subcontractors
B26	Any Green and Golden Bell Frogs or other resident frogs are to be handled in accordance with the Chytrid fungus hygiene protocols (DECC 2008c) and released into the most appropriate nearby habitat area	Construction	Principal Contractor/ Subcontractors
B27	All fauna interactions will be recorded in the Project Fauna Register and records will be maintained in accordance with Catch and Release Licence Conditions and any other requirements of DPE in relation to handling and relocation of native fauna.	Construction	Principal Contractor/ Subcontractors
B28	Clearing of vegetation will be minimised, while maintaining appropriate standards of safety and allowing for efficient construction activities. Where practicable, clearance of or disturbance of vegetation (outside of No Go Zones) on the site or adjacent public roads for access during construction shall be minimised.	Construction	Principal Contractor/ Subcontractors
B29	Where practicable, do not use other areas of retained vegetation (outside of No Go Zones), for equipment laydown etc.	Construction	Principal Contractor/ Subcontractors
B30	During works, operators will make best endeavours to ensure machinery contact (such as by machinery booms, extended arms or when swinging buckets) with retained vegetation adjacent to but overhanging the works areas is avoided. Do not place any cleared vegetation over existing habitat structures.	Construction	Principal Contractor/ Subcontractors
B31	Cleared vegetation will be stockpiled separately at the edge of the approved works area and will be re-used for rehabilitation or for erosion and sediment control. There will be no burning of cleared vegetation.	Per Event	Principal Contractor/ Subcontractors
B32	Record all vegetation clearing on Disturbance Record Sheet including details of PCT.	Construction	Principal Contractor
B33	If bush rock or boulders are encountered during disturbance, these should be stockpiled for re-use on the CROW during rehabilitation unless otherwise directed by the PKPP representative.	Construction	Principal Contractor/ Subcontractors
B34	A site specific erosion and sediment control plan (ESCP) will be prepared as part of the CEMP to provide control of all land based excavation and stockpiling requirements. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with 'Managing Urban Stormwater: Soil and Construction Volume 1' (Landcom 2004) ('the Blue Book).	Construction	Principal Contractor/ Subcontractors
B35	A site specific emergency spill plan will be developed, and will include spill management measures in accordance relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers).	Construction	Principal Contractor/ Subcontractors

No	Management Measure	Implementation	Responsibility
B36	An emergency spill kit will be kept on site at all times. All staff will be made aware of the location of the spill kit and trained in its use.	Construction	Principal Contractor/ Subcontractors
B37	When dewatering is required following major rain events, dewatering discharge points will preferentially be to vegetated areas adjacent to excavations and will not be directly to watercourses. Discharge scour protection or flow dissipation measures will be installed at the release site. Fauna protection measures will be applied to pump inlets. Refer also to Soil and Water Management Plan (SWMP) for dewatering protocol and release parameters.	Construction	Principal Contractor/ Subcontractors
B38	In the event of any native fauna being encountered within the works areas they will be provided with the opportunity to move into surrounding unimpacted areas, or otherwise disperse away from the works area, without interference / harassment. Any native fauna found that seek refuge or remain in the works area, rather than moving away, will be reported to Supervisor and/or Environmental Coordinator who will arrange assessment and relocation/ removal.	Construction	Principal Contractor/ Subcontractors
B39	Limit the time that excavations are open to minimise impacts to fauna where possible: backfill/cover as soon as practicable to prevent fauna ingress or install measures to enable fauna escape such as earthen ramps. Where backfill of excavations is impracticable, install fauna refuge bags and undertake pre-start inspections to identify and re-locate impacted fauna as required. Undertake re-inspection of excavations immediately prior to backfill, if not detected by the fauna handler report any observed fauna to the Supervisor and / or Environmental Coordinator who will arrange assessment and relocation/removal.	Construction	Principal Contractor/ Subcontractors
B40	Any injury or death of fauna caused by construction activities will be reported to the environmental coordinator/ecologist/fauna handler. Maintain contact lists for local/regional fauna rescue organisations at all times and transport injured animals as required. Pest species, and severely injured fauna may be euthanised by qualified and licensed wildlife handlers. Personnel required to euthanise animals shall consider methods that are humane, painless and rapid, alternatively these animals will be taken to a veterinarian for euthanasia.	Per event	Principal Contractor/ Subcontractors
B41	Good housekeeping will be undertaken of all work areas and all waste will be placed in designated waste bins which shall be covered. Remove waste regularly to avoid attracting native and pest fauna to the site. Do not feed fauna. No pets are to be brought to site.	Construction	Principal Contractor/ Subcontractors
B42	Minimise the period in which the area is left disturbed through works scheduling; rehabilitate disturbed areas as soon as practicable.	Construction	Principal Contractor/ Subcontractors
B43	Construction equipment and infrastructure will be removed progressively from the Project area after construction works are completed.	Construction	Principal Contractor/ Subcontractors
B44	Temporary erosion control measures (established during construction) will be removed and replaced with transitional and permanent controls.	Construction	Principal Contractor/ Subcontractors
B45	All waste / refuse from construction will be removed from the Project areas Flagging/signage and protection used to identify environmental sensitivities will be removed and disposed of at the completion of reinstatement/rehabilitation.	Construction	Principal Contractor/ Subcontractors
B46	Ensure all work areas (lay downs, stockpile areas and access roads etc.) are restored to a state as close as practicable to their original condition, noting any specific conditions that may be associated with significant vegetation/habitat disturbance and landowner/stakeholder/Third Party requirements and commitments.	Construction	Principal Contractor/ Subcontractors
B47	The principal method of regeneration and restoration of disturbed areas will be the re-spreading of the preserved topsoil containing existing seed bank stock and propagules associated with the pre-disturbance vegetation communities/pastures. Use cover crops as required to accelerate re-vegetation and stabilisation of disturbed areas.	Construction	Principal Contractor/ Subcontractors
B48	Rehabilitation will commence as soon as practicable and progressively across the Project area after construction works are completed.	Construction	Principal Contractor/ Subcontractors
B49	Following the re-spreading of topsoil, any cleared vegetation stockpiled for re-use will be re-spread (excluding weed material) to further encourage the propagation of native seed stock and propagules.	Construction	Principal Contractor/ Subcontractors

No	Management Measure	Implementation	Responsibility
B50	During construction works, the following, will constitute a biodiversity disturbance incident: <ul style="list-style-type: none"> > Non-compliance with the biodiversity management requirements of this BMP > Any damage to known environmentally sensitive sites > Any injury or death of fauna as a result of construction activities, and > Any incursion into 'No Go' and exclusion zones including access within any new sites that are identified and delineated during works. 	Construction	Principal Contractor/ Subcontractors
B51	Incidents as described above are to be immediately reported to the Project Manager for immediate notification to PKPP and Regulator as required. Refer to CEMP Sect 7.1	Construction	Principal Contractor/ Subcontractors

5 MONITORING AND INSPECTIONS

The LECH Manager (or delegate) shall coordinate environmental inspections and monitoring of works during the conduct of construction activities to check and record compliances with works procedures and this BMP.

Inspections and monitoring will include:

- > Pre-Clearance survey, completed in advance of disturbance to ensure all environmental sensitivities including HBTs, 'No Go' areas and disturbance limits are delineated
- > Weekly review of active works to ensure works are conducted in compliance with this BMP
- > Compliance with the above management measures
- > The adequate installation, maintenance and effectiveness of native flora and fauna protection / management measures
- > The integrity of "no go" areas
- > Presence of native fauna in works areas, and
- > The effectiveness of site stabilisation, reinstatement and rehabilitation measures.

The frequency of inspections may be increased to reflect the risk associated with potential impacts during adverse weather conditions or during specific construction activities.

Site inspections will be recorded (along with actions and issues observed) and actioned appropriately within agreed timeframes as part of Environmental Inspection Checklist. Additional requirements and responsibilities in relation to inspections are documented in Section 8 of the CEMP.

6 RECORD KEEPING AND REPORTING

6.1 Record Keeping

The Project shall maintain a documentation and record system in support of this BMP and monthly Project HSE reporting requirements to enable review and auditing of environmental management systems and procedures.

The following records are expected to be generated in relation to BMP inspections and monitoring:

- > Site Inspection Records
- > Disturbance Records
- > Vegetation (HBT, native vegetation etc) removal records
- > Fauna Interaction Records

- > Stakeholder discussion records
- > Induction, training and awareness records
- > Site and construction activity specific records and registers
- > Reporting of Environmental Incident, non-conformances and corrective actions
- > Audit reports, and
- > Complaints.

6.2 Reporting

Daily, Weekly, Monthly and Annual Reporting will include information on relevant environmental data including Air Quality and commentary as generated in support of incident and complaint management, regulatory and contractual requirements.

7 REVIEW AND IMPROVEMENT

Section 8.6 and 8.7 of the CEMP describes the process for the review and continual improvement of project documents including this BMP.

Continual improvement of this BMP will be achieved by ongoing evaluation of environmental management performance against environmental policies, objectives and targets, for the purpose of identifying opportunities for improvement.

The continual improvement process is designed to:

- > Identification of opportunities for improvement of environmental management and performance
- > Identification through incident investigation the cause or causes of non-conformance,
- > Development of corrective and preventative measures to address non-conformance and process deficiency
- > Assessment of the effectiveness of corrective actions
- > Documentation and communication of change and process improvements, and
- > Any updates to the BMP as described above.

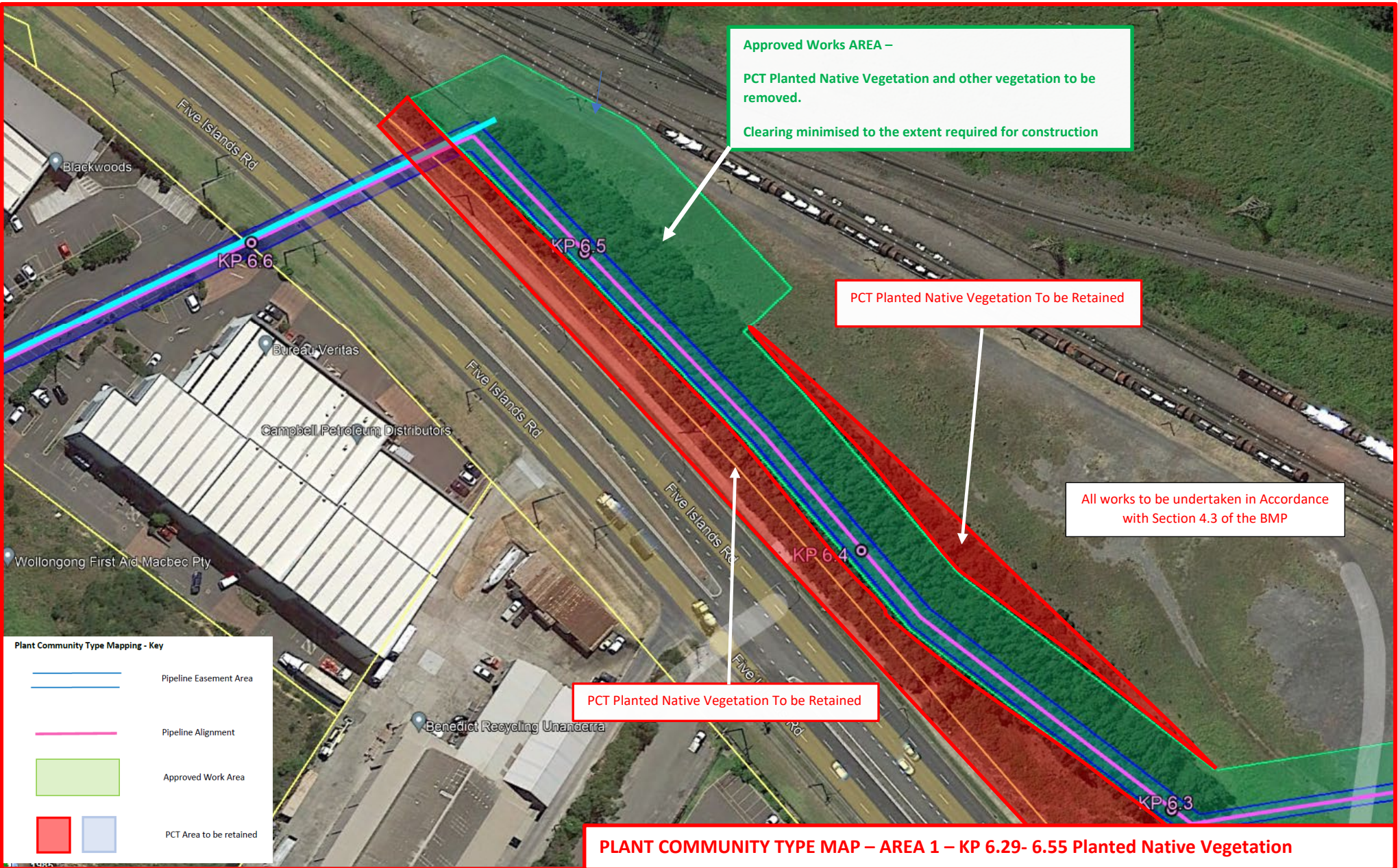
A copy of any updated plan and changes will be distributed to all relevant stakeholders and regulatory authorities. Any changes to work practices arising from document review will be communicated via pre-start alerts, toolboxes, SWMS review and or site specific awareness sessions.

APPENDIX A - CONSULTATION RECORD

The following table provides a detailed record of the consultation activities associated with this Plan.

Stakeholder	Date Sent	Send Method	Due Date	Date Received	Comments
Wollongong City Council (WCC)	30/08/2022	Email	13/09/2022	10/11/2022	Completing review, however, note that the deadline has passed.
Sydney Trains	30/08/2022	Email	13/09/2022	15/09/2022	No Comments
Transport for NSW	30/08/2022	Email	13/09/2022	21/09/2022	No Comments

APPENDIX B - PLANT COMMUNITY TYPE MAPS





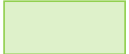


Approved Works AREA –
 PCT Planted Native Vegetation and other vegetation to be removed.
 Clearing minimised to the extent required for construction

PCT Planted Native Vegetation To be Retained

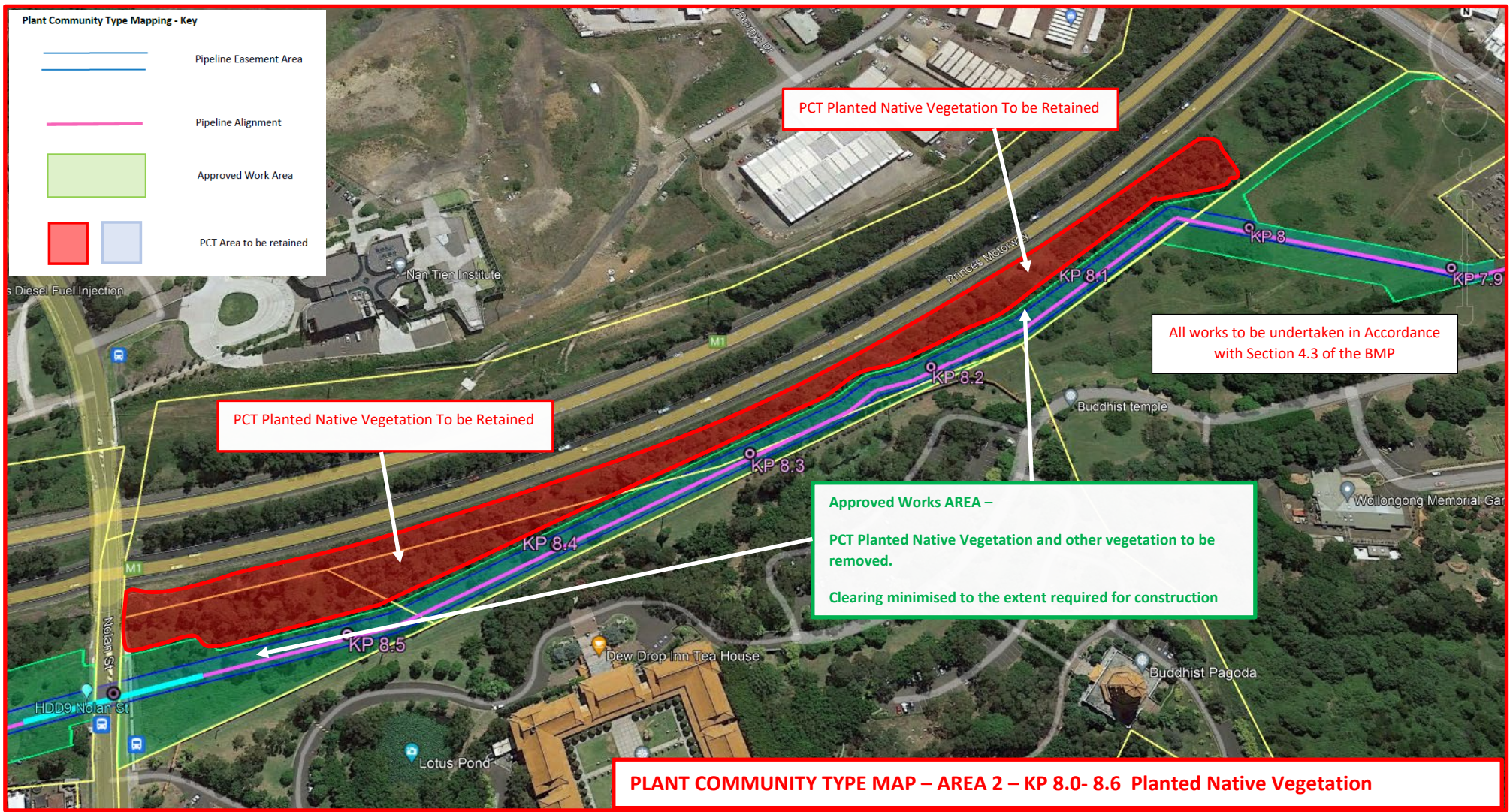
All works to be undertaken in Accordance with Section 4.3 of the BMP

PCT Planted Native Vegetation To be Retained

Plant Community Type Mapping - Key

	Pipeline Easement Area
	Pipeline Alignment
	Approved Work Area
	PCT Area to be retained
	

PLANT COMMUNITY TYPE MAP – AREA 1 – KP 6.29- 6.55 Planted Native Vegetation



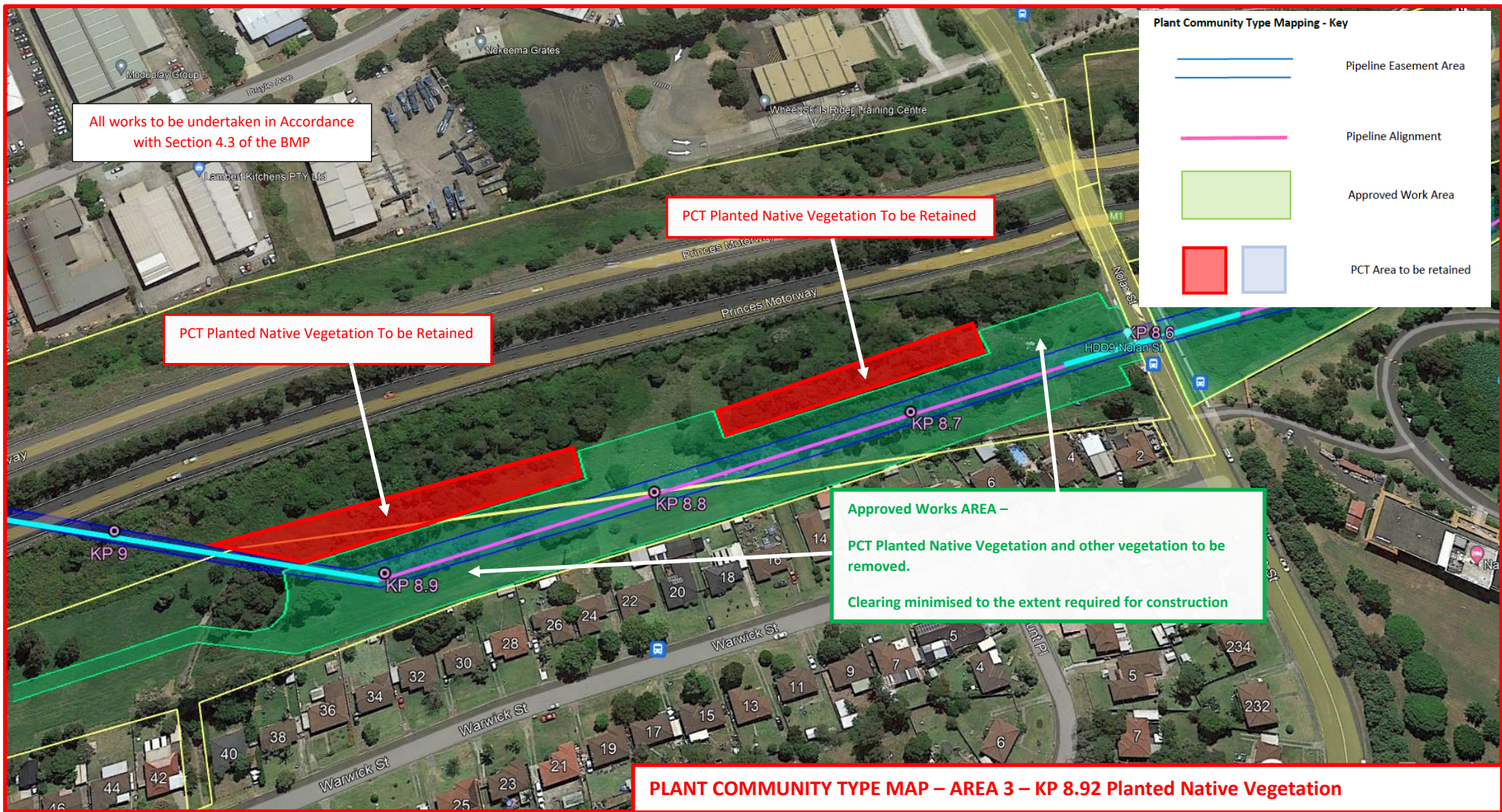
PCT Planted Native Vegetation To be Retained

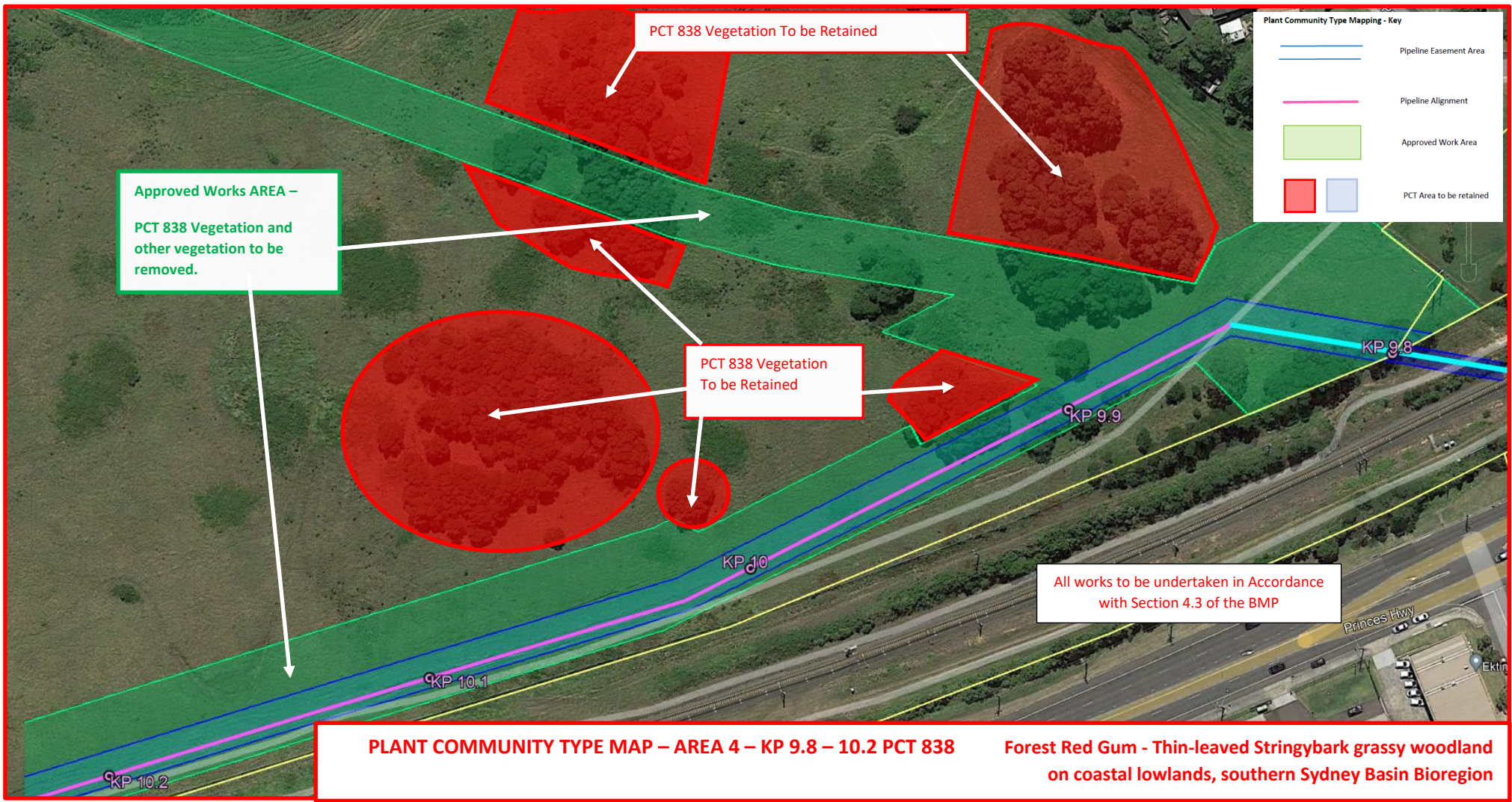
PCT Planted Native Vegetation To be Retained

All works to be undertaken in Accordance with Section 4.3 of the BMP

Approved Works AREA –
 PCT Planted Native Vegetation and other vegetation to be removed.
 Clearing minimised to the extent required for construction

PLANT COMMUNITY TYPE MAP – AREA 2 – KP 8.0- 8.6 Planted Native Vegetation





Plant Community Type Mapping - Key

	Pipeline Easement Area
	Pipeline Alignment
	Approved Work Area
	PCT Area to be retained
	PCT Area to be removed

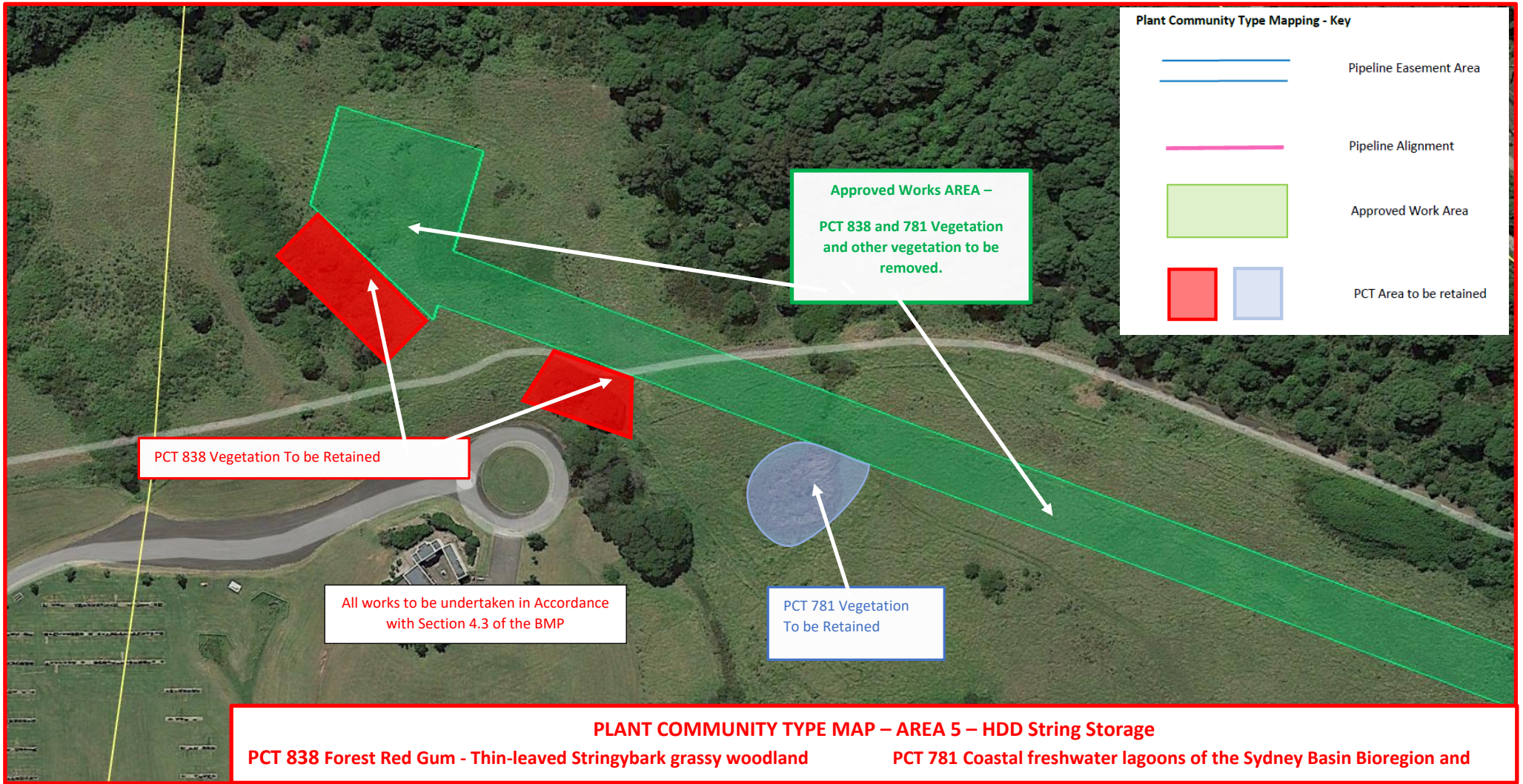
Approved Works AREA –
PCT 838 Vegetation and other vegetation to be removed.

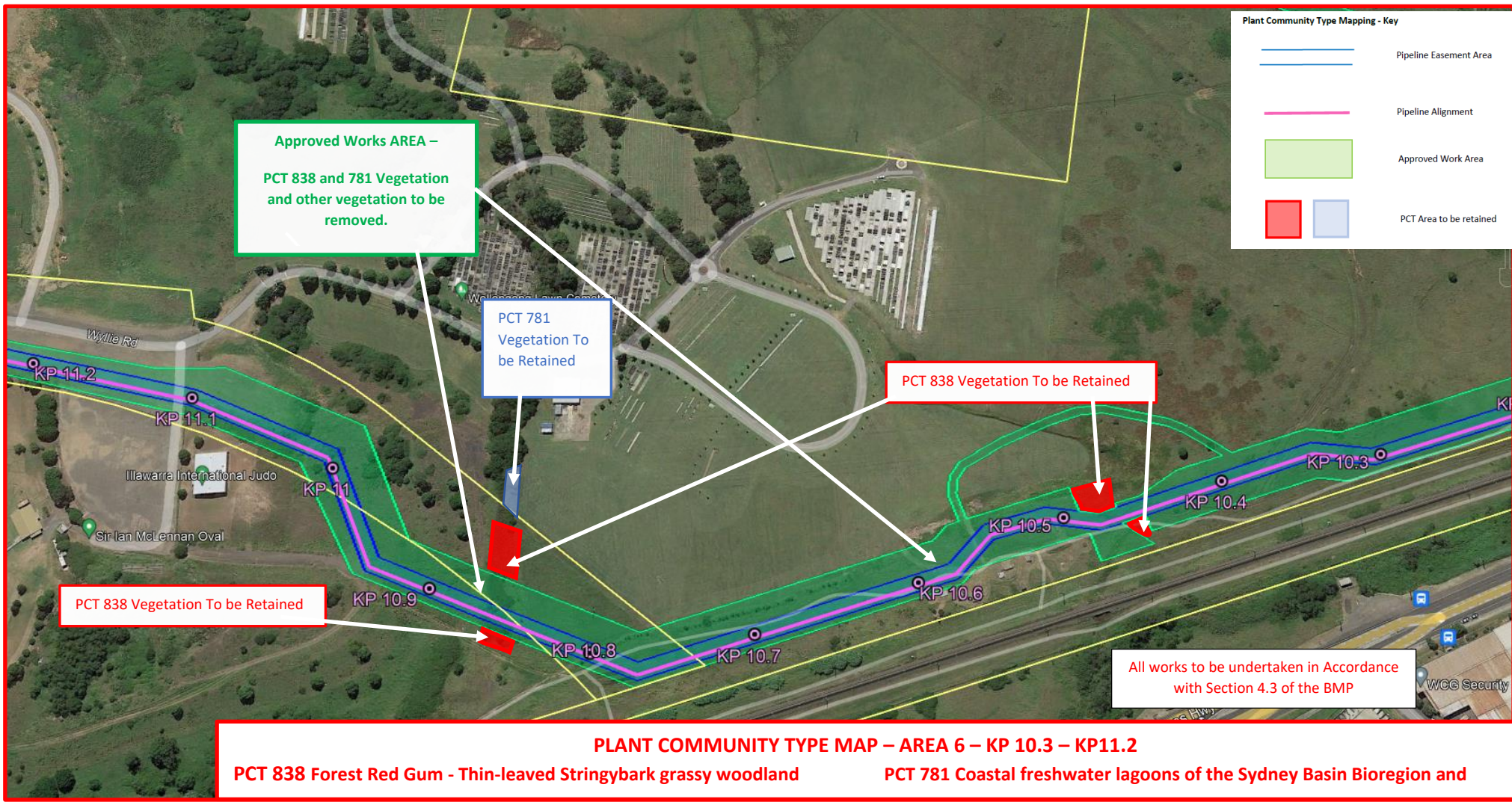
PCT 838 Vegetation To be Retained

PCT 838 Vegetation To be Retained

All works to be undertaken in Accordance with Section 4.3 of the BMP

PLANT COMMUNITY TYPE MAP – AREA 4 – KP 9.8 – 10.2 PCT 838 **Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion**





Plant Community Type Mapping - Key

	Pipeline Easement Area
	Pipeline Alignment
	Approved Work Area
	PCT Area to be retained

Approved Works AREA -
PCT 838 and 781 Vegetation
and other vegetation to be
removed.

PCT 781
Vegetation To
be Retained

PCT 838 Vegetation To be Retained

PCT 838 Vegetation To be Retained

All works to be undertaken in Accordance
 with Section 4.3 of the BMP

PLANT COMMUNITY TYPE MAP - AREA 6 - KP 10.3 - KP11.2
PCT 838 Forest Red Gum - Thin-leaved Stringybark grassy woodland **PCT 781 Coastal freshwater lagoons of the Sydney Basin Bioregion and**