Prepared for
Ampol Australia Petroleum Pty Ltd
ABN: 17 000 032 128

Kurnell Terminal SSD-5544 MOD-7

Modification Report

12 May 2025

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Kurnell Terminal SSD-5544 MOD-7

Modification Report

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ABN: 17 000 032 128

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Limitations

AECOM Australia Pty Ltd (AECOM) has prepared this Modification Report in accordance with the usual care and thoroughness and based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this Modification Report.

This Modification Report has been produced in accordance with the stipulations in the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2021.

Where this Modification Report indicates that information has been provided to AECOM by third parties, AECOM has made no independent verification of this information except as expressly stated in the Modification Report. AECOM assumes no liability for any inaccuracies in or omissions to that information.

This Modification Report was prepared between March 2024 and March 2025 and is based on the conditions encountered and information reviewed at the time of preparation. AECOM disclaims responsibility for changes that may have occurred after this time.

This Modification Report should be read in full. No responsibility is accepted for use of any part of this Modification Report in any other context or for any other purpose.

Notes on text

As a determination of the proposed modification will only be made after the Modification Report has been on public display and submissions considered, the future consolidated tense is used throughout this Modification Report when describing the proposed works, alternatives, and assessing impacts. “Would” is therefore used throughout the text in preference to “will.”

If all approvals are given for the proposed works to proceed, where applicable, all “would” references should be interpreted as “will,” subject to final conditions of consent.

Definitions

Term	Definition
the Site	Kurnell Terminal on the southern side of Botany Bay, in Kurnell, NSW. Refer to Section 2.1.2 (the Site) and Figure 1-1.
the approved project	The original conversion project and subsequent demolition and other projects through which the Kurnell Refinery was converted to the Kurnell Terminal as approved under SSD-5544 and subsequent modifications. The approved project was divided into two phases: • Converting infrastructure to allow the Site to operate as a terminal and shutdown the refinery (the conversion works); and • Demolition and removal of redundant infrastructure (the demolition works). Refer to Section and 3.1 and Figure 3-1.
SSD-5544	State Significant Development (SSD) application reference 5544.
the conversion works	The works associated with the approved project. Refer to Section 3.2 and Figure 3-2.
the demolition works	The works predominantly associated with SSD-5544 MOD-1. Refer to Section 3.2 and Figure 3-2.
the proposed modification	The relocation of operational infrastructure within the boundaries of the Site, the removal of non-operational infrastructure and remediation and grading works. Refer to Section 4.0 and Figure 4-1.
the proposed modification works	The works that are proposed under this modification MOD-7. Refer to Section 4.0 and Figure 4-1.
the Modification Report	The report prepared to document the assessment of the proposed modification.
onsite	Works that are undertaken at the Site.
Project Area	The location within the Site that the proposed modification works would occur (see also, Zones). Refer to Section 2.1.3 (Project Area) and Figure 1-1.
Eastern Right of Way (RoW)	The area considered as Zone 1A.
Ampol	The proponent of the proposed modification. The operator of the Kurnell Terminal.
study area	The geographical extent where environmental impacts from the proposed modification would be expected to occur. As defined by the specialist for each environmental matter. Where a study area is not stated, the Project Area is the study area.
Zones	Following a review of their landholdings at Kurnell to understand future use opportunities, Ampol have split the Site into various zones, as defined below and shown in Figure 1-1.
	Zone 1 – The area that continues to be used as an operational fuel terminal.
	Zone 1A – The Eastern Right of Way, which is used by the operational fuel terminal.
	Zone 2 – The former refinery process areas and scrap yard area, now largely vacant.
	Zone 3 – The Former Caltex Lubrication Oil Refinery area, now largely vacant.
	Zones 4 and 5 – Areas of undeveloped land containing extensive native vegetation.

Term	Definition
MOD-1	Modification 1 comprised of demolition works (SSD-5544 MOD-1), consented 10 August 2015. Refer to Section 3.2 and Figure 3-2.
MOD-2	Modification 2 comprised of Asbestos Contaminated Soil (ACS) management works (SSD-5544 MOD-2), consented 27 October 2017. Refer to Section 3.3 and Figure 3-3.
MOD-3	Modification 3 comprised of Tank 101's demolition (SSD-5544 MOD-3), consented 17 November 2017. Refer to Section 3.4 and Figure 3-4.
MOD-4	Modification 4 comprised of a update to the timing of demolition works (SSD-5544 MOD-4), consented on 9 August 2018. Refer to Section 3.5.
MOD-5	Modification 5 comprised of an increase in the capacity of the ACS Containment Cell, extension in the duration of ACS management works and allowance for the retention of a portion of the cooling water outlet pipeline beneath Prince Charles Parade and adjacent dune area of Silver Beach (SSD-5544 MOD-5), consented on 10 July 2019. Refer to Section 3.5.
MOD-6	Modification 6 comprised of an extension of the ACS management works period (SSD-5544 MOD-6), consented 21 January 2020. Refer to Section 3.6.
MOD-7	Modification 7 comprised of the works proposed under this modification (SSD-5544 MOD-7) and described in this Modification Report. Refer to Section 3.7 and Figure 4-1.

The following terms is used in the Biodiversity Development Assessment Report (BDAR) and Section 7.11 in line with the Biodiversity Assessment Methodology (BAM).

Term	Definition
Subject land	The subject land is the same as the "Project Area," as defined in Section 2.1.3 (Project Area) and shown on Figure 1-1.
Development Site	The development site is the same as the "Site," as defined in Section 2.1.2 (the Site) and shown on Figure 1-1.
Development footprint	The development footprint comprises the area of direct impact associated with the proposed modification, which is restricted to Zones 2 and 3 as well as several discrete areas in Zones 1 and 1A, which represent indicative infrastructure relocation areas, as shown in Figure 4-1.
Assessment area	The assessment area includes the subject land and the area of land within a 1,500 m buffer zone surrounding the subject land, as shown in Figure 7-18.

Abbreviations

Abbreviation	Definition
AAQ NEMP	*National Environment Protection (Ambient Air Quality) Measure 2021*
ABS	Australian Bureau of Statistics
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACS	Asbestos contaminated soil
AEC	Area of environmental concern
AECOM	AECOM Australia Pty Ltd
AEP	Annual event probability
AHD	Australian Height Datum
AHIMS	Australian Heritage Information Management System
Airports Act	*Airports Act 1996*
Airports Regulation	*Airports (Protection of Airspace) Regulations 1996 (Protection of Airspace Regulation)*
AMBS	Australian Museum Business Services
Ampol	Ampol Refineries (NSW) Pty Ltd
ANZAST	Australian and New Zealand and Australian State and Territory
ANZECC	Australian and New Zealand Environment and Conservation Council
AOBV	Areas of outstanding biodiversity value
AQIA	Air Quality Impact Assessment
AQMP	Air Quality Management Plan
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
ASSMAC	Acid Sulfate Soil Management Advisory Committee
BAM	Biodiversity Assessment Methodology
BAM-C	Biodiversity Assessment Methodology Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
Biodiversity and Conservation SEPP	*State Environmental Planning Policy (Biodiversity and Conservation) 2021*
bgl	Below ground level
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
BWMP	Biodiversity and Weed Management Plan
CBD	Central Business District
CBOX	CBOX Containers Australia PTY Limited
CEMP	Construction Environmental Management Plan

Abbreviation	Definition
CLOR	Caltex Lubricant Oil Refinery
COPC	Contaminants of potential concern
CSEP	Community and Stakeholder Engagement Plan
CWO	Cooling Water Outlet
DA	Development Application
dB(A)	A-weighted decibels
DCP	Development Control Plan
DEC	NSW Department of Environment and Conservation
DECC	Department of Energy and Climate Change
DECCW	Department of Environment, Climate Change and Water
DEMP	Demolition Environmental Management Plan
DoIW	Directory of Important Wetlands
DPE	Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
ENM	Excavated natural material
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EP&A regulation	*Environmental Planning and Assessment Regulation 2021*
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESD	Ecologically sustainable development
FWS	Firewater system
GDE	Groundwater Dependent Ecosystem
GHD	GHD Group Pty Ltd
GMP	Groundwater Monitoring Plan
GWMP	Groundwater Management Plan
Ha	Hectares
HAZID	Hazard identification
HEPA	Heads of EPAs Australia and New Zealand
Heritage Act	*Heritage Act 1977 (NSW)*
HIA	Heritage Impact Assessment

Abbreviation	Definition
HIAP	Hazardous Industry Planning Advisory Paper
HMS	The *Caltex Kurnell Refinery Heritage Management Strategy* (Australian Museum Consulting, 2014b)
IAF	Induced air flotation
IAQM	Institute of Air Quality Management
IBRA	Interim Biogeographic Regionalisation for Australia
ICOMOS	International Council on Monuments and Sites
IRSAD	Index of Relative Socio-economic Advantage and Disadvantage
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
LNAPL	Light non-aqueous phase liquid
LOC	Loss of containment
LPG	Liquefied petroleum gas
LSPS	Sutherland Shire Local Strategic Planning Statement 2020
m^3	Cubic metre
mbgl	Metres below ground level
MHF	Major Hazard Facility
ML	Megalitres
ML/yr	Megalitres per year
MNES	Matters of National Environmental Significance
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NML	Noise management levels
NSW	New South Wales
NT Act	*Native Title Act 1993*
NVIA	Noise and Visual Impact Assessment
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OEMP	Operation Environmental Management Plan
OPP	Organophosphorus Pesticides
OSD	Onsite detention
OSOM	Oversize and Overmass
OWS	Oily water sewer
PAD	Potential Archaeological Deposit
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential Acid Sulfate Soils
PCB	Polychlorinated Biphenyls

Abbreviation	Definition
PCT	Plant community Type
PFAS	Perfluoroalkyl and Polyfluoroalkyl Substances
PHA	Preliminary Hazard Analysis
PHC	Petroleum related hydrocarbons
PM	Particulate Matter
PM_{10}	Particulate Matter particles with a diameter of 10 micrometres or less
$PM_{2.5}$	Particulate Matter particles that have a diameter of 2.5 micrometres or less
PP	Planning Priorities
PULP	Premium Unleaded Petrol
QRA	Qualitative Risk Assessment
RAP	Remedial Action Plan
RAS	Remediation Action Strategy
RPIP Mountain	Refining Process Improvement Project Mountain
RRO	Resource Recovery Order
RSW	Restricted solid waste
SAII	Significant and Irreversible Impacts
SAQP	Sampling and Analysis Quality Plan
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
SIA	Social Impact Assessment
Site auditor	EPA accredited Site Auditor
SPULP	Super Premium Unleaded Petrol
SSC	Sutherland Shire Council
SSD	State Significant Development
SSI	State Significant Infrastructure
SSIP	Stormwater Separation Improvement Project
SVOC	Semi Volatile Organic Contaminants
SWMP	Soils and Water Management Plan
SWS	Stormwater System
TEC	Threatened ecological communities
TfNSW	Transport for NSW
HAZDEM	The Hazard and Risk Analysis of the Proposed Caltex Kurnell Refinery Demolition Works
TRH	Total Recovered Hydrocarbons
TTIA	Traffic and Transport Impact Assessment
UPL	Unleaded Petroleum
URS	URS Asia Pacific Pty Ltd (acquired by AECOM in 2014)
VENM	Virgin Excavated Natural Material

Abbreviation	Definition
VI	Vegetation integrity
VOC	Volatile Organic Contaminants
WHSMP	Work Health and Safety Management Plan
WQO	Water Quality Objectives
WRMP	Waste and Resource Management Plant
WSP	WSP Global Inc
WWTP	Waste Water Treatment Plant

Executive summary

Introduction

The Kurnell Terminal ('the Site') is located on the southern side of Botany Bay, in Kurnell, New South Wales (NSW). In 2012, Ampol Refineries (NSW) Pty Ltd (Ampol) announced that the oil refinery and fuel terminal would be converted to a finished product terminal (the 'approved project'), ceasing refinery operations in 2014.

The approved project

Development consent was received to complete the approved project under State Significant Development (SSD) application reference 5544 (SSD-5544). The process to convert the refinery to a terminal involved a number of activities, including upgrades and changes to operational infrastructure, and removal and demolition of redundant infrastructure. The objective of the approved project was, and remains, "*to establish a viable, safe, reliable, and sustainable finished product import terminal at Kurnell*." This includes providing a safe working environment at the terminal and ensuring that the operation is not burdened by unnecessary costs.

Ampol has modified SSD-5544 six times to complete the various conversion and demolition works. Currently, the operational infrastructure is primarily located in the northern part of the Site (Zones 1 and 1A). Other parts of Ampol's landholdings at Kurnell include largely vacant areas of previously developed land (Zones 2 and 3) and areas of undeveloped land containing extensive native vegetation (Zones 4 and 5).

The proposed modification

Ampol intends to consolidate operational infrastructure, remove redundant assets, and undertake remediation and grading. Completion of these works (the 'proposed modification,' MOD-7) would continue the safe, viable and reliable operation of the Kurnell Terminal, whilst preparing the land for future uses. The location within the Site that these modification works would occur is referred to as the 'Project Area.'

A description of the proposed modification for which development consent is sought is provided in Section 4.0 (Description of the proposed modification).

Statutory context

This change (SSD-5544 MOD-7) would be a modification to development consent SSD-5544 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This modification is sought as:

- The works are a continuation of the approved project
- The end result of these works would be substantially the same development as the approved project under SSD-5544 (as modified)
- The proposed modification would likely result in a greater than minimal environmental impact.

A full review of the permissibility of the proposed modification under the EP&A Act is provided in Section 5.0 (Statutory context). A detailed review of key State and Commonwealth legislation, as well as State, regional, and local planning policies that apply to the proposed modification is provided in Appendix B.

Engagement

In order to inform this Modification Report, consultation with the NSW Department of Planning, Housing, and Infrastructure (DPHI), Sutherland Shire Council (Council), NSW Environment Protection Authority (NSW EPA), SafeWork NSW, and the Kurnell Community.

A summary of the consultation activities completed during the preparation of this Modification Report is provided in Section 6.0 (Engagement).

Environmental assessment

An assessment of potential impacts relating to the proposed modification was undertaken and are summarised in below. Additional mitigation measures have been proposed alongside existing measures to manage these potential impacts.

Table E.1 Environmental assessment summary

Matter	Summary
Hazards and risk	A Preliminary Hazard Analysis (PHA) was prepared by R4Risk to assess the potential hazards and risks of the proposed modification (Appendix F). Potential impacts identified during construction and operation relate to capping works in Zone 2 and augmentation of the existing firewater system (FWS) in Zone 1. All construction safety hazards identified, including the potential loss of containment of hydrocarbons, were assessed as having potential impacts to workforce safety only, and would be managed through existing Work Health and Safety Management Plan (WHSMP). The implementation of mitigation measures would help ensure impacts identified are reduced to a tolerable level.
Soils, groundwater and contamination	A Soils, Groundwater, and Contamination Report was prepared by AECOM to assess the potential impacts of the proposed modification on soils, groundwater, and receivers that could be impacted by ground contamination (Appendix G). A Conceptual Remediation Action Plan (RAP) (Appendix H) has been prepared to support and guide the proposed modification works. Potential impacts identified during construction relate to spills and leaks, importation of soils, and disturbance of existing contamination and Potential Acid Sulfate Soils (PASS), resulting in potential exposure of the Site and construction workers to contamination present in the soil and groundwater, creation of nuisance odours, and migration of contaminants into groundwater or stormwater. However, the completion of remediation works as part of the proposed modification would have an overall positive environmental impact by reducing ground contamination, and presents a framework for future management of remaining contaminants. Potential impacts identified during operation were consistent with the approved project. Following soil remediation, and for the ongoing operation of the terminal, ongoing management of residual contaminated soil and/ or groundwater would continue to be undertaken. Mitigation measures for management of contaminants included the implementation of a Conceptual RAP (Appendix H). The implementation of mitigation measures would help ensure adverse impacts relating to soils, groundwater and contamination are effectively managed.

Matter	Summary
Surface water, wastewater and flooding	A Surface Water, Wastewater and Flooding Report was prepared to assess potential surface water, wastewater, and flooding impacts of the proposed modification on water resources within the Site and in receiving areas. (Appendix I). Potential impacts identified during construction relate to general construction activities disturbing the surfaces across the Site resulting in pollution or erosion and sedimentation of the surrounding environment. To prevent loss of existing flood storage and to avoid offsite flooding impacts, earthworks and capping would be completed in a manner that does not significantly alter existing surface levels. As the Oily Water Sewer (OWS) infrastructure would be removed in certain areas in Zones 2 and 3, the Surface Water System (SWS) would collect additional surface water runoff that would have previously been collected by the OWS. This has the potential to increase peak discharge rates from the Site. To address these potential impacts, a new onsite detention (OSD) system would be constructed to manage surface flows that have been redirected from the OWS network to the SWS. The implementation of mitigation measures would help ensure adverse impacts relating to surface water, wastewater, and flooding are effectively managed.
Aboriginal cultural heritage	An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared by AECOM to assess the impacts of the proposed modification and to provide an appropriate management strategy for any identified values (Appendix J). Potential impacts identified during construction relate to the potential for Aboriginal objects to be located in buried soil profiles and impacted during intrusive works. Considering that the proposed modification works are contained wholly within previously disturbed areas within the Site boundary, no impacts to Aboriginal heritage values are expected once the proposed modification works are completed. The implementation of mitigation measures would help ensure that adverse impacts upon Aboriginal heritage values are effectively managed.
Historic heritage	A Heritage Impact Assessment (HIA) was prepared to assess the impacts of the proposed modification on potential non-Aboriginal heritage values (Appendix K). Potential impacts identified during construction relate to the demolition of three buildings in Zone 2 that retain high or moderate heritage significance associated to the archaeological heritage listing, Australian Oil Refinery (A2524). Today, these buildings are isolated from the operational terminal infrastructure and are used for non-essential storage by Ampol. As such, they do not retain practical value, and, following the demolition of refinery infrastructure, these buildings are now decontextualised remnants of the former refinery's operation. There would be no additional impact from the operation of the proposed modification, as these buildings would be removed during construction. The implementation of mitigation measures would help ensure adverse impacts upon historic heritage are effectively managed.

Matter	Summary
Traffic and transport	A qualitative Traffic and Transport Impact Assessment (TTIA) was prepared to assess the impacts of the proposed modification on the surrounding road network (Appendix L). The total number of construction vehicle movements (heavy vehicles) would be approximately up to 136 per day and up to 14 per hour. This increase in vehicle trip movements is not expected to change the performance of the surrounding road network. The Site would continue to operate as previously approved, with minimal changes in terms of operational vehicle traffic movements, beyond a small number of additional trips to access the proposed storage shed in Zone 1A. Given this negligible increase, traffic volumes are expected to remain consistent with the forecast traffic levels, without the proposed modification. The implementation of mitigation measures would help ensure adverse impacts upon traffic and transport are effectively managed.
Noise and vibration	A Noise and Vibration Impact Assessment (NVIA) was prepared to assess the impacts of the proposed modification and outline mitigation measures (Appendix M). Potential impacts during construction relate to construction noise levels at some residential receivers predicted to exceed the 'highly noise affected' level of 75 decibels (dB(A)). This is primarily due to works occurring in close proximity to residents (i.e. Zone 1A during construction of a warehouse, and along the north east boundary of the Site during augmentation of the FWS). However, these works are expected to be minimal in duration (up to three months in Zone 1A) and intermittent. Potential impacts identified during operation relate to relocated infrastructure operating in their new locations. Specifically, the FWS would be relocated to the FWS Relocation Area in the north western end of the Site; two indicative location options have been assessed. This equipment would be tested on a monthly and annual basis. The operational assessment found that noise from the relocated FWS during monthly testing would not be discernible, but may be heard from both location options during annual testing. This would only occur once per year for a limited time. The implementation of mitigation measures would help ensure adverse impacts relating to noise and vibration are effectively managed.
Social	A Social Impact Assessment (SIA) was prepared to understand community concerns regarding the proposed modification and the potential social impacts (Appendix O). Potential impacts identified during construction were associated with local amenity and businesses, due to noise and vibration, air quality, and visual amenity reduction and their associated impacts to businesses within the social locality. Potential impacts identified during operation were related to changes in amenity due to the relocation of equipment. The implementation of mitigation measures would help ensure adverse impacts upon social receivers are effectively managed.

Matter	Summary
Air quality	An Air Quality Impact Assessment (AQIA) was prepared to understand potential impacts during construction and operation of the proposed modification on local air quality (Appendix N). Potential impacts identified during construction related to unmitigated dust impacts associated with demolition, earthworks, and construction activities, resulting in dust soiling upon sensitive human and ecological receptors. Potential impacts identified during operation relate to relocated infrastructure operating in their new locations. Specifically, the relocated FWS and its associated diesel pumps during annual and monthly maintenance testing. Operation of the diesel engines during maintenance testing of the FWS pumps would result in combustion emissions. However, it is noted that maintenance would occur intermittently and for short time periods. The implementation of mitigation measures would help ensure adverse impacts relating to air quality are effectively managed.
Biodiversity	A Biodiversity Development Assessment Report (BDAR) was prepared by Biosis to assess the impacts of the proposed modification on biodiversity, and propose mitigation measures where required (Appendix P). Potential impacts identified during construction would include direct impacts to 5.36 ha of native vegetation, including one endangered ecological community; exotic grass; planted exotic vegetation; habitat for the threatened species (Giant Dragonfly and Southern Myotis); and the removal of one hollow bearing tree. Various indirect and prescribed impacts were also identified, such as trampling of threatened flora species and vehicle strike. Finally, potential Serious and Irreversible Impacts (SAII) were considered for the Giant Dragonfly, considered a SAII entity; however, SAII impacts are not anticipated. Both ecosystem credit offsetting and species credit offsetting are required for the proposed modification. A staged approach to the retirement of the proposed modification's biodiversity credit liability would be undertaken. During operation, existing plans and additional management measures proposed as part of this Modification Report would be implemented to manage potential impacts to biodiversity following construction, including the existing Operational Environmental Management Plan (OEMP) and one or more Environmental Management Plan(s) (EMP) and Groundwater Monitoring Plan(s) (GMP), and. The implementation of mitigation measures would help ensure adverse impacts upon biodiversity values are effectively managed.
Waste	Section 7.12 (Other impacts) of the Modification Report qualitatively assessed the impacts of the proposed modifications waste. Potential impacts identified during construction were associated with the generation of waste from the demolition and removal of infrastructure, excavation of contaminated soil and removal of temporary environmental controls and structures during demobilisation. Potential impacts identified during operation were consistent with the approved project. The implementation of mitigation measures would help ensure adverse impacts relating to waste are effectively managed.

Matter	Summary
Landscape and visual	Section 7.12 (Other impacts) of the Modification Report qualitatively assessed the impacts of the landscape and visual impacts of the proposed modification. Potential impacts upon views of the Site may be experienced during construction and operation by local residential and recreational zones, and the local road network. However, the proposed modification would be in keeping with the existing heavy industrial zoning of the Site, and construction works would be largely obscured from view of the public across the Site due to presence of existing screening on the Site boundary. No measures are required to manage these negligible changes.
Cumulative impacts	Section 7.13 (Cumulative impacts) of the Modification Report assessed cumulative impacts of the proposed modification. Potential impacts during construction were identified for the Breen Resource Recovery Facility and Kurnell Planning Proposal related to traffic and transport. Consultation with Transport for NSW (TfNSW), Sutherland Shire Council, and other regional project proponents would be undertaken understand the interaction of the proposed modification and the projects identified with potential traffic and transport impacts. To limit construction fatigue, engagement with affected residents and businesses would be carried out. Potential impacts during operation were identified for the Kurnell Stormwater Separation Improvement Project related to noise and vibration during annual testing of the relocated FWS. The implementation of mitigation measures would help ensure adverse cumulative impacts are effectively managed.

Justification

This Modification Report has concluded that the proposed modification should proceed because:

- The proposed modification is substantially the same development as the approved project
- The proposed modification would align with the primary objective of the approved project, being to maintain the continued safe, viable, and reliable operations at Kurnell
- Potential economic, social, environmental, or cumulative impacts would be managed through the mitigation and management measures
- The implementation of the identified mitigation measures would help ensure that adverse impacts from the proposed modification are negligible.

On the basis of the discussion within this Modification Report, the proposed modification is considered to be justified.

1.0 Introduction

1.1 Overview

The Kurnell Terminal ('the Site') is located on the southern side of Botany Bay, in Kurnell, New South Wales (NSW) (Figure 1-1). In 2012, Ampol Refineries (NSW) Pty Ltd (Ampol) announced that the oil refinery and fuel terminal would be converted to a finished product terminal (the 'approved project'), ceasing refinery operations in 2014.

The process to convert the refinery to a terminal involved a number of activities, including upgrades and changes to operational infrastructure, and removal and demolition of redundant infrastructure. The objective of the approved project was, and remains, "*to establish a viable, safe, reliable, and sustainable finished product import terminal at Kurnell*." This includes providing a safe working environment at the terminal and ensuring that the operation is not burdened by unnecessary costs.

Development consent was received to complete the approved project under State Significant Development (SSD) application reference 5544 (SSD-5544). Ampol has modified SSD-5544 six times to complete the conversion and demolition works.

Ampol's landholdings at Kurnell have been split into zones to help describe the former and current land uses (as detailed in Table 1-1 and shown in Figure 1-1). Currently, the operational infrastructure is primarily located in the northern part of the Site (Zone 1 and 1A).

Table 1-1 Former and current land uses at the Kurnell Terminal

Zone	Former use (prior to 2012)	Current use
Zone 1	Operational refinery and fuel terminal, containing the Northern, Eastern, North Western, and Western Tank Farms, the Wastewater Treatment Plant (WWTP), Liquefied Petroleum Gas (LPG) storage and loading infrastructure, site offices, Oil Movements Centre, pumps, fire water infrastructure, stormwater and wastewater pipelines, and operational pipeways.	Operational fuel terminal, containing the Northern, Eastern, North Western, and Western Tank Farms, the WWTP, site offices, Oil Movements Centre, pumps, fire water infrastructure, and operational pipeways.
Zone 1A	Eastern Right of Way, which provides pipeline easements from the Kurnell Wharf through the Kurnell Township to the Site and facilities supporting the wharf and right of way.	No change
Zone 2	Caltex Oil refinery process infrastructure, pipelines, pumps, warehouse/stores, fire water infrastructure, fire training area, waste management area, offices, cafeteria, laboratory, stormwater and wastewater pipelines, and associated supporting operations and infrastructure.	Largely vacant. Operational warehouses, operational substations, and pipework remain. Asbestos Contaminated Soil Cell is present. Targeted remediation works are being undertaken.
Zone 3	Caltex Lubrication Oli Refinery (CLOR), process infrastructure, warehouses, CLOR tank farms, pipelines, fire water infrastructure, stormwater and wastewater pipelines, and associated supporting operations and infrastructure.	Largely vacant. Operational substations stormwater and wastewater pipeline remain. Vegetated, contaminated area named Refining Process Improvement Project Mountain (RPIP) Mountain located south east corner. Targeted remediation works are being undertaken.
Zones 4 and 5	Undeveloped land containing extensive native vegetation.	No change

Ampol intends to consolidate operational infrastructure, remove redundant assets, and undertake remediation and grading. Completion of these works (the 'proposed modification,' MOD-7) would continue the safe, viable and reliable operation of the Kurnell Terminal, whilst preparing the land for future uses. The location within the Site that these modification works would occur is referred to as the 'Project Area.'

This change (SSD-5544 MOD-7) would be modification to development consent SSD-5544 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) considered to be a continuation of the approved project. The proposed modification works would support the primary function and purpose of the Site, being to operate as a finished product fuel terminal. These works would reduce the commercial burden of managing redundant or aging terminal infrastructure and support the maintenance of key infrastructure. As such, the end result of the proposed modification works would be substantially the same development as the approved project under SSD-5544 (as modified), refer to Section 1.4, Section 5.0 and Appendix B for further detail.

This Modification Report has been prepared to support a modification application to SSD-5544. In line with the requirements of Section 4.55 of the EP&A Act, this Modification Report provides the information required by Section 100 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). This Modification Report considers a range of relevant environmental, safety, legal, social, and economic impacts related to the proposed modification.

1.2 Proponent and team

The proponent for the proposed modification is Ampol Refineries (NSW) Pty Ltd (Ampol) (ABN: 19 000 108 725), 2 Solander Street Kurnell, NSW 2231, with the primary contact being Keiran Fleming – Planning, Transaction, and Development Manager.

This Modification Report has been prepared by AECOM Australia Pty Ltd (AECOM), ABN 20 093 846 925, Level 21, 420 George Street Sydney, NSW 2000. The Registered Environmental Assessment Practitioner for the proposed modification is William Miles, a Technical Director – Environment at AECOM. His Certification Number is R80018.

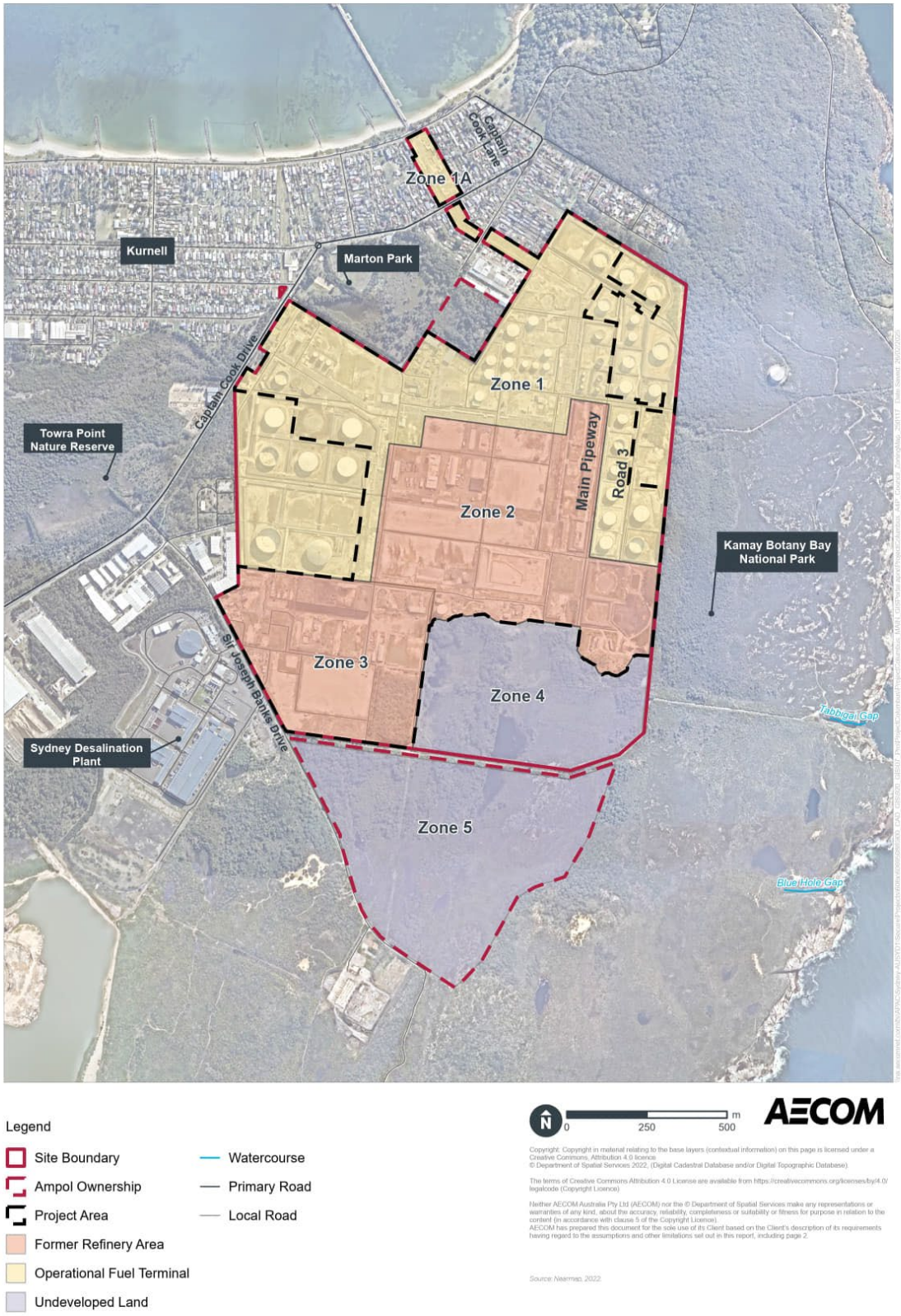

Figure 1-1 Ampol Kurnell Terminal (the Site)

1.3 Need, objectives and alternatives

1.3.1 Background

As part of SSD-5544, a number of previous Development Applications (DAs) for the Site were surrendered, and SSD-5544 is now the dominant consent for the Site. SSD-5544 has been the subject of six modifications:

- Modification 1 – Demolition works (SSD-5544 MOD-1), consented 10 August 2015
- Modification 2 – Asbestos contaminated soil (ACS) management works (SSD-5544 MOD-2), consented 27 October 2017
- Modification 3 – Tank 101 demolition (SSD-5544 MOD-3), consented 17 November 2017
- Modification 4 – Timing of demolition works (SSD-5544 MOD-4), consented on 9 August 2018
- Modification 5 – Increased the capacity of the ACS Containment Cell, extended the duration of ACS management works and allowed for the retention of a portion of the cooling water outlet pipeline beneath Prince Charles Parade and adjacent dune area of Silver Beach (SSD-5544 MOD-5), consented on 10 July 2019
- Modification 6 – Extension of the ACS management works period (SSD-5544 MOD-6), consented 21 January 2020.

These various works all relate to the objective of the approved project to establish a viable, safe, reliable, and sustainable finished product import terminal at Kurnell.

1.3.2 Need and objectives of the approved project

As noted within the Environmental Impact Statement (EIS) for SSD-5544, *"Ampol initiated a review of its refining operations in May 2011."* This review concluded that, *"the Ampol Kurnell and Lytton refineries in their current configuration are relatively small and are disadvantaged compared to the modern, larger scale, and more efficient refineries in the Asian region. This disadvantage is exacerbated by the impact of the ongoing strength of the Australian dollar, lower Ampol refining margins, and increasing costs on the 'as is' refining business. As a result of the refining review, Ampol is proposing to close the Kurnell Refinery and convert the Site to a petroleum fuels import (finished product) terminal."*

While it was concluded that the refinery business was no longer viable at Kurnell, the EIS also stated that the Site was at the hub of Ampol's supply chain for NSW and ACT and therefore needed to be retained as a finished product terminal to receive and distribute refined petroleum product. This provided the need for the approved project (SSD-5544) and supported its objective, which was:

"To ensure that Ampol's operations within Australia remain viable whilst ensuring that the company can provide a safe, reliable, and sustainable supply of petroleum fuels to NSW and the ACT."

1.3.3 Need and objectives of the proposed modification

The southern and central parts of the Site were previously used for the refining of crude oil and related uses, with Zone 2 formerly being the refinery process area, and Zone 3 formerly containing the Caltex Lubrication Oil Refinery (CLOR). Following the cessation of refining in 2014, the conversion of the Site to a fuel terminal and the removal of refinery infrastructure, these southern and central areas of the Site have been largely vacant notwithstanding some remnant infrastructure. Infrastructure that remains in these areas that support the operations on the Site include parts of the oily water sewer (OWS) infrastructure, firewater systems (FWS), electrical assets, and certain buildings and structures.

Ampol intends to consolidate operational infrastructure, remove redundant assets, and undertake remediation and grading. Completion of these works (the 'proposed modification') would continue the safe, viable, and reliable operation of the Kurnell Terminal, whilst preparing the land for future uses. The location within the Site that these modification works would occur is referred to as the 'Project Area.' A description of these works (the 'proposed modification') is provided in Section 4.0.

The proposed internal reconfigurations would help maintain operational efficiency and safety within the Site. The scale of the modification is contained and focused, ensuring that the core function and size of the facility remain consistent with SSD-5544. This approach aligns with approved Kurnell Refinery Conversion project, without introducing new elements that would significantly change the nature or increase the scale of the Site's operations.

As such, the objectives of the proposed modification are to:

- Maintain the safe, reliable, and sustainable operation of the terminal and related land uses
- Facilitate future land uses.

1.3.4 Alternatives considered

Three options were considered by Ampol to inform the proposed modification:

- Option 1: Base case, or 'do nothing' approach
- Option 2: Consolidation of operational infrastructure, including relocation of the hydrocarbon pipelines from Zone 2 to Zone 1, removal of redundant assets, and remediation to facilitate future land uses. As part of this full scope, options for remediation in Zones 2 and 3, and adaptive reuse of the buildings in Zone 2, were considered
- Option 3: Option 2, with relocation of the hydrocarbon pipelines removed from scope.

Each option is discussed in further detail below.

Option 1 – Do nothing approach

The 'do nothing' option would involve leaving the Site in its current configuration, with remediation and environmental management measures being undertaken as part of the existing Kurnell Remediation Action Strategy (RAS) (Ampol, 2019) and Environmental Protection Licence (No. 837) (EPL); however, the proposed remediation would not be as extensive as presented in the proposed modification.

Option 2 – Consolidation of operational infrastructure, including relocation of the hydrocarbon pipelines, removal of redundant infrastructure, and remediation

Ampol's review of the Site identified a number of works to help improve the terminal's operation, address legacy refinery contamination issues and make vacant land available for future land uses. These works involve removing or relocating above and below ground infrastructure removing redundant infrastructure, and remediating ground contamination.

Relocation of infrastructure

By reconfiguring internal operational infrastructure, the function of the terminal would be maintained within a smaller area, without affecting the operational efficiency and safety of the terminal, thereby ensuring that the original objectives of SSD-5544 continue to be met.

The hydrocarbon pipelines would be relocated from the Main Pipeway (Zone 2) to adjacent to Road 3 (Zone 1) (see Figure 1-1). The need for relocation was based on removing as much operational infrastructure as possible from Zones 2 and 3 to facilitate future land uses opportunities. The new pipelines would be installed ahead of the existing pipelines being removed. Connections to the existing terminal infrastructure would be readied and tested ahead of the existing pipelines being decommissioned. Minor excavation works would be expected for installation of the footings for the new pipelines.

The FWS would be relocated within the FWS Relocation Area in Zone 1, including a new firewater tank and pipework to allow it to service the terminal infrastructure, with specific siting selected during detailed design. Two indicative locations have been considered for the relocation of the FWS. These locations have been selected based on optioneering completed in the concept design phase in consultation with key stakeholders, including Firewater and Process Safety Subject Matter Experts. Should Option 1 be selected, measures would be incorporated into the design of the buildings containing the diesel engines powering the pumps to limit noise and air quality impacts (see the Noise and Vibration Impact Assessment (Appendix M) and Air Quality Impact Assessment (Appendix N) for future information).

A new stormwater pump would be installed, and operate intermittently following periods of heavy rainfall, to transfer potentially contaminated stormwater from areas of Zone 2 to the OWS system. Two options have been identified for the new pumps adjacent to the ACS Containment Cell. The preferred option at the junction of Road 6 and Road Q; and the alternate on the eastern end of Road Q, south of the ACS containment sump (Figure 4-1). Construction would be limited to one option, selected as part of detailed design.

Removal of infrastructure

Non-operational infrastructure, i.e. assets that are currently redundant or would become redundant following the relocation of existing infrastructure, would be removed and disposed of appropriately. This would allow Ampol to safely and efficiently remediate the land and develop a landform that can be used for future uses. The retention and maintenance of redundant infrastructure and associated risks has a financial cost which adversely impacts the viability and safety of terminal.

Three buildings in the centre of the Site (the storehouse, workshop, and Central Control Building) are proposed to be removed. These buildings were constructed as part of the original construction of the Kurnell Terminal and support the heritage significance of the Site (i.e. archaeological item of local heritage significance on the Sutherland Shire Local Environmental Plan (LEP) 2015: “Australian Oil Refinery” (A2524)).

Today, these buildings are isolated away from the operational terminal infrastructure, are oversized and are therefore not in use other than the Workshop and Storehouse, which are used for non-essential storage by Ampol.

To prepare the land for other land uses and to reduce the maintenance costs at the terminal, the retention of these legacy buildings is not considered feasible. The heritage buildings do not retain practical value, and, following the demolition of refinery infrastructure, these buildings are now decontextualised remnants of the former refinery’s operation. There is a reasonable risk of future uses of the land being prevented by their presence, particularly owing to the financial burden of renovation and continued maintenance of the buildings. The benefits associated with the remediation and future use of the Site outweigh the financial burden and operational challenges of retaining these three heritage buildings.

Remediation

To address legacy refinery issues and make vacant land available for future uses, remediation would be undertaken in Zones 2 and 3, and where required in Zone 1. Remediation would meet the commercial/ industrial land use standard, as defined by *Amended National Environment Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013) (ASC NEPM) (NEPM, 2013).

Options for remediation are presented in the attached Conceptual Remedial Action Plan (RAP) (Appendix H). In accordance with the ASC NEPM (NEPM, 2013), the preferred hierarchy of options for site remediation and management of soil contamination are:

1. Onsite remediation of soil contamination, so that the risk associated with the contaminant is reduced to an acceptable level.
2. Offsite remediation of excavated soil, so that the risk associated with the contaminant is reduced to an acceptable level, after which it is returned to the site.

If it is not practicable for either of the above options to be implemented, then other options for consideration can include:

1. Containment of the contamination onsite either in-situ with appropriate controls that reduce the risk to an acceptable level, or in an appropriately designed and managed containment facility.
2. Removal of contaminated soil to an approved site or facility, and replacement with clean fill where necessary.
3. Adoption of a less sensitive land use or controls onsite activities that would reduce the need for remedial works.

A detailed review of the options assessment for remediation is presented in the Conceptual RAP (Appendix H).

Option 3 – Consolidation of operational infrastructure, removal of redundant infrastructure, and remediation, and excluding relocation of the hydrocarbon pipelines,

This option involves the scope outlined in Option 2, with the relocation of the hydrocarbon pipelines removed from the scope.

Summary

Option 1 would result in some remediation of ground contamination onsite. However, the retention of operational and redundant infrastructure in its current configuration would mean that terminal operations would be spread over a larger area and would not be optimised. This option would maintain a higher operational cost for the terminal, would maintain some legacy safety risks related to the presence of redundant infrastructure, and would not facilitate future land uses at the Site. As such, this option was discounted.

Options 2 and 3 are fundamentally the same, except that Option 2 includes the relocation of hydrocarbon pipelines from the main pipeway to a new location adjacent to Road 3. The relocation of hydrocarbon pipelines is not currently a priority at the Site. At this time, operations can continue with hydrocarbon pipelines in their current configuration, and remediation would not be impeded by their presence. The need to relocate hydrocarbon pipelines would be considered in the future following further investigations.

Option 3 is therefore the preferred option as it meets the original objective of the approved project, being to ensure Ampol's operations in Australia remain viable and the objectives of the proposed modification to maintain the safe, reliable, and sustainable operation of the terminal and facilitate future land uses.

1.4 Section 4.55(2) modification

Given the anticipated impacts associated with the proposed modification works, Ampol is seeking to modify development consent SSD-5544 under Section 4.55(2) of the EP&A Act, which includes 'other modifications.'

As described further in Appendix B, the proposed modification is substantially the same development as the approved project in that:

- The proposed modification is considered to be a continuation of the approved project, which aimed to convert the Kurnell Refinery to a "Finished Product Terminal." The primary function and purpose of the Site to operate as a finished product fuel terminal would be supported by works associated with the proposed modification.
- The objective of the approved project was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*." The proposed modification works would meet this objective by removing redundant infrastructure and relocating or augmenting operational infrastructure within a more manageable and focused operational terminal area. These works would reduce the commercial burden of managing redundant or aging terminal infrastructure and support the maintenance of key infrastructure for site safety purposes.

On this basis, Ampol is seeking to modify the development consent for SSD-5544, pursuant to Section 4.55 of the EP&A Act.

This Modification Report has been prepared in accordance with the relevant requirements of the EP&A Regulation; specifically, Sections 99 and 100, which apply to the proposed modification. Section 99 of the EP&A Regulation outlines the information that must be included within this Modification Report. The relevant requirements contained under Section 99 and Section 100 and where these have been addressed in the Modification Report are shown in Table A-9-1 and Table A-9-2 in Appendix A respectively.

1.5 Structure of this Modification Report

This Modification Report has been prepared in broad accordance with the NSW Government's Department of Planning and Environment (DPE) "*State significant development guidelines – preparing a modification report: Appendix E to the state significant development guidelines*" (DPE, 2022). This guideline provides a detailed explanation of the form and content requirements for SSD modification reports. Pursuant to the EP&A Regulation, a modification report submitted to NSW Department of Planning, Housing and Infrastructure (DPHI) in support of an SSD modification application must be prepared having regard to the SSD guidelines prepared by the Planning Secretary. Table 1-2 provides a summary of the structure of this Modification Report.

Table 1-2 Structure of this Modification Report

Section	Description
Executive summary	This summarises the key issues and findings detailed in the other parts of the Modification Report.
Introduction	Section 1.0 provides an outline of the approved project, the proponent, the need for the proposed modification, the objectives, and alternatives considered.
Strategic context	Section 2.0 provides a description of the Site and summarises strategies and plans relevant to the approved project and the proposed modification.
Summary of the approved project description	Section 3.0 summarises the approved project description, including past modifications.
Description of the proposed modification	Section 4.0 provides a detailed description of the proposed modification, including discussion of Conditions of Consent that need to be modified.
Statutory context	Section 5.0 discusses relevant controlling legislation and planning policy.
Engagement	Section 6.0 summarises stakeholder engagement undertaken for the proposed modification, and the methodology proposed for future consultation.
Assessment of impacts	Section 7.1 provides a high-level scoping assessment of potential environmental impacts of the proposed modification and identifies areas requiring further assessment. Sections 7.2 to 7.13 provide a more detailed assessment of the potential environmental impacts of the proposed modification.
Justification of the modification	Section 8.0 provides a justification and evaluation of the modified project as a whole, having regard to the economic, environmental and social impacts of the modified project and the principles of ecologically sustainable development.
Statutory compliance tables	Appendix A outlines how the relevant requirements contained under Section 99 and Section 100 of the EP&A Act have been addressed within this Modification Report.
Statutory context	Appendix B provides an overview of the permissibility of the proposed modification under the EP&A Act, and its compliance with other relevant NSW legislation, relevant Commonwealth legislation, State Environmental Planning Policy, and the Sutherland Shire Local Environmental Plan 2015.
Consolidated project description	Appendix C provides a consolidated project description for the Kurnell Refinery Conversion, incorporating changes required for the proposed modification.
Consolidated mitigation measures table	Appendix D provides a consolidated table of environmental mitigation measures, incorporating any changes required for the proposed modification.

Section	Description
Conditions of consent to be modified	Appendix E provides a consolidated table of conditions of consent of SSD-5544 to be modified.
Technical reports	The following technical reports are included as Appendix F to R: Appendix F – Preliminary hazard analysis Appendix G – Soils, groundwater, and contamination report Appendix H – Conceptual Remedial Action Plan Appendix I – Surface water, wastewater, and flooding report Appendix J – Aboriginal cultural heritage assessment report Appendix K – Heritage impact assessment report Appendix L – Traffic and transport assessment report Appendix M – Noise and vibration impact assessment report Appendix N – Air quality assessment report Appendix O – Social impact assessment report Appendix P – Biodiversity development assessment report. Appendix Q – Matters of National Environmental Significance Appendix R – Cumulative projects long list.

2.0 Strategic context

This section provides:

- An overview of the Site and its immediate context
- A summary of the key government strategies and policies that provide strategic support for the approved project and how these align with the objectives of the proposed modification.

2.1 Site description

2.1.1 Regional context

The Site is located in the Sutherland Shire LGA, on the Kurnell Peninsula in Sydney, NSW, as shown in Figure 2-1. The Sutherland Shire LGA has an area of 333.6 hectares, with a population of about 230,200 (ABS, 2021). The closest residential area to the Project Area is Kurnell, which is located close to the north and north west of the Site. The Site is located approximately 17 km from Sydney Central Business District (CBD), and Cronulla residential areas are located approximately 5 km to the south west.

The Site (Figure 1-1) is bounded by the Kamay Botany Bay National Park to the south and east, Captain Cook Drive to the north west, and Sir Joseph Banks Drive to the south west. The northern Site boundary is bordered by Solander Street, a small southern section of Cook Street, light industry, residential dwellings off the eastern side of Cook Street, and undeveloped land on the southern side of Reserve Road. The Eastern Right of Way (Zone 1A) is bounded by Prince Charles Parade to the north, and residential dwellings along Prince Charles Parade, Captain Cook Drive, and Cook Street along the east and west.

There are a number of reserves in proximity of the Site. Marton Park, comprising a developed recreational park area and an undeveloped wetland area, is located adjacent to the northern boundary of the Site on the northern side of Solander Street. Captain Cook's Landing Place Park is located approximately 500 m to the north of the Site, while Bonna Point Reserve is located approximately 1.4 km north west of the Site. Towra Point Nature Reserve is a Ramsar wetland and located west of the Site, on the opposite side of Captain Cook Drive. Quibray Bay also includes Towra Point Aquatic Reserve which, whilst not part of Towra Point Nature Reserve or Ramsar wetland, forms a wider ecosystem with it. To the north of Kurnell is Botany Bay, a large bay with a diverse number of uses and habitats and where the Georges and Cooks Rivers meet before joining the Pacific Ocean.

2.1.2 The Site

The Site consists of a largely developed and fenced area encompassing the Kurnell Terminal and the fenced Eastern Right of Way that passes through the Kurnell Township. The Site consists of a large number of allotments. Ampol also owns land to the south of the Site (Zones 4 and 5) and a part of Marton Park along the northern boundary (Figure 1-1).

Topography of the Site ranges from 2 m Australian Height Datum (AHD) in Zone 1A, about 3 to 5 m AHD in the majority of Zones 1, 2 and 3, and reaching a peak of about 20 m AHD along the eastern boundary of Zone 2, associated with the interface of the adjacent Kamay Botany Bay National Park.

The Site is typically accessed off Solander Street which is accessed from Captain Cook Drive. Secondary access is also available from Sir Joseph Banks Drive.

Under the Sutherland Shire Local Environmental Plan (LEP) 2015, the whole Site is zoned as E5 Heavy Industrial. The dominant existing land use at the Site is the Kurnell Terminal. This use is consented under SSD-5544, as modified. The Site also operates under EPL 837 and a Major Hazard Facility licence.

Between 1956 and 2014, the Site was used as both an oil refinery and a fuel terminal. Since refining ceased in 2014, the Site has been primarily used as a finished fuel import terminal. The former refinery uses at the Site means that an ongoing program of targeted remediation activities, in line with the NSW EPA approved Remediation Action Strategy (RAS), are being completed.

When the Site operated as a refinery, around 900 people were employed at the Site, increasing to around 1,100 during shutdown and maintenance events. Currently around 30 Ampol employees and up to 100 contractors work at the Kurnell Terminal. Noise from the Site is controlled by SSD-5544 and EPL 837.

Most of the Site is listed as an 'archaeological site' under Part 2 of Schedule 5 of the LEP as 'The Australian Oil Refinery' (#A2524). The majority of the Project Area is within the curtilage of the archaeological site designation.

Existing utilities

The Site is currently serviced via a connection to the 250 mm and 200 mm potable water main located on Captain Cook Drive. Stormwater and wastewater from the Site are managed through a Stormwater System (SWS) and an OWS respectively. The purpose of the SWS is to capture, treat, and discharge stormwater from areas of the Site into to Botany Bay, Quibray Bay, and Marton Park. The purpose of the OWS is to capture, manage, and treat potentially contaminated stormwater and wastewater from the terminal before directing it to the onsite Waste Water Treatment Plant (WWTP) for discharge under EPL 837. Topography within the Site is generally flat, with the land rising to the eastern boundary of the Site, and drains channelling water toward the WWTP in the north east.

The Site is currently serviced via a 33 kV Ausgrid underground transmission connection located on Captain Cook Drive. During the closure of the Kurnell Refinery, high voltage electrical substations, power distribution rooms, and electrical infrastructure (such as buried cables) were redesigned and constructed to the requirements of a bulk fuel terminal, predominantly to maintain constant electrical supply to the Site with minimal capital expenditure.

The firewater system at the Site currently operates via a network of fire hydrants, monitors, fixed and semi-fixed foam systems, and underground and aboveground firewater pipelines running through the Site, as well as a firewater tank and pump system in the southern part of the Zone 2.

Description of related development

The dominant existing land use at the Site is the Kurnell Terminal. This use is consented under SSD-5544, which has been modified six times, as described in Section 3.0 (Summary of the approved project description). A large number of previous development consents were surrendered as part of the application for SSD-5544.

Other planning approvals are also active at the Site, including:

- Major project approval for the Kurnell Jet Fuel B Pipeline Upgrade Project (MP11_0004)
- Local project approvals:
    - Targeted infrastructure improvement works, such as the Kurnell Stormwater Separation Improvement Project (DA24/0008)
    - Small, targeted remediation activities, such as the Kurnell Terminal Asbestos Remediation Project (DA20/0079), and its subsequent modification (MA24/0070), and Scrapyard Area (DA23/0798)
    - Licence holder activities (e.g. CBOX Containers Australia PTY Limited (CBOX) storage).

2.1.3 Project Area

The Project Area (Figure 1-1) consists of the majority of Zone 1 and the entirety of Zones 1A, 2, and 3. This area has been delineated to facilitate:

- The removal of remaining redundant refinery infrastructure from Zones 2 and 3
- Relocation of infrastructure essential to terminal operations to parts of Zones 1 and 1A.

Remediation and grading works required in Zones 1, 2 and 3.

Table 2-1 lists the allotments within each zone relevant to the Project Area.

Table 2-1 Allotments within the Project Area

Zone	Lots/ DP
Zone 1 (Operational fuel terminal)	Lot 25 (DP 776328), Lots 56, 57, and 62 (DP 908), Lot 1 (DP 1044690), Lots 283 and 570 (DP 752064), Lot 1 (DP 132055)
Zone 1A (Eastern Right of Way)	Lots H, J, and K (DP 362655), Lot D, F, and G (DP 361103), Lots 43-46, 77-79, 122-125 (DP 8135), Lot B (DP 338897)
Zone 2 (Former refinery process areas and scrap yard)	Lot 25 (DP 776328), Lots 56, 57, and 62 (DP 908), Lot 283 (DP 752064)
Zone 3 (Former Caltex Lubrication Oli Refinery)	Lot 1 (DP 215819), Lots 1 and 2 (DP 126647), Lot 2 (DP 215818)

2.1.4 Land ownerships and agreements

Ampol (as Ampol Refineries (NSW) Pty Ltd, previously Caltex Refineries (NSW) Pty Ltd) is the sole landowner of the Site and Project Area and has not entered into any agreements with other parties to mitigate or offset the impacts of the proposed modification at this time.

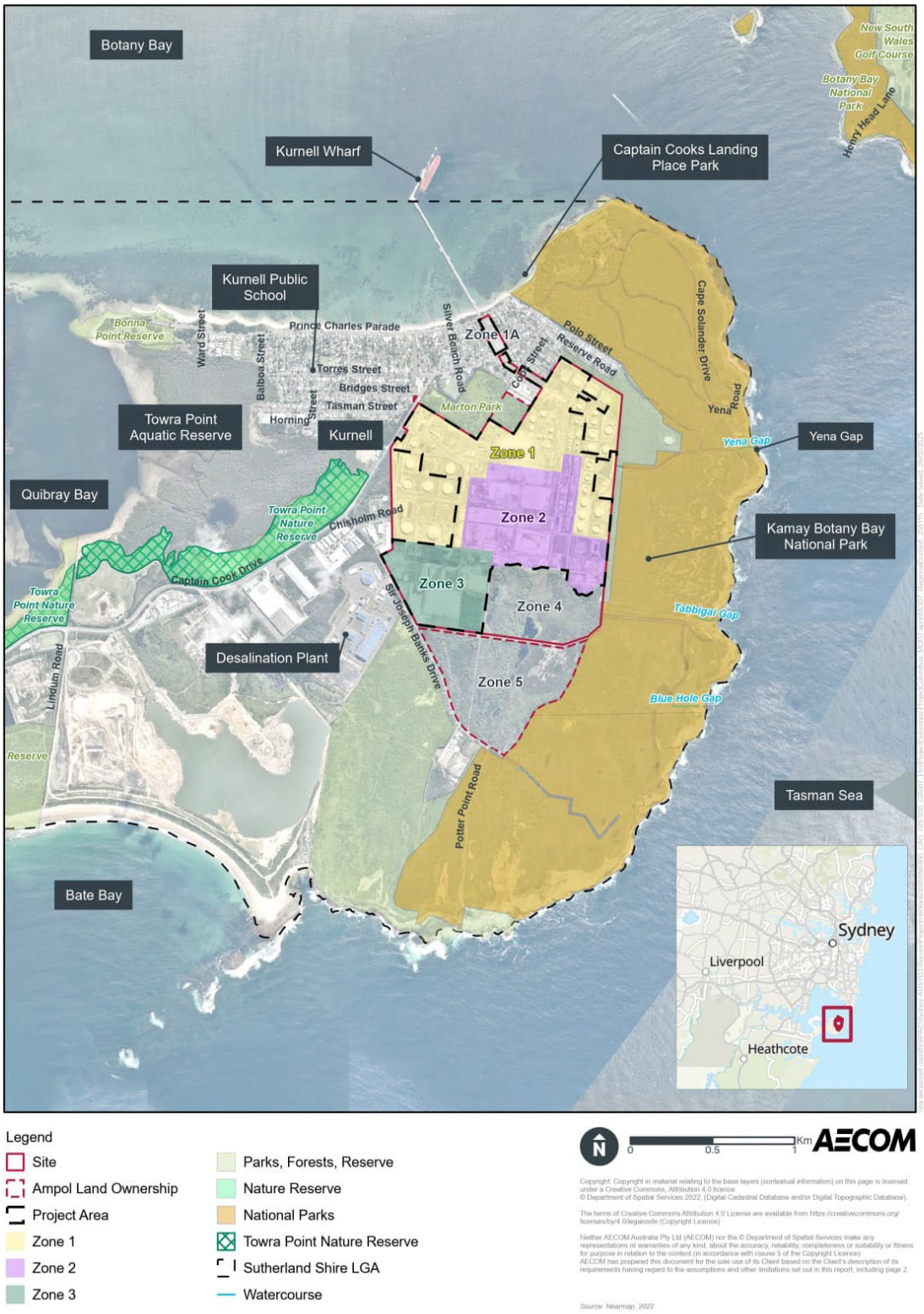

Figure 2-1 Regional context

2.2 Strategic planning context

2.2.1 State Infrastructure Strategy

The *NSW State Infrastructure Strategy 2022-2042* (Infrastructure NSW, 2022) builds on the NSW Government's major long-term infrastructure plans as initially outlined within NSW State Infrastructure Strategy 2012. The strategy sets out the government's priorities for the next 20 years, and combined with the *Future Transport Strategy 2056* (Transport for NSW, 2022) and the *Greater Sydney Region Plan, A Metropolis of Three Cities* (Greater Sydney Commission, 2018a) brings together infrastructure investment and land-use planning for Greater Sydney.

The Strategy outlines infrastructure needs by district. The key geographic infrastructure responses for the Eastern Harbour City (where the Site is located) are largely focused on transport, social, access, cultural and education priorities.

No State infrastructure initiatives have been identified that apply to Kurnell or the Site by the State Infrastructure Strategy 2022-2042. As such, the proposed modification does not conflict with the aims of State Infrastructure Strategy 2022-2042.

2.2.2 Greater Sydney Region Plan – A Metropolis of Three Cities

The *Greater Sydney Region Plan, A Metropolis of Three Cities* (Greater Sydney Commission, 2018a) is built on a vision of three cities where most residents live within 30 minutes of their jobs, education and health facilities, services, and great places. This is consistent with *10 Directions in Directions for a Greater Sydney* (Greater Sydney Commission, 2017) which establish the aspirations for the region over the next 40 years and are a core component of the vision and a measure of the Plan's performance.

To meet the needs of a growing and changing population, the vision seeks to transform Greater Sydney into a metropolis of three cities:

- The Western Parkland City
- The Central River City
- The Eastern Harbour City.

The Site is located on the southern boundary of Eastern Harbour City. The vision brings new thinking to land use and transport patterns to boost Greater Sydney's infrastructure and collaboration, liveability, productivity, and sustainability by spreading the benefits of growth in the decades to come.

Eastern Harbour City Vision

The Eastern Harbour City possesses Australia's global gateway and financial capital, the Harbour CBD, as its metropolitan centre. Well-established, well-serviced, and highly accessible by its radial rail network, it contains half a million jobs and the largest office market in the region.

The proposed modification would align with the *Eastern Harbour City Vision* (Greater Sydney Commission, 2018b) and relevant key objectives identified in the *Greater Sydney Region Plan, A Metropolis of Three Cities* (Greater Sydney Commission, 2018a) including:

- Objective 2: Infrastructure aligns with forecast growth
- Objective 3: Infrastructure adapts to meet future needs
- Objective 4: Infrastructure is optimised
- Objective 23: Industrial and urban services land is planned, retained, and managed.

The proposed modification aligns with the above objectives by:

- Optimising safe and sustainable operations at the Site that align with future forecasted growth and meet the future needs of fuel terminals
- Facilitating future land uses at the Site that allow industrial land to be planned, retained, and managed as well as optimised.

Therefore, the proposed modification aligns with the Greater Sydney Region Plan – Eastern Harbour City Vision.

South District Plan 2018

The *South District Plan 2018* (Greater Sydney Commission, 2018c) (the District Plan) covers the Canterbury-Bankstown, Georges River, and Sutherland Local Government Areas (LGA). The District Plan is a 20-year plan to manage growth in the context of economic, social, and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing the Greater Sydney Region Plan, at a district level and is a bridge between regional and local planning. The District Plan informs local strategic planning statements and local environmental plans, the assessment of planning proposals as well as community strategic plans and policies. The District Plan also assists councils to plan for and support growth and change and align their local planning strategies to place-based outcomes.

Development of the Site would align with the relevant Planning Priorities (PP) identified in the Plan, including:

- PPS1: Planning for a city supported by infrastructure
- PPS9: Growing investment, business opportunities and jobs in strategic centres
- PPS10: Retaining and managing industrial and urban services land
- PPS11: Supporting growth of targeted industry sectors.

The proposed modification aligns with the above objectives by:

- Optimising safe and sustainable operations at the Site that support the growth of targeted industry sectors
- Providing employment opportunities in growing industries that plan for a city supported by infrastructure
- Retaining industrial land uses at the Site that support the growth of targeted industry sectors
- Facilitating future land uses at the Site that allow industrial land to be appropriately retained and managed.

Therefore, the proposed modification aligns with the *Greater Sydney Region Plan – South District Plan 2018*.

2.2.3 Sutherland Shire Local Strategic Planning Statement 2020

The *Sutherland Shire Local Strategic Planning Statement* (LSPS) (Sutherland Shire Council, 2020) identifies the key outcomes Sutherland Shire Council aims to achieve when developing policies and making land use decisions, and in advocating to other levels of government regarding decisions that involve the LGA.

The LSPS expresses the vision and planning principles to guide land use decisions for the next 20 years. It identifies priorities to deliver specific land use outcomes for infrastructure, housing, town centres, employment, transport, recreation, and the environment. It sets short, medium, and long-term actions to achieve these outcomes and an implementation and monitoring framework. The LSPS for Sutherland Shire shapes how the planning framework, comprising the LEP, development control plan (DCP), and development contributions plans evolve over time. It provides local context to other Council strategies and priorities and is consistent with the strategic direction set by the Greater Sydney Region Plan and the South District Plan. It informs Sutherland Shire Council's consideration of planning proposals and may support the Council's consideration and determination of development applications.

The proposed modification would align with the following planning priorities of the LSPS:

- PP1: Align planning to existing infrastructure by retaining industrial land uses at the Site
- PP6: Collaborative partnerships that ensure the community's best interests are considered by implementing the Site's Community and Stakeholder Engagement Plan
- PP15: Grow industrial and urban services jobs by providing employment and future land use at the Site
- PP23: Manage risks from hazards by optimising safe and sustainable operations at the Site.

2.2.4 Land Use Safety Study (Kurnell Peninsula) 2007

The *Land Use Safety Study* (NSW Planning, 2007) assessed the risks from the Kurnell Refinery operations, prior to the conversion works, to existing and future residential land uses and provided recommendations for risk reduction and development control. The *Land Use Safety Study* identified three main sources of risk from the refinery:

1. Fires from large crude oil and refined petroleum product storage tanks and associated transfer pipelines
2. Fires, explosions, or toxic gas releases from processing areas
3. Fires and explosions from large, liquefied petroleum gas (LPG) storage.

Crude oil and LPG are no longer stored at the Site and refinery process units have been removed.

The Preliminary Hazards Analysis (PHA) for the proposed modification examines the current and future operations of the Site and is summarised within Section 7.2 (Hazards and risk) and presented in full in Appendix F.

2.2.5 Kamay Botany Bay National Park Master Plan

The Site is located close to the Kamay Botany Bay National Park. A Master Plan for the Kamay Botany Bay National Park has been prepared on behalf of DPHI (Neeson Murcutt Architects, 2019). The Master Plan sets out three stages of upgrades proposed to be carried out within the National Park close to the Site. These upgrades are predominantly focussed around improving the existing buildings and facilities, providing additional amenities, and improving walking trails and access arrangements.

The proposed modification would not conflict with the plans for the Kamay Botany Bay National Park.

3.0 Summary of the approved project description

This section provides an overview of the approved project by which development consent was obtained pursuant to SSD-5544 including MOD-1 to MOD-6. A revised project description (including the proposed modification) is available in Appendix C.

3.1 Conversion works

The conversion works involved the conversion of tanks and installation of pumps and associated pipelines to allow for the cessation of refining at the Site and to allow for the expansion of terminal operations. These works occurred within the approved project area as presented in Figure 3-1.

Ampol received development consent for the conversion works in January 2014 (SSD-5544). Cessation of refinery operations occurred in Q4 of 2014. By mid-2015 all of the works approved under this initial development consent for the Project were completed except for a number of tank conversions which continued until the end of 2016. The Kurnell Terminal uses part of the Site in a manner similar to the refinery, i.e. for the storage and distribution of petroleum products. These works were and continue to be managed in line with the EPL for the Site.

Following completion of the conversion works (i.e. end of 2016) the Site had a nominal maximum storage capacity of 925 megalitres (ML) of refined product and by-products. The Kurnell Terminal has consent to manage Gasoline (Unleaded Petrol (ULP), Premium Unleaded Petrol (PULP) and Super Premium Unleaded Petrol (SPULP), Diesel and Jet Fuel. The terminal also has consent to manage slop[1] and wastewater.

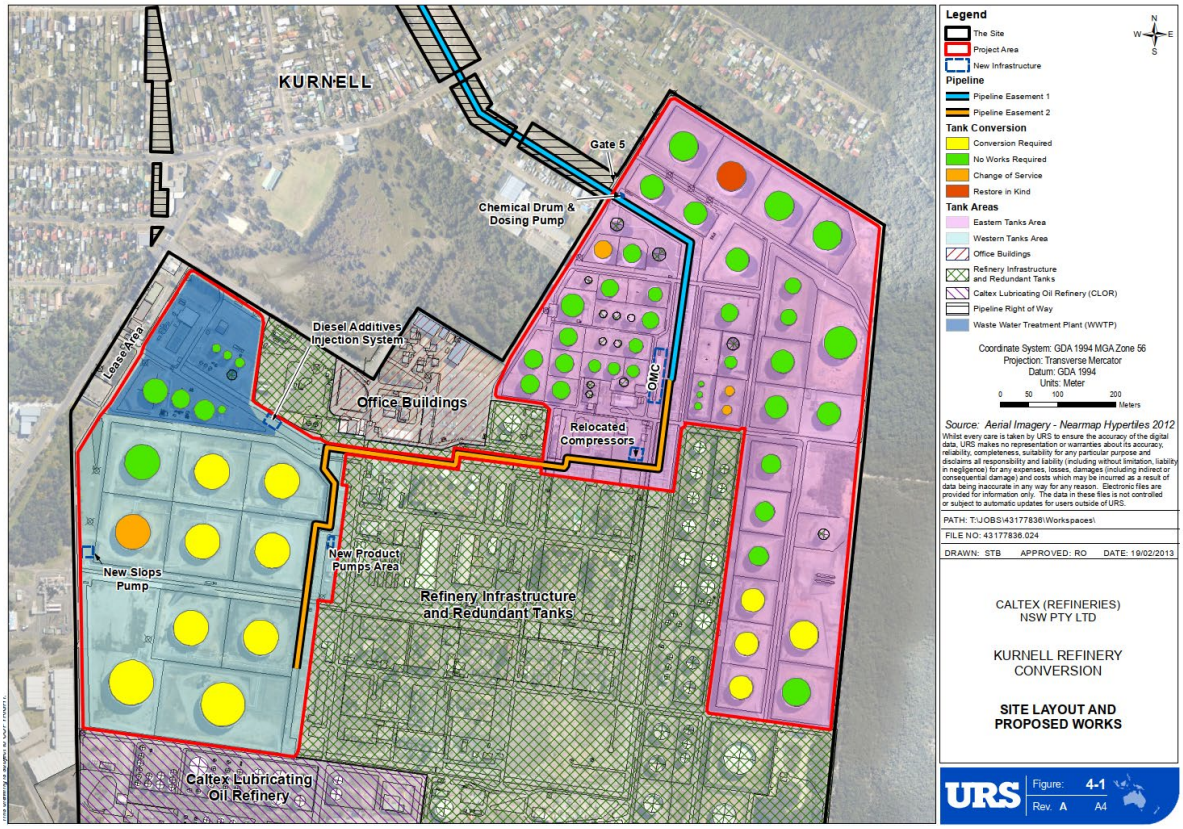

Figure 3-1 Approved project (URS, 2013)

[1] Slop or slop oil is a petrochemical industry term for recovered petroleum hydrocarbons in a refinery or terminal, which requires further processing to make it suitable for sale and use. It is a product which Ampol would either reprocess at a separate facility or sell to a customer.

3.2 Modification 1 – Demolition works (SSD-5544 MOD-1)

The main demolition works involved the following activities:

- Demolition, dismantling or removal of:
  - Refinery process units and associated infrastructure
  - Redundant tanks and associated infrastructure
  - Redundant pipeways and above and underground pipelines, including the Cooling Water Outlet (CWO) pipeline and Cooling Water Intake pipelines on Kurnell Wharf
  - Redundant buildings and services
- Associated civil works with the works outlined above
- Waste management activities including concrete crushing
- Returning the works areas to ground level.

These works occurred within the 'Demolition Works Area' as presented in Figure 3-2.

This consent also included measures to manage the excavation, testing, storage and disposal of various soils at the Site, including hydrocarbon contaminated soils and ACSs, during the demolition works. Management and mitigation measures and the conditions of consent for the demolition works were agreed with various regulators and documented within the Demolition Environmental Management Plan (DEMP). The DEMP was agreed with a number of stakeholders.

Ampol received development consent for the demolition works in August 2015. The demolition phase SSD-5544 concluded in March 2020.

3.3 Modification 2 – Asbestos Contaminated Soil (ACS) management works (SSD-5544 MOD-2)

The Asbestos Contamination Soil (ACS) Management Project involved works to remove ACS from areas around the Site and place them in a Containment Cell in order to remove the hygiene risk and the *Work Health and Safety Regulation 2011 Exemption* from the pipeways. The ACS management works broadly involved the following activities:

- Additional soil sampling within the pipeways to further improve the accuracy of waste classification of the soil prior to placement in the Containment Cell or ACS biopile[2]
- Construction of the Containment Cell base and leachate collection system in the proposed cell location and installation of ground water monitoring wells down gradient of the proposed cell
- Excavation and transportation of ACSs that have been classified as general or restricted solid waste directly to the Containment Cell location for emplacement
- Excavation and transportation of ACSs from the pipeways that have been classified as hazardous waste to be either treated via biopiling prior to placement in the cell, or removed from Site to an appropriately licenced facility
- Environmental management of both the Containment Cell and the temporary ACS biopile areas and verifying the removal of ACS from the pipeways
- Closure, management and monitoring of the Containment Cell.

These works occurred within the 'ACS Modification Works Area' as presented in Figure 3-3. Ampol received development consent for the ACS management works in October 2017. The ACS management works were delayed and required an extension of the construction program, which is discussed in Sections 3.6 (Modification 5) and 3.7 (Modification 6).

[2] A biopile is an *ex-situ* treatment technology that leverages biological processes to convert contaminants to low-toxicity byproducts. Excavated soil or sediment is placed in piles onto an impermeable base or pad equipped with aeration to optimize and control the rate of biodegradation. Further description is provided in Section 4.2.4 (Stage 3 – Remediation).

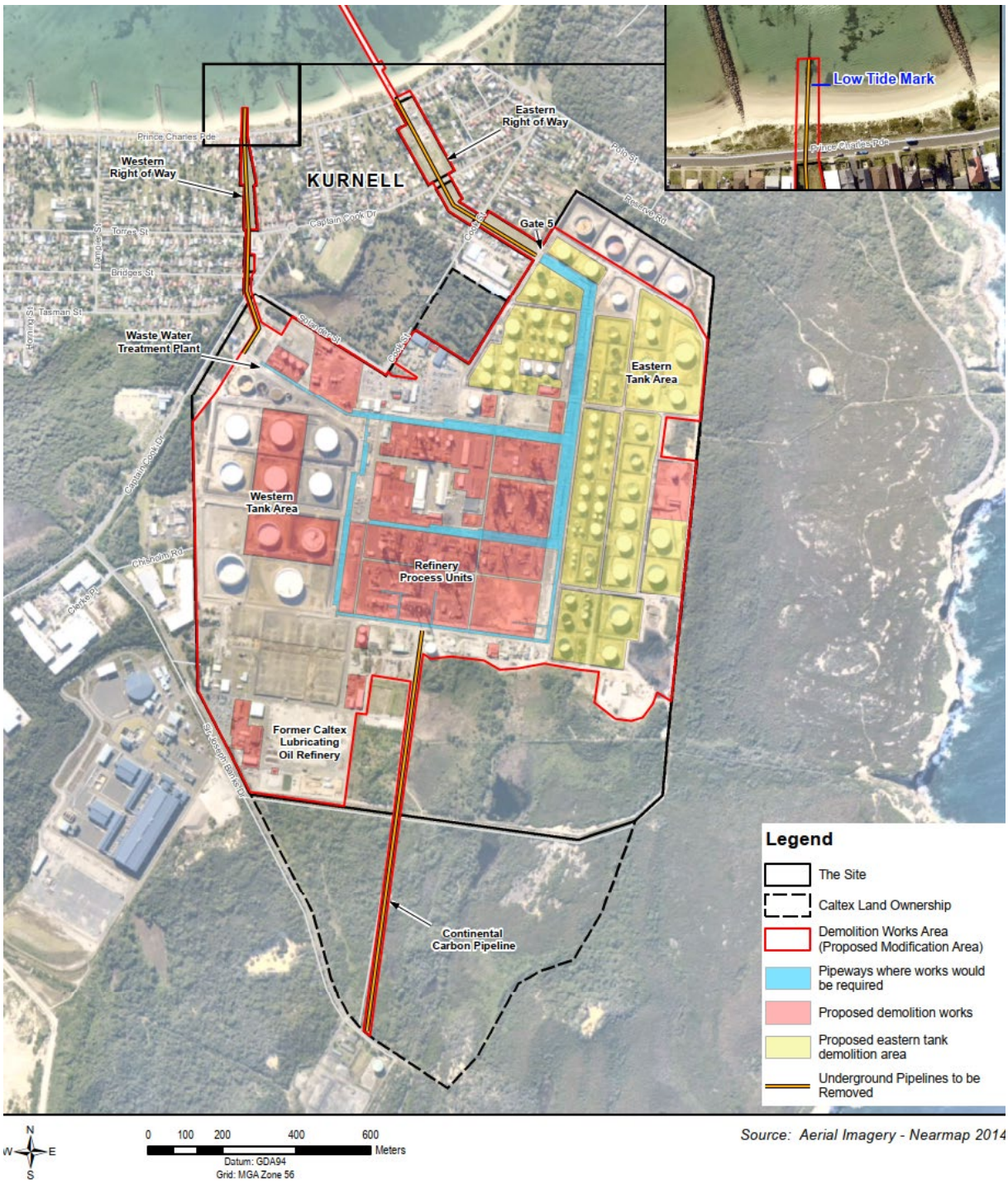

Figure 3-2 MOD-1 (Demolition works) (URS , 2014)

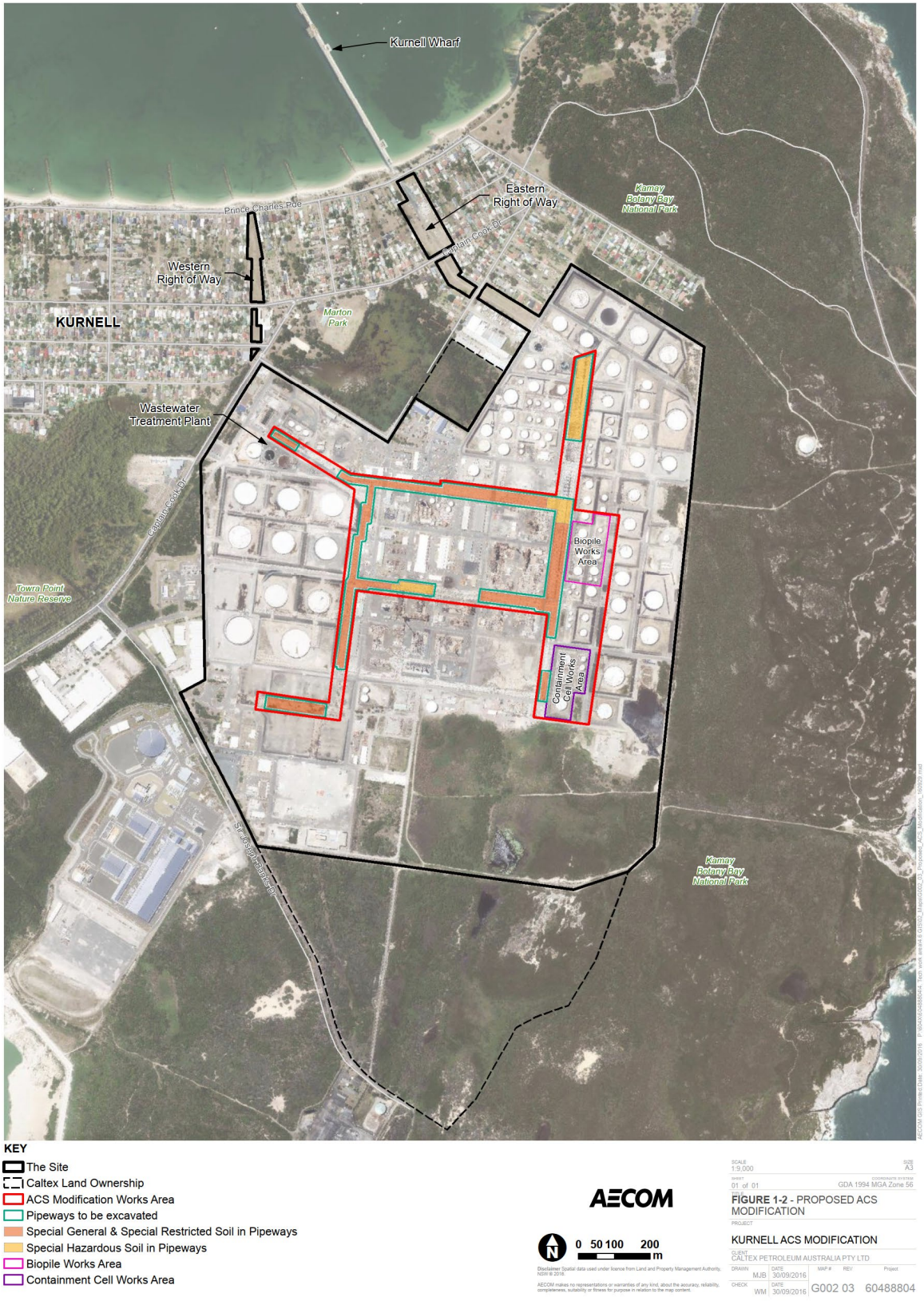

Figure 3-3 MOD-2 (ACS Management works) (AECOM, 2016)

3.4 Modification 3 – Tank 101 demolition (SSD-5544 MOD-3)

The works to remove the tank included the following activities:

- Disconnection of the tank from the existing pipework
- Demolition and dismantling of Tank 101 (and associated infrastructure)
- Associated civil works with the works outlined above
- Intermediate storage of the demolished material prior to disposal or recycling
- Returning the works areas to ground level.

The work was undertaken during daytime hours only and was managed as part of the demolition activities in accordance with the DEMP and associated sub-plans where applicable.

Ampol received development consent for the Tank 101 demolition works in November 2017, refer to Figure 3-4. The Tank 101 demolition works were delayed and required an extension of the construction program, which is discussed in Section 3.5 (Modification 4).

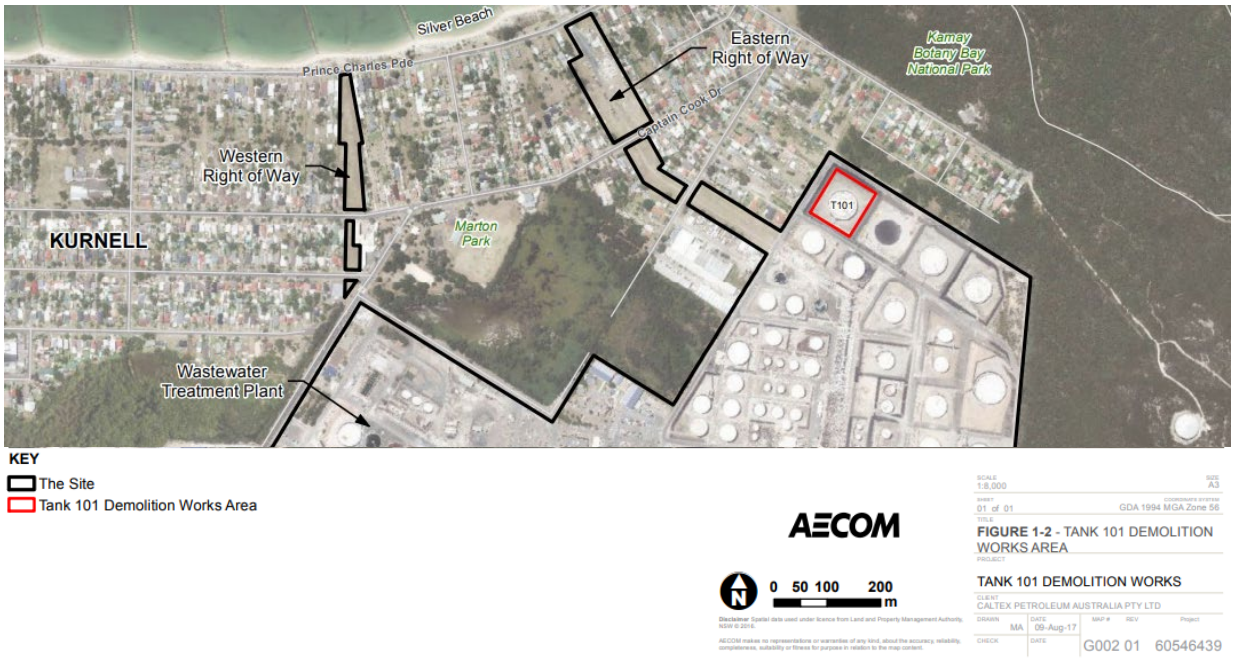

Figure 3-4 MOD-3 (Tank 101 demolition) (AECOM, 2017)

3.5 Modification 4 – Timing of demolition works (SSD-5544 MOD-4)

When operating as a refinery, the Site contained a number of butane assets related to storage, transport, and dosing. These assets were to be demolished and removed as part of the demolition works (SSD-5544 MOD-1). However, following development consent to remove these assets, Ampol initiated a review to see if they could be retained and reused.

After a detailed internal review, Ampol decided that retention and reuse of the butane assets was not a viable option and therefore confirmed that these assets were no longer required. The uncertainty regarding the future butane assets and the confirmation regarding their proposed removal resulted in a delay to demolition works program which required a modification to Condition of Consent B7A of SSD-5544 to enable their permissible removal.

The modification of Condition B7A allowed an extension of the demolition works by 10 months, to June 2019, and accommodated both the demolition of the butane assets as well as the remaining activities consented under MOD-1.

Ampol received development consent for the extension of the construction program for the Tank 101 demolition works in August 2018. The Tank 101 demolition works were completed in line with the updated program.

3.6 Modification 5 – ACS Containment Cell and CWO pipeline (SSD-5544 MOD-5)

This modification involved three main components:

- An increase in the final capacity of the ACS Containment Cell (approved under SSD-5544 MOD-2) from 15,300 cubic metres (m^3) to 22,240 m^3
- An amendment of Condition B7B of the Conditions of Consent (as modified) to extend the duration of ACS management works from 30 April 2019 by six months to 30 November 2019
- An amendment of Condition B16A of the Conditions of Consent to allow for the retention of portions of the CWO pipeline beneath the dune area of Silver Beach where it has been deemed not feasible to remove.

Ampol received development consent for the ACS Containment Cell and CWO pipeline works in July 2019.

3.7 Modification 6 – Extension of the ACS management works period (SSD-5544 MOD-6)

The ACS management works were originally expected to be completed by April 2019 (conditioned under SSD-5544 MOD2). Due to some of the capping works requiring completion by specialist contractors, and delays on another project, the selected contractors could not complete the necessary HDPE liner work by this date requiring works to be extended to November 2019 under SSD-5544 MOD-5.

The remaining civil works to cap the Containment Cell (installing a drainage layer, marker layers, clean soil, and topsoil) could also not be completed by this revised deadline. Ampol proposed to extend the duration of ACS management works from November 2019 to March 2020, which required modification of Condition B7B.

Ampol received development consent for the extension of the construction program for the ACS management works in January 2020. The ACS management works were completed by the agreed date of March 2020.

4.0 Description of the proposed modification

4.1 Introduction

This section provides an overview of the key components of the proposed modification compared to the approved project, a description of the proposed modification works, construction requirements for the modification, and associated ancillary facilities and infrastructure.

4.2 Proposed modification

4.2.1 Key elements of the proposed modification

To support the continued safe, viable, and reliable operation of the Site and to facilitate the future use of the Site, the proposed modification works involve:

- **Stage 1 – Preparation works**: Preparing the Project Area for proposed modification works.
- **Stage 2 – Removal, relocation and/or augmentation of infrastructure**, including:
  - Relocation and/or augmentation of FWS and OWS systems and construction of new operational facilities, including replacement warehouses
  - Decommissioning and removal of non-operational assets, redundant structures and electrical assets.
- **Stage 3 – Remediation**: Addressing legacy ground contamination, including ACS.
- **Stage 4 – Grading**: Landforming the Project Area following removal of infrastructure and ground remediation activities and preparing Zones 2 and 3 for future use.
- **Stage 5 – Demobilisation**: Demobilisation of construction and remediation equipment.

Depending on where different works are required across the Site these stages may be completed sequentially or concurrently.

A summary of project elements requiring modification and how they relate to the approved project is provided in Table 4-1. A detailed description of the works is provided in Sections 4.2.2 to 4.2.6. The proposed modification works would be undertaken within the Project Area shown on Figure 4-1. All activities would adhere to the Kurnell Terminal permit to work system to ensure compliance with environmental and safety protocols.

Table 4-1 Modified project summary table

Stage	Element	Approved project	Modified project
Stage 1	Project Area	Project Area delineation	• Prepare the Project Area for the proposed modification works required under Stages 2, 3 and 4 and exclude other parts of the Site from proposed modification works.
Stage 2	Oily water sewer (OWS)	Maintain location in Zones 2 and 3	• Divert surface water runoff from potentially contaminated areas in Zone 2 to Zone 1 via new OWS interception pits/ lines until Stage 3 remediation is complete. • Divert potential leachate from ACS Containment Cell in Zone 2 to Zone 1 OWS system. • Remove all redundant OWS infrastructure.

Stage	Element	Approved project	Modified project
	Firewater systems (FWS)	Maintain location in Zones 1, 2, and 3	• Augment or remove FWS infrastructure from Zones 2 and 3. • If removed from Zone 2, augment existing FWS in Zone 1 with a new firewater tank and pipework to service the terminal infrastructure. • Locate the new firewater tank and pumphouse within the FWS Relocation Area (specific siting selected during detailed design).
	Electrical assets	Maintain location in Zone 2 and 3	• Remove redundant electrical assets in Zones 2 and 3, including five substations.
	Structures	Maintain location in Zone 2 and 3	• Demolish structures in Zones 2 and 3 (noted in Figure 4-1) • Construct new 'fit for purpose' warehouse and Oil Spill Equipment Storeroom within Zone 1. • Construct new storage shed in Zone 1A.
Stage 3	Remediation	Removal of ACS from pipeways and either containment onsite or offsite disposal	• Remediate land in Zones 2 and 3 as necessary. • Remediate land in Zone 1 where infrastructure is relocated and/ or augmented as necessary. • Conduct remediation to a commercial/ industrial land use under the ASC NEPM (NEPM, 2013).
Stage 4	OWS	Maintain location in Zones 2 and 3	• Disconnect and remove remaining underground OWS lines from Zones 2 and 3, except for lines connecting to the ACS Containment Cell. • Install a new pump adjacent to the ACS Containment Cell. Two site options have been identified (refer to Figure 4-1) (specific siting selected during detailed design).
Stage 4	Grading	Grading following demolition of structures, and removal of infrastructure across the Site and relevant project areas	• Construct new onsite detention (OSD) basins in Zone 3 to attenuate runoff and maintain pre-construction surface water flow rates. • Grade Zone 2 following Stage 2 and Stage 3 activities to manage stormwater and prepare for future land uses. • Grade Zones 1 and 3 as necessary.
Stage 5	Demobilisation	Demobilisation of construction equipment.	• Demobilisation of construction and remediation equipment.

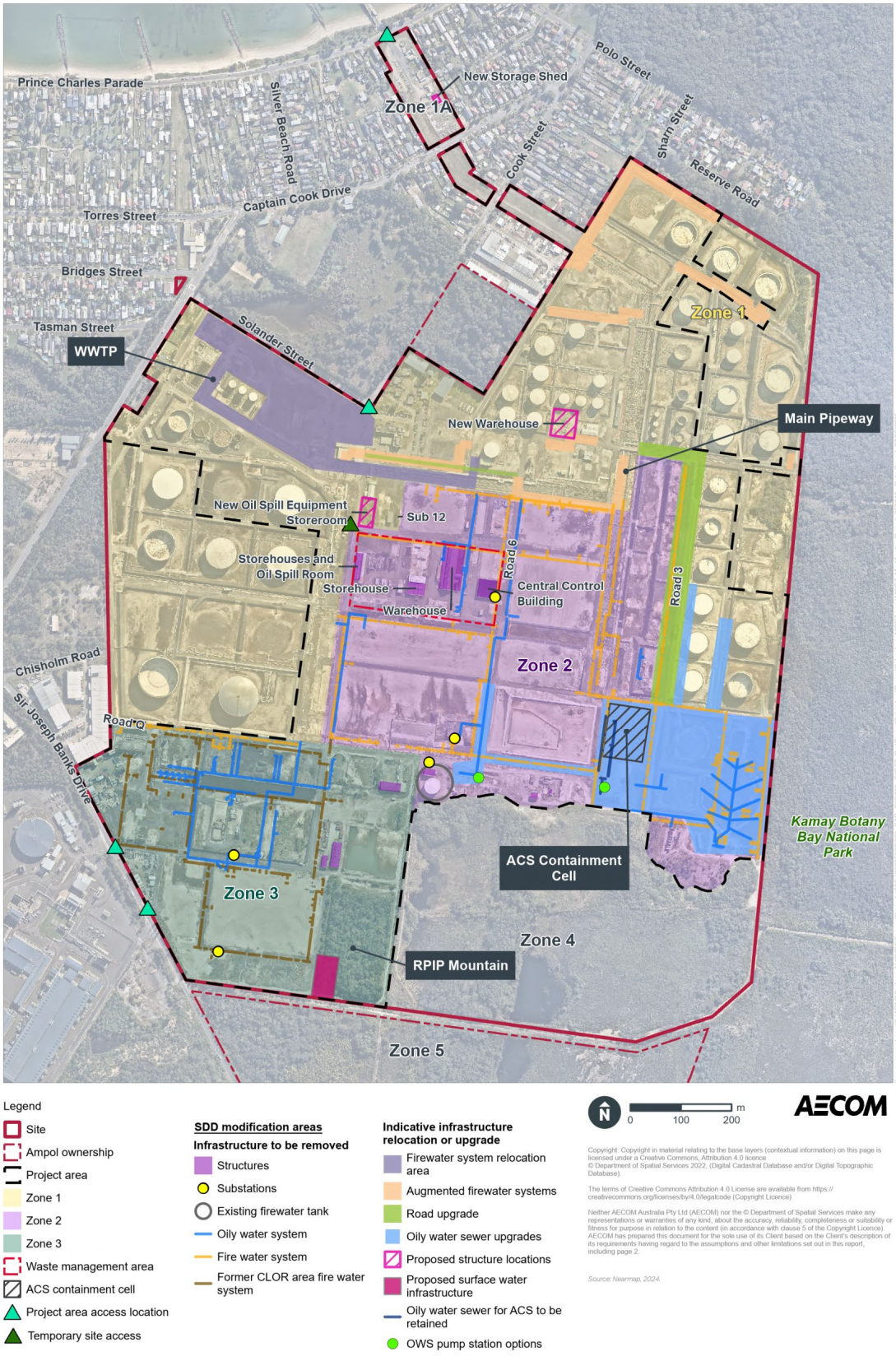

Figure 4-1 Proposed modification

4.2.2 Stage 1 – Preparation works

In order to prepare the relevant parts of the Site for the proposed modification works the following activities would be completed:

- Installation of fencing and signage to separate terminal activities and parts of the Site outside the Project Area from proposed modification works
- Establishment of temporary facilities (e.g. site offices) and parking for construction workers within the Site
- Removal of vegetation, where permitted and required
- Installation of temporary erosion and sediment controls for the proposed modification works
- Establishment of access to services/ utilities
- Service locating would be undertaken across the Project Area to confirm the location and type of active services.

Where necessary, these activities are discussed in more detail below.

Establishment of fencing and signage

Prior to the proposed modification works commencing, cyclone fencing (or suitable equivalent) would be installed where necessary to isolate the Project Area from the terminal operations and vegetated areas to the south. Gates would be installed at appropriate locations (e.g. between Zone 1 and Zone 2), to allow access for contractors and Ampol staff during the modification works and to allow for the movement of staff or emergency services across the Site. This fencing would be used to exclude contractors from certain parts of the Site where modification works are not proposed.

Some parts of Zones 1, 2, and 3 would also be excluded from the Project Area. These exclusion zones would be established to either protect key infrastructure or sensitive land uses (e.g. ACS Containment Cell).

Establishment of temporary facilities and access

A temporary access point (and temporary project office) would be established at the proposed entrance for Zones 2 and 3. The entrance for Zone 2 would be to the south of the existing terminal gatehouse at the border of Zone 1 and Zone 2. The entrance for Zone 3 would be at the existing Site access point off Sir Josephs Banks Drive.

Each entry points would be used at different times during construction depending on the staging and location of work within the Site. It is likely that following temporary facilities would be located close to the entrance being used as the primary access point at any given time:

- First aid office
- Stores
- Personnel decontamination area
- Amenities
- Wheel washing facilities.

Other temporary facilities similar to those listed above may also be located throughout Zones 1, 2 and 3 as needed to allow the proposed modification works to occur.

Zone 1A would be accessed via the existing access point on Prince Charles Parade. A secondary access point is available on Captain Cook Drive for smaller vehicles.

Removal of vegetation

Limited native vegetation is present within the Project Area, and the vegetation that is present is heavily degraded due to historic clearing and current land uses.

Vegetation clearance would occur, where required, to allow for the relocation of infrastructure and remediation.

Establishment of erosion and sediment controls

Erosion and sediment controls would be established, as required, across the Project Area in accordance with 'The Blue Book' *Managing Urban Stormwater - Soils and Construction Volume 1 and 2* (Landcom, 2004). These controls would be checked periodically throughout the delivery of the modification works and if necessary, changed or revised. The objective of the temporary erosion and sediment controls would be to manage sediment and contamination that may be mobilised by surface water flows from the modification works.

Service location

Service locating would be undertaken across the Project Area to confirm the location of and identify active services. If necessary additional service investigations would be completed ahead of ground disturbance works commencing alongside consultation with utility companies and/or Ampol staff.

4.2.3 Stage 2 – Removal, relocation and/or augmentation of infrastructure

Following preparation works, certain structures and infrastructure would either be permanently demolished and removed or reconstructed in Zones 1 and 1A, or augmented. Demolition would involve removal of the above ground elements of the infrastructure first, followed by the removal of at grade and subsurface infrastructure. At grade and subsurface infrastructure would only be removed where required (e.g. concrete slabs may be retained for construction, geotechnical or dust management reasons). Where structures or infrastructure need to be relocated it is likely that new fit for purpose and/or upgraded infrastructure would be provided.

The subsequent sections detail the proposed removal, relocation and/or augmentation works.

Oily water sewer

The purpose of the OWS is to capture, manage, and treat potentially contaminated stormwater and wastewater from the terminal before directing it to the onsite Waste Water Treatment Plant (WWTP) for treatment and subsequent discharge in line with EPL 837. The OWS predominantly services Zone 1 but it also services parts of Zone 2 and Zone 3. In particular the OWS has a connection to the wastewater sump from the ACS Containment Cell.

The proposed modification works include the removal of the OWS (including all pits and pipework) from Zones 2 and 3 except for a connection to the ACS Containment Cell wastewater sump and a diversion line from west of the ACS Containment Cell and along the northern boundary of Zone 2. These works are likely to be undertaken progressively to help manage potential contaminated surface water flows from other Stage 2 works or Stage 3 remediation activities (described further in Section 4.5 (Ancillary facilities and infrastructure). As such, some sections of the OWS in Zones 2 and 3 may only be removed following certain remediation activities (Stage 3).

Prior to the removal of the relevant sections of the OWS from Zones 2 and 3, the surface water flows from areas serviced by this infrastructure would be managed in line with the contamination and erosion risks present. Where the relevant area is still likely to contaminate surface water, this water would either be:

- Intercepted or diverted to the remaining sections on OWS for treatment at the WWTP; or
- Captured/ contained and transported to the WWTP for treatment.

Intercepting or diverting contaminated stormwater flows could include modifying interception infrastructure (such as existing pits, manholes, storages) and the installation of temporary pipes, pits, and pump stations to direct flows towards existing OWS infrastructure.

Where the relevant area is unlikely to result in contaminated surface water (e.g. due to remediation activities being complete), these surface water flows would be redirected to the Site’s existing SWS.

The redirection of 'clean' stormwater flows to alternative infrastructure would allow redundant OWS infrastructure in Zones 2 and 3 to be removed progressively and would help continue to safely manage contaminated run-off from remediation areas (described in Section 4.2.4 (Stage 3 – Remediation)). Following completion of the remediation activities proposed during Stage 3, the land within Zones 2 and 3 would be at a commercial/ industrial standard and would no longer need to be serviced by the OWS. At this time, any remaining OWS infrastructure would be removed from Zones 2 and 3 except for a connection to the ACS Containment Cell wastewater sump and the diversion line from west of the ACS.

A new permanent pump would be installed following disconnection from the existing OWS infrastructure in Zone 2. The pump would operate intermittently, following periods of heavy rainfall, to transfer potentially contaminated stormwater to the OWS system. Two options for the location of the new pump are being considered, with construction limited to one option selected during detailed design.

The pump would be installed in a sealed chamber below the existing ground level, at a minimum water level and therefore permanently submerged. Excavations of approximately 4.5 mbgl would be required, based on a 4 m deep pit, and an additional 0.5 m concrete slab, which would be installed at the base of the pit.

The removal of OWS infrastructure may require excavation work of up to 3 mbgl for removal of below ground pipework and pits. Where complete removal is not feasible due to proximity to existing infrastructure or other considerations (e.g. geotechnical), existing pipes and/or pits would be cleaned, infilled with stabilised sand, cement slurry, or equivalent, and left in-situ.

Once removed, redundant pipes and materials from the OWS would be sent offsite for recycling or disposal based on material type and waste classification.

Firewater systems

The FWS at the Site currently operates via a network of fire hydrants, monitors, fixed and semi-fixed foam systems, and underground and aboveground firewater pipelines running through the Site, as well as a firewater tank and pump system, housed in a pumphouse in the southern part of the Zone 2. Following the removal of refinery infrastructure in Zones 2 and 3, the FWS within these zones is no longer required.

In order to align the FWS with the current terminal footprint, the FWS infrastructure in Zones 2 and 3 would be removed or augmented and, where necessary, replaced or augmented in Zone 1 (as shown in Figure 4-1). These works would include:

- Augmentation or disconnection and removal of the FWS infrastructure in Zones 2 and 3
- If removed in Zone 2, installation of new firewater pipelines, relocated pumps, and the construction of a new 3 megalitre (ML) firewater tank in the FWS Relocation Area in Zone 1
- Augmentation of other FWS infrastructure within Zone 1.

If required, the FWS would be relocated to one of the two siting options (refer to Figure 4-1) within the FWS Relocation Area in Zone 1. Works to relocate the FWS would last approximately eight months. These works would include:

- Excavation to a depth of 1 mbgl and remediation of the ground, where required (in line with the approach set out in Section 4.2.4 – Stage 3 – Remediation)
- Construction of new foundations for the firewater tank, pumps, and pipework
- Construction and installation of the new FWS infrastructure:
    - The new tank would be approximately 12 m in height and 22 m in width and built in accordance with AS 2304-2011 *Standard Water storage tanks for fire protection systems*
    - The pumphouse would be built like-for-like with its existing counterpart, with three adjoining walls of around 5 m in height
    - Existing pumps would be relocated and installed in the new pumphouse.

- Connection of the existing and new firewater infrastructure (including the connection of pipes from the new tank to the main header).

To minimise the downtime of the FWS, new lines would be constructed parallel to the existing lines. The process to connect the new infrastructure with the existing system would occur during a FWS shutdown period, and last approximately two weeks. FWS shutdown periods are planned, permitted, and managed in line with existing terminal procedures.

This modification application is seeking development consent for two siting options for the new FWS infrastructure within the FWS Relocation Area, shown on Figure 4-1. Construction would be limited to one option, selected as part of detailed design. This is discussed further in Section 4.4 (Operation).

Augmentation of existing FWS infrastructure would involve replacement of some of the existing pipes (as shown in Figure 4-1) with pipes of a larger diameter (between 400 to 600 mm diameter). Where these pipes are underground, excavations of up to 1 mbgl would be required to access and replace the infrastructure.

The FWS pipework through Zone 2 would be disconnected and removed. The FWS in Zone 3 has already been disconnected from the main system but has been left in position. The pipes would be removed, and excavations up to 1 mbgl may be required to remove the pipework, footings, and foundations.

Once removed, redundant pipes and materials from the FWS would be sent offsite for recycling or disposal based on material type and waste classification.

Electrical assets

During the closure of the Kurnell Refinery, high voltage electrical substations, power distribution rooms, and electrical infrastructure (such as buried cables) were redesigned to meet the requirements of the terminal. Following an electrical audit, existing substations / switchboard rooms in Zones 2 and 3 have been deemed to be no longer required and are therefore proposed for demolition.

All above-ground redundant electrical assets in Zones 2 and 3 would be decommissioned and removed. Below ground cables would be de-energized and either retained for potential future use or removed in accordance with AS/NZS 3000:2018 *Electrical installations*.

Once removed, redundant electrical cables and materials from the electrical assets would be sent offsite for recycling or disposal based on material type and waste classification.

Structures

A number of buildings and other structures are located within Zones 2 and 3 (Figure 4-1). These include small storage structures and larger buildings such as the storehouse, main warehouse, central control building, and the Oil Spill Room. Many of these buildings are no longer fit for purpose for the terminal and are relatively isolated from the terminal footprint. On this basis, and to facilitate the future use of Zones 2 and 3, Ampol are proposing to remove these structures as part of the proposed modification works.

Each structure proposed for demolition would be demolished to ground level and, where possible, their slab, foundations, and footings removed. The foundations of buildings and structures previously demolished as part of the approved project within Zones 2 and 3 would be also excavated and removed, where they haven't already been removed and where practicable. These activities would require excavation works up to 2 mbgl, depending on depth of footings (generally focused within 1 mbgl).

Once removed, building waste materials from the demolition would be sent offsite for recycling or disposal based on material type and waste classification. Concrete would be crushed within the waste management area and where appropriate, used as backfill during Stages 3 and 4 to reduce the soil deficit and to improve the geotechnical stability of the land. Concrete waste that cannot be used would be taken offsite for sale, recycling or disposal.

A new 'fit for purpose' warehouse would be constructed within Zone 1 to house maintenance supplies and small-scale terminal maintenance activities currently undertaken in part of the oversized existing main warehouse building in Zone 2. This new warehouse would be approximately 32 m by 25 m, with an awning of 35 m by 10 m, and up to 8 m tall. The new warehouse would also include space adjacent

to the structure for semi-trailer parking and an extension of the wet store area of 25 m by 10 m. The proposed location for the new warehouse is to the north of Pipeway A.

A new Oil Spill Equipment Storeroom, approximately 18 m by 14 m and up to 8 m tall, would also be constructed in Zone 1. The location of the new Oil Spill Equipment Storeroom would be adjacent to the existing Firehouse near Substation 12.

A new storage shed would be constructed in Zone 1A to store boats and emergency aquatic spill response kits. This would be approximately 18 m by 14 m and less than 4 m tall.

Construction of the new warehouse, Oil Spill Equipment Storeroom, and storage shed would involve excavation and installation of foundations of up to 1 mbgl, laying a slab, installation and connection to Site utilities, construction of the structure, and internal fit out.

Waste management

Redundant infrastructure would be cleaned, processed, and stored prior to reuse or removal from Site. Infrastructure and waste materials would be tracked in line with a Material Tracking Plan (see measure C5 in the Consolidated Mitigation Measures (Appendix D).

A waste management area for surface and subsurface materials removed (e.g. concrete, metals/ reinforcement bar, drainage lines, electrical equipment) would be established in an area shown on Figure 4-2. Once material is removed or excavated it would be sorted and stockpiled separately in this area prior to processing. The waste management area would remain for the duration of the modification works.

It is estimated that the proposed modification would involve the processing of approximately 40,000 m^3 of concrete predominantly from slabs and asphalt. As described above, concrete would be crushed within the waste management area and where appropriate, used as backfill during Stages 3 and 4 to reduce the soil deficit and to improve the geotechnical stability of the land. Concrete waste that cannot be used would be taken offsite for sale, recycling, or disposal.

Where soils are brought from other sites, the material should be classified as virgin excavated natural material (VENM), excavated natural material (ENM) as defined by the ENM Order, 2014, or material covered under an NSW EPA specific Resource Recovery Order (RRO). The soils would be managed in line with this order as well as a specific Validation Plan, which would outline acceptance criteria, and sampling and analytical requirements. Once material is validated (using the criteria outlined in the Validation Plan), the soil would be reused onsite under an NSW EPA approved Resource Recovery Exemption. The imported fill would be stockpiled and tracked separately to the onsite materials and tested/ validated to confirm they have been remediated for reuse on the Project Area.

Contaminated soils encountered during Stage 2 would be managed in line with the processes outlined in Section 4.2.4 (Stage 3 – Remediation). If contaminated liquids are encountered (for example potentially where pipework is being removed), appropriate containment/ spill mitigation measures would be employed as part of the approved Spill Response Plan (see measure B4 in the Consolidated Mitigation Measures (Appendix D) and the Soils and Water Management Plan (see measure C18). Light non-aqueous phase liquid (LNAPL) and/or impacted water would be directed to the WWTP or contained and disposed offsite by a licensed contractor as discussed below.

4.2.4 Stage 3 – Remediation

Background

Significant soil and groundwater investigations have been conducted on the Site since the 1990s. An Environmental Site Assessment Data Gap Assessment (WSP, 2018) was undertaken to reduce data gaps within the former refinery process unit areas, pipeways of the site and redundant tank bunds. Additional investigations conducted between 2018 and 2023 have been completed to understand the type, location, concentration, depth, volume, and risk associated with contaminants of potential concern (COPC). Primary COPCs in soils and groundwater at the Site comprise the following:

- Asbestos
- Petroleum related hydrocarbons (PHC)
- Per- and polyfluoroalkyl substances (PFAS).

In 2019, Ampol collated the ground investigation works completed to that point and developed the Kurnell Remediation Action Strategy (RAS) (Ampol, 2019), which identified areas of potential ground and groundwater contamination, and provided information on areas identified for remediation with the context of continued terminal use. Since 2019, additional ground investigation and remediation activities have been competed to further define and manage areas impacted by contamination.

Conceptual Remedial Action Plan

A Conceptual RAP (Appendix H) has been prepared to support the proposed modification, and to:

- Provide a summary of historical environmental characterisation studies
- Identify the scope of necessary remedial activities potentially required
- Identify the remedial strategy(ies) to be adopted
- Document the proposed remediation methodology
- Establish validation criteria relevant to the commercial/ industrial land use and detail the validation program as part of a future Validation Sampling and Analysis Quality Plan (SAQP).

The Conceptual RAP has been prepared in accordance with the NSW EPA Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2020). It would be updated to one or a number of Detailed RAPs following further investigations within the Project Area and receipt of relevant conditions of consent for Modification Application SSD-5544 MOD-7. The differences between this version (the Conceptual RAP) and the future final version(s) (the Detailed RAP(s)) are presented in the Conceptual RAP in Appendix H.

The Conceptual RAP has been reviewed by an EPA accredited Site Auditor (Site Auditor). Future Detailed RAP(s) would also be reviewed by an EPA accredited Site Auditor prior to commencement of remedial activities to facilitate future validation of the site and Site Auditor sign-off in the form of a Site Audit Statement and Site Audit Report. Validation requirements are further discussed in the following sections.

The Conceptual RAP outlines management of the remediation works across the Project Area and identifies the remediation approach and proposed remediation technologies to be utilised for the proposed modification works. This is described below.

Remediation approach

Overview

Remediation and/ or management of ground contamination would be required across Zones 2 and 3, and parts of Zone 1, where soil and groundwater quality does not currently meet the commercial/ industrial land use standard, as defined by ASC NEPC (NEPM, 2013).

As part of this proposed modification, where ground disturbance is proposed within Zone 1, contaminated material would be managed in accordance with the terminal's existing OEMP (Ampol, 2021) and Kurnell RAS (Ampol, 2019) and subsequent progress reports, last prepared in November 2023 (Ampol, 2023). Excavation works in Zone 1 would be limited to shallow excavations related to installation of footings and foundations. Excess soil or fill material generated during these works would be categorised and either disposed offsite to landfill (consistent with the OEMP) or potentially incorporated into Zone 2 and 3 remediation activities.

To remediate areas of ground contamination within the Zones 2 and 3 (referred to as 'remediation areas'), contaminated soils would be tested and categorised and either be:

- Excavated (Figure 4-2), and treated onsite for reuse (i.e. through biopiling or stabilisation), or disposed offsite; or
- Managed in situ and capped (Figure 4-3).

The primary technologies that would be used to remediate identified contamination would be based the matrix provided in Table 4-2. A description of the remediation technologies required for the modification works, their indicative location within the Project Area and relevant environmental controls is provided the sections below.

Table 4-2 Remediation options matrix

Contaminant	Excavation and onsite biopiling	Excavation and onsite stabilisation	Capping (in situ management)	Offsite disposal
Asbestos	N/A	N/A	Yes	Yes
Hydrocarbons	Yes	No	Yes	Yes
PFAS	N/A	Yes	Yes	Yes

Where soil in the Project Area has been assessed as not requiring remediation, this is because the soil and groundwater quality either:

- Already meets the commercial/ industrial standard (refer to Appendix H); and/ or
- The remaining contamination impacts either do not pose a risk to human health or the environment or can be managed and mitigated by implementation of existing environmental management procedures for the Site.

Where residual concentrations are assessed to still be present above criteria after soil remediation activities, remediation capping works would be undertaken to address residual impacts.

Two types of capping would be used depending on the types of contamination present:

- Type 1 capping: A soil capping layer underlain by a geotextile marker layer or equivalent highly visible marker to separate contaminated and non-contaminated soils. The primary remediation strategy to address asbestos contamination in soils.
- Type 2 capping: Layers of structural fill, a geotextile separation marker and impermeable HDPE or low permeability layer. Primarily used in areas with residual PFAS and/ or hydrocarbon impacts

Capping works would be undertaken underneath active pipelines, where required, in order to maintain access to pipelines for operational and maintenance purposes.

Key areas requiring either capping to address asbestos and residual PFAS and/ or hydrocarbon impacts have been identified, as per Figure 4-3, which shows the indicative locations where the Type 1 and Type 2 capping may be required across the Project Area. During the remediation works, if the remaining Zone 2 and 3 areas are found to require capping, it is assumed that this would be Type 1 (shown in Figure 4-3 as “contingency”).

Stage 3 (Remediation) would commence concurrently with Stage 2 (Removal and/ or relocation of infrastructure).

Based on the analytical data obtained from previous site investigations, the soil remediation works would be limited to less than 4 mbgl and would be generally focused within 1 mbgl.

For hydrocarbon (PHC), asbestos, and/or PFAS impacted soils, Figure 4-2 shows the approximate areas that would require excavation for either onsite treatment or disposal offsite. As presented in the Conceptual RAP (Appendix H), the volume of hydrocarbon, asbestos and/or PFAS impacted soil that would require excavation and either treatment or offsite disposal has been estimated at 83,000 m^3. This area of contamination may require “chasing” during remediation works, which involves the process of continuing to remove/excavate contamination that extends beyond the initially identified areas. Therefore, for the purpose of the assessment within this Modification Report, an approximate contingency soil volume of 40,600 m^3 (50%) has also been included for assessment (i.e. a total of 123,600 m^3).

To prevent loss of existing flood storage and to avoid offsite flooding impacts, earthworks and capping would be completed in a manner that does not significantly alter existing surface levels. For example, areas requiring up to 300 mm of capping that are within areas of flood storage would need to be initially excavated by 300 mm before the capping occurs. Areas requiring excavation prior to capping are shown on Figure 4-3. Additional excavation (approximately 183,130 m^3 of excavated soil, with 91,565 m^3 contingency) would be required in these areas to allow for the capping layer.

The estimate of 266,130 m^3 (with contingency allowance for 132,165 m^3) is comprised of the following excavation areas, soil volume estimates, and contingency volumes.

Table 4-3 Excavations

Name	Excavation volume (m^3)	Contingency excavation volume (m^3)	Total volume (m^3)
Zone 1 (Infrastructure construction works)	13,000	6,500	19,500
Zone 2 and 3 (OWS removal)	11,800	5,000	16,800
Excavation 1 (PHC)	4,000	2,000	6,000
Excavation 2 (PHC)	15,550	7,775	23,325
Excavation 3 (PHC)	2,450	1,225	3,675
Excavation 4 (PFAS)	10,000	5,000	15,000
Excavation 5 (PFAS)	2,550	1,275	3,825
Asbestos Excavation	23,650	11,825	35,475
Capping Excavation	183,130	91,565	274,695
Total	**266,130**	**132,165**	**398,295**

Once contaminated soils are excavated, soil sampling and analytical testing would occur within the excavations to validate the remaining soil against a pre-determined validation criteria and in accordance with the specific Validation SAQP.

Impacted soils to be treated ex-situ would be excavated and stockpiled based on visual and olfactory evidence, field screening, and laboratory data. Contaminated soils would be stockpiled separately depending on the type and concentrations of contamination present and the remediation technology required within the waste management area.

Where it is not feasible to remediate the soils with the technologies listed above, they would be disposed offsite untreated, and in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014) to an appropriately licensed facility.

Figure 4-2 also shows the indicative locations where the excavated soils would be stored, managed, and treated, which is discussed further in the Biopiling and Stabilisation sections below.

Figure 4-2 Excavation and excavated material management

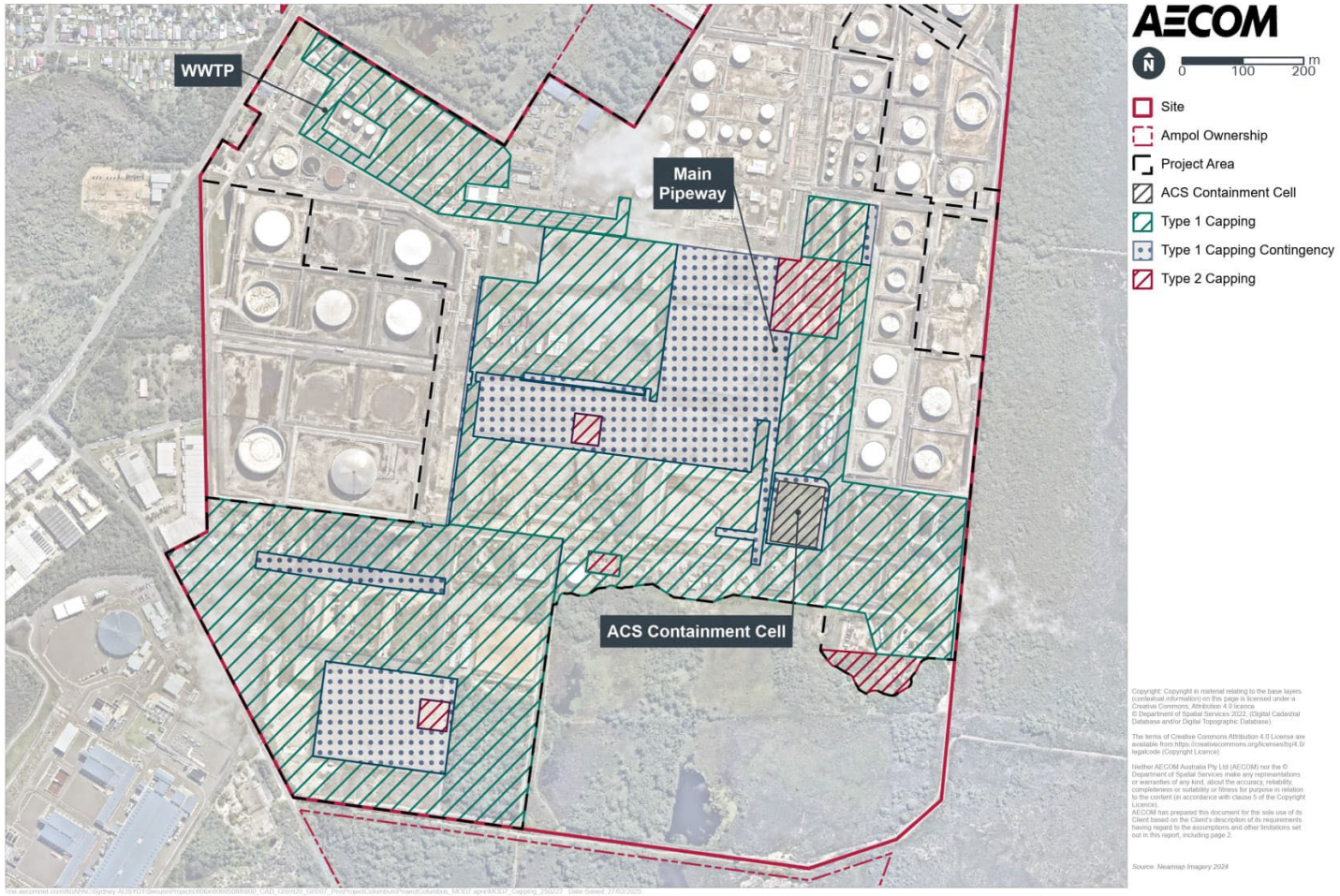

Figure 4-3 Capping areas

Biopiling

Following testing, soils requiring remediation due to hydrocarbon impacts, but not impacted by asbestos or PFAS, would be remediated by biopiling, where practicable. Under normal conditions, naturally occurring bacteria in the ground slowly degrade hydrocarbon contamination to compounds that do not pose a risk to human health or the environment. Biopiling promotes and facilitates this natural process (through the addition of nutrients etc.) expediting the remediation process. Based on ground investigations it is estimated that approximately 10,000 m^3 of hydrocarbon contaminated soil from the Project Area would be remediated by biopiling, however a contingency soil volume of 5,000 m^3 has also been included for this assessment (i.e. a total of 15,000 m^3).

Biopiles would be established within areas shown on Figure 4-2. Prior to setting out the biopiling areas, these areas would be remediated and/or managed (if required) prior to being prepared with a base clay or HDPE liner, where suitable concrete slabs are not present. A compacted sand base would be established over the liner to enable adequate air exchange into the biopile. The soils would be mixed with nutrients or other soil amendments and placed in the biopile area. The biopiles would be covered with an impermeable material to reduce stormwater ingress and dust creation. Measures to minimise the creation of dust and odour emissions during the construction of the biopiles would include:

- Covering surfaces
- Minimising exposed area
- Wetting down exposed soils
- Dust monitoring or observations.

The biopile would be maintained under negative pressure with blowers to mitigate fugitive gas emissions to the atmosphere. Off-gas from the process would be passed through air filters to remove volatile hydrocarbons and regular air monitoring of the air emissions would confirm when exchange of air filters is required. Moisture, temperature, nutrients, oxygen, and pH would be monitored regularly and controlled to enhance biodegradation.

The addition of nutrients/ amendments, compost, microbes, and moisture (as appropriate) to the biopile and the movement of air with a blower through the material would stimulate aerobic microbial activity within the soils and promote the biodegradation of hydrocarbons.

The biopiling base would be graded towards a collection point. Leachate from the biopiles would be sent to the WWTP (via the OWS system) for treatment prior to being discharged in line with the EPL 837.

Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure 4-2). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers.

Regular testing of the soil in the biopiles would occur to confirm when the soil has been remediated to an industrial/ commercial standard. Once the soil is remediated to this standard, the biopiles would be deconstructed and the soil would be reused onsite as backfill or for capping.

Stabilisation

Excavated soils from the former Fire Training Area and small quantities of soil impacted by PFAS from other areas would be disposed offsite; however, should larger volumes of contaminated soil be present in a specific location, or if the concentrations result in the soils being classified as Restricted Soil Waste (RSW) or higher, ex-situ stabilisation maybe required. The decision to either dispose of the contaminated soils offsite or to use stabilisation would be based on a cost benefit analysis.

Stabilisation involves the use of a binding reagent (typically activated carbon) to encapsulate contaminants). To confirm the appropriate approach for soil stabilisation, bench scale trial testing would be undertaken to:

- Confirm the optimal treatment application (i.e. additive ratios)
- Demonstrate longer-term effectiveness of the treatment
- Demonstrate that the treated material has been appropriately stabilised and is suitable to be reinstated into excavations and/or accepted by an appropriately licenced landfill.

Following the completion of the bench scale trial, the results would be confirmed and the full-scale stabilisation works would commence.

Once excavated, PFAS impacted soils would be stockpiled separately to non-contaminated soils and other contaminated soils in the waste management area. Stabilisation works would progress in a sequential manner with progressive validation testing conducted to confirm the remediation objectives have been achieved.

The stabilisation works would require setup of the stabilisation process (preparation and construction of treatment areas) and related environmental controls.

Following set up the stabilisation process involves the thorough mixing of the selected additives into the soil. This would be undertaken in a segregated area as shown in Figure 4-2. This may be achieved using either an excavator fitted with at grid bucket, or mixing plant/ trommel including a feed hopper, mixing apparatus and an additive hopper depending on the volume of soils to be treated and the associated scale of mixing operation required.

Once complete, the treated material would be validated for onsite reuse or classified for offsite disposal.

Capping

Onsite *in-situ* containment by capping would be carried out where soils have residual COPC concentrations that pose a potential risk for direct contact.

Capping would be considered in the areas shown on Figure 4-3. The need for capping in these areas would be confirmed following additional sampling to be conducted as part of the data gap assessment and Detailed RAP(s) planning.

Capping of soil would be conducted sequentially in a staged manner. Following remediation of one area, soils would be validated in accordance with a specific SAQP (further described below). During validation of one area, remediation of the next area would commence, with the first area being clearly marked to avoid potential cross-contamination from other parts of the Project Area. Capping of soil could occur concurrently in different spatial areas where cross-contamination is not a concern.

Two types of capping would be used depending on the types of contamination present. These two capping approaches (Type 1 and Type 2) are described in detail below. Capping thickness would meet the requirements of an industrial/ commercial land use and would be designed to meet the final landform grade. The thickness may be reduced if contaminated materials are situated under building slabs, roadways and other hardstand surfaces.

<u>Type 1 capping</u>

The primary remediation strategy to address asbestos contamination in soils is to cap the contamination by creating a physical barrier that would prevent exposure to asbestos (this is referred to herein as Type 1 capping). It is estimated that approximately 60 ha across Zones 2 and 3 would be capped with a Type 1 capping layer. The Type 1 capping layer would typically comprise a standard 300 mm clean fill cap underlain by a geotextile marker layer to delineate areas which still contain asbestos. Capping thickness would meet the requirements of a industrial/ commercial land use and would be designed to meet the final landform grade (refer to Section 4.2.5 (Stage 4 – Grading)).

A schematic for a typical Type 1 capping layer is shown in Figure 4-4. The precise depth, design and extent of the Type 1 capping across the Project Area would be agreed with the Site Auditor and outlined in the relevant Detailed RAP.

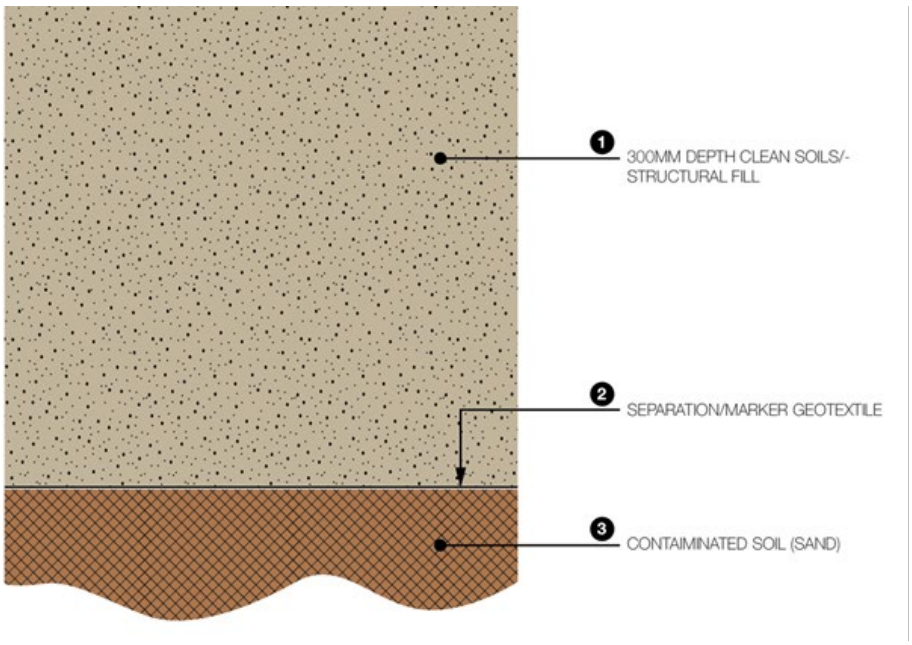

Figure 4-4 Schematic for typical Type 1 capping layer

Type 2 capping

If required, an impermeable cap would also be constructed in areas with residual PFAS and/ or hydrocarbon impacts (Type 2 capping). The Type 2 capping layer has been designed both as a vapour barrier to prevent migration of volatile vapours and also as an impermeable barrier to mitigate further migration of PFAS into groundwater. The typical construction of the Type 2 capping layer would comprise 200 mm structural fill over a geotextile separation marker followed by 100 mm of clean soil/ structural fill followed by protection geofabric and impermeable HDPE or low permeability layer.

A schematic for typical Type 2 capping layer is shown in Figure 4-5. The precise depth, design and extent of the Type 2 capping across the Project Area would be agreed with the Site Auditor and outlined in the relevant Detailed RAP.

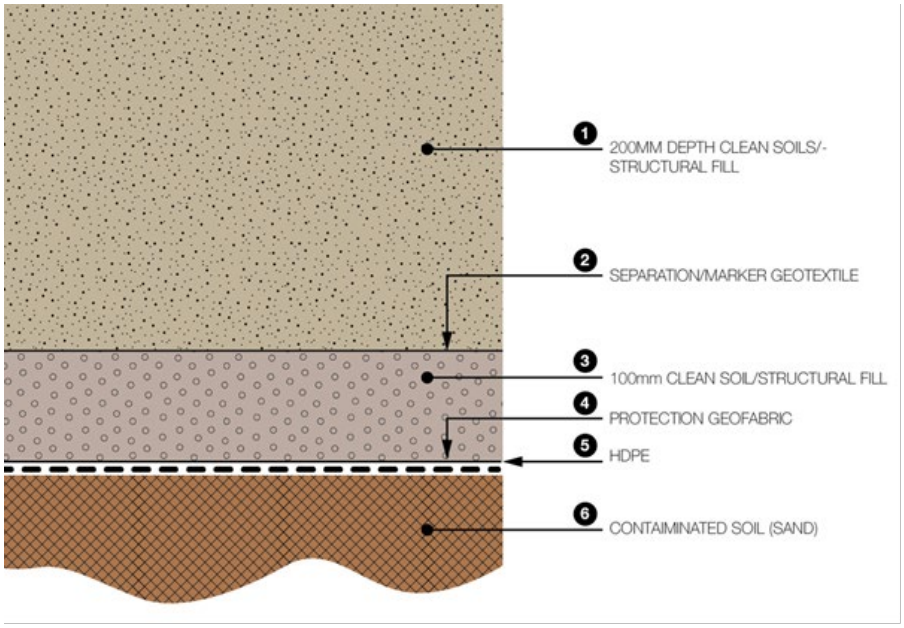

Figure 4-5 Schematic for typical Type 2 capping layer

Offsite disposal (untreated soils)

Where contaminated soils or sludges cannot be treated and reused or managed in situ, they would be disposed offsite to an appropriately licenced facility by licenced contractors. Up to 40,000 m^3 of contaminated soil, fill, or sludge material may require offsite disposal. This untreated material may be petroleum or non-petroleum impacted soils or sludges.

Soils to be disposed offsite would be excavated and transported to a dedicated section of the waste management area for temporary storage or containment (depending on their characteristics). Further testing and waste classification in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014) would be undertaken prior to disposing of these materials offsite.

Groundwater

Based on existing investigations, as presented in the Conceptual RAP (Appendix H), groundwater contaminants are present above commercial/ industrial standard; however, where these residual concentrations are assessed to still be present above criteria after soil remediation activities, remediation capping works would be undertaken to prevent exposure to future commercial/ industrial site users. Furthermore, the groundwater conditions are likely to improve further based on the following:

- **Primary sources**: Various primary sources have been removed previously from Zone 2 and 3, with the majority of remnant subsurface infrastructure (such as below ground pipework) to be removed during the proposed modification.
- **Secondary sources**: Shallow hydrocarbon impacts would be addressed as part of the soil remediation works by the excavation of impacted soils to the extent practicable. As part of these works, impacted water may accumulate in these excavations either from groundwater ingress or stormwater flows. Impacted groundwater in these excavations would be removed, captured, and tested. In the majority of cases, it is expected that this groundwater would be treated through the WWTP, however it may also be disposed offsite if required.
- **Ongoing monitoring**: Following soil remediation, groundwater monitoring would continue to confirm groundwater conditions in the short term. The soil remediation process itself is likely to significantly improve groundwater conditions over the long term, assisted by natural attenuation (this process involves allowing naturally occurring micro-organisms in the ground to biodegrade hydrocarbon contamination).

Active remediation of groundwater is not anticipated to be required; should it be warranted based on a risk assessment, in-situ treatment with injection of chemical oxidants or colloidal carbon would be undertaken.

Following soil remediation, ongoing management of contaminated groundwater would continue to be undertaken. As recommended in the Conceptual RAP, one or more Groundwater Monitoring Plan(s) (GMP) would be prepared for Zones 2 and 3 to confirm residual COPCs in groundwater are being appropriately managed in the Project Area. The GMP(s) would be reviewed and approved by the Site Auditor as part of their review and approval of the final validation report and one or more Environmental Management Plan(s) (EMP).

Validation

Following treatment, soils would be subject to validation testing against a pre-determined validation criteria and in accordance with a specific SAQP. Soils which have been validated to meet the commercial/ industrial standard (including any validated imported materials) would be stockpiled separately from soils requiring remediation.

Validated soils, or validated soils mixed with the crushed concrete, would be placed in excavations as soon as practicable following removal of contaminated soils and subsurface infrastructure.

At the completion of the remediation works, areas used for stockpiling contaminated soils would be validated appropriately in accordance with a specific SAQP. Tracking documentation would be completed for each excavation and stockpile in accordance with the Material Tracking Plan.

Following the completion of the remediation works, one or more (depending on the staging approach for the remediation works) Validation Report(s) would be prepared in accordance with the NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and reviewed and approved by the Site Auditor, confirming that the area(s) are suitable for future commercial/ industrial land uses. The Validation Report may include progressive validation reports for separate portions of the Project Area to enable progressive validation of these areas.

One or more EMP(s) would be prepared for implementation across the Project Area to appropriately manage residual contaminated soil and/ or groundwater impacts that do not meet commercial/ industrial standards. The EMP(s) would include GMP(s), which would detail groundwater monitoring requirements for the Project Area. The EMP(s) would be provided to the Site Auditor for endorsement.

Once the remediation works are complete, Site Audit Statements and Site Audit Reports would be prepared by the Site Auditor in accordance with the *Guidelines for the NSW Site Auditor Scheme* (3rd edition) (NSW EPA, 2017a).

4.2.5 Stage 4 – Grading

Following remediation works, the Project Area would be graded to facilitate the ongoing management of the Kurnell Terminal and/ or future land uses in the western half of Zone 2 and northern part of Zone 3 (refer to Figure 4-6). The levels across the rest of the Project Area would remain the same as existing. Grading would allow stormwater flows across Zones 2 and 3 to be directed to the existing SWS at the Site and for flows in Zone 1 to be managed by either the SWS or the OWS, as required.

Surface treatments, such as grassing or temporary pavement, would be provided to help mitigate soil erosion and limit sediment discharging into the existing drainage network.

The grading works would consist of the following activities:

- Placement and compaction of fill to required levels over remediated surface
- Forming the finished design surface through grading
- If required, placement of an additional surface layer (typically topsoil) and surface treatment (grassing, spray grass or temporary pavement).

4.2.6 Stage 5 – Demobilisation

Demobilisation from the Project Area would include:

- Removal of plant and equipment
- Securing Zones 2 and 3
- Removal of temporary environmental controls and waste management areas
- Removal of offices, temporary structures etc. installed within the Project Area as part of Stage 1.

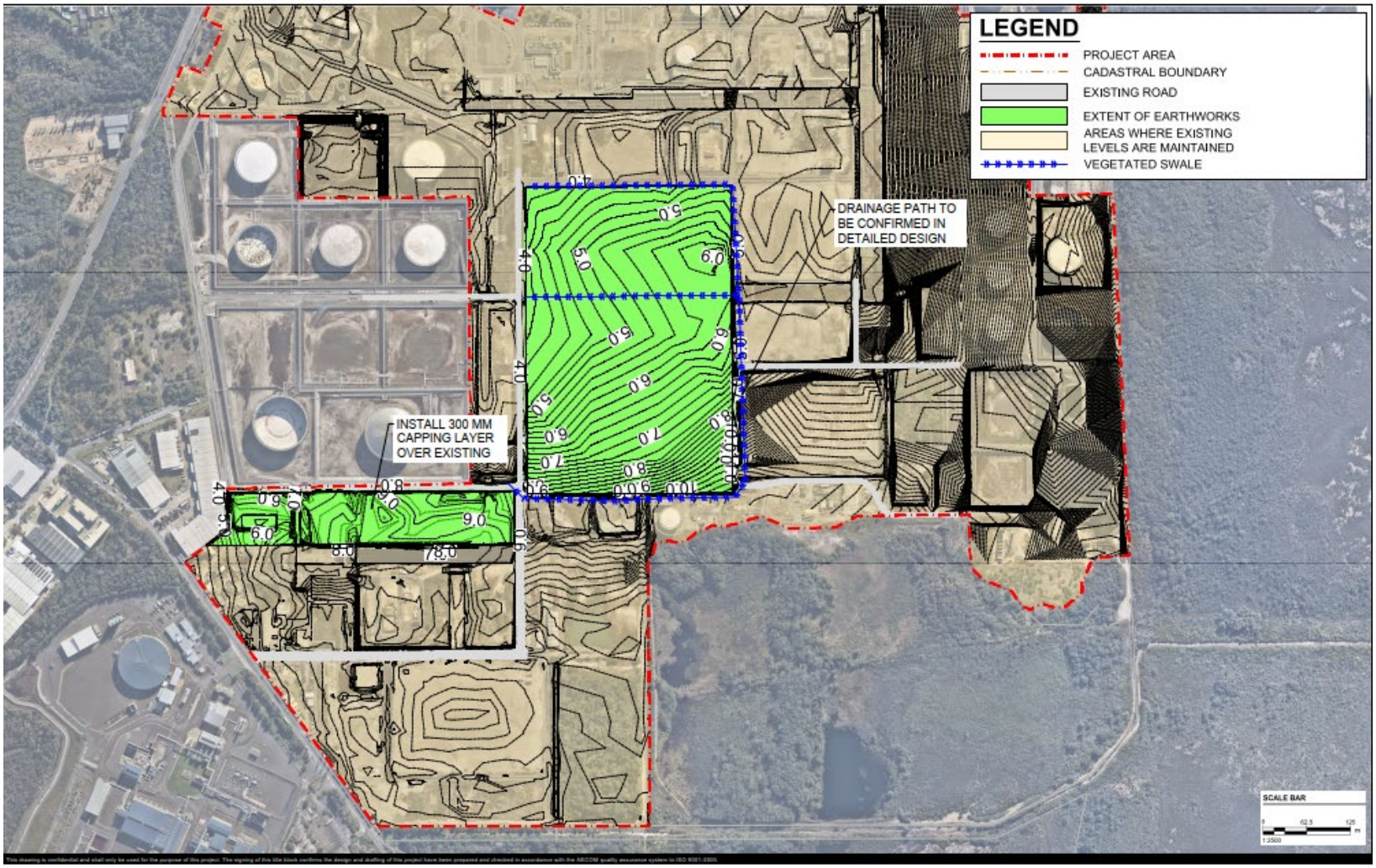

Figure 4-6 Concept landform plan

Note: Levels in AHD

4.3 Construction staging and program

4.3.1 Construction program

Works are planned to commence in August 2025 and would continue for about 12 months for infrastructure removal scopes and up to four years for remediation works in accordance with the schedule in Table 4-4.

Table 4-4 Proposed modification program

Stage	Indicative timeframe
Stage 1 – Preparation works	August 2025
Stage 2 – Removal and/or relocation of infrastructure[1]	August 2025 – August 2026
Stage 3 – Remediation	August 2025 – July 2029
Stage 4 – Grading	Zone 2: August 2026 – December 2026 Zone 3: Up to July 2029
Stage 5 – Demobilisation	September 2026 (for all works except remediation)
[1] Construction in Zone 1A expected to last 3 months.	

4.3.2 Working hours

In line with Condition C18 of SSD-5544, construction works would comply with following hours:

- Monday to Sunday – 7am to 10pm.

High noise generating construction works, including works within the Eastern Right of Way (Zone 1A), would be confined to less sensitive times of the day and not undertaken on Sundays, public holidays, or outside of the hours 7am and 6pm Monday to Saturday (in line with Condition C19).

Construction works outside of the work hours identified above would only be undertaken in the following circumstances (in line with Condition C20):

- Works that are inaudible at nearest sensitive land receivers
- Works that are consistent with Ampol's existing maintenance procedures and are in accordance with EPL 837
- Works agreed to in writing by the EPA or DPHI
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons
- Where it is required in an emergency to avoid the loss of lives, property and/ or to prevent environmental harm.

Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure 4-2). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers.

4.3.3 Construction plant and equipment

The plant and equipment that would be used to deliver the modification works is shown in Table 4-5.

Table 4-5 Indicative plant and equipment

Plant/ equipment	Maximum number required per day (all stages except Stage 3)	Maximum number required per day (Stage 3)
Front end loader	6	6
20 t excavator	6	6
Dump truck	6	6
Grader (up to 7 m blade)	-	4
Large crane (60 t)	4	-
Elevated work platform	6	-
Franna crane (30 t)	6	-
Cement truck	6	-
Bobcat	6	2
Water cart	6	6
Concrete crusher	2	-
Telehandler	6	-
Truck and dog (offsite disposal)	6	6
Truck and dog (imported fill)	-	12
Generator	2	2
Biopiling blower	-	8

4.3.4 Construction traffic

The traffic generated by the proposed modification would incorporate a mix of construction plant vehicles, delivery vehicles, and construction personnel movements that would scale up and down throughout construction. A summary of the construction vehicles and associated staff numbers that would be required during the works is summarised in Table 4-6.

Table 4-6 Workforce and plant requirements for construction

Description		Maximum daily movements (return trips)	Peak hour trips[1]
Heavy vehicles	Construction vehicles (cranes, semi-trailers, etc.)	10	0
	Truck and dog (offsite disposal and imported fill)	120	12
	Equipment/ material delivery vehicles	6	2
	Subtotal	***136***	***14***
Private vehicles	Construction personnel[2]	200	100
Total		**336**	**114**
Heavy vehicle proportion		40%	12%

Description	Maximum daily movements (return trips)	Peak hour trips[1]
[1] *Assumptions:* • *Conservatively, it has been assumed that all personnel would arrive to Site during the AM Peak Hour and depart during the PM Peak Hour* • *Personnel would utilise their own private vehicle with no use of car-pooling or public transport* • *Heavy vehicle movements would be evenly distributed throughout the hours of operation (10-hour workdays during weekdays and 5-hour workdays on Saturdays)* • *All plant delivery vehicles are assumed to occur on the same day in order to produce a 'worst-case' scenario.* [2] *Max number of construction staff (refer to Table 4-7).*		

During the three-month construction period in Zone 1A, the number of heavy vehicles accessing the Site would remain the same, but about three construction vehicles (cranes, semi-trailers, etc.), six truck and dog (off-site disposal and imported fill), and three equipment/ material delivery vehicles return trips would be expected to access Zone 1A. Vehicles to be used for this work will be selected to ensure suitability on the local road network and will not be Oversize and Overmass Vehicles (OSOM).

4.3.5 Workforce

Table 4-7 provides the workforce profile for the proposed modification, including current and projected numbers during construction and operation. The current workforce, including Ampol employees and contractors is approximately.

Table 4-7 Workforce numbers (current and projected)

Type	2025	2026	2027	2028	2029
Ampol employees	30[1]	30	30	30	30
Contractors	100[1]	100	100	100	100
Workforce for the proposed modification	100	25	25	25	25
Total	**230**	**155**	**155**	**155**	**155**
Notes: *1. Current employee numbers at the Site.*					

4.4 Operation

Once the modification works are complete, the Site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for SSD-5544 and the requirements of EPL 837.

Relocated equipment would operate in their new locations as shown on Figure 4-1.

As discussed in Table 4-1, the FWS would be relocated within the FWS Relocation Area in Zone 1, including a new firewater tank and pipework to allow it to service the terminal infrastructure, with specific siting selected during detailed design.

For the purpose of assessment in this Modification Report, two indicative locations have been assessed for the relocation of the FWS, which have been selected based on optioneering completed in the concept design phase in consultation with key stakeholders, including Firewater and Process Safety Subject Matter Experts. The location of each option is shown in Figure 4-7.

Figure 4-7 Relocated FWS – Indicative locations

Operation and maintenance of the relocated FWS would be consistent with existing operations. The FWS would include three diesel engines used to operate FWS pumps housed within an enclosed area. Regular maintenance testing of the pumps would include:

- Operation of all three pumps individually for approximately half an hour once a month
- One annual maintenance test conducted over a two-hour period once per year.

4.5 Ancillary facilities and infrastructure

4.5.1 Electricity

Construction

Electricity would be required for the duration of construction. Coordination would be required between the decommissioning of electrical assets across Zones 2 and 3 and other construction works requiring electricity. To manage this, electricity would be routed from existing substations in Zone 2 and 3, prior to demolition, or from Zone 1 as required for the duration of construction. Following modification works, electricity for terminal operations would be supplied by substations in Zone 1.

Construction works would use electricity from within the Site, with the exception of Stage 3 biopiling works, which would require generators.

Operational

As noted in Section 4.2.3 (Stage 2 – Removal and/or relocation of infrastructure), both above and below ground electrical infrastructure were retained at the Site during the original Kurnell Refinery Conversion works. Given Ampol's intent to consolidate site operations, no electrical infrastructure would be required in Zones 2 and 3 once the modification works are complete.

4.5.2 Water, stormwater, and wastewater management

Construction

The Site includes seven main stormwater sub-catchments. An underground pipe network and above ground open drains are present throughout the Site. Stormwater and wastewater from the Site are currently managed through the SWS and the OWS respectively.

Stormwater from the Site, inflows, and runoff generally flows from east to the west, with the higher point close to Kamay Botany Bay National Park. Key Site stormwater outlets include Quibray Bay, Botany Bay, and Marton Park Wetland. Modification works are not proposed to the SWS, except where required for remediation as discussed below. Modification works to the OWS are detailed in Section 4.2.3 (Stage 2 – Removal and/or relocation of infrastructure).

During the remediation works, the existing surface water management system (pipeways and box drains) would continue to operate.

As the remediation progresses, the stormwater and wastewater systems would be progressively isolated where remediation works are occurring, with excavation pits being bunded temporarily to minimise the impact on surface water from contact with contaminated soils. Stormwater would be diverted around the work areas using temporary drainage channels. Surface water runoff would continue to follow existing drainage patterns, unless temporary diversion from active remediation areas is warranted.

The approach to managing water within remediation areas and disturbed areas is as follows:

- Minimise the volume of potentially contaminated water during construction of the proposed modification wherever possible by directing surface water away from excavations, depressions, pits, and stockpiles by the construction of drainage works such as bunds and diversion drains. These measures would minimise the flow of surface water into parts of the Project Area that contain potentially contaminated materials
- Capturing uncontaminated surface water where possible and using it during the works for various activities, e.g. dust suppression, wheel washing, etc. To assist in the collection of surface water, a temporary sediment basin may be constructed in a suitable location to be determined during detailed design
- Capturing potentially contaminated water (e.g. in bunded remediation areas) and directing it to the WWTP, if appropriate, or disposing of it at an appropriately licensed facility.

The generation of impacted surface water would be minimised by:

- Covering biopiles and contaminated soil stockpiles to reduce the amount of contaminated water produced
- Completing the remediation in a staged manner so as to minimise the extent of excavations at any one time that could collect water and require dewatering and treatment at the WWTP.

Liquids and water that is produced or collected during the works would be directed through the existing OWS system and, where possible, to the WWTP. If it is not practical for the liquids and water to be sent via this system, it would be collected (e.g. in a tanker, vacuum truck) and be transported to the WWTP for subsequent treatment and discharge in line with EPL 837, or taken offsite for disposal at appropriately licensed facility. Accumulated groundwater in excavated areas would be tested to confirm that it can be appropriately treated in the WWTP.

Operational

Stormwater generated on the Site would continue to be collected in the SWS from areas that have been designated as having low risk of interaction with petroleum products. Stormwater would continue to be discharged offsite into the three receiving water bodies: Quibray Bay, Botany Bay, and Marton Park Wetland.

Where disconnection and removal of OWS is proposed, controls to limit peak discharge and ensure appropriate water quality is achieved would be put in place once areas have been remediated, stabilised and disconnected from the OWS system. Runoff from catchments within Zone 2 are partially managed by pumps and splitter pits to only allow clean water to be discharged and the peak flow rate to be controlled. This system would continue to operate post remediation such that no additional infrastructure is required for Zone 2.

Two additional detention basins are required to manage Zone 3 discharges: one would be located within existing pipeway infrastructure, and one would require construction of a new temporary detention basin/ swale within Zone 3 (refer to Figure 4-1).

Sediment control measures would be required until remediated areas are stabilised. Short term monitoring would likely be required to confirm that these areas are functioning as expected.

Where water may have been impacted by petroleum products, the OWS would continue to handle this water. This water is treated at the WWTP prior to being discharged to the Tasman Sea under EPL 837.

4.5.3 Sewers

Sewerage management would continue to operate as described in the Kurnell Refinery Conversion EIS (URS, 2013) and would be consistent with the development consent for the approved project.

4.5.4 Road access

Road access arrangements would continue to operate as described in the Kurnell Refinery Conversion EIS (URS, 2013) and would be consistent with the development consent for the approved project.

Access to Zone 1A would continue to be primarily from Prince Charles Parade. A secondary access point is available on Captain Cook Drive for smaller vehicles.

4.6 Environmental management

4.6.1 Construction

The current operations at the terminal are managed under the Operational Environmental Management Plan (OEMP) Kurnell Terminal, Final Stage 2 (Ampol, 2021) (as approved by DPE, now DPHI). This OEMP helps Ampol comply with its requirements under the development consent for the Kurnell Terminal (SSD-5544), EPL 837, and the MHF licence for the terminal. This is the primary document that informs how the Site identifies and provides management solutions for potential environmental impacts arising from terminal operations.

In order to maintain compliance with relevant legislative and regulatory requirements, Ampol also implements an Environmental Management System (EMS). The EMS consists of a suite of internal policy documents and plans. The EMS is overseen by a dedicated member of the Ampol Environment Team.

Appendix D (Consolidated mitigation measures) presents the consolidated list of measures that would assist in avoiding, mitigating, or managing the anticipated impacts associated with the proposed modification works. These measures would be incorporated into the modified conditions of consent for the proposed modification and, during construction, would be implemented through a Construction Environment Management Plan (CEMP).

The CEMP would cover all environmental matters associated with the construction of the proposed modification and would include the mitigation measures and controls identified in Sections 7.2 (Hazards and risk) to 7.13 (Cumulative impacts).

The CEMP would help ensure that:

- All work complies with all relevant environmental legislation, regulations, and standards
- Environmental factors are taken into account for each activity
- Maintenance of environmental compliance and performance is achieved through ongoing environmental monitoring and reporting
- Regular audits are performed to confirm compliance with environmental policies and standards.

As discussed in Section 4.2.4 (Stage 3 – Remediation) and the Conceptual RAP (Appendix G), Detailed RAP(s) would be prepared separately to the CEMP, prior to the commencement of remediation.

Workforce safety would continue to be managed onsite in line with the measures and procedures outlined in the existing Work Health and Safety Management Plan (WHSMP) for the Site, as updated for the modification works.

4.6.2 Operation

The OEMP would continue to be active for the proposed modification following construction. Updates required to address issues identified as part of this Modification Report are presented in Appendix D (Consolidated mitigation measures).

4.7 Conditions of consent to be modified

A list of conditions of consent from SSD-5544 (as modified) to be amended as a result of this modification application is provided in Appendix E.

5.0 Statutory context

This section reviews the permissibility of the proposed modification under the EP&A Act. A detailed review of key State and Commonwealth legislation, as well as State, regional, and local planning policies that apply to the proposed modification is provided in Appendix B.

5.1 Environmental Planning and Assessment Act 1979

5.1.1 Permissibility

Ampol is seeking approval to modify the approved project (SSD-5544) under Division 4.9, Part 4 of the EP&A Act.

As the proposed modification involves works that would result in greater than a minimal environmental impact on environmental matters such as soils, contamination and groundwater, biodiversity and noise, Section 4.55(2) of the EP&A Act applies.

The proposed modification is substantially the same development as the approved project in that:

- The proposed modification is considered to be a continuation of the approved project, which aimed to convert the Kurnell Refinery to a "Finish Product Terminal." The primary function and purpose of the Site to operate as a finished product fuel terminal would be supported by works associated with the proposed modification.
- The objective of the approved project was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*." The proposed modification works would meet this objective by removing redundant infrastructure and relocating and updating new operational infrastructure within a more manageable and focused operational terminal area. These works would reduce the commercial burden of managing redundant or aging terminal infrastructure and allow key infrastructure to be maintained for site safety purposes.

On this basis, Ampol is seeking to modify the development consent for SSD-5544, pursuant to Section 4.55(2) of the EP&A Act.

Details of how the proposed modification complies with provisions of Section 4.55(2) of the EP&A Act is provided in the Appendix B.

5.1.2 Matters for consideration

Section 4.55(3) of the EP&A Act states that a modification application must address the relevant matters of consideration listed under Section 4.15(1) of the EP&A Act. In response, Table 5-1 identifies each matter of consideration listed under Section 4.15(1) of the EP&A Act and the document reference where each matter is addressed.

Table 5-1 Matters for consideration under Section 4.15(1) of the EP&A Act

Section 4.15(1) requirement	Reference
The provisions of any of the following that apply to the land to which the development application relates	
Any environmental planning instrument	Sections 5.2 (State Environmental Planning Policies) and 5.3 (Local Environmental Plan)
Any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	Section 5.5 (Draft Environmental Planning Instruments)
Any development control plan	Not applicable

Section 4.15(1) requirement	Reference
Any planning agreement that has been entered into under Section 7.4, or any draft planning agreement that a developer has offered to enter into under Section 7.4	Section 5.1.2 (Matters for consideration)
The regulations (to the extent that they prescribe matters for the purposes of this paragraph)	Section 5.1 (EP&A Act)
The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	Section 7.0 (Assessment of impacts)
The suitability of the site for the development	Section 8.0 (Justification of the modification)
Any submissions made in accordance with this Act or the regulations	Section 8.0 (Justification of the modification)
The public interest	

Planning agreements

As noted in Table 5-1, Section 4.15(1)(a)(iiia) of the EP&A Act requires the consent authority to consider:

Any planning agreement that has been entered into under Section 7.4, or any draft planning agreement that a developer has offered to enter under Section 7.4.

At the time of lodgement of this modification application there were no planning agreements that are relevant to the proposed modification that should be considered as part of this modification.

Submissions

As noted in Table 5-1, Section 4.15(1)(d) of the EP&A Act requires the consent authority to consider:

Any submissions made in accordance with this Act or the regulations.

Submissions received as a result of this modification would be considered and responded to appropriately.

5.2 State Environmental Planning Policies

The following SEPPs are considered relevant to the proposed modification or the land to which it relates:

- *State Environment Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP)
- *State Environment Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP)
- *State Environment Planning Policy* (*Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP).

These SEPPs and their requirements are Table B-9-3 addressed in Table B-9-3 within Appendix B.

5.3 Local Environmental Plan

The Project Area is located in the Sutherland Shire LGA and therefore the planning controls contained in the Sutherland Shire LEP 2015 are relevant. The LEP aims to make local environmental planning provisions for land in Sutherland Shire in accordance with the relevant standard environmental planning instrument under Section 3.20 of the EP&A Act.

The Site and Project Area are located on land that is zoned is zoned *E5 Heavy Industrial* (Figure B-2). The objectives of the *E5 Heavy Industrial* land use zone under the LEP are:

- *To provide areas for industries that need to be separated from other land uses*
- *To ensure the efficient and viable use of land for industrial uses*
- *To minimise any adverse effect of industry on other land uses*
- *To encourage employment opportunities.*

Under the land use definitions provided in the 'Dictionary' of the LEP, the proposed modification would be considered supporting development for the Kurnell Terminal, a 'liquid fuel depot,' which is classed as a 'heavy industrial storage establishment.' 'Liquid fuel depots' and 'heavy industrial storage establishments' are not specifically mentioned in the LEP as land uses that are either permitted without consent, permitted with consent, or prohibited under *E5 Heavy Industrial*. However, the land uses listed under 'permitted with consent' include "*Any other development not specified in item 2 (permitted without consent) or 4 (prohibited)*." Additionally, permissibility for the proposed modification is achieved through Section 4.55(2) of the EP&A Act (Sections 1.4 and 5.1.1).

The LEP aims to promote an appropriate balance of development and management of the environment that would be ecologically sustainable, socially equitable and economically viable. As discussed in Section 8.0, the proposed modification is consistent with the principles or ecologically sustainable development.

A number of principal development standards and local provisions under the LEP have been considered. A discussion of these provisions and the relevance to the proposed modification is provided in Table B-9-4 within Appendix B. The review found that the proposed modification is compliant with the principal development standards and local provisions of the LEP.

5.4 Commonwealth legislation

Relevant Commonwealth legislation for the proposed modification includes:

- *Airports Act 1996* (Airports Act) and *Airports (Protection of Airspace) Regulations 1996* (Protection of Airspace Regulation)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Native Title Act 1993* (Native Title Act).

The proposed modification's compliance with the above legislation is discussed in Appendix B.

A review the potential impacts of the proposed modification on nearby Maters of National Environmental Significance (MNES) has been undertaken and found that construction and operation of the proposed modification would be unlikely to result in a significant direct or indirect adverse impact on MNES. As such the proposed modification does not constitute as a controlled action (refer to Appendix B for further detail).

5.5 Draft Environmental Planning Instruments

Section 4.15(1)(a)(ii) of the EP&A Act requires the consent authority to consider:

"Any proposed instrument that is or has been the subject of public consultation under the [EP&A] Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved."

At the time of lodgement of this modification application, there were no draft environmental planning instruments that are relevant to the proposed modification that should be considered as part of this modification.

6.0 Engagement

Ampol is focused on having a positive impact on the communities and economies in which they operate, including playing a leading role in Australia's energy transition. Ampol have and will continue to consider the local community needs, as well as the value of the unique environment and cultural significance of Kurnell during the design, assessment and development of the proposed modification.

As the proposed modification progresses, Ampol will engage and share information with stakeholders and the Kurnell community about the proposed modification through various forums and provide opportunities for the community to submit feedback and ask questions to help inform Ampol's decisions.

Ampol is considering options for the future use of the Zone 2 and 3 within the Site. The future use of these zones would be subject to separate approval processes. Consultation on the future use options has been undertaken in tandem with the consultation undertaken for the proposed modification to provide the public and regulators with an understanding of the future vision for Zone 2 and 3. However, only responses relating to the proposed modification (i.e. infrastructure modifications, remediation, and limited grading works) have been considered in this Modification Report. Consultation for future use options will continue during their development.

This section documents the community and stakeholder engagement effort for the proposed modification.

6.1 Methodology

A Community and Stakeholder Engagement Plan (CSEP) has been prepared for the wider Kurnell Land Development Project, which includes the proposed modification. The CSEP outlines the stakeholders, engagement risks and mitigation measures, tools and activities to implement a streamlined engagement approach for the proposed modification as well as the potential future land uses at the Site.

Th CSEP aims to achieve the following engagement objectives:

- Communicate Ampol's strategy and vision for the future of the Site to stakeholders and bring stakeholders and the community on the Ampol "journey"
- Gain community acceptance for Ampol's strategy and overall transition of the Site by including the community and stakeholders in the decision making-process where appropriate
- Achieve good social outcomes by hearing, understanding, and responding to community and stakeholder feedback
- Put in place tools and tracking to allow consultation for each development is continuously building on previous understanding of stakeholder issues, values, and perceptions
- Streamline communication and engagement activities for the Site, where possible, to reduce consultation fatigue and confusion
- Maintain and enhance Ampol's reputation as a "good neighbour" in the community and amongst stakeholders.

6.2 Consultation undertaken to date

Ampol maintains an open dialogue between the personnel responsible for the Site and those residents with whom it shares the Kurnell Peninsula. Community meetings, announcements and feedback sessions with the residents are part of the ongoing consultation process.

Consultation on the proposed modification has included liaison with Government agencies including DPHI, EPA, Sutherland Shire Council (Council), and SafeWork NSW.

A summary of consultation undertaken with agency and community stakeholders is outlined in Table 6-1. Where relevant, a cross reference to where the issue has been addressed in the Modification Report is also provided.

Table 6-1 Stakeholder engagement

Department	Engagement method	Date	Comments and issues identified	Where addressed in Modification Report
NSW DPHI	Scoping letter	April 2024	Letter issued to DPHI, providing an overview of the Project Area, proposed modification works, permissibility, and environmental assessment scope. Identified the key issues to be assessed in the Modification Report. Invited DPHI to attend a meeting to discuss the proposed modification.	-
	Kurnell Land Development Consultation Meeting	May 2024	Ampol facilitated a discussion with DPHI related to the strategic direction for the Site, an overview of the Site, proposed modification works, permissibility, and consultation strategy. DPHI noted the approach and requested that the following items be addressed in the Modification Report:	-
			• Ongoing management of the ACS Containment Cell	Section 4.0 (Description of the proposed modification) Conceptual RAP (Appendix H)
			• That a risk assessment should be conducted for the proposed modification	Preliminary Hazard Analysis (Appendix F) and summarised in Section 7.2
			• Proximity of warehouse uses	Preliminary Hazard Analysis (Appendix F) and summarised in Section 7.2
			• Justification that the works can be progressed as a modification application	Section 5.1.1 (Permissibility) Appendix B (Statutory context)
			• That Ampol should consult with the EPA, Safework NSW, and Sutherland Shire Council.	Refer to Table 6-1 (Stakeholder engagement)
	Pre-lodgement meeting	February 2025	Ampol facilitated a discussion with DPHI to provide a summary of the proposed modification, the Modification Report, and findings of the technical assessments. DPHI did not have any comments regarding the proposed modification.	-

Department	Engagement method	Date	Comments and issues identified	Where addressed in Modification Report
Sutherland Shire Council	Kurnell Land Development Consultation Meeting	February 2024 April 2024 June 2024 January 2025 March 2025	Ampol has facilitated multiple discussions with Council, including a site inspection at the Kurnell Terminal to provide an overview of the Site, discuss the strategic direction for the Site, the proposed modification works, permissibility, and consultation strategy. During these meetings, Council was supportive of the modification approach. Questions received from Council related to the overall Site strategy, future uses of the Site, and remediation associated with the proposed modification, as well as ongoing operational of the terminal.	Section 4.0 (Description of the proposed modification)
			The inspection in June 2024 included a review of the remediation approach with Ampol's appointed independent auditor in attendance.	Conceptual RAP (Appendix H)
NSW Environment Protection Authority (EPA)	Kurnell Land Development Consultation Meeting	July 2024	Ampol facilitated a discussion with the EPA and discussed the strategic direction for the Site, an overview of the Site, proposed modification works and permissibility and consultation strategy. The EPA did not raise any issues or concerns with the proposed modification. They raised questions related to the overall Site strategy, future uses of the Site, and remediation associated with the proposed modification.	Conceptual RAP (Appendix H)
	Site inspection	August 2024	The EPA attended Site to discuss infrastructure relocation, remediation, and the future use of the Site. The EPA did not raise additional issues or concerns but referenced the Kurnell Stormwater Separation Improvement Project, which has been considered as part of the proposed modification.	Surface water, wastewater and flooding report (Appendix I) and summarised in Section 7.4

Department	Engagement method	Date	Comments and issues identified	Where addressed in Modification Report
	Kurnell Land Development Consultation Meeting	March 2025	Ampol facilitated a meeting with the EPA to provide an overview of the key findings of the impact assessment. The EPA asked about soils, groundwater and contamination, noise and vibration exceedances, and air quality impacts from the FWS relocation.	Soils, groundwater, and contamination report (Appendix G) and summarised in Section 7.3 Noise and vibration impact assessment (Appendix M) and summarised in Section 7.8 Air quality impact assessment (Appendix N) and summarised in Section 7.10
			The EPA also asked whether a greenhouse gas assessment had been completed.	Section 7.1.1 (Environmental matters)
SafeWork NSW	Kurnell Land Development Consultation Meeting	May 2024	Ampol facilitated a meeting with SafeWork NSW. Ampol provided details of the Kurnell Land Use Safety Study, strategic direction for the Site, the proposed modification works, permissibility, and consultation strategy. SafeWork NSW noted that it would like to focus on finalising the Major Hazard Facility Licence. Ampol meets with SafeWork regularly to discuss the current evaluation of the Kurnell Safety Case being conducted by SafeWork NSW.	Preliminary Hazard Analysis (Appendix F) and summarised in Section 7.2
	Kurnell Land Development Consultation Meeting	September 2024	SafeWork specifically requested information in relation to Ampol's process safety team involvement, how the modification may impact current operations, and the proposed firewater system relocation.	Preliminary Hazard Analysis (Appendix F) and summarised in Section 7.2

Department	Engagement method	Date	Comments and issues identified	Where addressed in Modification Report
Kurnell Community	A regular community newsletter available online, distributed by email and letterbox drop to residents of Kurnell.	18 April 2024 18 October 2024 February 2025	Ampol provides updates on operations at the terminal including upgrades or work being undertaken, proposed developments at the Site, and what Ampol has being doing in the community. The proposed modification works were discussed in the April and October 2024 newsletters. No direct feedback was received on the proposed modification.	-
	Community hotline: 1800 719 669.	Ongoing	No direct feedback was received on the proposed modification.	-
	Email: community@ampol.com.au.	Ongoing	No direct feedback was received on the proposed modification.	-
	An opt-in community notification platform for emergencies or major incidents	Ongoing	No direct feedback was received on the proposed modification.	-

6.3 Future consultation

Ampol would continue to engage with regulators and the community as part of the modification application process. If the proposed modification is consented, Ampol would continue to engage with the relevant stakeholders.

7.0 Assessment of impacts

This modification report summarises and documents a range of environmental assessments relevant to the proposed modification. These assessments identify potential environmental impacts that may result from the modification works and identify measures to manage or mitigate these impacts as appropriate. A scoping assessment was undertaken to confirm the appropriate level of assessment required for each environmental matter. The key considerations for the scoping assessment are outlined below.

This section also outlines the consistent approach used in Sections 7.2 to 7.11 to discuss and present the outcomes of the relevant environmental assessments.

7.1 Environmental scoping assessment

The identification of existing constraints, potential impacts, and confirmation of appropriate assessment methodologies was determined through a scoping assessment. The scoping assessment for the proposed modification works was based on:

- A review of available information and documents relating to the existing environment, including consideration of local receptors, based on the existing Site and regional context (Section 2.1)
- Site visits, investigations and appraisals
- Consultation with agencies, community groups, and other stakeholders (Section 6.0)
- A review of relevant legislation and planning policy (Section 5.0), and identification of the sensitivities of the local environment (Section 2.1)
- A review of the characteristics of the proposed modification (Section 4.0) and how they relate to the approved project (Section 3.0)
- An identification of other projects or actions that may cumulatively add to a perceived impact from the proposed modification (Section 7.13).

7.1.1 Environmental matters

The environmental matters considered relevant for the assessment of the proposed modification are presented in Table 7-1. The high-level scoping assessment categorised each relevant matter as either a ‘Key issue,’ ‘Moderate issue,’ or ‘Other issue’ based on the sensitivity of the surrounding environment and the nature of the proposed works. The assessment of key and moderate issues has been documented in an appended technical report. All other matters are assessed qualitatively within this report.

Table 7-1 Environmental matters

Key assessment issue	Moderate issue	Other matters
Hazards and risk	Aboriginal cultural heritage	Waste
Soils, groundwater, and contamination	Traffic and transport	Landscape and visual
Surface water, wastewater, and flooding	Social	-
Historic heritage	Air quality	-
Noise and vibration	Biodiversity	-

The assessment of these matters are presented in Sections 7.2 (Hazards and risk) to 7.13 (Cumulative impacts).

During the discussion with the EPA in March 2025, Ampol were asked whether a greenhouse gas (GHG) assessment had been completed. A GHG assessment was not considered necessary as most of the infrastructure to be constructed as part of the proposed modification would replace older infrastructure, as either a like-for-like replacement, or would be a newer model and more fuel and energy efficient. As such, any change in GHG emissions would be negligible. Therefore, completion of a GHG assessment would be disproportionate with the expected level of impact and has not been included in this Modification Report.

7.1.2 Format of the assessment chapters

A common format has been adopted for reporting each of the assessment sections of the Modification Report (Sections 7.2 to 7.12). This is outlined below.

Section 7.13 (Cumulative impacts) also utilised this common format, excluding the existing environment section as existing baseline conditions have already been well-established earlier in the Modification Report.

Introduction

This section provides an overview of the environmental matter under consideration. It also provides cross-reference to the technical assessments or relevant appendices that have been used to inform the assessment chapter.

Methodology

This section summarises the methodology for:

- Determining the existing environment relevant to the particular environmental matter
- Conducting an assessment of the potential impacts of the modification works in relation to the particular environmental matter.

Assessments can either be quantitative (relying on criteria, standards, and thresholds) or qualitative (using certain scientific material, but ultimately making decisions based on professional judgement).

Existing environment

This section describes the key components, characteristics, and the status of the existing environment within the study area relevant to the environmental matter. Where a study area is not stated, the Project Area is the study area. It also considers changes to the existing environment over the period of time that the modification works would take place.

As the proposed modification is a modification to the approved project, the existing environment also considers the influence of the approved project and other surrounding existing operations or activities on the existing environment.

Key receptors for each assessment will be identified and described in this section.

Impact assessment

This section identifies potential impacts of the construction and operation of the proposed modification to sensitive receptors for the particular environmental matter.

Impacts can be considered:

- Direct or indirect
- Adverse or beneficial
- Significant, non-significant or neutral.

Management measures

This section described the management and mitigation measures that have been identified to avoid, reduce, or compensate for the effects of impacts on the environment.

Mitigation measures presented for the proposed modification are based on those approved for the approved project. Where the assessment identifies the need for additional or revisions to those presented in the approved SSD-5544 (as modified), these changes are presented in the management measure section of each environmental matter. Additional and/ or modified environmental safeguards and management measures to those presented in the approved SSD-5544 are shown in **bold** and deleted measures, or parts of measures, have been ~~struck out~~. Where approved measures have been consolidated to reduce duplication, these have been underlined.

The mitigation hierarchy has been used to help identify management and mitigation measures for each of the technical assessments. Wherever possible, impacts have been firstly avoided, then either reduced at source or at receptor where avoidance cannot be achieved, and finally either compensated or offset where avoidance or reduction is not possible or would not achieve practicable or acceptable levels of mitigation.

If management and mitigation measures are to be implemented through particular environmental management plans, then these are also discussed.

7.2 Hazards and risk

A Preliminary Hazard Analysis (PHA) was prepared by R4Risk for the proposed modification (Appendix F). The purpose of this report was to identify potential hazards related to the proposed modification and assesses their associated risk. This section summarises the findings of this report.

7.2.1 Methodology

The approach for the PHA was prepared in accordance with *Assessment Guideline – Multi-level Risk Assessment* (DPI, 2011) and *Hazardous Industry Planning Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning* (HIPAP 4) (DPE, 2011) and considered the following existing risk assessments undertaken at the Site:

- Kurnell Terminal – Quantitative Risk Assessment (QRA) (referred to as the 'QRA') (R4Risk, 2021)
- The Hazard and Risk Analysis of the Proposed Caltex Kurnell Refinery Demolition Works (referred to as the 'HAZDEM') (Planager, 2014).

Under the Multi-Level Risk Assessment Guidelines, a Level 2 analysis was deemed appropriate for the PHA, based on the outcomes of the QRA, which indicated that the frequency of risk contributors having offsite consequences is relatively low. In a Level 2 analysis, the likelihood and consequence severity of each hazardous event is evaluated to identify events with significant offsite impacts. The risk (i.e. the likelihood and consequence severity) associated with hazardous events assessed as having the potential for significant offsite impacts was then quantified to allow for comparison with the risk tolerability criteria. Where a Level 2 analysis is unable to demonstrate that the risk criteria will be met, a Level 3 analysis (requiring quantitative assessment) is considered. Following the assessment, Level 2 analysis was deemed appropriate for the potential hazardous events.

To identify potential hazards related to the proposed modification and assess their associated risk, the following steps were undertaken as part of the PHA:

- Hazard identification, including hazard screening with potential impacts to human health and the environment:
  - A hazard identification (HAZID) workshop was held on the 22 August 2024, led by R4Risk, with representatives from Ampol, Arriscar, and AECOM with relevant knowledge of the proposed modification, existing infrastructure, and terminal operations
  - Preliminary screening of hazardous materials stored and handled at the Site
- Risk analysis, involving:
  - Consequence assessment – An assessment of the effect of each hazard scenario (Table 7-2). A significant impact was specified as a severity of *Major* or higher
  - Likelihood assessment – An assessment of likelihood of each hazard scenario (Table 7-3)
  - Risk assessment – Based on the combination of likelihood and consequence of creditable risk scenarios, using the Ampol Risk Matrix (summarised in Table 7-4) and risk rating definitions (summarised in Table 7-5)
  - Comparison of the outcomes of the risk assessment with established risk criteria to establish compliance or recommend appropriate risk controls.

Hazards with only onsite impacts were excluded from further analysis, as these are not the focus of land-use planning. During the proposed modification works, all work would be undertaken in accordance with existing site controls (e.g. permit to work). These would be detailed in the applicable WHSMP (see Section 4.6).

Table 7-2 Consequence severity

Rating	Safety		Environmental
	Workforce	Public	
Incidental	Minor injury such as a first aid.	No impact	Spill/ release with no harm to community of the environment.
Minor	One or more injuries, not severe.	One or more minor injuries such as a first aid.	Impacts such as localised or short-term effects on habitat, species or environmental media.
Moderate	One or more severe injuries including permanently disabling injuries.	One or more injuries, not severe.	Impacts such as localised, long-term degradation of sensitive habitat or widespread, short-term impacts to habitat, species or environmental media.
Major	Fatalities (between 1 and 4)	One or more severe injuries including permanently disabling injuries.	Impacts such as localised but irreversible habitat loss or widespread, long-term effects on habitat, species or environmental media.
Severe	Multiple fatalities (between 5 and 50)	Multiple fatalities (between 1 and 10)	Impacts such as significant, widespread and persistent changes in habitat, species or environmental media (e.g. widespread habitat degradation).
Catastrophic	Multiple fatalities (over 50)	Multiple fatalities (over 10)	Impacts such as persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.

Table 7-3 Likelihood criteria

Rating	Qualitative Descriptor	Quantitative Frequency
Likely	Event can reasonably be expected to occur at the Site during its lifetime.	5 x 10-2 per year (i.e. one in twenty per year)
Occasional	Conditions may allow the Event to occur at the Site during its lifetime.	5 x 10-3 per year (i.e. 5 in a thousand per year)
Seldom	Exceptional conditions may allow the consequences to occur within the Site during its lifetime.	5 x 10-4 per year (i.e. 500 in a million per year)
Unlikely	Reasonable to expect that the event will not occur at the Site during its lifetime.	5 x 10-5 per year (i.e. 50 in a million per year)
Remote	Has occurred once or twice within Industry.	5 x 10-6 per year (i.e. 5 in a million per year)
Rare	The event type is barely credible, with members often questioning the validity for inclusion.	5 x 10-7 per year (i.e. half in one million per year)

Table 7-4 Ampol risk matrix (summarised)

Likelihood	Consequence					
	Incidental	Minor	Moderate	Major	Severe	Catastrophic
Likely	6	5	4	3	2	1
Occasional	7	6	5	4	3	2
Seldom	8	7	6	5	4	3
Unlikely	9	8	7	6	5	4
Remote	10	9	8	7	6	5
Rare	10	10	9	8	7	6
Source: (Ampol, 2022)						

Table 7-5 Risk rating definitions

Risk Rating	Definition
7-10	Broadly acceptable risk
6	Acceptable if demonstrated that the risk is reduced so far as is reasonably practicable
5	Tolerable only if it is demonstrated that no further risk reduction is practicable. Further risk analysis may be required (e.g. quantitative analysis)
1-4	Intolerable. Risk reduction actions must be applied to reduce risk to a tolerable level

7.2.2 Existing environment

The Site is a Major Hazard Facility (MHF). Existing process hazards within the Site are associated with the operation of the Kurnell Terminal and the storage and distribution of bulk petroleum products. Hazardous materials stored and handled at the Site are flammable and combustible liquids (i.e. hydrocarbons), including:

- Gasoline, i.e. ULP, PULP, SPULP
- Jet Fuel
- Diesel
- Slop (a mixture of gasoline, jet fuel, and diesel with some water).

The hazards related to the operation of the terminal have been previously assessed and are well understood.

The closest residential area to the Project Area is Kurnell, which is located close to the north and north west of the Site and zoned as C4 Environmental Living on the Sutherland Shire LEP. The closest ecological receptors to the Project Area are Kamay Botany Bay National Park (close to the eastern side of the Project Area) as well as Towra Point Nature Reserve, a Ramsar wetland located west of the Site, on the opposite side of Captain Cook Drive.

Whilst limited vegetation is present within the Project Area, parts of the Project Area (along the east and southern boundaries of Zones 1 and 2, and the south and western boundaries of Zone 2) are located in category one bushfire prone land and vegetation buffer (Figure 7-1). There are no known mapped mine subsidence districts within the Project Area.

Figure 7-1 Bushfire prone land

7.2.3 Impact assessment – Construction

Hazard identification

Hazards identified during construction as having potential impacts on people or the environment are summarised in Table 7-6.

Table 7-6 Construction hazards

ID	Hazardous Event	Cause	Risk Evaluation Required?
1	Security breach	Potential for an unauthorised access and/ or security breach, caused by multiple site accesses required for the construction of the proposed modification.	No. This would be managed under the updated WHSMP for the Site, updated as required for the proposed modification.
2	Traffic/ vehicle impacts	Potential vehicle accidents and onsite injury, caused by an increase in construction vehicles which may lead to an increase in traffic on roads local to the Project Area.	No. This would be managed under mitigation measures presented in Section 7.7 (Traffic and transport).
3	Release of domestic sewage	Potential exposure of workers to raw sewage, caused by the removal of domestic sewerage as part of building demolition.	No. This would be managed under mitigation measures presented in Section 7.12.
4	Worker exposure to contaminated materials	Potential exposure of workers to contamination, caused by the demolition and handling of contaminated materials (e.g. asbestos in underground firewater pipes).	No. This would be managed under mitigation measures presented in Section 7.3 (Soils, groundwater, and contamination).
5	Worker exposure to contaminated soil or water	Potential exposure of workers to contamination, caused by presence of contaminated soil and/or water in excavation areas.	No. This would be managed under mitigation measures presented in Section 7.3 (Soils, groundwater, and contamination).
6	Worker exposure to hazardous ground gases	Potential exposure of workers to ground gases, caused by presence of contaminated ground gases in excavation areas.	No. This would be managed under mitigation measures presented in Section 7.3 (Soils, groundwater, and contamination).
7	Interaction with underground services (cables and/or oily water sewer)	Potential for workers to experience electric shock or onsite fatality caused by the installation of the connection to underground municipal water supply for the firewater tank.	No. Managed under site permits and safety procedures (e.g. underground cable detection).
8	Worker electric shock	Potential for workers to experience electric shock or onsite fatality caused by interaction with unidentified live cables during demolition.	No. This would be managed under the updated WHSMP for the Site, updated as required for the proposed modification.

ID	Hazardous Event	Cause	Risk Evaluation Required?
9	Loss of containment of hydrocarbons (LOC)	Potential damage to live hydrocarbon pipelines during capping in Zone 2 along the Main Pipeway, augmentation of FWS in Zone 1 in the vicinity of live hydrocarbon pipelines, or presence of construction equipment in the Main Pipeway. Damage to live hydrocarbon pipelines may result in loss of containment, pool fires, or onsite fatality.	Yes.
10	Increased dust production	Potential for excess dust in the surrounding environment, caused by demolition, construction, excavation, remediation, and/or grading activities.	No. This would be managed under mitigation measures presented in Section 7.10 (Air quality).
11	Excess odour	Potential odour impacts, caused by demolition, construction, and excavation in proximity of biopiles.	No. This would be managed under mitigation measures presented in Section 7.10 (Air quality).

Risk assessment

All construction safety hazards identified, including the potential loss of containment of hydrocarbons along the pipeway, were assessed as having potential impacts to workforce safety only. The land in the Main Pipeway is proposed to be capped; this would involve capping the area underneath the pipes, with no change proposed to the live hydrocarbon pipelines. Should plant or equipment damage the live hydrocarbon pipes, this could result in a release in hydrocarbons contained within the pipeways, potentially leading to a pool fire.

The residual risk rating of hazardous event 9 (LOC of hydrocarbons) is presented in Table 7-7.

Table 7-7 Summary of hazardous construction events with potential offsite risk

ID	Hazardous Event	Consequence Category	Consequence Severity	Likelihood Rating	Risk Rating
9	Loss of containment of hydrocarbons	Workforce Safety	Major	Unlikely	6

The Main Pipeway is located over 400 m from offsite receivers. Considering its distance from receivers and the small potential extent of the radiant heat impacts noted in the PHA, a pool fire caused by loss of containment of hydrocarbons would not exceed injury or fatality thresholds offsite. It would therefore impact on workforce safety only.

At a level 6 risk rating, the risk is acceptable if demonstrated that the risk is reduced so far as is reasonably practicable. Workforce safety would continue to be managed in line with the measures and procedures outlined in the WHSMP for the Site, as updated for the modification works (described in Section 4.6). Measures would include permit-to-work systems and exclusion zones to ensure the work is carried out with appropriate precautions to reduce the risk to a tolerable level.

Mitigation measures presented in Section 7.2.5 would limit the consequence and/or reduce the frequency of events presented in Table 7-7. As such, the risk associated with hazards during construction are expected to be at a tolerable level, provided that the appropriate mitigation measures are implemented.

7.2.4 Impact assessment – Operation

Hazard identification

The proposed modification does not include any changes to the storage or handling of the hazardous materials. Additionally, it does not include the introduction of new hazardous materials. As such, no new hazardous events related to the operation of the fuel terminal following completion of the proposed modification were identified. Similarly, no change to the hazards associated with the external impacts (e.g. bushfires, flooding, airplane impacts, etc.) were identified.

Hazards identified during operation as having potential impacts on people or the environment are summarised in Table 7-8.

Table 7-8 Operational hazards

ID	Hazardous Event	Cause	Risk Evaluation Required?
12	Exhaust gases exposure	Potential exposure to exhaust gases to the community, caused by the relocated diesel firewater system pumps.	No. This would be managed under mitigation measures presented in Section 7.10 (Air quality).
13	Excess noise	Potential community exposure to excess noise, caused by the relocation of diesel firewater system pumps.	No. This would be managed under mitigation measures presented in Section 7.8 (Noise and vibration).
14	Vehicle accident	Potential vehicle accident or injury, caused by the new firewater tank reflecting sunlight into the eyes of drivers when driving along Solander Street. Two indicative locations have been identified in the FWS Relocation Area, with Option 1 located closer to Solander Street and the issue being specific to Solander Street.	Yes.
15	Escalation of fires	Potential incident related to escalation of a Dangerous Goods warehouse fire, caused by not adhering to the required storage arrangements (e.g. quantities, segregation, separation etc.).	No. New Warehouse would be designed to be fit for purpose. Ongoing use of the warehouse would be managed via operating procedures.
16	Overflow of OWS	Potential overflow of the OWS emergency storage and release into the environment, caused by the OWS pump losing power.	No. Suitable vehicle access for tanker vacuum trucks would be provided during detailed design.
17	Overflow of OWS	Potential overflow of the OWS emergency storage and release to the environment, caused by high demand on the OWS system restricting the new tie-in point.	No. During high demand on the OWS, the 400-series tanks in the Eastern Tank Farm's floating roof water drain point would be given hydraulic preference over the new OWS feed lines.

Risk assessment

Hazardous event 14 (Vehicle accident) was the only operational event identified to have potential offsite impacts. This event relates to sunlight reflecting off the new firewater storage tank and into the eyes of drivers along Solander Street resulting in a vehicle accident. There has been one previous incident where the driver was travelling west along Solander Street. This assessment has therefore taken a conservative approach and assumed this is a possible risk when travelling west along Solander Street in the afternoon or east in the morning.

Its associated residual risk rating is presented in Table 7-9.

Table 7-9 Summary of hazardous operation events with potential offsite risk

ID	Hazardous Event	Consequence Category	Consequence Severity	Likelihood Rating	Risk Rating
14	Vehicle accident	Public Safety	Major	Seldom	5

Hazardous event 14 was assessed as having consequences to public safety. At a level 5 risk rating, the risk is tolerable only if it is demonstrated that no further risk reduction is practicable. Additional measures presented in Section 7.2.5, relating to applying landscaping treatments around the tank or equivalent treatments to the tank to reduce impaired visibility whilst driving, would limit the consequence and/or reduce the frequency of these events. Following the implementation of these measures, the risk would be reduced to a tolerable level.

7.2.5 Management measures

A selection of additional or modified mitigation measures to manage potential hazards associated with the proposed modification are outlined in Table 7-10, with the consolidated list provided in Appendix D (Consolidated mitigation measures). Other mitigation measures identified in this Modification Report that are relevant to the management of potential hazards include those specified in Sections 4.6 (Environmental management), 7.3 (Soils, groundwater, and contamination), 7.7 (Traffic and transport), 7.8 (Noise and vibration), and 7.10 (Air quality).

Table 7-10 Mitigation measures – Hazards and risk

ID	Issue	Mitigation measure
B1	Hazards and risk	A program of routine testing, inspection and maintenance would be developed for each new piece of equipment or instrumentation. This program would be added to the preventative maintenance program already established for existing plant and equipment.
B2	Fire safety	The recommendations of the Fire Safety Study and **SSD-5544 MOD-7 Fire Safety Study Addendum, as appended to the PHA (Appendix F) of the MOD-7 Modification Report),** would be implemented for the design and operation of the terminal.
B4	Spill response	The relevant spill response plan for the Site would be updated for the ~~proposed~~ terminal.
B11	**Work health and safety**	**Ampol would continue to implement onsite safety processes and procedures and update the relevant existing Work Health and Safety Management Plan (WHSMP) to include the proposed modification as required.** Procedures would include training staff for the safe use and handling of hazardous/ flammable/ contaminated materials, use of relevant safety equipment, and incident reporting and response processes.
B12	**Hazards and risk**	**The SSD-5544 MOD-7 HAZID Workshop Recommendations, as appended to the PHA (Appendix F of the MOD-7 Modification Report), would be implemented for the design and operation of MOD-7 infrastructure.**

7.3 Soils, groundwater, and contamination

A Soils, Groundwater, and Contamination Report was prepared for the proposed modification (Appendix G). The purpose of this report was to provide a desktop assessment to assess the potential impacts of the proposed modification on soils, groundwater, and receivers that could be impacted by ground contamination. This section summarises the findings of this report.

7.3.1 Methodology

The Soils, Groundwater, and Contamination Report was prepared using the following methodology:

- Review of existing reports relevant to the Project Area, including but not limited to:
  - The Conceptual RAP (Appendix H)
  - Kurnell Remediation Action Strategy (Ampol, 2019)
- Assessment of potential impacts of the proposed modification on soils and groundwater, as well as impacts related to ground contamination
- Identification of additional mitigation measures to minimise the risk of potential impacts to soils, and groundwater, as well as risks related to contamination.

Relevant guidelines for the soils, groundwater, and contamination assessment include but are not limited to:

- Australian and New Zealand and Australian State and Territory Governments (ANZAST), 2018, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZAST, 2018)
- Heads of EPAs Australia and New Zealand (HEPA), 2020. *PFAS National Environmental Management Plan 2.0* (HEPA, 2020)
- Landcom, 2004. *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004)
- NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC), 1998. *Acid Sulfate Soils Assessment Guidelines.* August 1998 (ASSMAC, 1998)
- NSW Department of Land and Water Conservation, 2002. *Site Investigation for Urban Salinity* (NSW Department of Land and Water Conservation., 2002)
- National Environment Protection Council (NEPC), 1999. *National Environment Protection (Assessment of Site Contamination) Measure 2013* (NEPC, 1999)
- NSW EPA, 2015. *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (NSW EPA, 2015)
- NSW EPA, 2019. *Assessment and management of hazardous ground gases: Contaminated Land Guidelines* (NSW EPA, 2019)
- NSW Department of Environment and Conservation (DEC), 2007. *Guidelines for the Assessment and Management of Groundwater Contamination* (DEC, 2007)
- NSW EPA, 2020. *Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020).

A full list can be found in the Soils, Groundwater, and Contamination Report (Appendix G).

7.3.2 Existing environment

Topography

The Site is situated on the Kurnell Peninsula, an elevated plateau of Hawkesbury Sandstone, approximately 18 km in length. Surface elevations across the Kurnell Township range from 0 m AHD within swamplands at Quibray Bay, to 55 m AHD within the Kamay Botany Bay National Park, south east of the Site.

Geology and soils

The Site lies on the aeolian Kurnell landscape unit, composed of gently undulating to rolling coastal dune field and relict dunes (SEED, 2001).

From historical investigations at the Site, the bedrock surface elevation rises toward the east and south of the Site, with sandstone outcrops mapped at the north east and south east boundaries. Intrusive investigations have identified sandstone bedrock in Zone 3 to be shallower in the northern portion, with depths ranging from 0.5 to 3.0 m below ground level (bgl), and deeper in the southern portion, from depth of 5.5 to 10.50 mbgl. Bedrock depths in Zone 2 ranged from between 0.5 to 4.0 mbgl in the south east and increasing with depth towards the north west up to 20.7 mbgl (WSP, 2023). Bedrock depths in Zone 1 and 1A would be expected to be typically between 10 and 20 mbgl.

Acid sulfate soils

Acid sulfate soils (ASS) is the common name given to a range of soil types containing iron sulfides, with the most common being pyrite. In the acid sulfate risk maps under the Sutherland Shire LEP 2015, most of the Site is mapped as having Class 4 risk of ASS being present; whilst some areas within Zone 1, particularly within the FWS Relocation Area, are mapped as having Class 3 risk of ASS being present (refer to Figure B-5). Class 3 and 4 mapped areas require development consent where works would be more than 3 or 4 m below the natural ground surface, respectively.

A recent investigation within Zone 1 related to an upgrade of surface water infrastructure included an ASS assessment to support excavation and trenching works. Soil testing for ASS found PASS. The PASS was identified within grey stained sands with sulphurous odours at depths typically greater than 2 mbgl (AECOM, 2024).

Hydrogeology

Shallow groundwater at the Site is generally encountered at 2 m below ground level (bgl), with depths ranging between 0.4 mbgl (perched water, overlying shallow rock) and 8.9 mbgl. Within Zone 2 groundwater is at an average of 1.4 mbgl, and within Zone 3 groundwater is at an average of 1.7 mbgl, within an unconfined aquifer in Quaternary sands (the Botany Sands Aquifer). Furthermore, groundwater in Zone 1 lies between 0.66 and 1.4 mbgl (Geo-Environmental Engineering, 2022a). No permanent perched groundwater has been identified, though temporary perched conditions could occur following rainfall events, until water has infiltrated into underlying units. Groundwater flow direction at the Site is influenced by an east-west groundwater divide that runs through the northern portion of Zone 3. To the north of the divide, groundwater flow direction is generally to the north west. To the south of the divide, groundwater flow direction is generally to the south west.

Receiving water bodies for groundwater migrating offsite are Botany Bay to the north and Quibray Bay to the west. Quibray Bay is considered sensitive and parts of it comprise Towra Point Nature Reserve or Towra Pont Aquatic Reserve. Marton Park Wetland on the northern side of the Site, and wetlands in Zone 4 and 5 to the south of Zone 2 are mapped as Coastal Wetlands in Chapter 2 (Coastal management) in SEPP (Resilience and Hazards). Groundwater bores for garden irrigation are also present within the Kurnell residential area.

Groundwater dependent ecosystems

Groundwater dependant ecosystems (GDEs) rely on groundwater presence for maintenance of the ecosystem's health. GDEs can be impacted by changes in groundwater quality and water table changes from surrounding urban, agricultural, extractive, or industrial land uses.

Using the Australian Government Bureau of Meteorology GDE Atlas (Bureau of Meteorology, 2024), two GDEs have been identified within 500 m of the Site:

- High potential GDE in Marton Park, located adjacent to the northern boundary of Zone 1 (Coastal Sand Forest)
- Low potential GDE in Towra Point Nature Reserve, located about 450 m west of the Project Area (River Mangrove).

Contamination

Areas of environmental concern (AEC) where contamination is known or could be present from former potentially contaminating activities is detailed in the Conceptual RAP (Appendix H), and shown in Figure 7-2.

COPCs associated with the AECs are listed in Figure 7-2.

Figure 7-2 Areas of environmental concern

Table 7-11 Contaminants of potential concern across the AECs

Source type	COPCs
Primary sources – Includes current and historic infrastructure, containers used for the bulk storage or transport of chemicals, and current and historic site activities (e.g. refuelling, or firefighting training).	• Asbestos • Petroleum hydrocarbons comprising - TRH - Benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN) - Polycyclic aromatic hydrocarbons (PAHs) • PFAS.
Secondary sources – Includes soil (including reworked fill of unknown origin within RPIP Mountain) and groundwater (including LNAPL) impacted by petroleum hydrocarbons, chemical solvents, and other chemicals.	• Heavy metals (As, Ni, Cu, Zn, Pb, Hg, Cd, Cr) • Organochlorine and Organophosphorus (OCP and OPP) Pesticides • Phenols • Polychlorinated Biphenyls (PCBs) • Volatile Organic Contaminants (VOCs) • Semi Volatile Organic Contaminants (SVOCs).

Based on the physical and chemical parameters of the COPCs identified, exposure pathways that may be relevant to each COPC for human receptors are presented in Table 7-12. A potentially complete pathway occurs where there is a complete exposure pathway between the contamination source and the receptor.

Table 7-12 COPCs and potential contamination linkages

COPC	Relevant pathways	Pathway linkage
PFAS	• Dermal contact and incidental ingestion of soil, groundwater, and/or surface water	Potentially complete
TRH, BTEXN, VOCs	• Dermal contact and incidental ingestion of soil, groundwater, and/or surface water • Inhalation of soil derived dust in indoor and/ or outdoor air • Inhalation of soil vapours within a trench • Inhalation of soil vapours within indoor air.	Potentially complete
PAHs, SVOCs, metals, OCPs/ OPPs, PCBs	• Dermal contact and incidental ingestion of soil, groundwater, and/or surface water • Inhalation of soil derived dust in indoor and/ or outdoor air	Potentially complete
Asbestos	• Inhalation of soil derived dust or fibres in indoor and/ or outdoor air	Potentially complete

7.3.3 Impact assessment – Construction

Potential soils, groundwater, and contamination impacts during the construction of the proposed modification include:

- Disturbance of existing contamination and PASS
- Groundwater interference
- Generation of contaminated wastes
- Importation of soil
- Spills and leaks.

These impacts are detailed further in the below sections.

As there remains a risk of these impacts during intrusive works, measures have been proposed to mitigate these risks (Section 7.3.5).

Disturbance of existing contamination

The construction works would include disturbance of contaminated and uncontaminated soils during excavation works undertaken as part of remediation, demolition, and grading works. Potential adverse impacts that could occur include:

- Potential exposure of the Site and construction workers to contamination present in the soil and groundwater during the works
- Generation of nuisance odours
- Potential for cross-contamination of clean soils with contaminated spoil during construction works from earthmoving and stockpiling activities
- Soil erosion and sedimentation during construction causing contaminated stormwater and/ or sediment to discharge and impact surrounding land and waterways.

Mitigation measures to address these potential impacts are provided in Section 7.3.5.

However, the completion of remediation works undertaken as part of the proposed modification would have an overall positive environmental impact by reducing the risk the existing contamination poses.

A Conceptual RAP (Appendix H) has been prepared to support and guide the proposed modification works. The Conceptual RAP identifies the remediation approach and proposed remediation technologies to be utilised for the proposed modification, as well as management measure for this process.

Disturbance of potential acid sulfate soils

PASS could potentially be disturbed in areas where excavations exceed 2 mbgl or where groundwater is lowered below the depth of PASS. Most excavations are anticipated to be less than 1 mbgl, but deeper excavations between 2 and 4.5 mbgl could occur. Temporary dewatering of excavations may be required during construction; however, this is not anticipated to result in groundwater table lowering in the surrounding aquifer beyond more than 2 mbgl.

Based on the estimated remediation volumes, there is potential for greater than 1,000 tonnes of PASS to be excavated. Mitigation measures to address these potential impacts are provided in Section 7.3.5.

Groundwater interference

Temporary groundwater dewatering would be required during construction when groundwater accumulates in trenches and excavations, which would extend to 4.5 mbgl in some areas. Testing for COPCs would be undertaken to confirm that this water can be appropriately treated in the WWTP. It is anticipated that the system, including the WWTP, would have sufficient capacity during remediation activities as the WWTP was originally designed to service the refinery, which is no longer in operation. Treated water effluent from the Site would then be discharged via outfall to the Tasman Sea at Yena Gap under EPL 837. Groundwater that that cannot be treated at the WWTP would either be pre-treated by another method or disposed to an appropriately licenced liquid waste facility.

A quarterly groundwater monitoring program is currently implemented by Ampol at the Site as part of the existing OEMP as a protection measure to identify the potential for migration of hydrocarbon contaminated groundwater before it leaves the Site. The monitoring program includes monitoring wells in the central part of the Site, and various boundary monitoring wells along the northern and western boundaries, corresponding to the down gradient direction of groundwater flow. This monitoring program would continue throughout the construction period of the proposed modification to identify positive or negative changes in groundwater quality during the modification works.

The closest GDE, as identified in Section 7.3.2, lie adjacent to the northern boundary of Zone 1 at Marton Park. The closest works to Marton Park would be construction, including remediation, in the FWS Relocation Area. Excavation for capping and new foundations for the firewater tank, pumps, and pipework would be limited to 1 mbgl (Section 4.2.3).

Excavation works along the southern boundary of Zone 2, including capping and construction of the OWS Pump Station, would lie within land mapped as Proximity Area for Coastal Wetlands (Figure B-1).

Whilst there is a short-term risk of dewatering in the immediate vicinity of the proposed modification works, changes to groundwater levels and quality within the GDE at Marton Park and to the wetlands south of Zone 2 are not anticipated. Potential impacts to groundwater would be temporary and anticipated to be less than 3 megalitres per year (ML/yr) and managed through a Groundwater Management Plan (GWMP) during construction to check groundwater level changes, as outlined in the mitigation measures presented in Section 7.3.5. Minor and temporary dewatering activities that are estimated to take less than 3 ML/yr of groundwater generally do not require a licence or approval due to exemptions in the *Water Management (General) Regulation 2018 (*Water Management Regulation). The requirement for a licence or approval related to the NSW *Water Management Act 2000* (Water Management Act) would be determined during detailed design in consultation with relevant agencies.

In-situ treatment of groundwater with injection of chemical oxidants or colloidal carbon would be considered if warranted based on a risk assessment. Any amendments added or injected into the subsurface are not anticipated have an appreciable effect on groundwater quality (other than reduction in COPC concentrations). This would be monitored and confirmed as part of the GWMP.

Importation of spoil

Treated excavated material would be validated for onsite reuse or, where the treated material does not meet validation and/or re-use criteria, it would be classified for offsite disposal. Where additional material is required to backfill excavations and level areas of the Site, soil would be imported to the Site. Soil imported to the Site can have negative impacts if contaminated with chemicals or asbestos, or has unsuitable physical properties (e.g. pH, salinity). As stated in the Conceptual RAP (Appendix H), where soils are brought from other sites, the material should be classified as VENM, excavated natural material (ENM) as defined by the ENM Order, 2014, or material covered under an NSW EPA specific Resource Recovery Order (RRO).

Spills and leaks

Spills or leaks on unsealed and unbunded surfaces can contaminate underlaying soils and migrate into groundwater or stormwater. Potential contamination of soil and groundwater could occur during construction works from:

- Spills from removal of pipes and tanks
- Hydraulic fluid leaks from excavators and other mobile plant
- Spills during plant refuelling
- Spills or leaks of hazardous materials stored and used onsite, including oil and fuel for site plant and vehicles, stored liquid wastes from remediation works, and dewatering activities.

Mitigation measures outlined in Section 7.3.5 would help avoid and mitigate potential impacts from spills and leaks.

7.3.4 Impact assessment – Operation

Once the proposed modification works are complete, the Site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for SSD-5544. As stated in the EIS (URS, 2013), operations would be carried out with applicable federal, state, and local permits, approvals, and regulatory requirements, as managed through the existing environmental management system at the Site.

Following soil remediation, and for the ongoing operation of the terminal, ongoing management of contaminated groundwater would continue to be undertaken. Residual contaminated soil and/ or groundwater impacts remaining after active remediation would be managed in line with the measures presented in Section 7.3.5. These would include Environmental Management Plan(s) and, where required, GMP(s) under the existing Kurnell Terminal OEMP.

Stormwater flows across Zones 2 and 3 would be directed to the existing SWS at the Site, and flows in Zone 1 would be managed by either the SWS or the OWS, as required (discussed further in Section 7.4). As such, there are not expected to be additional adverse impacts from the operation relating to soils and erosion.

This approach is outlined in the mitigation measures provided in Section 7.3.5.

7.3.5 Management measures

A selection of additional or modified mitigation measures to manage potential soils, groundwater, and contamination impacts associated with the proposed modification are outlined in Table 7-13, with the consolidated list provided in Appendix D (Consolidated mitigation measures). Other mitigation measures identified in this Modification Report that are relevant to the management of potential air quality impacts include those specified in Section 7.12 (Other matters – Waste).

Table 7-13 Mitigation measures – Soils, groundwater, and contamination

ID	Issue	Mitigation measure
C1	Management of soils	A Soils ~~and Erosion~~ **and Water** Management Plan **(SWMP)** would be developed as part of the Construction Environmental Management Plan (CEMP) to manage the excavation, testing, stockpiling, reuse, and rehabilitation of soils **as well as water management requirements**. This plan would be developed in accordance with 'The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2 (Landcom, 2004) and would outline: • The areas where soil disturbance is likely • Soil testing procedures • Soil handling procedures • Locations where soil would be stockpiled on-site for either removal, treatment, or reuse • Locations of potentially contaminated areas • Procedures to reduce erosion and the spread of dust • Restricting traffic to defined roads or tracks where necessary • Measures to manage vehicles leaving the Site to reduce soil on public roads • ~~The rehabilitation of bare soil following completion of the construction works~~ • Inspection program for any erosion control structures and bunded areas • How excavations would be staged so that the length of time that excavations are left open and temporary stockpiles are required is minimised • **Remediated soils and validated crushed clean concrete slabs would be used as backfill where practicable. Imported material would be classified as virgin excavated natural material (VENM), excavated natural material (ENM) as defined by the ENM Order, 2014, or material covered under an NSW EPA specific Resource Recovery Order (RRO)** • Measures to protect excavations from increased stormwater runoff (e.g. by using bunds or similar structures where required) • That equipment is to be maintained and operated in a proper and efficient condition to reduce the likelihood of spills or leaks • How the rehabilitation of bare soil would be managed across the Site once areas are returned to grade

ID	Issue	Mitigation measure
C2	Stockpiles	All materials would be stockpiled in accordance with 'The Blue Book' *Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004). Principal controls would include the following: • Silt fences would be installed around stockpiles to reduce erosion and protect vegetation or Site infrastructure as necessary • Silt and sediment traps would be installed across stormwater drains in proximity to excavation areas • Stockpiles would be restricted to cleared areas and not impact any vegetation • **Contaminated s**~~S~~tockpiles would be placed on impermeable ~~sheeting~~ **surface** • Stockpiles would be covered and wetted down in order to reduce dust creation • Stockpiles would not be located in close proximity to any stormwater drainage systems **(where possible)** • ~~Caltex~~ **Ampol** would not stockpile in areas that are prone to flooding as identified in ~~Figure 4-10 of Appendix D of the Demolition Works SEE~~ in **the Surface water, wastewater, and flooding report (Appendix I of the MOD-7 Modification Report**) • Stockpile locations and erosion and sediment control requirements associated with the ~~Project~~ **proposed modification** would be reviewed by a suitably qualified person to ensure that the recommended measures achieve the environmental outcomes for the Site.
C4	Excavated soils	Excavated soils would be **inspected and if necessary,** tested for both contaminants and odour using standard practices **Should elevated levels of contamination or odour (i.e. levels above those expected or planned for in the relevant location) be present in the soils or excavations, work related to the excavation would be suspended until a suitably qualified environmental consultant can instruct on how best to proceed to manage contamination, or vapour, or odour risks to deliver the works and achieve work health and safety and environmental compliance requirements.**
C5	Material tracking	Clean materials would be separated from contaminated materials for reuse as backfill where required. **A Material Tracking Plan would be implemented to track materials to be reused or removed from the Site.**
C7	Suspected contaminated materials	Suspected contaminated materials would be assessed and classified in accordance with Environment Protection Licence (No. 837) (EPL) requirements and NSW (~~2009~~ **2014**) *Waste Classification Guidelines: Part 1: Classifying Waste*, batched, further tested (where required) and disposed by a licenced contractor.
C8	Disposal of contaminated soils or groundwater	Disposal of ~~any~~ contaminated soils or groundwater would be in accordance with EPL requirements and NSW DECCW's *Waste Classification Guidelines* and the Contamination Management Plan (CMP) for the ~~Project~~ **proposed modification**. Contaminated materials **to be disposed offsite** would be sent to appropriately licensed facilities in accordance with the *Contaminated Land Management Act 1997*.

ID	Issue	Mitigation measure
C9	Acid Sulfate Soils	If Acid Sulfate Soils (ASS) are encountered during construction ~~or the ACS Modification works,~~ an ASS Management Plan **(ASSMP)** would be prepared in accordance with the ASS Manual (*ASS Management Advisory Committee 1998*).
C10	Groundwater management	A Groundwater Management Plan (GWMP) would be developed and included within the CEMP. This plan would outline the measures that would be used to manage the testing, dewatering, storage, movement and treatment of any groundwater intercepted during the construction phase. Measures would include: • Measures for the dewatering, storage, movement and treatment of groundwater encountered in excavations. Dewatered groundwater would be collected and sent to the on-site Wastewater Treatment Plant in accordance with the established Site wastewater management procedures, unless it is tested and is of suitable quality to be directed to stormwater • The use of appropriate drip trays and interception techniques for any construction specific liquids stored on the Site • Bunding of any fuel or chemical storage area at the construction Site • Regular inspection of construction equipment to ensure any leaks are minimised and rectified • Management of vehicles leaving the Site to reduce soil on roads, production of dust and the introduction of contamination to the groundwater and/or stormwater system • Appropriate and timely disposal of any contaminated soil, water or waste generated during construction • ~~Regular inspection of erosion control structures and bunded areas~~ • Regular inspection and testing of containment areas~~, drainage lines and process pipe work~~ • A plan for corrective action should an unexpected **find** ~~increase in contaminants of potential concern (COPC)~~ be observed ~~in the groundwater monitoring~~ **during the proposed modification**. • **Management and monitoring of dewatering activities adjacent to Marton Park and the wetlands in Zone 4** • **Management and monitoring of groundwater quality should in-situ treatment of groundwater be warranted.**
C11	Contamination	Any runoff that may accumulate in excavations would be periodically tested for elevated levels of contamination. Water that is found to have elevated levels of contaminants would be collected and sent to the onsite Waste **W**~~w~~ater Treatment Plant in accordance with the established refinery wastewater management procedures.
C15	Work health and safety	Permits would be required to work in the areas where potential soil and groundwater contamination exists. The work permit includes requirements such as monitoring and **personal protective equipment (**PPE**)**. No unauthorised entry into these areas ~~is~~ **would be** permitted, without a permit.

ID	Issue	Mitigation measure
C16	Environmental management	Appropriate inspection, assessment, maintenance and repair programmes that would be implemented as part of the operation of the ~~Project~~ **terminal (as modified)**. These safeguards would be incorporated into the updated management plans for the proposed terminal. The ~~Project~~ **terminal (as modified)** would be appropriately licenced under the *Protection of the Environment Operations Act 1997* and would be managed in accordance with EPL requirements.
C17	Contamination management	A Contamination Management Plan would be developed to outline measures for monitoring, handling, storing and managing contaminated soils and contaminated groundwater. It would include the following: • Excavated soils would be **inspected and if necessary,** tested for both contaminants and odour using standard practices • **Should elevated levels of contamination or odour (i.e. levels above those expected or planned for in the relevant location) be present in the soils or excavations, work related to the excavation would be suspended until a suitably qualified environmental consultant can instruct on how best to proceed to manage contamination, or vapour, or odour risks to deliver the works and achieve work health and safety and environmental compliance requirements.** • ~~During excavation visual and olfactory indicators of impact would be monitored. Where there is potential for volatile organic contaminants (based on known ground conditions) or where hydrocarbons are seen or smelt during excavations, soils would be inspected for hydrocarbon impacts using a PID and/or testing.~~ • ~~Excavated soils would not be used for backfill if they are impacted at levels exceeding commercial/ industrial as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.*~~ • **Where the risk of presence of asbestos has been identified,** ~~All~~ excavations would be sampled ~~for asbestos~~. Asbestos assessment would be undertaken in accordance with Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.* • ~~Asbestos impacted soil not found in the pipeways would be disposed of at the ACS containment cell or removed from the Site as soon as practicable if excavated. If these soils need to be temporarily stockpiled they would be stored at a defined location at the former CLOR site, covered and labelled as asbestos waste.~~ Asbestos impacted soil would be classified in accordance with NSW EPA guidelines for transport and disposal at ~~either the ACS Containment Cell or~~ a licensed landfill ~~(~~and in accordance with the Site waste management system and the ~~Demolition~~ Waste and Resource Management Plan (~~D~~WRMP) ~~for the demolition works~~ **or capped and contained onsite in accordance with the Detailed RAP(s)**. The excavation, transport and disposal of asbestos impacted soil would be undertaken by a licenced contractor and comply with NSW ~~WorkCover~~ **SafeWork** requirements. • Hydrocarbon impacted soil would not be temporarily stockpiled adjacent to the excavation. If these soils need to be temporarily stockpiled**,** they would be stored at a defined location ~~at the~~

ID	Issue	Mitigation measure
		~~former CLOR site~~ **in accordance with the Detailed RAP(s).** • Excavated soils would be separated into stockpiles according to odours, staining and other environmental indicators. Soils that are potentially contaminated (following visual and olfactory inspection and or use of monitoring equipment) would be placed on impermeable ~~sheeting~~ surfaces into uniquely identified stockpiles and appropriately bunded and managed. The bunds would be impermeable and of sufficient capacity to ensure that runoff from these stockpiles is contained prior to being sent to the WWTP. • ~~Works in the vicinity of the contaminated water would be suspended until the environmental consultant can further assess the impacted groundwater and the associated risks.~~ • ~~Where no contamination issues are identified, excavated material would be used as backfill to bring the excavated area back to grade as soon as practicable. If required, certified VENM, ENM or appropriated remediated material would be used to provide additional backfill material.~~ • If excavated material cannot be re-used or managed onsite then it would be removed off-site as waste to an appropriately licensed facility. • Further, excavated material; would be classified in accordance with EPL condition O5.1 which requires "any liquid and/or non-liquid waste generated and/or stored [at the Site] is assessed and classified in accordance with the ~~NSW (2009) *Waste Classification Guidelines: Part 1: Classifying Waste*, batched and further tested (where required, for example Toxicity Characteristics Leaching Procedure (TCLP) testing)~~ **NSW EPA Waste Classification Guidelines as in force from time to time**." • **Where contaminants exceed General and/or Restricted Solid Waste, and/or Hazardous Waste classification, the toxicity characteristics leaching procedure (TCLP) would be conducted to assess the leachable concentration and classification of waste can be reduced.** • The method of disposal or reuse would be in line with the materials' classification in accordance with specifications set out in a ~~D~~WRMP. • Where soils are reused on Site (i.e. are not considered to be impacted at levels exceeding commercial/ industrial as defined by *Schedule B1 Guidelines, Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013)* a record would be kept ~~(in the Waste Management Database)~~ of where these soils are reused, the volumes reused; the type and levels of contaminants present in the soils and the soil classification.
C20	Asbestos	An Asbestos Management Plan would be developed in accordance with the relevant guidelines. ~~Caltex~~ **Ampol** would utilise existing registers, procedures and plans in place for the Site for the preparation of an Asbestos Management Plan.

ID	Issue	Mitigation measure
C32	Operational environmental management	The OEMP for the Site would ~~be updated to include~~ **continue to implement** the following measures: • **Appropriate groundwater monitoring, in accordance with the Site's EPL.** • ~~Quarterly groundwater monitoring for two years for the two installed monitoring wells. Following this time, annual groundwater monitoring would be undertaken to provide ongoing demonstration that the containment cell liner is operating effectively. Monitoring of these bores would occur in accordance with the existing groundwater monitoring program for the Site.~~ • Regular inspections of the Containment Cell to monitor the effectiveness of the erosion and sediment control measures incorporated into the design of the containment cell, in line with the Site's existing Inspection Checklist and following heavy rain events.
C33	**Remediation Action Plans**	**The Conceptual Remediation Action Plan (RAP) for MOD-7 works would be implemented, which would include:** **a. Data gap investigations within the Project Area** **b. Preparation of one or more Detailed RAP(s).** **The Detailed RAP(s) would be prepared in accordance with NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and be reviewed by the Site Auditor.**
C34	**Potential Acid Sulfate Soil**	**Detailed investigations within the Project Area would include targeted sampling to identify the presence of Potential Acid Sulfate Soil (PASS) within remediation areas where excavations are anticipated to be greater than 2 metres below ground level (mbgl). The results would be used to inform preparation of the ASSMP for the proposed modification if required.**
C35	**Validation Report(s)**	**One or more Validation Report(s) would be prepared in accordance with the NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and reviewed and approved by the Site Auditor, confirming that the area(s) are suitable for future commercial/ industrial land uses.** **Where Validation Report(s) are required for land within the audit boundary (see Figure 1, Appendix A of the Concept RAP), these would be subject to Site Audit Statements (SAS) and Site Audit Reports (SAR).**
C36	**Residual contaminated soil and/ or groundwater**	**Where relevant, one or more Environmental Management Plan(s) (EMP) would be prepared where residual contaminated soil and/ or groundwater impacts that do not meet commercial/ industrial standards and further monitoring or management is required. The EMP(s) may include Groundwater Monitoring Plan(s), which would detail groundwater monitoring requirements. The EMP(s) would be provided to the Site Auditor for endorsement.**
C37	**Licences**	**The requirement for a licence and/or approval from the relevant agencies for the extraction of groundwater during excavation works would be determined during detailed design.**
C38	Contaminated groundwater	Construction personnel would be made aware of the potential presence of Non Aqueous Phase Liquids (NAPL) and would be shown how to identify its presence. The GWMP would include management measures to appropriately deal with any NAPL found onsite.

7.4 Surface water, wastewater, and flooding

A Surface Water, Wastewater and Flooding Report was prepared for the proposed modification (Appendix I). The purpose of this report is to provide an assessment of the potential surface water, wastewater, and flooding impacts of the proposed modification on water resources within the Site and in receiving areas. This section summarises the findings of this report.

7.4.1 Methodology

An assessment approach was developed in accordance with relevant legislation, policies, guidelines, and the Site's current EPL. The Surface Water, Wastewater and Flooding Report involved:

- Consideration of the legislative framework that governs the proposed modification
- A desktop review of existing information to characterise the existing environment, identify surface water receptors, detail existing surface water, wastewater, and flood management at the Site
- Assessment of potential construction, operational, and cumulative impacts relating to surface water, wastewater, and flooding
- Identification of appropriate mitigation and management measures to manage potential impacts on and from the surface water environment.

Relevant policies and guidelines for the Surface Water, Wastewater and Flooding Report are listed below:

- Department of Agriculture and Water Resources, 2018, *National Water Quality Management Strategy* (Department of Agriculture and Water Resources, 2018)
- Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000, *Guidelines for Aquatic Ecosystems* (ANZECC & ARMCANZ, 2000)
- Sutherland Shire Council, 2015, *Development Control Plan* (Sutherland Shire Council, 2015)
- Engineers Australia, 2006, *Australian Runoff Quality – A guide to Water Sensitive Urban Design* (Engineers Australia, 2006)
- Ball et al., 2019, *Australian Rainfall and Runoff: A Guide to Flood Estimation* (Ball, et al., 2019)
- Landcom, 2004, *The Blue Book: Managing Urban Stormwater - Soils and Construction Volume 1 and 2* (Landcom, 2004).

7.4.2 Existing environment

Existing climate

A summary of the historic regional climatic conditions is provided in Table 7-14 to understand how existing weather conditions are likely to influence surface water runoff, water storage, and flooding. Sydney Airport provided the nearest weather station to the Site, located approximately 8.5 km north.

Table 7-14 Summary of climatic conditions

Climatic conditions	Summary
Climate zone	The Site is located in a temperate climate zone characterised by warm summers and consistent rainfall over the calendar year.
Average rainfall	The Site experiences 1,092 mm per annum, with the months of January to June exhibiting heavier rainfall compared to later months in the calendar year.
Average temperature	The Site experiences mean maximum and minimum temperatures ranges between 18 and 27°C during summer months and 7 and 19°C in winter months.

Climatic conditions	Summary
Net water balance[3]	The Site's average annual evaporation is 1,830 mm per annum, exceeding the total annual rainfall. This indicates there is a water deficit in the region, where pools of water would experience net drying conditions in most months of the year. Net wetting conditions would only occur in the remaining two months of the year (May and June).

Catchment

The Project Area is located within the Botany Bay catchment. The Botany Bay catchment is a major coastal catchment covering a total area of 1,165 km^2 and is comprised of four main sub-catchments, of which, the Site is located within the sub-catchment draining directly into Botany Bay.

Botany Bay and its catchment waterways have been subject to ongoing threats, including those arising from polluted surface waters originating at non-agricultural land uses. This is a result of the substantial development across the catchment, with almost 40% of its land being used for urban, industrial, or commercial uses. The main surface water pollutants of concern include nitrogen, phosphorus, and total suspended solids.

Topography

Natural surface levels further east, outside the Site extents and within the National Park, continue rising to a natural ridgeline. Peak elevations along this ridgeline reach 35 mAHD.

Surface water features

The Site is located near several surface water features that support a range of environmental values and sensitivities, including areas of ecological value. These surface water features are shown in Figure 7-3.

[3] Demonstrated through a comparison of rainfall and evaporation

Figure 7-3 Surface water features

Surface water

As described in Section 2.1.2, surface water runoff generated by the Site is captured and conveyed by one of two systems, as defined in Table 7-15.

Table 7-15 Existing surface water systems

Surface water system	Definition
SWS	Collecting surface water runoff from areas that have a designated low risk potential for interaction with petroleum products. This generally includes runoff from roadways, hardstand areas, roof areas, and undeveloped/ vacant land. Water conveyed by this SWS is considered to be relatively 'clean' in comparison to oily waters at the Site. This water receives a level of treatment prior to discharging offsite and to the receiving waterbodies, including Quibray Bay, Botany Bay, or the Marton Park Wetland.
OWS	Collecting and containing wastewater from previous refinery process areas and surface water where there is a potential for interaction with petroleum products. This oily water is directed to the onsite WWTP for treatment before discharging to the Tasman Sea via the Yena Gap under the conditions of EPL 837. All wastewater is treated using the biotreator WWTP or the oil-water separators/ induced air flotation (IAF) system.

Surface water system

The Site has seven main catchment areas draining to the existing SWS. The catchment extents, their discharge points and their contents are described in Table 7-16 and shown in Figure 7-4. The proposed modification works would be spread across all catchments except for Catchment G.

Table 7-16 Existing surface water catchments

Catchment	Area (ha)	Description
A	65	Eastern and northern area of the Site which includes the large eastern tank area.
B	66	Central area of the Site which contains the majority of ex-refinery process areas as well as the central control building, warehouse, storehouses and oil spill room; in addition to the western part of the Site which contains the WWTP, western tank area, the Quibray Bay Stormwater Retention Basin and parking area.
C	1	Northern corner of the Site which includes main offices, former staff houses, gardens, visitor and employee car park, and wetland.
D[1]	6	An area between the former CLOR in the south west and the former refinery area.
E	26	South western corner of the Site occupied by the area containing the former CLOR site.
F	107	South eastern corner of the Site, which predominately comprises relatively undeveloped land and a small area of tank compound, the ACS Containment Cell, the landfarm area (which is a bioremediation site), a recycling area, and a sludge lagoon.
G	7	North eastern undeveloped area mostly outside of the Site boundary, which is part of the Kamay Botany Bay National Park.

Notes:

1. *Catchment D is no longer a separate catchment and is now part of Catchment B. It has been maintained as a separate catchment for consistency with previous surface water reports.*

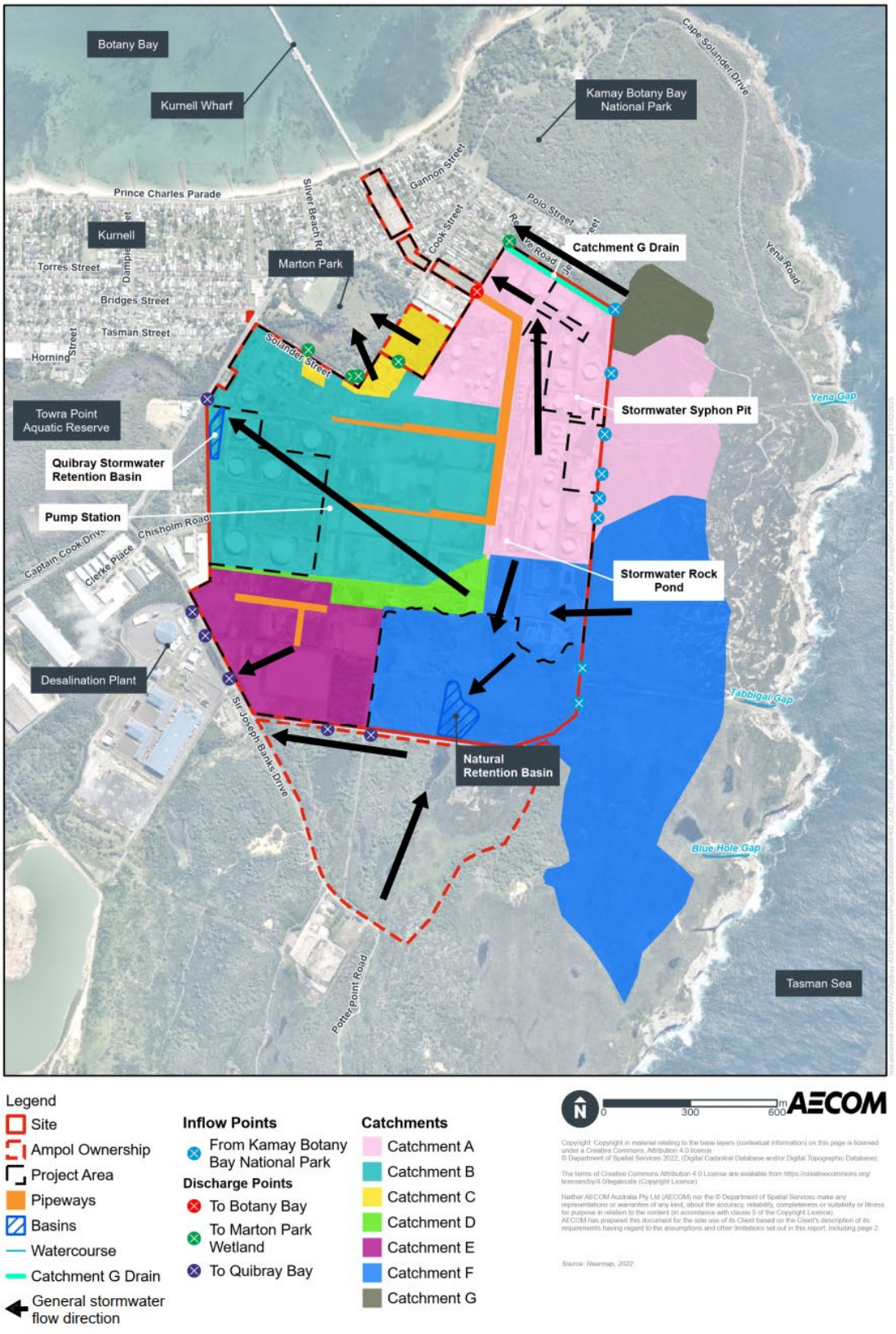

Figure 7-4 Existing surface water catchments and discharge and inflow points

While surface water management strategies significantly reduce risk, rare extreme weather events have historically posed challenges, primarily due to the interaction between surface water and wastewater during severe storm events. In April 2022, the Kurnell Peninsula experienced a flood event estimated to be in the order of a 1% Annual Exceedance Probability (AEP) event[4] (AECOM, 2023), caused by a rare combination of high rainfall intensity, minimal ground absorption, and high tide coinciding with the period of peak rainfall. Stormwater runoff in Kurnell Terminal, which included runoff from the upstream Kamay Botany Bay National Park, inundated the area of the existing WWTP and flooded the separators and associated sumps. This event led to wastewater from the OWS entering the SWS and exiting the Site without undergoing the necessary treatment.

Significant upgrades to the Site's SWS and OWS have since been consented as part of the Kurnell Stormwater Separation Improvement Project (SSIP) and are discussed further below. Construction is currently underway and upgrades would be completed in mid-2025, prior to construction of the proposed modification.

Oily water sewer

Various sources of oily water are present across the Site drain to the existing OWS. These sources include but are not limited to:

- Surface water runoff within tank bund areas, near process units and pump slabs
- Fuel released from storage tanks or their associated piping which is contained within the bunded area surrounding the tank
- Firewater used in combating a fire which is contained in the bunded areas
- Hydrocarbon contaminated water from remediation works
- Surface water that collects in the former CLOR areas.

Treated OWS effluent must meet the strict pollutant concentration levels, in accordance with EPL 837, with samples sent to a National Association of Testing Authorities (NATA) accredited lab independent of Ampol prior to being discharged.

Condition of receiving waterbodies

Surface water quality from Catchments E and F discharge to Quibray Bay via drainage lines running along Sir Joseph Banks Drive. As part of their Strategic Water Monitoring Plan, the open drainage channel on Sir Joseph Banks Drive is monitored by the Sutherland Shire Council (Station No. SSC06), which provides insight into the quality of water runoff from Catchments E and F. The overall water quality has been consistently rated as 'fair' for the past 11 years (Sutherland Shire Council, 2024).

Flooding

The suburb of Kurnell is susceptible to flooding as it sits within a large, localised depression and has low-lying topography relative to water levels within Botany Bay and Quibray Bay. Flooding within the Kurnell township catchment and at the Site can occur as a result of the following mechanisms, which may occur in combination or in isolation:

- Coastal flooding – From high tides or storm surges that causes water levels to rise in Botany Bay and Quibray Bay
- Catchment flooding – From intense rainfall over the catchment which causes large flows and a rise in water levels along drainage paths and within low-lying areas. The rise in water level may also be affected by flow constrictions (e.g., culverts, blockages, fences, and buildings).

[4] AEP is the chance of a flood of a specific size occurring in any one year, expressed as a percentage. A 1% AEP flood has a 1% or 1 in 100 chance of being reached or exceeded in any given year

Two separate flood modelling results have been used to describe existing flooding conditions across the surrounding areas:

- Kurnell Township Flood Study (MWAwater, 2009): This flood modelling was commissioned by Sutherland Shire Council and focused on the residential area of Kurnell, providing adjacent flood levels and depths along the north and north western boundaries of the Site
- AA-004 Kurnell South Area Stormwater Management Project (BPM Projects, 2024): This flood modelling focused on the Kurnell Terminal to simulate the upgrades proposed as part of the proposed SSIP. The findings indicated that the proposed SSIP upgrades would improve existing flood extents across the Site and downstream residential areas.

Figure 7-5 presents flood depth results with the proposed SSIP upgrades in the combined 1% AEP rainfall event and 1% AEP tide event. This provides an indication of where areas in the Site that provide flood storage, including the tank bunds (those in the Western Tank Farm will be used as retention basins during operation of the SSIP) and in pipeways.

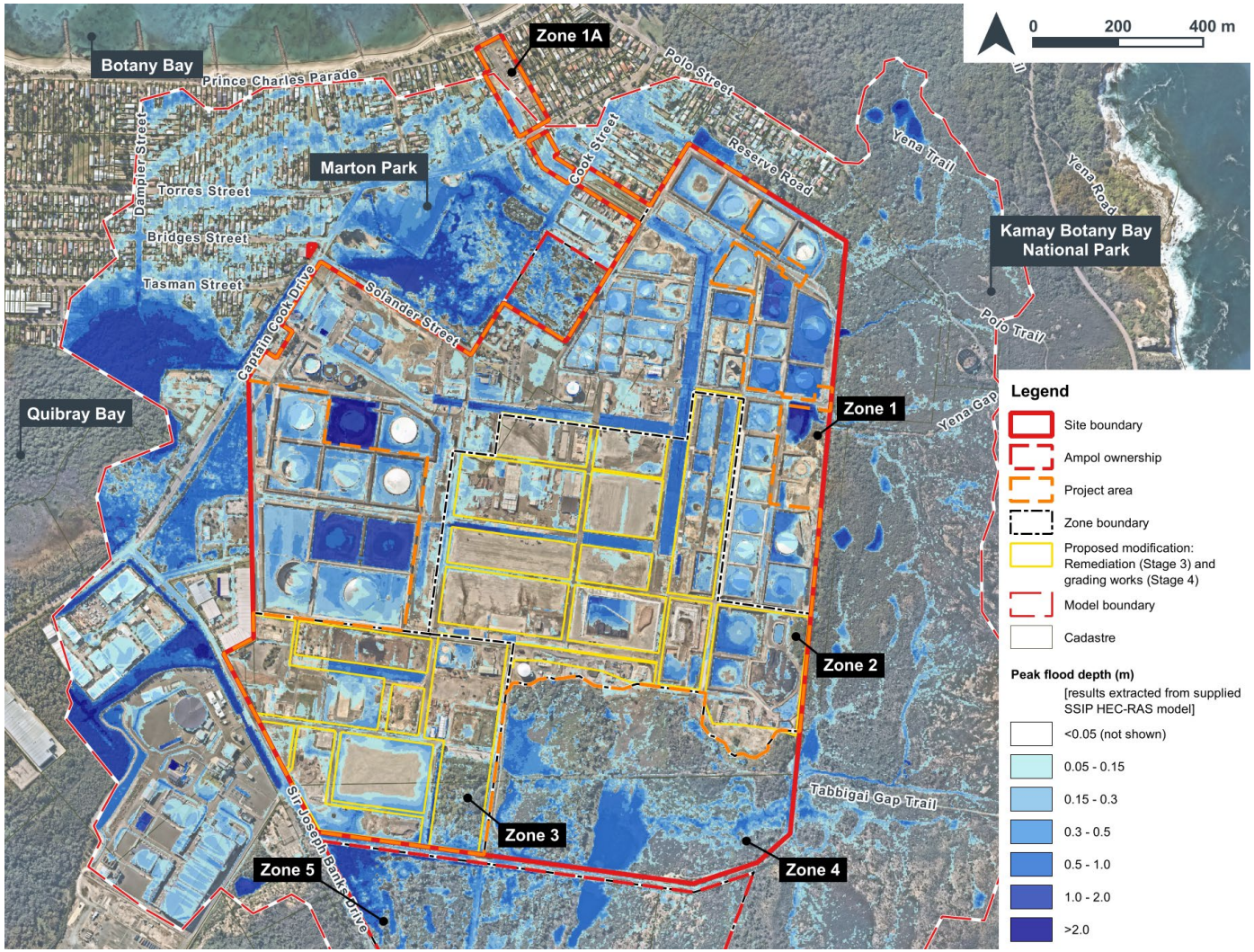

Figure 7-5 Flood depth results with the proposed SSIP upgrades in the combined 1% AEP rainfall event and 1% AEP tide event

7.4.3 Impact assessment – Construction

Drainage impacts

The existing SWS would remain operational during all stages of the construction of the proposed modification to continue servicing the Site during periods of rainfall.

The SWS networks are generally located within the internal road network. As the proposed modification works are limited to land located outside of the road network, they would not alter existing drainage paths across the Site and surface water flows would continue to drain towards the designated surface water treatment and discharge locations for each sub-catchment.

If the proposed modification works were to block existing SWS infrastructure or block the overland flow paths leading existing drainage paths, surface water flows could be diverted elsewhere, thereby changing the quality and quantity of water leaving the Site. Measures have been proposed to mitigate this potential impact (Section 7.4.5).

The proposed modification works are not anticipated to significantly increase surface water runoff during the construction, as new impervious areas are not being introduced; above-ground structures would be relocated to areas in Zones 1 and 1A that were already impervious under pre-proposed modification conditions.

Oily water management

Most of the Project Area is already disconnected from the existing OWS system and therefore would not be impacted by the removal of redundant OWS networks. Areas that currently drain to the OWS network would continue to do so until the proposed diversion line has been constructed (towards the end of Stage 2) or until the area has been remediated (in Stage 3) and can safely drain to the SWS. Retaining the existing OWS infrastructure for as long as necessary during the construction phase would prevent oily water from entering the SWS and bypassing treatment at the WWTP, thereby preventing uncontrolled release of wastewater during the construction phase.

The WWTP would continue to operate during the construction phase, discharging treated effluent to the Tasman Sea via the Yena Gap under the conditions of the EPL 837. The existing treatment capacity of the WWTP would be capable of containing and treating all onsite wastewater generated during construction of the proposed modification. The existing OWS network and WWTP would also be protected during construction works, to avoid damaging or blocking this existing infrastructure.

Water quality impacts

The pollution of downstream waters and ecosystems may occur from surface water runoff carrying nutrients, sediments, oil, greases, and organic or inorganic contaminants into drains and watercourses.

A summary of proposed construction activities that have the potential to impact surface water quality is provided below:

- Increased onsite traffic, which has the potential to increase dust, transport sediments, and increase the presence of oils and greases on surfaces
- Construction works to augment the existing FWS in Zone 1 has the potential to increase the dispersion of dust, soils, and sediments, transport sediments, and increase the presence of oils and greases on surfaces
- Excavation works and stockpiling of loose soils has the potential to the disperse dust, soils, sediments and other sorbed pollutants by wind and interaction with surface water runoff
- The removal of surface cover and soil exposure increases the potential for erosion and sediment-laden runoff
- Dewatering of open excavations and construction basins has the potential to discharge contaminated or untreated water
- Damage or blockage of pits and pipes during removal and relocation works has the potential to increased overland flows and increase the risk of surface waters interacting with petroleum products, sediments and other pollutants on the surface

- Concrete washout from structure relocation and/or construction of new OWS pits and pipes has the potential to runoff
- Concrete dust has the potential to mobilise through wind and interact with surface water runoff
- Accidental spills of petroleum products, lubricants, chemicals, excess or waste concrete, wastewater and leachate (from machinery/ equipment or augmented/ removed/ relocated infrastructure) has the potential to enter downstream waterways.

A summary of the potential impacts to sensitive receptors in nearby waterbodies and aquatic ecosystems (such as Towra Point Nature Reserve, Marton Park Wetland, Quibray Bay, Botany Bay, and areas within Proximity Areas for Coastal Wetlands) is provided below:

- Increased influx of sediments resulting in high turbidity, lower dissolved oxygen levels, and increased toxicant concentrations
- Increased influx of nutrients resulting in eutrophication, prioritising the growth of toxic/ invasive algal species over native flora
- Increased influx of oils and greases resulting in acute toxicity or bioaccumulation
- Changes in pH levels and toxicant concentrations resulting in fish kill.

The proposed modification works would be carried out in stages to minimise ground disturbance, soil exposure, and stored waste. Additional measures to mitigate impacts are presented in Section 7.4.5.

Flooding impacts

Potential flooding impacts during the construction phase have been considered, including how the proposed modification would potentially impact existing flood behaviour within the Site, how floodwaters would impact the proposed modification, and whether potential impacts would have follow-on effects across downstream locations.

Potential impacts of construction works on flooding

Flood modelling completed for the SSIP (BPM Projects, 2024) indicated that parts of the Project Area to undergo remediation would be subject to localised flooding in a combined 1% AEP rainfall event and 1% AEP tide event (Figure 7-5). Most of these areas are only subject to small amounts of flooding from local flows exceeding the internal road network's hydraulic capacity. However, a significant amount of flood storage is provided within the existing pipeways and tank bunds.

In areas that would undergo capping in Stage 3 (Figure 4-3), a layer of 300 mm would be lain atop contaminated soils. This would result in surface levels being raised by 300 mm and removal of existing bunds, potentially reducing existing flood storage at the Site. Loss of this flood storage could increase existing flood extents at other locations across the Site or even across external areas. To prevent loss of existing flood storage and to avoid offsite flooding impacts, the proposed design has incorporated the following measures:

- Existing bunds would be retained across the eastern side of Zone 2 to continue containing floodwaters generated by these areas, as shown in Figure 7-6
- Earthworks would be completed in a manner that does not significantly alter existing surface levels. For example, areas requiring up to 300 mm of capping would need to be initially excavated by 300 mm before the capping occurs.

These measures would prevent significant changes to existing flood storage volumes, which would in turn minimise the likelihood of localised flood impacts resulting from the proposed modification at other onsite or offsite locations.

Flooding impacts on construction works

Existing levels across the Project Area would remain the same or be lowered following the capping works, as described above. As such, the Site's resilience against external floodwaters would not change from that which currently exists. Existing surface levels along the Site boundaries would also remain untouched, thereby maintaining the same level required to keep external floodwaters out of the Site.

The management of external flows from the upstream Kamay Botany Bay National Park would be retained during construction. Flood protection would be required around excavated or susceptible construction zones, to divert large external surface flows entering the Site around these construction zones. These diversion works would direct flows around construction zones and back towards the existing SWS to prevent localised flood issues. Proposed earthworks would be staged to minimise the extent of required diversion works at any one time.

However, it is unlikely that significant flow diversion works would be required as the existing road network currently acts as an overland flow path for local and external floodwaters moving through the Site. The proposed modification would not impact the road network which would continue to provide an overland flow path during construction.

7.4.4 Impact assessment – Operation

Following completion of construction, the Site would continue to operate as described in the approval documentation for the approved project. However, remediation and removal of underground OWS lines from certain areas in Zones 2 and 3, may lead to potential operational impacts on drainage, wastewater, water quality, and flooding.

Drainage impacts

Currently, stormwater in Zones 2 and 3 is collected and processed under either the SWS or OWS systems. Under future operational conditions, following the removal of underground OWS lines from certain areas in Zones 2 and 3, the SWS would collect additional surface water runoff that would have previously been collected by the OWS.

Figure 7-6 illustrates the areas where stormwater is currently collected by the OWS and the areas that would be redirected from the OWS to the SWS as part of the proposed modification.

Following the proposed modification, the stormwater catchment area of Catchments B & D, E, and F would increase. Table 7-17 summarises changes in the catchment area of the OWS and SWS and increases in the stormwater area of each catchment and Table 7-18 summarises the changes to each catchment under post-modification conditions.

Table 7-17 Changes to the catchment area

Catchment	Total area (ha)	Existing condition		Post construction conditions			
		OWS (ha)	SWS (ha)	OWS (ha)	SWS (ha)	SWS Area Increase (ha)	SWS Area Increase (%)
B&D	72.6	22.0	50.6	19.9	52.7	2.1	4.1%
E	26.0	4.8	21.2	0.0	26.0	4.8	22.8%
F	107	4.1	102.9	0.0	107	4.1	4.0%

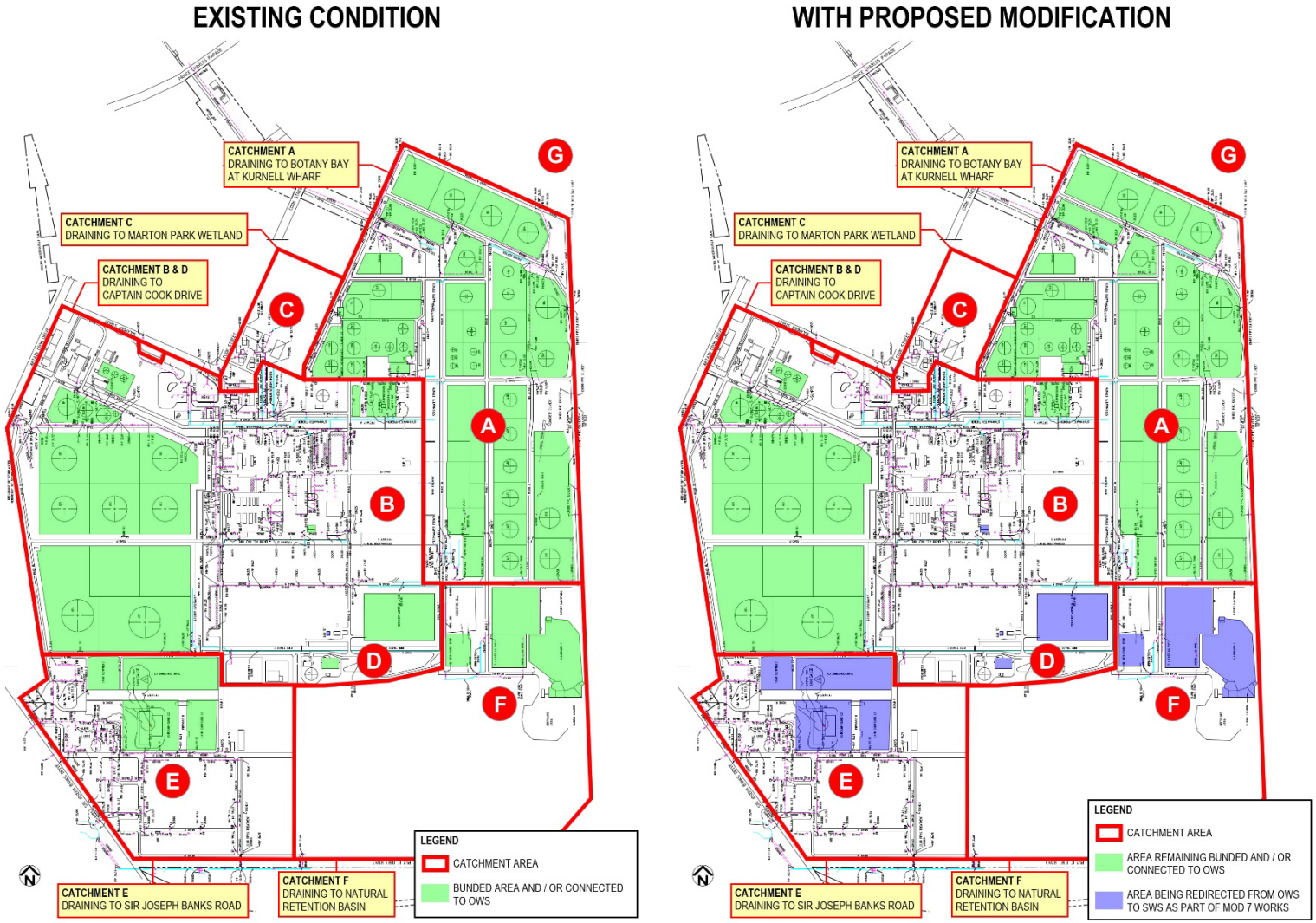

Figure 7-6 Areas being redirected from the OWS to the SWS

Table 7-18 Changes to each catchment under post-modification conditions

Catchment	Change
B & D	Under the proposed modification, stormwater from an area of 2.1 ha (4.1% of the total catchment area) would be redirected from the OWS to the SWS. Flows from the additional stormwater catchment would travel through the existing system, and flows exceeding the capacity of the OWS would be temporarily stored in the basin upstream of the pump (see Figure 7-7). Additionally, as part of the approved SSIP, a new pump station has been commissioned to redirect excess surface water to three vacant tank bunds in the Eastern Tank Farm. Since the outflow in the existing system is currently (and would continue to be) monitored, regulated, and controlled via its outlet and the new SSIP pump system, an increase in peak flow discharge into the basin or Quibray Bay is not expected. As such, additional detention controls are not required for Catchments B & D.
E	Under the proposed modification, stormwater from an area of 4.8 ha (22.8% of the total catchment area) would be redirected from the OWS to the SWS and eventually discharge into the drainage channel along Sir Joseph Banks Road. Preliminary modelling indicated that redirecting the additional area to the SWS would increase overland flows across the catchment by 1.5 m^3/s in the 1% AEP event. This increase in overland flow would cause a 10-20% increase in the total flow heading north west along Sir Joseph Banks Drive. This increase in flow has potential to overload or exacerbate existing drainage conditions along Sir Joseph Banks Drive, with potential to also increase peak flow rates entering Quibray Bay, which would increase overland flow velocities and potentially scour or erode the natural channels leading to the bay. As part of the proposed modification, dense vegetative cover in RPIP Mountain (see Figure 4-1) would be removed and replaced with a capping surface. Removal of vegetation would remove the rainfall interception and reduce the time taken for rainfall to convert to runoff, leading to an increase in peak discharge rates from this area into the downstream drainage system along Sir Joseph Banks Drive. Preliminary modelling indicated that the additional peak discharge rates from RPIP Mountain could increase by up to 0.6 m^3/s in the 1% AEP event and increase the total peak flow rates along Sir Joseph Banks Drive by 3 to 10%, which has potential to overload or exacerbate existing drainage conditions along this channel or across downstream areas. To address these potential impacts, a new onsite detention (OSD) system would be constructed in Catchment E to manage discharge rates from this area where surface flows are being redirected from the OWS network to the SWS. This would limit post-modification discharge rates back to pre-modification discharge rates mitigating post-modification downstream impacts. Additionally, the redundant pipe track in Zone 3 would be adjusted to retain water and further manage discharge rates in this area. Modelling results show that a detention storage volume in the order of 1,100 m^3 would be required.
F	Under the proposed modification, stormwater from an area of 4.1 ha (4% of the total catchment area) would be redirected from the OWS to the SWS. Due to excavation prior to capping, the surface levels would remain the same following construction, and existing bunds would continue to provide a detention function, and therefore, no additional detention is required for Catchment F. Significant changes in peak discharge rates in Catchment F are not anticipated during the operation of the proposed modification.

Oily water management

The existing OWS within Zones 2 and 3[5] would be decommissioned and removed. These works would be undertaken progressively to help manage potential contaminated surface water flows from other Stage 2 works or Stage 3 remediation activities. The OWS network in Zone 1 would continue to direct oily water and leachate towards the WWTP for treatment.

The remaining and remediated portions of Zones 2 and 3 would not produce oily water runoff after completion of the proposed modification works, and all surface water runoff from these zones would be of suitable quality for redirection to the existing SWS.

On this basis, the total oily water load from the Site entering the OWS system and WWTP would be significantly reduced during periods of rainfall. The OWS and WWTP are therefore unlikely to be impacted by the proposed modification and would continue to operate as per the approved project.

Water quality impacts

During operation, leachate from the ACS Containment Cell would continue to drain to the WWTP via the OWS diversion line connected to Zone 1 (Figure 4-1). Disturbed surfaces across the Site would be stabilised and remediated to provide sufficient surface cover, such as hardstand compaction or temporary vegetative cover, until future land uses are developed. It is assumed that existing flow controls or water quality treatment devices would remain and be maintained during operation. The capping area in Zones 2 and 3 would be stabilised with adequate surface cover, maintaining current stormwater discharge rates through the proposed OSD systems. There is minimal risk of pollution of surface water runoff during the ultimate state of operation, once surface cover/ vegetative cover has been well established.

However, there is some potential for erosion and sedimentation on the capping area immediately after construction ceases, when surface/ vegetative cover is not yet fully established and these surfaces and loose soils remain exposed. Erosion and sedimentation control measures would be implemented at the source until surfaces are stabilised (refer to Section 7.4.5). With such control measures in place, the risk of sediment pollution of stormwater is considered to be minimal.

Under the Sutherland Shire Council DCP, developments must reduce pollutants and sediments in surface water discharge to minimise environmental impact, achieving the pollutant reduction targets specified in Table 2-1 of Appendix I. Given the Site's proximity to sensitive aquatic ecosystems, such as Towra Point Nature Reserve and Marton Park Wetland, the Water Quality Objectives (WQOs) outlined in the ANZECC (2001) *Guidelines for the Protection of Aquatic Ecosystems 2015* (Sutherland Shire Council, 2015) have been considered when setting stormwater pollutant levels for the proposed modification.

Short-term post-construction water quality monitoring at main outlets of the catchments would be undertaken to confirm the discharged stormwater pollutant levels meet the required WQOs. In accordance with the ANZECC & ARMCANZ guidelines (ANZECC & ARMCANZ, 2000), baseline water quality sampling would be conducted at the proposed monitoring locations prior to the construction to define the baseline water quality conditions. Proposed stormwater quality monitoring locations are shown in Figure 7-7.

Table 7-19 below summarises proposed stormwater quality mitigation measures for each impacted catchment within the Project Area. By implementing the mitigation measures outlined in Section 7.4.5, potential water quality impacts on downstream sensitive receptors would be effectively mitigated.

[5] Except for a connection to the ACS containment cell wastewater sump and a diversion line from west of the ACS containment cell and along the northern boundary of Zone 2.

Table 7-19 Proposed stormwater quality mitigation measures for the Project Area

Catchment	Proposed stormwater quality mitigation measures
B&D	• At source, erosion and sediment control measures to be implemented until remediated surfaces are stabilised • Post stabilisation of landforms – Sediment control measures such as sediment traps upstream of pumps or outlet pits • Short-term water quality monitoring at Basin 1B (Location A, refer to in Figure 7-7) during three wet weather events during discharge. In the event of non-compliance, corrective and preventative actions would be identified.
E	• At source sediment control until remediated surfaces are stabilised • Post stabilisation of landforms – sediment control measures, such as sediment traps upstream of OSD discharge proposed at the Pipeway A & B (CLOR) and in RPIP Mountain • Addition of trash rack at OSD discharge to prevent gross pollutants leaving site • Short-term water quality monitoring at Locations B and C (refer to Figure 7-7) during 3 wet weather events during discharge. In the event of non-compliance, corrective and preventative actions would be identified.
F	• At source sediment control until remediated surfaces are stabilised • Post stabilisation of landforms – Sediment control measures, such as sediment traps upstream of the bunded tank discharge, could be considered. For example, outlet control could consist of a riser pit with a trash rack to manage gross pollutants and an orifice to regulate peak discharge. • Addition of trash rack at bunded tank discharge to prevent gross pollutants leaving site • Short-term water quality monitoring at Location D (refer to Figure 7-7) to monitor water discharged from the proposed orifice during three wet weather events. In the event of non-compliance, corrective and preventative actions would be identified.

Flooding impacts

The operational phase of the proposed modification is not expected to alter existing flooding conditions on or offsite. Whilst there would be changes to surface levels in several areas within Zones 2 and 3 which may slightly reduce rainwater attenuation within the Site, as most of these areas are above the 1% AEP flood level and the flood depth in submerged areas is quite shallow, the potential changes in flood storage across the Project Area would be insignificant. As such, the proposed modification is not anticipated to have an adverse impact on flooding during operation.

The proposed modification would also not alter the paths for external flows coming from the Kamay Botany Bay National Park or overland flow paths across the Site, as these overland flow paths generally follow the existing road network, which would not be impacted by the proposed modification. No additional mitigation measures are required to manage flooding impacts during operation.

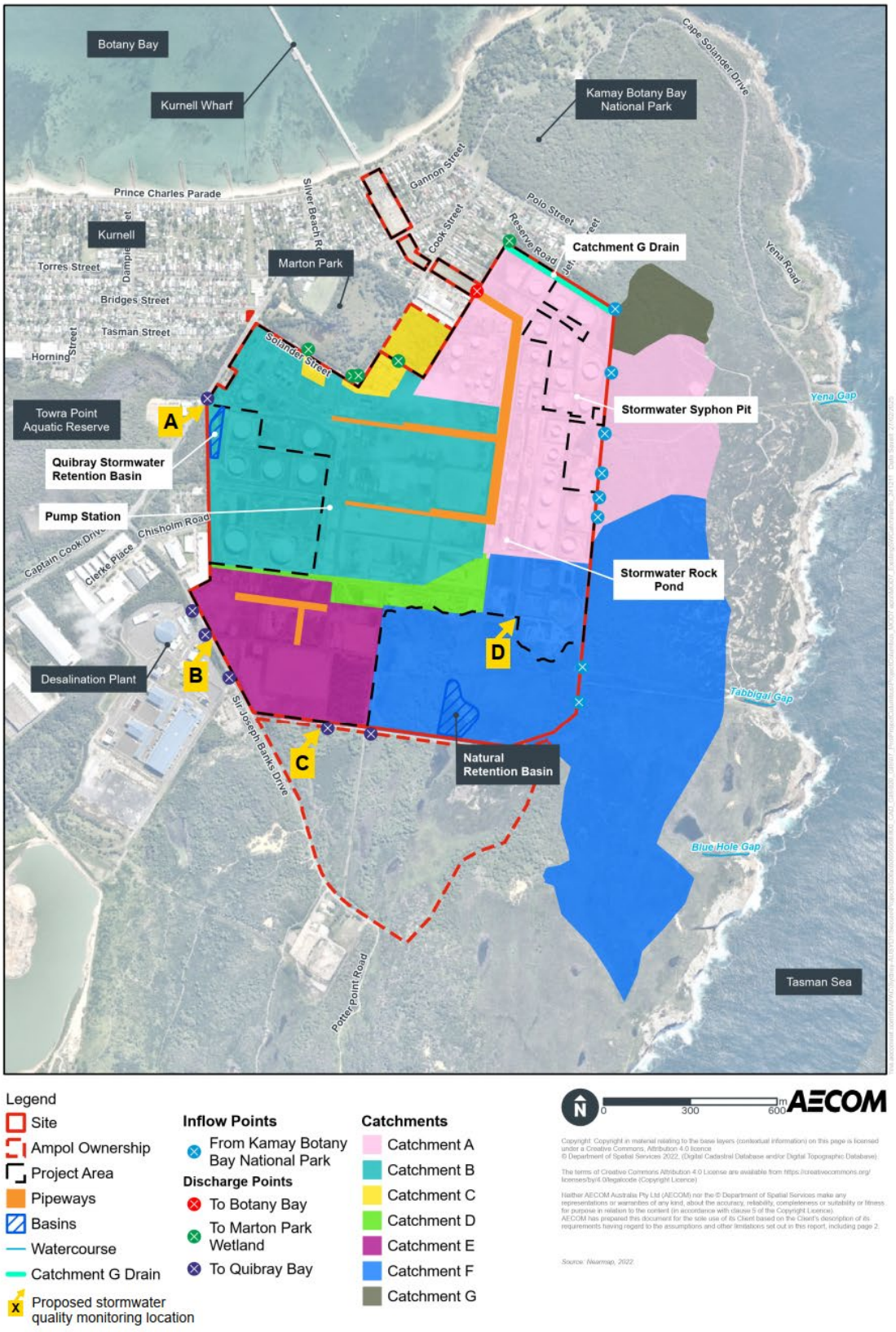

Figure 7-7 Proposed stormwater quality monitoring locations

7.4.5 Management measures

A selection of additional or modified mitigation measures to manage potential surface water, wastewater, and flooding impacts associated with the proposed modification are outlined in Table 7-20, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-20 Mitigation measures – Surface water, wastewater, and flooding

ID	Issue	Mitigation measure
F1	Soil and water management	The Construction Environmental Management Plan (CEMP) for the ~~Project~~ **proposed modification** would include a Soil ~~and Erosion~~ **and Water** Management Plan. This plan would include the following measures: • ~~All materials would be stockpiled in accordance with '*The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004)~~ • Silt fences would be installed around stockpiles to reduce erosion and the movement of suspended solids as necessary • Soil stockpiles and any polluted materials would be stored in designated areas which are not in close proximity to any stormwater drainage systems • Erosion control structures, bunded areas, containment areas, drainage lines and interception measures would be subject to regular inspection • Clean materials would be separated from contaminated materials • Soil erosion and sedimentation devices would remain in place until the disturbed ground surface is restored. These devices would also capture any gross pollutants.
F2	Soil and water management	A Soils and Water Management Plan would **include** ~~be developed as a sub plan to the DEMP. M~~**m**easures to be ~~included in the plan and~~ implemented during the ~~demolition~~ **construction** works to protect stormwater quality ~~would~~ includ**ing** ~~e~~: • Stormwater or groundwater ponded in excavations would be sent to the WWTP, unless it is tested and is of suitable quality to be directed to stormwater • Stormwater that is captured in the bunds around the contaminated soil stockpiles would be collected and sent to the WWTP • Silt fencing and/or alternate sediment control measures would be installed around soil stockpiles and disturbed areas or areas where dust suppression is being undertaken • Regular inspection would be undertaken of soil stockpiles~~/~~ **and** excavation areas, including following rainfall events • ~~Regular inspection of excavation areas and containment cell area, including following rainfall events~~ • Regular inspections would be undertaken of stormwater drains down hydraulic gradient of disturbed areas.~~;~~ • ~~Stormwater management measures incorporated into the design of the containment cell would be regularly inspected during operation in line with the Site's existing Inspection Checklist and following heavy rain events;~~ • ~~If stormwater quality is impacted during the demolition works and ACS Modification works in areas that have been disturbed, water would be diverted to the intermediate sewer system; and~~ • ~~During the demolition works and ACS Modification works, following notable but prolonged rainfall events (over three days) or~~

ID	Issue	Mitigation measure
		~~following heavy rainfall events over a shorter timescale, water sampling would be completed at the stormwater retention basin to ensure that the quality of the water is of an appropriate standard to be discharged from the Site. Water that is not of an appropriate quality would be either treated in situ or directed to the WWTP.~~
F4	Discharge	Discharges from the Wastewater Treatment Plant would be within existing EPL limits during ~~demolition,~~ construction and operation. ~~Any required change to this Oily Water Management System would be discussed and agreed with NSW EPA.~~
F5	Spills	The measures and processes currently in place at the Site to prevent ~~any~~ loss of contaminant would be maintained throughout the ~~demolition, construction and~~ operation phases of the **terminal (as modified) and during the delivery of the** ~~Project~~ **proposed modification**. This includes appropriate measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (as relevant). All bunds on tanks which are retained in service would meet the capacity requirements of *Australian Standard AS1940* during the operation of the ~~Project~~ **terminal (as modified)**.
F8	Surface water management	The following measures would be employed during and following the ~~demolition~~ **remediation and grading** of ~~the refinery process units and associated infrastructure~~ **land within Zones 2 and 3 (see Figure 1-1 of the MOD-7 Modification Report)**: • Appropriate bunding and controls would be put in place to prevent stormwater runoff from ~~the demolition works area~~ **contaminated soils** entering the stormwater system. • Following the completion of the ~~demolition~~ **remediation** works and removal of redundant infrastructure, the ~~former refinery process~~ area **defined in Figure 4-6 of the MOD-7 Modification Report** would be regraded. The regrading would aim to ~~ensure~~ **confirm** that water does not pool in this area. • As part of the regrading works, the surface material in this area would meet the commercial/industrial criteria as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013*. ~~A crushed aggregate made from clean concrete and asphalt from the demolition works would also be spread across the surface to help reduce soil erosion.~~ **Surface treatments, such as grassing or temporary pavement, would be provided to help mitigate soil erosion** • Stormwater runoff collected in the stormwater system would be subject to the controls within this system ~~(such as the oily water separators)~~ prior to being discharged.
F9	Soil erosion and sedimentation	**All** excavation **and capping works** ~~of the pipeways~~ would be staged, effectively minimising the area of disturbance at one time. The ~~ACS Modification~~ **proposed modification** works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation.
F10	Surface water management	Local weather patterns would be monitored to **confirm** ~~ensure~~ that workers completing the ~~ACS Modification~~ **construction** works at the Site were aware of predicted heavy rainfalls so that work could be stopped in the pipeways **and other flood-prone areas** prior to them containing surface water flows.

ID	Issue	Mitigation measure
F12	Offsite flood risk	Earthworks required for MOD-7 works would not remove existing bunding in the Site and would not result in an increased offsite flood risk.
F13	Discharge rates	Post-MOD-7 construction discharge rates from the Site would not exceed pre-construction discharge rates.
F14	Stormwater quality monitoring	Stormwater quality monitoring would be carried out pre-construction to establish a baseline, as well as short-term post-construction to confirm the efficacy of stormwater treatments. This water quality monitoring would be undertaken in accordance with the Blue Book (Landcom, 2004) and ANZECC & ARMCANZ (2000) guidelines. In the event of non-compliance, corrective and preventative actions would be identified.
F15	Protection of existing infrastructure	The existing OWS network would be protected during construction works, to avoid damaging or blocking this existing infrastructure and the WWTP.

7.5 Aboriginal cultural heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared for the proposed modification (Appendix J). The aim of this report was to identify Aboriginal cultural heritage values of the Project Area, assess potential impacts to them, and to provide appropriate management strategies as required. This section summarises the findings of the ACHAR.

7.5.1 Methodology

The ACHAR was prepared using the following methodology:

- Undertake background research to define the environmental, archaeological and ethnohistoric context of the Site
- Undertake a visual inspection of the Project Area
- Engagement with Registered Aboriginal Parties (RAPs) throughout the assessment process
- Assess the potential impacts of the proposed modification on Aboriginal cultural heritage
- Identify mitigation measures to minimise the risk of potential impacts to Aboriginal cultural heritage.

Information regarding the Aboriginal heritage values of the Project Area was obtained through background research, archaeological survey, and Aboriginal community consultation. A total of 14 RAPs were consulted for the assessment, with key consultation activities including:

- Review of the draft assessment methodology
- Participation in the Site inspection
- Review of a draft of the ACHAR.

Relevant guidelines for the production of the ACHAR are listed below:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b)
- *The Burra Charter: The Australia International Council on Monuments and Sites* (ICOMOS) *Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites, 2013)
- *Ask First: A Guide to Respecting Indigenous Heritage Places and Values* (Australian Heritage Commission, 2002)
- *Engage Early: Guidance for proponents on best practice Indigenous Engagement for environmental assessments under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* (Australian Government Department of the Environment, 2016)

Further details of the methodology are provided in the ACHAR (Appendix J).

7.5.2 Existing environment

Environmental context

Prior to the construction of the Australian Oil Refinery, land within the Project Area and immediate surrounds comprised part of a broader aeolian landscape characterised by gently undulating to rolling sand dunes, as well as swales, lagoons, marshes, and swamps, mostly covered by thick, low-lying heathland. Original vegetation communities of the Site and surrounds would have supplied Aboriginal people in the area with an extensive array of edible and otherwise useful plant species. The underlying geology of the peninsula is Hawkesbury Sandstone, which can be found at varying depths (up to 100 m).

Swamp, marsh, and lagoon-like features shown on early parish maps are likely to have supported a diverse suite of wetland species including a range of sedges, rushes, and aquatic herbs. This vegetation would likewise have supported a large and diverse range of terrestrial, aquatic and avian fauna.

The Project Area has been subject to significant historical disturbances including construction of the Australian Oil Refinery in the 1950s, as well as its ongoing use over the past seven decades. These include:

- Construction of several vehicle tracks across the peninsula prior to 1943
- Near complete clearance of native vegetation within the Project Area prior to 1956, including clearing scrub and draining and filling swamps
- Bulk earthworks to excavate and shape the Site to install various refinery infrastructure in late 1950s
- Establishment of large bunds to separate the refinery from the surrounding landscape, with a significant portion of the sand for this sourced from dredging in Botany Bay
- Further vegetation clearance and installation of refinery infrastructure around 1970 resulting in the complete removal of existing vegetation across the Project Area
- Ongoing development of the Site, including construction of new and removal of refinery infrastructure from the 1970s to present.

Today, no natural watercourses are located within the Project Area.

Geotechnical investigations of the parts of the Site were completed by WSP Australia (2024). Soils within the Site are characterised as ‘Disturbed Terrain’, having been disturbed to a depth of at least 1.35 to 2.5 mbgl with original soils either removed, buried, or otherwise severely disturbed. Beneath this fill layer, trace shell materials were observed between 5 and 7.5 mbgl, indicating the possibility of intact (i.e., undisturbed by the construction of the refinery) shell middens present beneath fill layers. Further detail can be found in Table 5-3 and Figure 5-1 of the ACHAR.

Archaeological context

Available archaeological data indicate that Aboriginal people have occupied the Sydney region[6] for at least 36,000 years (Williams *et al.*, 2014). The Aboriginal archaeological record of the Kurnell Peninsula is well-researched, with investigations of this record having been undertaken since the early 20th century, beginning with the identification of numerous Aboriginal midden sites by Doak and Macauley-Doyle (1927).

A search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 10 November 2023 for a 4 x 4 km area centred on the Project Area. A total of 70 Aboriginal archaeological sites were identified within the search area comprising 42 middens, 20 open artefact sites (i.e., artefact scatters and isolated artefacts), four areas of Potential Archaeological Deposit (PAD), three burials, and one rock engraving. None of these sites are located within the Project Area (refer to Figure 7-8).

[6] Following Attenbrow (2012a), the land bounded by the coast on the east, by the Hawkesbury-Nepean River in the north and west, and by a line running east-west through Picton and Stanwell Park in the south.

Figure 7-8 AHIMS in proximity to the Project Area

Previous archaeological investigations within the Project Area have been limited to a surface survey conducted by Australian Museum Business Services (AMBS) (Australian Museum Business Services, 2013) for the approved project. This limited investigation is a consequence of the refinery's construction in 1950, prior to the implementation of the *National Parks and Wildlife Act 1974*, as well as its continuous use since that time. Nonetheless, the Kurnell Peninsula is well researched having been the focus of multiple investigations incorporating both archaeological survey and test excavation since the 1920s. Generally, shell middens and open artefact sites have dominated the Aboriginal archaeological record of the Kurnell Peninsula, and excavated and surface recorded flaked stone artefact assemblages indicate an emphasis on the procurement and reduction of silcrete as raw materials. A full summary of findings of previous Aboriginal archaeological investigations is presented in Section 6.2.2 of the ACHAR (Appendix J).

The baseline review presented in the ACHAR concluded that the Aboriginal heritage values of the Project Area lie with its forming part of the broader Kurnell Peninsula cultural landscape, which is culturally significant for its association with the first meeting between the Gweagal people and Europeans in 1770.

Visual inspection

A visual inspection of the Project Area was undertaken on 6 June 2024 and 5 December 2024 by an AECOM Principal Aboriginal Heritage Specialist and a La Perouse Local Aboriginal Land Council (LALC) site officer, under escort by Ampol personnel.

No evidence of past Aboriginal occupation was observed during the visual inspection. Nonetheless, most of the land within the Project Area was found to retain moderate potential for Aboriginal archaeological deposits in undisturbed sand layers below the surface.

7.5.3 Impact assessment – Construction

The proposed modification would not impact any known items of Aboriginal cultural value. No known sites exist within the Project Area and no additional sites were identified within the ACHAR.

Excavations would be required for the removal of existing infrastructure, installation of new or upgraded infrastructure, remediation, and grading. The deepest excavations, up to 4.5 mbgl, would be required to install the new pit and pump for OWS upgrades along the southern boundary of Zone 2. The majority of works would be completed within the upper, disturbed/ fill layers of the Site, which are assessed as having low archaeological potential. These fill layers occur up to a maximum depth of 2.5 mbgl.

There remains moderate potential of unexpected sites present beneath fill layers within the Project Area. These may include shell middens, open artefact deposits, and hearths. There is also limited potential for Aboriginal burials. If intact, these deposits could be of moderate to high scientific significance. Nearby excavations suggest that archaeological materials may be found up to 3 mbgl, with the possibility of presence of deeper archaeological materials.

As there remains a risk that Aboriginal objects located in buried soil profiles could be impacted during intrusive works, measures have been proposed to mitigate this risk (refer to Section 7.5.5).

7.5.4 Impact assessment – Operation

Considering that the proposed modification works are contained wholly within previously disturbed areas within the Site boundary, no impacts to Aboriginal heritage values are expected once the proposed modification works are completed.

7.5.5 Management measures

A selection of additional or modified mitigation measures to manage potential heritage impacts associated with the proposed modification are outlined in Table 7-21, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-21 Mitigation measures – Aboriginal heritage

ID	Issue	Mitigation measure
J10	Unexpected finds	A Stop Works procedure would be implemented should any **unexpected finds of** Aboriginal Heritage **or non-Aboriginal heritage importance** ~~items~~ be found. Works would cease at the vicinity of the item and ~~OEH~~ **Heritage NSW** would be notified as soon as possible
J14	**Aboriginal cultural heritage management**	**An Aboriginal Cultural Heritage Management Plan (ACHMP) would be prepared and implemented for the proposed modification. Measures would include:** • **A map outlining where 'intact sands' (as described in the MOD-7 Aboriginal Cultural Heritage Assessment Report) could be disturbed. This map would be shared with MOD-7 contractors** • **Where impacts to Aboriginal archaeological deposits are identified, a Registered Aboriginal Party representative would be engaged to monitor works in this area** • **If Aboriginal archaeological deposits are identified during intrusive subsurface works, Aboriginal archaeological works would be prepared to a standard comparable to that required by the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. Printed and/or digital copies of associated reports would be made available to Registered Aboriginal Parties upon request.** • **Ampol would ensure that the proposed modification's standard environmental site induction includes an Aboriginal heritage component.** **The ACHMP for the proposed modification would be subject to periodic review to verify that all mitigation measures are being adhered to and are working effectively.**
J15	**Aboriginal ancestral remains**	**An Aboriginal community representative must be present where it is reasonably suspected burials or human remains may be encountered. If human remains are unexpectedly encountered and they are thought to be Aboriginal, the Aboriginal community would be notified immediately.** **Recording of Aboriginal ancestral remains would be undertaken by, or be conducted under the direct supervision of, a specialist physical anthropologist or other suitably qualified person.** **Archaeological reporting of Aboriginal ancestral remains would be undertaken by, or reviewed by, a specialist physical anthropologist or other suitably qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains as the remains of Aboriginal people rather than as scientific specimens.**
J16	**Consultation with Registered Aboriginal Parties**	**Provisions regarding appropriate consultation protocols with Registered Aboriginal Parties would be included in the ACHMP. Contact details and preferred contact methods for each Registered Aboriginal Party, as well other relevant stakeholders, would be specified.**

7.6 Historic heritage

A Heritage Impact Assessment (HIA) was prepared for the proposed modification (Appendix K). The purpose of the HIA was to assess the impacts of the proposed modification on potential non-Aboriginal heritage values. This section summarises the findings of the HIA.

7.6.1 Methodology

To understand and describe the non-Aboriginal heritage values and the potential impact on them by the proposed modification, the following methodology was followed:

- Undertaking searches of relevant statutory heritage databases
- Conducting a desktop review of relevant heritage and archaeological assessments undertaken within and adjacent to the Project Area, including:
  - The *Caltex Kurnell Refinery Conversion: Heritage Impact Assessment* (Australian Museum Business Services, 2013) that was prepared to support the Kurnell Refinery Conversion EIS (referred to as the '2013 HIA')
  - The *Caltex Kurnell Refinery Demolition: Heritage Impact Assessment* (Australian Museum Consulting, 2014a) that was prepared to support SSD-5544 MOD-1 (referred to as the '2014 HIA')
  - The *Caltex Kurnell Refinery Heritage Management Strategy* (Australian Museum Consulting, 2014b) (referred to as the 'HMS') that was prepared in response to the conditions of consent for SSD-5544
- Undertake targeted site inspections over one day
- Identify non-Aboriginal heritage items with the potential to be impacted by the proposed modification
- Assess the potential impacts of the proposed modification on non-Aboriginal heritage values and identified items during construction and operation
- Preparation of management measures to address potential impacts to non-Aboriginal heritage.

Relevant guidelines for the HIA are listed below:

- ICOMOS *Burra Charter* (Australia International Council on Monuments and Sites, 2013) and the *NSW Heritage Manual* (Heritage Office & NSW Department of Urban Affairs and Planning, 1996)

7.6.2 Existing environment

Site context

Following the initial landing of Captain Cook and the *Endeavour* in 1770 and the subsequent arrival of the First Fleet in 1788, the Kurnell peninsula was not formally settled by Europeans until 1815. The peninsula was initially used for farming, timber, and sand extraction, as well as recreational activities, such as fishing, camping, picnicking, and bushwalking.

In the early 1950s, Ampol (formerly Caltex) commenced construction of the Australian Oil Refinery. Construction involved the draining of swamps, clearing of scrub, and installation of roads, water supplies, and sewerage facilities. This activity led to further development of the peninsula and of the Kurnell township. During the peak of construction in 1955, approximately 3,000 people were employed at the Site, with most arriving at work each day by bus from Cronulla.

The refinery began its production in 1956. With approximately 500 permanent employees, the refinery was pumping finished fuel products across Botany Bay via submarine pipelines to the Banksmeadow terminal, where they were transferred to road and rail tankers for further distribution throughout NSW. Fuel products were also shipped out from the Kurnell wharf via a fleet of small Australian flag tankers. Expansion occurred throughout its lifetime, including but not limited to the construction of the Australian Lubricating Oil Refinery (ALOR, later known as the CLOR) in the 1960s, and various health and safety improvements in the 1980s and 90s.

Operation continued until 2014, when refining ceased following Caltex's announcement to convert the Site to a finished products terminal. In January 2014, under SSD-5544, development consent was granted for the conversion works to proceed. In the fourth quarter of 2014, all refinery operations had ceased and by mid-2015, all of the works approved under the initial development consent had been completed, with the exception of some tank conversions, which were completed by the end of 2016.

Heritage significance

The Site is listed as an archaeological heritage item, the Australian Oil Refinery (A2524). Another item, the Four-Wheel Drive Track (A2523) passes through the Site (Figure 7-9).

The Australian Oil Refinery's archaeological site covers the footprint of the former Australian Oil Refinery, and the Project Area is wholly within the boundary of the archaeological site. In the past decade, many of the former buildings and tanks associated with the former refinery have been demolished, and any subsurface remains of these buildings and infrastructure, including pipeways, contribute to the archaeological value of the Site.

The 2013 HIA (Australian Museum Business Services, 2013) was prepared to support the Kurnell Refinery Conversion EIS. It presented an assessment of the heritage significance of the former Kurnell Refinery against the heritage significance criteria. Infrastructure and buildings assessed to be of heritage significance in the HMS (Australian Museum Consulting, 2014b), that are of relevance to this proposed modification, are summarised in Table 7-22 and shown on Figure 7-9.

Table 7-22 Significance of potentially affected buildings and structures

Building/ Feature	Heritage values (2014)	Proposed action (2014)	Modifications and observations (2024)
Pipelines	High significance. Original and early pipe tracks. Alterations do not detract.	Majority of pre-existing line systems, including seven underground pipelines to be demolished. Some line systems not included in demolition works.	Sections of oily water sewer and firewater systems to be removed
Warehouse (Area 2, Road M)	High significance. Original building. Good integrity: various modifications but key elements of design and original features extant. Continues to be used for purposes same as or similar to original purpose.	Not included in demolition works.	Warehouse currently used for storage. Exterior appears to have deteriorated since 2013. Proposed for demolition.
Storehouse (Area 2, Road M)	High significance. Original building, fair integrity. Various modifications but key elements of design and some original features extant. Continues to be used for purposes same as or similar to original purpose.	Not included in demolition works.	Currently used for storage. Exterior appears to have deteriorated significantly since 2014. Proposed for demolition.
Oil Spill Room (Area 2, Road 9)	Little significance.	Not included in demolition works.	Proposed for demolition.

Building/ Feature	Heritage values (2014)	Proposed action (2014)	Modifications and observations (2024)
Central Control Building (Area 2, Road 6)	Moderate significance. Recent building. Good integrity. Provides important evidence of technical change in refinery processes.	Not included in demolition works.	Significantly deteriorated since 2014. Proposed for demolition.
Substations (Area 2)	Little significance.	Recent constructions.	Proposed for demolition.

The Four-Wheel Drive Track archaeological site is located partially within the Project Area. The archaeological site represents the theme of transport and its difficulties, and the isolation of some areas within Sutherland Shire until very recently.

Visual inspection

An inspection of the Project Area was undertaken on 6 June 2024 by Dr Darran Jordan. The inspection included a car survey across the entire Site, as well as pedestrian inspections around structures proposed for either demolition or relocation.

No surface expressions of heritage sites were identified in any of the proposed construction areas, which were identified as having been highly disturbed by past impacts. It was noted that the buildings appear to have deteriorated in varying degrees when compared to recordings made of them in 2014.

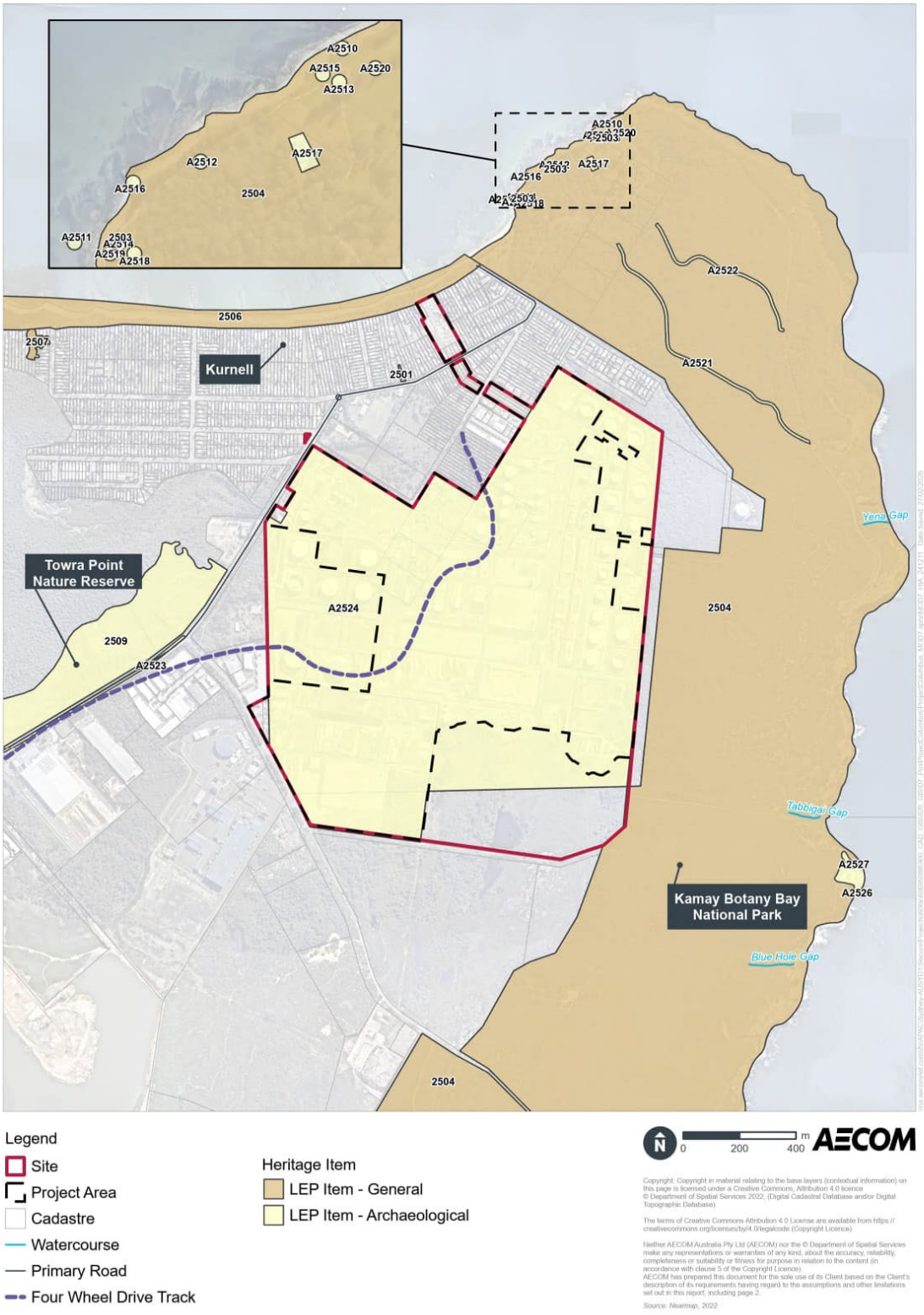

Figure 7-9 Heritage items

7.6.3 Impact assessment – Construction

Demolition of existing structures

Ten structures are proposed to be demolished as part of the proposed modification. These are listed below with the heritage significance presented in the HMS (Australian Museum Consulting, 2014b):

- Storehouse (heritage significance – **High**)
- Warehouse (heritage significance – **High**)
- Oil Spill Room (heritage significance – Little)
- Central Control Building (heritage significance – **Moderate**)
- Three unnamed structures in Zone 2 (none of heritage significance)
- Three unnamed buildings in Zone 3 (none of heritage significance).

The three buildings of heritage significance (the storehouse, workshop, and Central Control Building) were retained in 2014 in fulfilment of Strategy 14 of the HMS (Australian Museum Consulting, 2014b), being the retention of a representative sample of significant original buildings in use across the Site. The heritage significance of these three buildings is recognised; however, it is considered that their high to moderate heritage significance relates to intangible characteristics related to their role in the operations of the former refinery, rather than their existing tangible characteristics.

Today, these buildings are isolated away from the operational terminal infrastructure and are therefore not in use other than the Workshop and Storehouse, which are used for non-essential storage by Ampol. These buildings are now decontextualised remnants of the former refinery's operation and no longer hold any practical or contemporary heritage significance or value. As most of the infrastructure and other buildings have already been demolished, the significance of the three buildings as crucial elements of the refinery is unavoidably diminished when removed from their original context.

Demolition of these buildings is required to help ensure Ampol's operations are reliable and sustainable, and to support future land uses at the Site. In keeping with best heritage practice, the retention of these buildings has been considered. However, the retention of the buildings in their current location and form is inconsistent with Ampol's operational requirements and risks ongoing safety, maintenance, and compliance obligations. The benefits associated with the remediation and future use of the Site outweighs the financial burden and operational challenges of retaining these three heritage buildings. The retention of the buildings is not considered feasible, owing to the financial burden of renovation and continued maintenance of the buildings, lack of function and inability to be adaptively reused, as well as the inherent limitations of remediation and future use of the land owing to their presence. It is considered that these circumstances demonstrate that the burden of their retention outweigh the benefits of their retention.

Removal, relocation and/or augmentation of other existing infrastructure

Firewater systems

In relation to the augmentation and/or removal of the FWS in Zones 1 and 2, the pipelines are considered to be of heritage significance in relation to their former use in the Australian Oil Refinery. However, as with the buildings, they have lost their tangible significance and it is considered that these pipelines may be augmented or removed without heritage constraint.

The FWS Relocation Area in Zone 1 was formerly used as a Liquefied Petroleum Gas (LPG) storage area during the Australian Oil Refinery's operations and was not considered to be of heritage significance. The FWS may be relocated without heritage constraint.

The firewater tank proposed to be demolished in the south of Zone 2 is not listed as a heritage item and its removal is not considered to have an impact on the heritage significance of the item.

The two substations to be demolished in Zone 3 are located in the CLOR area; it is noted that the CLOR area was not considered to be part of the former Australian Oil Refinery, and therefore has no heritage protection (Australian Museum Consulting, 2014b:154). All infrastructure in this area, including the substations, structures, OWS, and FWS, may be removed without heritage constraint.

Oily water sewer

The proposed locations for the OWS interception pit near the ACS Containment Cell are on the site of eight former tanks and a sludge lagoon, and the proposed new lines are proposed for former roadways and a small area between the lines of tanks in the Eastern Tank Area.

As the original tank area within the Kurnell Refinery, the HMS assessed the Eastern Tank Area as being of high heritage significance. By 2014, 14 of the 87 tanks were original, with the remaining tanks constructed at later phases. It was noted by the HMS that the retained tanks would, in an abandoned state, present a potential safety/ environment hazard.

Archaeological deposits associated with these works would comprise the footprints and possibly remains of the eight former tanks, redundant pipeways, and background industrial material. Given the extensive existing knowledge of the refinery and its operations, these types of deposits are not considered to be of any archaeological significance, particularly as the significance of the tanks lay in their operation as part of the refinery, rather than the fabric of the individual tanks.

There are no heritage constraints to these works.

Electrical assets

The two substations proposed to be demolished in the south of Zone 2 are not listed as heritage items and their removal is not considered to have an impact on the heritage significance of the item.

Construction of new buildings

Three new buildings would be constructed. These would be fit for purpose to allow the safe and sustained operation of the Kurnell Terminal.

Construction of new warehouse

This new warehouse would be constructed in an area that was formerly occupied by two tanks that have since been demolished. There are no heritage or archaeological constraints associated with the construction of the new warehouse.

Construction of new oil spill equipment storeroom

The new oil spill equipment storeroom would be constructed on vacant, disturbed ground which was formerly occupied by an unnamed building to the south of the former fire house. There are no known heritage or archaeological constraints associated with the construction of the new oil spill equipment storeroom.

Construction of storage shed

The storage shed would be constructed south of the existing Contractors Facilities. There are no known heritage or archaeological constraints associated with the construction of the new storage shed.

Road upgrades

The roadways are not identified as being of heritage significance; however, the alignments of these roads are important to interpreting the former layout of the refinery. It is therefore considered that the upgrading and retention of the alignment of these roads represent a minor positive impact to the overall significance of the Site.

7.6.4 Impact assessment – Operation

Once the modification works are complete, the Site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for SSD-5544.

As the Project Area is located within an archaeological site, impacts from an archaeological perspective would occur during the construction of the proposed modification. It is considered that there would be no additional impact from the operational phase of the proposed modification.

7.6.5 Management measures

A selection of additional or modified mitigation measures to manage potential non-Aboriginal heritage impacts associated with the proposed modification are outlined in Table 7-23, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-23 Mitigation measures – Non-Aboriginal heritage

ID	Issue	Mitigation measure
J2	Historic heritage management	If any further heritage items were discovered throughout the **delivery of the** ~~Project~~ **proposed modification**, work would cease until an assessment is carried out by a qualified heritage professional.
J4	Heritage Management Strategy	The Heritage Management Strategy (HMS) and the **relevant** management strategies within it would continue to be implemented.
J6	Historic heritage management	The sculptural panels by Bert Flugelman would be retained and preserved.
J9	Historic heritage management	If historical archaeological relics are unexpectedly found during the ~~demolition~~ **proposed modification** works, works in the area of the relics would cease and the Heritage Council of NSW would be notified.
J10	Unexpected finds	A Stop Works procedure would be implemented should any **unexpected finds of** Aboriginal Heritage **or non-Aboriginal heritage importance** ~~items~~ be found. Works would cease at the vicinity of the item and ~~OEH~~ **Heritage NSW** would be notified as soon as possible
J11	Human remains	If any human remains are disturbed, all work in the vicinity of the remains would stop immediately and the remains would not be further disturbed or moved. Works would cease at the vicinity of the item and ~~OEH~~ **Heritage NSW** and NSW Police would be notified as soon as possible.
J12	Historic heritage management	Prior to works commencing, all personnel and contractors involved in ground disturbance works would be briefed on the procedures to follow if human remains or unexpected heritage items are found.
J13	Historic heritage management	As part of the **CEMP** ~~DEMP~~, a Heritage Management Section ~~will~~ **would** be developed. This ~~will~~ **would** incorporate previous management and mitigation measures that are not already included in the HMS.

7.7 Traffic and transport

A Traffic and Transport Impact Assessment was prepared for the proposed modification (Appendix L). The purpose of the TTIA was to provide a qualitative traffic and transport assessment to understand the potential impacts of the proposed modification on the surrounding road network. This section summarises the findings of the TTIA.

7.7.1 Methodology

An assessment approach was developed in accordance with relevant guidelines to prepare a qualitative assessment of the potential impacts related to the proposed modification. The TTIA involved:

- A review of the construction traffic generation forecast of the proposed modification, and potential impacts from OSOM vehicles accessing the Project Area
- A qualitative assessment of potential transport and traffic impacts of the proposed modification including:
  - Road networks
  - Access and parking
  - Road safety
  - Public transport
  - Active transport
- A qualitative assessment of potential cumulative traffic and transport impacts to the surrounding road network
- Identifying mitigation measures for managing the potential impacts.

Relevant guidelines for the TTIA are listed below:

- *Guide to Traffic Management – Part 3: Traffic Studies and Analysis* (Austroads, 2020a)
- *Guide to Traffic Generating Developments Version 2.2* (Roads and Traffic Authority (RTA), 2002)
- *Technical Direction TDT2013/4a – Guide to Traffic Generating Developmen*ts (Roads and Maritime Services, 2013)
- *Guide to Traffic Management – Part 12: Integrated Transport Assessments for Developments* (Austroads, 2020b) and the complementary *Roads and Maritime Supplement to Austroads Guide* (Roads and Maritime Services, 2017).

Study area

For the purposes of the TTIA, a study area was identified that included the local road network and all transport facilities in the vicinity of the Site, including public transport and active transport. The study area predominantly encompasses the primary and secondary access points to the Site, Solander Street and Sir Jospeh Banks Drive respectively, as well as the main road to Kurnell, Captain Cook Drive.

An extended haulage route was identified from the intersection with The Boulevarde/ Taren Point Road/ Port Hacking Road. This was done to consider the connection between the Project Area and the wider classified road network, so as facilitate wider freight movements to the north and south of the Sutherland Shire local area. The extent of this study area is shown in Figure 7-10.

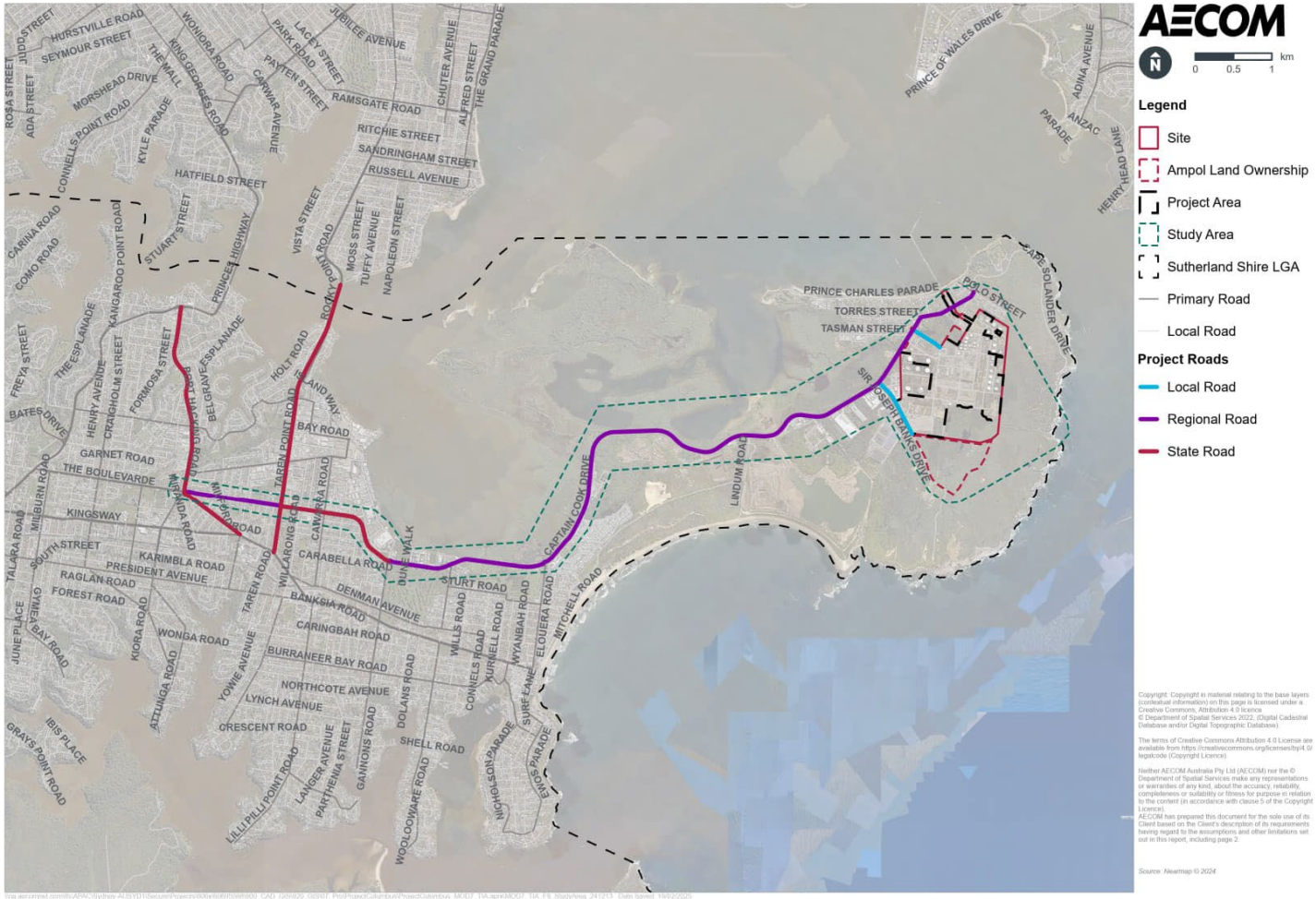

Figure 7-10 Study area – Traffic and transport

7.7.2 Existing environment

Road network

Captain Cook Drive is the main access road into Kurnell, travelling from east to west along the southern shoreline of Botany Bay. Captain Cook Drive begins west of the Project Area, at the junction of Taren Point Road and The Boulevard. Connections to Taren Point Road allow for access further north via Captain Cook Bridge, whilst connections through The Boulevard allows a direct connection to the A1 Princes Highway.

To the west of Gannons Road, Captain Cook Drive is a state road, and to the east of Gannons Road, a regional road.

In addition to Captain Cook Drive, other significant roads in the local road network include:

- The Boulevard – A regional road
- Taren Point Road – A classified road
- Port Hacking Road – A classified road
- Sir Joseph Banks Drive – A local road, connecting to Captain Cook Drive and running adjacent to the south west boundary of the Site, and providing secondary access from the south
- Solander Street – A local road, connecting to Captain Cook Drive and providing primary access to the Site from the north.

Existing network traffic volumes

Traffic surveys were undertaken on Wednesday 6 March 2024 to understand the existing turning movements at two key intersections on the main access road to the study area (Captain Cook Drive). These intersections are shown in Figure 7-11.

Counts from both intersections, Captain Cook Drive/ Elouera Road and Captain Cook Drive/ Sir Joseph Banks Drive, show an overall external road network peak at 8.00-9.00 am and 4.30-5.30 pm. Total traffic volumes travelling through the surveyed intersections are as follows:

- Captain Cook Drive/ Elouera Road
  - AM peak total volume = 2,056 vehicles
  - PM peak total volume = 2,247 vehicles
- Captain Cook Drive/ Sir Joseph Banks Drive
  - AM peak total volume = 699 vehicles
  - PM peak total volume = 752 vehicles.

Growth rates were applied to the traffic counts to reflect expected 2026 flows (the year of construction) using growth rates applied to traffic assessment for similar SSD projects in the study area[7], which both applied a background growth rate of 1% per annum. Table 7-24 shows the uplift on the 2024 survey data, to 2025 the peak year of construction. The existing data provides a reliable basis for understanding current traffic conditions and informs the assessment for the proposed modification.

Table 7-24 2024 traffic volumes uplifted to 2025

	Peak	2024 total volumes at each intersection	Uplift by 1% to 2025
Captain Cook Drive/ Elouera Road	AM	2,056	2,077
	PM	2,247	2,269
Captain Cook Drive/ Sir Joseph Banks Drive	AM	699	706
	PM	752	760

[7] Kamay Ferry Wharves (SSI-10049) and Breen Resourcing Facility (SSD-10412)

Figure 7-11 Traffic survey intersections

Access and parking

Solander Street is situated between the Site and Marton Park and is the primary access to the Kurnell Terminal. The road connects with Captain Cook Drive, which provides access to the local road network, and Cook Street within the Site.

Sir Joseph Banks Drive is a local road that runs in alignment with the south west boundary of the Project Area, and connects to Captain Cook Drive to the north. A secondary access point for the terminal is located roughly 500 m along Sir Joseph Banks Drive.

Extensive parking is available onsite. On-street parking is not provided along the majority of Captain Cook Drive but does occur within the section immediately to the north and south of the entrance to Solander Street. Sir Josephs Banks Drive provides some on-street parking, as well as informal parking, along the verges.

Road safety

Transport for NSW (TfNSW) provided an overview of all crashes near the Project Area for the five-year period between 2018 and 2022. The review of the crash data indicates that multiple crashes have occurred near the Site and on the key access routes to the Site. In total, 56 crashes occurred along Captain Cook Drive between 2018 and 2022 and 59% of these (33) occurred at intersections. Of all intersections, the intersection between The Boulevard/ Taren Point Road/ Captain Cook Drive experienced the highest number of crashes in the five-year period.

Public and active transport

The nearest railway station to the Site is Cronulla station, followed by Woolooware slightly further west, both along the Eastern Suburbs and Illawarra Line.

Bus connections to Kurnell include the 987 service, running from Cronulla Station to Cape Solander Drive and Captain Cook Drive. Additionally, the 985 bus service from Cronulla to Miranda via Woolooware Bay runs along Captain Cook Drive between Gannon Road and Elouera Road.

There is currently no ferry service in Kurnell; however, the NSW Government is building Kamay Ferry Wharves to create a water connection between La Perouse and Kurnell. Construction is occurring at the time of this report being written and is expected to be complete in early 2025.

Existing on-road cycleways exist along Captain Cook Drive to Trinity Street in the eastbound direction; in the westbound direction, there is a cycle lane and a shared path. From Trinity Street to Torres Street, there are cycle lanes in both directions.

7.7.3 Impact assessment – Construction

Road network

Construction traffic demand

The traffic generated by the proposed modification would incorporate a mix of construction plant vehicles, delivery vehicles, and construction personnel movements. A summary of the construction vehicles and associated staff numbers that would be required during the works is provided in Table 4-5 and Table 4-7.

Table 7-25 outlines the anticipated impacts of light and heavy construction vehicles on the surrounding road network considering the 2024 traffic volumes uplifted to 2025 (peak construction).

Table 7-25 Construction traffic impact on the road network

Vehicle type	Construction traffic impact
Light vehicles	During peak construction, 200 construction workers would be employed at the Site, in addition to existing Ampol employees and contractors. To provide a conservative assessment, all workers have been assumed to arrive at the Project Area in their own individual private vehicles. Construction personnel (light vehicles) would arrive at the Site in the AM and leave in the PM outside of external road network peaks (consistent with the expected working hours). As such, it is anticipated that construction personnel numbers would not have a significant impact on the external road network.

Vehicle type	Construction traffic impact
Heavy vehicles	During peak construction periods, the total number of construction vehicle movements (heavy vehicles) would be 136 per day and up to 14 per hour (spread over a 10 hour workday). It has been assumed that these vehicles would arrive and leave in the same hour; as such, this results in 7 HVs arriving and 7 HVs leaving the Site per hour over a 10 hour workday. Intersection modelling was undertaken for the nearby Breen Resource Recovery project (Ethos Urban, 2021). This indicated that all intersections along Captain Cook Drive were performing at an acceptable Level of Service (LOS) of C, indicating an acceptable level of operation and delay. As noted above, the total number of HVs arriving and leaving the Site at would be 14 per hour. Compared to the lowest volumes travelling through the surveyed intersections in 2025 (Captain Cook Drive/ Joseph Banks Drive AM: 713 vehicles), an increase in 14 heavy vehicles would equate to an increase of about 2%. As such, the increase in vehicle trips associated with this proposed modification is not expected to change the operational performance of the road network in the study area.

A small number of vehicles would be required to access Zone 1A as part of the construction works. This would include three construction vehicles (such as cranes, semi-trailers), six truck and dog (offsite disposal and imported fill), and three equipment/ material delivery vehicles return trips. Vehicles would travel along Captain Cook Drive to access Zone 1A via the existing access point on Prince Charles Parade. Given the small scope of work required in Zone 1A in comparison to the main terminal, and that works in Zone 1A would occur over three months, no impact is expected on the performance of the local road network.

To manage traffic movements related to the proposed modification, a Traffic Management Plan would be developed and implemented, as part of the CEMP (refer to Section 7.7.5).

Oversize and Overmass vehicles

OSOM vehicles are vehicles with overall dimensions or weight requiring special consideration when operated on the road network. The proposed modification requires the use of OSOM vehicles.

As previously approved modifications at the Site have utilised OSOM vehicles, the road network accessing the study area is understood to be equipped to accommodate OSOM vehicles of similar class. Measures to manage OSOM and other construction traffic are outlined in Section 7.7.5.

Heavy vehicles currently access Zone 1A via Silver Beach Road and Prince Charles Parade. Vehicles to be used for the proposed modification would be selected to ensure suitability on the local road network and would not be OSOM, as outlined in Section 7.7.5.

Access and parking

No impacts on existing property access for other properties has been identified, as existing access points to the Project Area would be utilised during construction.

Sufficient parking is available to construction vehicles and personnel. No impacts to parking availability surrounding the Project Area are anticipated, other than potential temporary loss of parking in the vicinity of Solander Street and Sir Joseph Banks Drive to accommodate OSOM vehicles needing to access the Project Area.

Where impacts are anticipated from OSOM vehicles, advanced notification of timings would be provided. Measures to manage OSOM and other construction traffic are outlined in Section 7.7.5.

Road safety

There is a risk of construction vehicles interacting with pedestrians, cyclists, and motorists on the road network surrounding the Site. Potential impacts on road safety for all users during construction would be managed through the mitigation measures outlined in Section 7.7.5.

Public and active transport

During construction, bus services and bus stop locations in the vicinity of the Site are unlikely to be impacted. Additionally, works would be carried out in a manner to maintain pedestrian and cyclist routes around the Site. Therefore, the proposed modification is not anticipated to impact the public or active transport.

7.7.4 Impact assessment – Operation

The Site would continue to operate as previously approved, with minimal changes in terms of operational vehicle traffic movements, beyond a small number of additional trips to access the proposed storage shed in Zone 1A. Given this negligible increase, traffic volumes in the study area during the operational scenario are expected to remain consistent with the forecast traffic levels, without the proposed modification. These minor changes are not expected to impact the performance of the road network in the study area. Consequently, an operational traffic assessment is not required.

7.7.5 Management measures

A selection of additional or modified mitigation measures to manage potential traffic and transport impacts associated with the proposed modification are outlined in Table 7-26, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-26 Mitigation measures – Traffic and transport

ID	Issue	Mitigation measure
I1	Traffic management	**Sutherland Shire Council and Kurnell residents would be informed of works that would significantly affect the road network at least two weeks prior to these activities occurring (or in line with regulatory requirements). Significant activities would include the MOD-7 works commencing, works to construct the new storage shed in Zone 1A commencing, and Oversize and Overmass (OSOM) movements along Captain Cook Drive.** ~~Local Authorities and Kurnell residents would be informed of any Project related work which would affect the road network.~~
I2	Traffic management	A **Construction** Traffic Management Plan **(CTMP)** would be developed for the construction~~/ demolition~~ phase. The Traffic Management Plan would comply with all relevant Regulations and By-Laws and in particular address safe access and egress to the public road network. The ~~Transport Management Plan~~ **CTMP** would include: • Hours of permitted vehicle activity • Designated routes for construction ~~and demolition~~ traffic and defined access points to the Site ~~and demolition works area~~ • Duration of works • Permitted ~~demolition~~ vehicle types • Designated areas within the Site and **MOD-7 Project Area** ~~demolition works area~~ for truck turning movements, parking, loading and unloading to allow heavy vehicles to enter and leave the Site and **MOD-7 Project Area** in a forward direction • Sequence for implementing traffic management measures should these be required • Procedures and/or principles for construction and demolition vehicle speed limits and the safe operation of construction and demolition vehicles • Coordination of off-site heavy vehicle movements from the ~~demolition works and ACS Modification works~~ **Site** to help ensure that heavy vehicle movements do not exceed ~~60~~ **136** movements per day~~.~~

ID	Issue	Mitigation measure
		• **Outline plan for the movement of OSOM vehicles accessing the Site, including routes, appropriate construction hours for deliveries, road closures, and permit requirements.**
I5	**Cumulative traffic management**	**Consultation with Transport for NSW, Sutherland Shire Council, and other proponents of the Breen Resource Recovery Facility and Kurnell Planning Proposal projects would take place, as relevant, through the delivery of the MOD-7 works to help manage potential cumulative traffic impacts along Captain Cook Drive.**

7.8 Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) was prepared for the proposed modification (Appendix M). The purpose of this assessment is to identify potential noise and vibration impacts and outline mitigation measures, as required. This section summarises the findings of the NVIA.

7.8.1 Methodology

The NVIA assessment was prepared using the following methodology:

- Identification of nearby noise and vibration sensitive receptors potentially affected by the proposed modification works
- Attended noise monitoring conducted at the Site on 5 September 2023 and 21 August 2024 to characterise the existing noise environment
- Prediction of noise levels during both construction and operation at sensitive receptors using SoundPLAN 8.2 noise modelling software. The noise modelling considered the following:
    - Construction noise likely to be generated by each stage of the proposed modification works based on the criteria defined in Condition C16 of the approved project (Table 7-27) and the *Interim Construction Noise Guideline* (DECCW, 2009)
    - Construction road traffic noise likely to be generated by construction vehicles based on the *Road Noise Policy* (NSW EPA, 2011)
    - Vibration from construction works likely to be generated at nearby sensitive receptors based on *German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures* (German Standard , 2016); *Evaluation and Measurement for Vibration in Buildings Part 2* (British Standard, 1993); and *Assessing Vibration: A Technical Guideline* (DEC, 2006)
    - Operational noise likely to be generated at nearby sensitive receptors based on the criteria defined in Condition C17 of the approved project (Table 7-30 and Table 7-31)
- Review of anticipated noise from the proposed modification against:
    - Approved noise limits for the approved project (Conditions C16 and C17 of SSD-5544, provided in EPL 837)
    - Recommended noise levels defined in the Noise Policy for Industry (NSW EPA, 2017b)
- Identification of additional mitigation measures to minimise potential noise and vibration impacts.

Operational vibration is not expected to be an issue as a result of the proposed modification. Operational activities would be in line with the development consent for the approved project and would not involve new activities that would create additional vibration levels at nearby sensitive receptors or adjacent properties. Therefore, an assessment of operational vibration impacts was not undertaken.

Existing noise and vibration criteria

The risk of adverse impacts of construction noise on a receptor is determined by:

- The extent of its emergence above the existing background noise level, i.e. how loud the noise is
- The duration of the event
- The characteristics of the noise, i.e. “annoying characteristics” such as tonality, intermittency, or dominant low-frequency content.

The criteria used in this assessment are detailed below.

Construction noise

Construction noise limits for the Site were defined in Condition C16 of the approved project, which states that construction noise generated by the development shall not exceed the criteria in Table 7-27. The NSW EPA defines the time of day as follows:

- Daytime: Monday to Saturday 7am – 6pm, or Sundays and public holidays 8am – 6pm
- Evening: Monday to Sunday 6pm – 10pm
- Night-time: The remaining periods.

Table 7-27 Construction noise criteria

Location	Day	Evening
	$L_{Aeq(15\ min),\ dB}$	$L_{Aeq(15\ min),\ dB}$
30D Cook Street	45	40
At any other residence or other noise sensitive receptor	50	45

Noise levels resulting from construction activities were modelled at nearby noise sensitive receptors and were compared to the construction noise criteria in Condition C16 of the approved project. Residential and non-residential receptors located within the Kurnell township, and/or up to 2 km from the approximate centre of the proposed modification works have been considered in the construction noise assessment.

Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure 4-2). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers. The remaining proposed modification works are not proposed to be conducted at night-time; therefore, a sleep disturbance assessment for the construction phase is not required.

Construction traffic noise

Construction traffic noise for the modification works has been assessed against the *Road Noise Policy*. The *Road Noise Policy* does not require assessment of noise impacts to commercial or industrial receptors. The construction road traffic noise assessment criteria are presented in Table 7-28.

Table 7-28 Road traffic noise assessment criteria

Road category	Type of land use	Assessment criteria, dB(A)	
		Day (7am 10pm)	Night (10pm 7am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/ arterial/ sub-arterial roads generated by land use developments	$L_{Aeq(15\ hour)}$ 60 dB(A)	$L_{Aeq(9\ hour)}$ 55 dB(A)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1\ hour)}$ 55 dB(A)	$L_{Aeq(1\ hour)}$ 50 dB(A)

Construction vibration

Construction vibration criteria is defined in Condition C23 of the approved project, which references the standards and guidelines summarised in Table 7-29.

Table 7-29 Standards/ guidelines used for assessing construction vibration

Item	Standard/ guideline
Structural damage	• Heritage structures – *German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures* • Non-heritage structures – *Evaluation and Measurement for Vibration in Buildings Part 2, (British Standard (BS) 7385:Part 2-1993)*
Human comfort (tactile vibration)	• *Assessing Vibration: A Technical Guideline*[1]

Notes:

1. *This document is based upon the guidelines contained in British Standard 6472:1992, "Evaluation of human exposure to vibration in buildings (1-80 Hz)." This British Standard was superseded in 2008 with BS 6472-1:2008 "Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting" and the 1992 version of the Standard was withdrawn. Although a new version of BS 6472 has been published, the Environment Protection Authority still requires vibration to be assessed in accordance with the 1992 version of the Standard at this point in time.*

Operation noise

Operational noise criteria to assess the addition of the proposed modification to the other activities at the Site are defined in Condition C17 of SSD 5544 (for residential receptors) and the NSW Noise Policy for Industry (for non-residential receptors). These criteria are summarised in Table 7-30 and Table 7-31.

Operational noise is assessed at the boundary of the noise sensitive receptor in accordance with the NSW *Noise Policy for Industry*. These criteria apply to environmental noise emissions from any plant installed as part of the proposed modification.

Table 7-30 Operational noise limits

Location	Day	Evening	Night	
	$L_{Aeq(15\ min)}$, dB	$L_{Aeq(15\ min)}$, dB	$L_{Aeq(15\ min)}$, dB	L_{Amax}, dB
At any private residential receptor	60	50	50	55

Notes:

1. *These criteria were developed for original use of the site specifically. However, it is recognised that the site is zoned for heavy industrial purposes and that ultimately the amenity of the area should be controlled by the criteria contained in Table 2-1 of the Industrial Noise Policy*

Table 7-31 Recommended L_{Aeq} amenity noise levels for non-residential receptors

Type of receptor	Time of day	Recommended L_{Aeq} noise level dB(A) (external)
School classroom	Noisiest 1-hour Period When in use	45[1]
Active recreation area	When in use	55
Commercial premises	When in use	65
Industrial premises	When in use	70

Notes:

1. *Internal criteria given in the Noise Policy for Industry. For the purposes of this assessment, it is assumed that an open window will achieve a 10 dB noise reduction from outside to inside. This is the criteria that has been presented.*

7.8.2 Existing environment

Noise sensitive receptors

During construction of the proposed modification, sensitive receptors that may be impacted are predominantly located within the Kurnell township and neighbouring industrial areas. The closest residential receptors are directly adjacent to the proposed modification work areas within Zone 1A – Eastern Right of Way. Representative sensitive receptors included in the construction noise and vibration assessment are shown on Figure 7-12. Fewer sensitive receptors were included in the operational noise and vibration assessment as noise impacts are anticipated to be in line with existing operations of the Site. Sensitive receptors included in this assessment are shown on Figure 7-12 and listed in Table 7-32.

Table 7-32 Operational noise assessment receptor locations

Receptor ID	Address	Land use classification
R1	16 Tasman Street, Kurnell	Residential – Suburban
R2	3 Torres Street, Kurnell	Residential – Suburban
R3	127 Captain Cook Drive, Kurnell	Residential – Suburban
R4	41 Cook Street, Kurnell	Residential – Suburban
R5	30D Cook Street, Kurnell	Residential – Suburban
R6	7 Jeffrey Street, Kurnell	Residential – Suburban
R7	8 Bridges Street, Kurnell	Residential – Suburban
R8	9 Bridges Street, Kurnell	Residential – Suburban
E1	96 Captain Cook Drive, Kurnell (Marton Community Hall)	Education
AR1	92-94 Captain Cook Drive, Kurnell (Marton Park)	Active Recreation Area
PR1	Kamay Botany Bay National Park	Passive Recreation Area
PR2	Kamay Botany Bay National Park	Passive Recreation Area
C1	160 Captain Cook Drive, Kurnell (Kurnell Recreation Club)	Commercial
I1	171-189 Captain Cook Drive, Kurnell (Ausgrid substation)	Industrial
I2	58-64 Cook Street, Kurnell	Industrial
I3	18-28 Sir Joseph Banks Drive, Kurnell	Industrial
I4	21 Sir Joseph Banks Drive, Kurnell	Industrial

Figure 7-12 Noise sensitive receptors defined for construction and operation

Attended noise measurements

Attended noise measurements were conducted within the Site on 5 September 2023 and 21 August 2024 (refer to Appendix M). Each source measurement was conducted over a period deemed to be representative of typical operation. Weather conditions were clear and calm on each day of monitoring.

7.8.3 Impact assessment – Construction

Construction noise modelling scenarios

Construction of the proposed modification is proposed to take place over a period of 12 months for infrastructure removal scopes, and up to four years for remediation works. Construction of the new shed in Zone 1A is expected to take three months.

Construction scenarios are based on the following:

- Scenario 1 – All works up to early 2026, including preparation works and relocation of critical infrastructure, construction of new infrastructure in Zone 1, and early capping works (Stages 1 to 5) (construction of the new shed in Zone 1A)
- Scenario 2 – All works from early 2026 onwards, including remediation and grading works (Stages 3 to 5)
- Scenario 3 – Construction of the new shed in Zone 1A (three months)
- Scenario 4 – All works up to early 2026, including preparation works and relocation of critical infrastructure, construction of new infrastructure in Zone 1, construction of the new shed in Zone 1A (three months only), and early capping works (Stages 1 to 5).

Refer to Appendix M for a summary of the construction activities including the proposed construction equipment and associated sound power levels in dB(A).

Construction noise levels

Table 7-33 presents the construction noise modelling results for residential properties and shows the number of properties where the construction noise management levels (NMLs) are likely to be exceeded during the proposed modification works. The table also presents the number of receptors where noise levels are predicted to exceed the highly affected level, 75 dB(A), as noted in the Interim Construction Noise Guideline (DECCW, 2009). This is illustrated in Annexure A of the NVIA (Appendix M).

It is important to consider that this assessment is representative of the worst case 15-minute period of construction activity. The assessed scenarios do not represent the ongoing day to day noise impact at noise sensitive receptors for an extended period of time. Particularly noisy activities, such as grading or concrete crushing, and those in Zone 1A, would persist for a fraction of the overall construction period and be confined to less sensitive times of the day and not undertaken on Sundays, public holidays, or outside of the hours 7am and 6pm Monday to Saturday (in line with Condition C19). In addition, the predictions use the shortest separation distance to each sensitive receptor; however, in reality, separation distances would vary between plant and sensitive receptors. Typical noise levels could be 5 to 10 dB(A) lower dependent on the location and nature of works.

Table 7-33 Number of sensitive receptors where construction noise management levels (NMLs) are exceeded

Phase	Exceedance of NML daytime construction hours[1]			Exceedance of NML during evening construction hours				Highly noise affected (>75dB(A))
	1 10 dB	11 20 dB	> 20 dB	1 5 dB	6 15 dB	16 25 dB	> 25 dB	
Scenario 1 (up to early 2026, no Zone 1A works)	405 residential 11 non-residential	120 residential 1 non-residential	33 residential 1 non-residential	185	423	120	33	5 residential
Scenario 2 (after early 2026)	30 residential 1 non-residential	0 residential 1 non-residential	0 residential 0 non-residential	304	51	0	0	0
Scenario 3 (Zone 1A works only)	179 residential 5 non-residential	94 residential 0 non-residential	34 residential 0 non-residential	-	-	-	-	19 residential
Scenario 4 (up to early 2026, including Zone 1A works)	312 residential 12 non-residential	190 residential 1 non-residential	67 residential 1 non-residential	-	-	-	-	24 residential

Notes:

1. *45 $L_{Aeq(15\ min),\ dB}$ at 30D Cook Street, and 50 $L_{Aeq(15\ min),\ dB}$ at any other residence or other noise sensitive receiver (see Table 7-27)*
2. *40 $L_{Aeq(15\ min),\ dB}$ at 30D Cook Street, and 45 $L_{Aeq(15\ min),\ dB}$ at any other residence or other noise sensitive receiver (see Table 7-27).*

During Scenario 1, a total of 558 receivers within Kurnell could experience noise levels above the SSD-5544 noise criteria during the day (see Table 7-27). Up to five receivers for Scenario 1 are expected to be highly affected and are generally concentrated along the north east boundary of the Site during FWS augmentation works. In the evening, a total of 761 receivers within Kurnell could experience noise levels above the SSD-5544 evening noise criteria. Exceedances are mostly considered to be 'clearly audible' at receivers during the daytime and evening periods, with some receivers experiencing moderately and highly intrusive noise levels.

Under Scenario 2, up to 30 residential receivers may experience noise above the SSD-5544 noise criteria, as less intense infrastructure works would be occurring (remediation, grading, etc.) within the centre of the Site, away from residential receivers. No receivers for Scenario 2 are expected to be highly affected. A total of 355 residential receivers may experience noise above the SSD-5544 evening noise criteria, with exceedances considered to be 'noticeable' or 'clearly audible' at receivers during both periods.

During Scenario 3, up to 307 receivers may experience noise levels above the SSD-554 construction noise criteria. Of these receivers, 19 are expected to be highly affected. The large number of highly affected receivers is due to the close proximity of the works to the residential areas within the Kurnell township. The works within Zone 1A would be conducted over a period of three months only, and noise-intensive activities would only occur intermittently.

For Scenario 4, a worse-case scenario has been considered, where works in Zone 1 would be occurring at the northern boundary of the main Site concurrently with the shorter term works in Zone 1A. The implication of this is that some receivers within the Kurnell township area would be affected by noise from both Zone 1 and Zone 1A concurrently. For this scenario, up to 569 receivers may experience noise levels above the SSD-5544 construction noise criteria. Exceedances would generally be 'clearly audible' at receivers, with some receivers experiencing moderately and highly intrusive noise levels. Of these receivers, 24 are expected to be highly affected along the north east boundary of the Site and in proximity to Zone 1A. However, as per Scenario 3, the impact of Scenario 4 would last for three months only, whilst the Zone 1A shed construction works are undertaken.

Management measures to mitigate noise impacts during construction are presented in Table 7-40, and would include consultation with potentially affected residences.

Table 7-33 also presents the construction noise modelling results for non-residential properties which shows the number of properties where the NMLs are likely to be exceeded during their hours of use.

Noise levels at 13 non-residential receivers are expected to exceed the construction NMLs during the construction phase. These receivers include Marton Park, Kurnell Preschool, Marton Community Hall, and Kurnell Recreation Club. N**o** non-residential receivers would be highly noise affected during any scenario. NML for non-residential receivers do not vary between the daytime and evening periods. Education receivers are not expected to operate during the evening, therefore the number of non-residential receivers where noise levels may exceed NML would be reduced during the evening.

Construction traffic noise

Given the existing traffic levels, additional traffic due to the construction of the proposed modification is expected to be negligible (refer to Section 7.7). Therefore, noise increases on Captain Cook Drive Road as a result of the modification works is likely to be less than 2 dB(A) during the peak construction period. No further consideration to construction traffic noise is required, in accordance with the *Road Noise Policy*.

As there remains a risk of construction noise level exceedances at sensitive receptors, particularly where there are exceedances over 75 dB(A) for residential receivers in proximity to the works in Zone 1A, measures have been proposed to mitigate this risk (Section 7.8.5), including recommended safe working distances for vibration intensive plant.

Construction vibration

The minimum working distances for vibration intensive equipment proposed to be utilised are outlined in Table 7-34. If these minimum working distances are complied with, no adverse impacts from vibration intensive works are likely in terms of human response or cosmetic damage.

Table 7-34 Recommended safe working distances for vibration intensive plant

Plant	Rating/ Description	Minimum working distance	
		Cosmetic damage (BS7385) Light framed structures	Human response
Small hydraulic hammer	(300 kg – 5 to 12 t excavator)	2 m	5 m
Medium hydraulic hammer	(900 kg – 12 to 18 t excavator)	7 m	19 m
Large hydraulic Hammer	(1,600 kg – 18 to 34 t excavator)	22 m	60 m
Jackhammer	Handheld	1 m (nominal)	2 m

7.8.4 Impact assessment – Operation

During operation, relocated infrastructure would operate in their new locations. Noise sources from the proposed modification that have the potential to affect nearby receivers include the new OWS pump, relocated FWS, and existing onsite equipment (Figure 7-13). The FWS would be relocated to the FWS Relocation Area in the north western end of the Site; two indicative location options have been assessed (Option 1 and Option 2). The new OWS management system would include two electric pumps in a duty/ standby arrangement, meaning that only one pump would be operational at any one time. At this stage, two location options are being considered for the OWS pump station. Conservatively, the location option that places the pump station closer to noise sensitive receivers has been assessed.

In order to assess a reasonable worst-case operational scenario, it is assumed that all of the proposed equipment within the Site would operate at full capacity, 24 hours a day, seven days a week. However, new onsite OWS operational plant would only operate after rainfall events to transfer potentially contaminated stormwater to the OWS system. Likewise, operation of the FWS would include three diesel engines that are subject to regular (monthly and annual) testing.

Three operational scenarios have been assessed, which include:

- Typical operation without FWS equipment operating
- Typical operation with the FWS equipment operating:
  - Monthly testing and maintenance activities for both options of the relocated FWS equipment, where the three diesel engines are tested individually; only one pump has been included
  - Annual testing and maintenance activities for both options of the relocated FWS equipment, where all three diesel engines are tested simultaneously; three pumps have been included.

Given that the night-time residential project noise criteria are the most stringent, the worst-case operational scenario has been assessed against the night-time residential criteria as per SSD-5544. Compliance with the night-time noise criteria would demonstrate compliance during the day and evening periods for all residential receivers for typical operation.

Maintenance of the FWS is only proposed during the daytime period, and therefore typical operation with the FWS equipment operating has been assessed against daytime criteria as per SSD-5544. Both FWS relocation options have been assessed with an assumed 5 m high barrier around three sides of each of the proposed pumphouse areas.

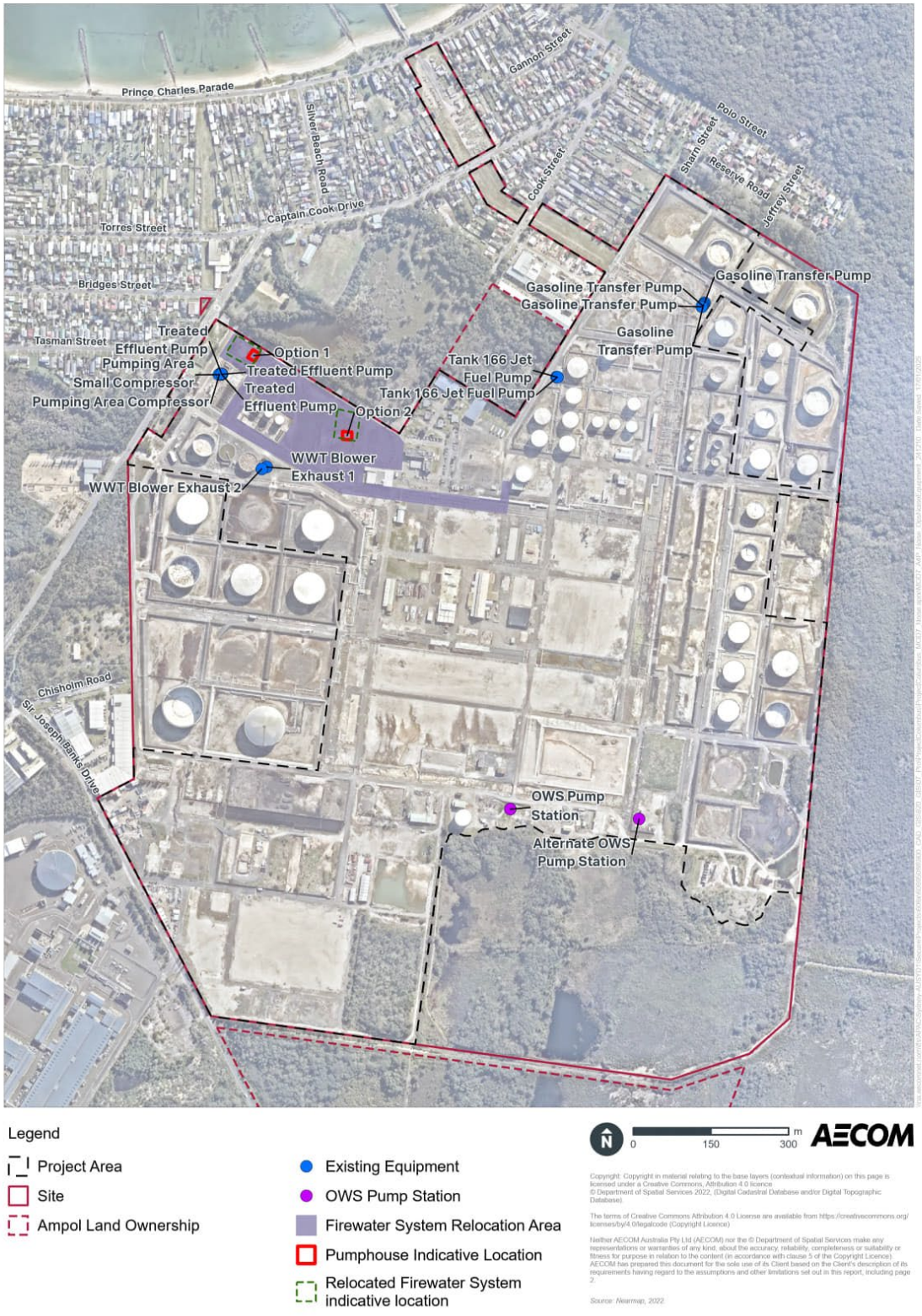

Figure 7-13 Operational noise assessment equipment locations

Operational noise – nighttime

Predicted noise levels from existing equipment and the OWS (nighttime) at nearby noise sensitive receivers under standard and noise enhancing meteorological conditions are presented in Table 7-35.

It can be seen in Table 7-35 that the predicted operational noise emissions for neutral and noise-enhancing meteorological conditions comply with the most stringent (night time) operational noise criteria at all locations.

Operational noise – daytime

Daytime FWS testing operational scenario – Option 1

The Option 1 FWS testing scenario considers all existing typically operating equipment onsite with the addition of the proposed new OWS pumps and the testing of the relocated FWS at the Option 1 location. Monthly testing assumes the noise impact of one FWS engine operating. Annual testing assesses the noise impact of all three FWS engines operating.

Monthly testing assessed the noise impact of one FWS engine operating. Results of the daytime monthly FWS testing operational scenario for Option 1 are presented in Table 7-36 for monthly testing. This shows that the predicted operational noise emissions from the proposed modification under the Option 1 monthly FWS testing scenario generally comply with the operational noise criteria for the daytime period under both neutral and noise-enhancing meteorological conditions. One minor exceedance of 2 dB is predicted for Marton Park; however, exceedances of up to 2 dB are generally not discernible to the average listener.

Annual testing assessed the noise impact of three FWS engine operating simultaneously. Results of the daytime annual FWS testing operational scenario for Option 1 are presented in Table 7-37 for annual testing. This shows that the predicted operational noise emissions from the proposed modification under the Option 1 annual testing scenario may lead to non-compliance during the daytime at some residential and recreation receivers under both neutral and noise-enhancing meteorological conditions. It is noted that this testing only occurs once per year for a limited time and it is not considered reasonable to apply noise mitigation measures.

Table 7-35 Predicted night time operational noise levels under standard and noise enhancing meteorological conditions

Receiver type	Receiver	Night time noise criteria, $L_{Aeq,15minute}$, dB(A)	Predicted L_{Aeq} noise levels, dB(A)			
			Standard weather[1]	Exceedance	Noise enhancing weather[2]	Exceedance
Residential	R1	50	30	-	33	-
	R2		34	-	37	-
	R3		36	-	39	-
	R4		37	-	40	-
	R5		41	-	44	-
	R6		34	-	37	-
	R7		44	-	46	-
	R8		40	-	43	-
Education	E1	45	32	-	35	-
Active recreation	AR1	55	37	-	39	-
Passive recreation	PR1	50	22	-	25	-
	PR2		22	-	26	-
Commercial	C1	65	33	-	33	-
Industrial	I1	70	34	-	37	-
	I2		44	-	44	-
	I3		33	-	33	-
	I4		27	-	28	-

Notes:

1. *Neutral weather considers 0.5 m/s winds source to receiver*
2. *Adverse weather considers the worst case of 3 m/s source to receiver wind and temperature inversions.*

Table 7-36 Predicted operational noise levels for monthly FWS testing under standard and noise enhancing meteorological conditions (Option 1)

Receiver type	Receiver	Daytime noise criteria, $L_{Aeq,15minute}$, dB(A)	Predicted L_{Aeq} noise levels, dB(A)			
			Standard weather[1]	Exceedance	Noise enhancing weather[2]	Exceedance
Residential	R1	60	54	-	56	-
	R2		54	-	56	-
	R3		48	-	50	-
	R4		38	-	41	-
	R5		41	-	44	-
	R6		34	-	37	-
	R7		58	-	59	-
	R8		57	-	58	-
Education	E1	45	37	-	39	-
Active recreation	AR1	55	55	-	57	2[3]
Passive recreation	PR1	50	32	-	35	-
	PR2		29	-	33	-
Commercial	C1	65	49	-	50	-
Industrial	I1	70	49	-	51	-
	I2		45	-	47	-
	I3		34	-	37	-
	I4		28	-	32	-

Notes:

3. *Neutral weather considers 0.5 m/s winds source to receiver*
4. *Noise enhancing weather considers the worst case of 3 m/s source to receiver wind and temperature inversions.*
5. *In accordance with the EPA Noise Policy for Industry, exceedances of up to 2 dB are considered negligible. They would not be discernible to the average listener and therefore would not warrant receiver-based treatments or controls*

Table 7-37 Predicted operational noise levels for annual FWS testing under standard and noise enhancing meteorological conditions (Option 1)

Receiver type	Receiver	Daytime noise criteria, $L_{Aeq,15minute}$, dB(A)	Predicted L_{Aeq} noise levels, dB(A)			
			Standard weather[1]	Exceedance	Noise enhancing weather[2]	Exceedance
Residential	R1	60	59	-	61	1[3]
	R2		58	-	61	1[3]
	R3		53	-	55	-
	R4		44	-	46	-
	R5		41	-	44	-
	R6		37	-	40	-
	R7		63	3	64	4
	R8		61	1[3]	63	3
Education	E1	45	40	-	42	-
Active recreation	AR1	55	60	5	61	6
Passive recreation	PR1	50	35	-	38	-
	PR2		33	-	36	-
Commercial	C1	65	53	-	55	-
Industrial	I1	70	54	-	56	-
	I2		46	-	48	-
	I3		36	-	39	-
	I4		30	-	33	-

Notes:

1. *Neutral weather considers 0.5 m/s winds source to receiver*
2. *Noise enhancing weather considers the worst case of 3 m/s source to receiver wind and temperature inversions.*
3. *In accordance with the EPA Noise Policy for Industry, exceedances of up to 2 dB are considered negligible. They would not be discernible to the average listener and therefore would not warrant receiver-based treatments or controls*

Daytime FWS testing operational scenario – Option 2

The Option 2 FWS testing scenario considers all existing typically operating equipment onsite, with the addition of the proposed new OWS pumps and the testing of the relocated FWS when located in the Option 2 location.

Results of the daytime monthly FWS testing operational scenario for Option 2 are presented in Table 7-38. This shows that the predicted operational noise emissions from the proposed modification under the Option 2 monthly FWS testing scenario comply with the daytime operational noise criteria at all receivers under both neutral and noise enhancing meteorological conditions.

Results of the daytime annual FWS testing operational scenario for Option 2 are presented in Table 7-39. This shows that the predicted operational noise emissions from the proposed modification for the annual FWS testing scenario comply with the daytime operational noise criteria at all receivers under neutral meteorological conditions.

Under noise enhancing meteorological conditions, noise levels exceed the criteria by 3 dB at the Marton Park recreational area. It is noted that this testing only occurs once per year for a limited time, and it is not considered reasonable to apply noise mitigation measures.

Equipment specifications and noise mitigation measures would be verified at the detailed design stage.

Table 7-38 Predicted operational noise levels for monthly FWS testing under standard and noise enhancing meteorological conditions (Option 2)

Receiver type	Receiver	Daytime noise criteria, $L_{Aeq,15minute}$, dB(A)	Predicted L_{Aeq} noise levels, dB(A)			
			Standard weather[1]	Exceedance	Noise enhancing weather[2]	Exceedance
Residential	R1	60	32	-	35	-
	R2		42	-	44	-
	R3		47	-	50	-
	R4		47	-	49	-
	R5		41	-	44	-
	R6		39	-	42	-
	R7		50	-	52	-
	R8		48	-	51	-
Education	E1	45	39	-	41	-
Active recreation	AR1	55	51	-	53	-
Passive recreation	PR1	50	27	-	30	-
	PR2		23	-	27	-
Commercial	C1	65	47	-	50	-
Industrial	I1	70	34	-	36	-
	I2		48	-	50	-
	I3		33	-	37	-
	I4		28	-	32	-

Notes:

1. *Neutral weather considers 0.5 m/s winds source to receiver*
2. *Noise enhancing weather considers the worst case of 3 m/s source to receiver wind and temperature inversions.*

Table 7-39 Predicted operational noise levels for annual FWS testing under standard and noise enhancing meteorological conditions (Option 2)

Receiver type	Receiver	Daytime noise criteria, $L_{Aeq,15minute}$, dB(A)	Predicted L_{Aeq} noise levels, dB(A)			
			Standard weather[1]	Exceedance	Noise enhancing weather[2]	Exceedance
Residential	R1	60	38	-	41	-
	R2		47	-	49	-
	R3		52	-	54	-
	R4		52	-	54	-
	R5		42	-	44	-
	R6		42	-	44	-
	R7		54	-	56	-
	R8		52	-	55	-
Education	E1	45	41	-	44	-
Active recreation	AR1	55	55	-	58	3
Passive recreation	PR1	50	30	-	33	-
	PR2		24	-	28	-
Commercial	C1	65	52	-	54	-
Industrial	I1	70	34	-	37	-
	I2		51	-	53	-
	I3		34	-	37	-
	I4		32	-	35	-

Notes:

1. *Neutral weather considers 0.5 m/s winds source to receiver*
2. *Noise enhancing weather considers the worst case of 3 m/s source to receiver wind and temperature inversions.*

7.8.5 Management measures

A selection of additional or modified mitigation measures to manage potential noise and vibration impacts associated with the proposed modification are outlined in Table 7-40, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-40 Mitigation measures – Noise and vibration

ID	Issue	Mitigation measure
G1	Noise and vibration management	The CEMP~~/ DEMP~~ for the Project would include a Noise and Vibration Management Plan (NVMP). The NVMP would outline: • The locations of noise sensitive receivers • **Potential significant noise and vibration generating activities associated with the proposed modification** • Relevant feasible and reasonable noise mitigation measures as per the *NSW Interim Construction Noise Guideline* • **Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance and controlling the location and use of vibration generating equipment** • ~~Construction noise monitoring procedures; and~~ • Construction equipment maintenance to ensure good working order • **A monitoring program to assess performance against relevant noise and vibration criteria** • **Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.**
G2	Plant and equipment	Low-noise plant and equipment would be selected, where practicable, in order to minimise potential for noise and vibration. All equipment would be regularly checked to ensure that the mufflers and other noise reduction equipment are working correctly.
G3	Noise management	Community consultation with local residents would be undertaken to assist in the alleviation of community concerns. Prior to the proposed **modification** ~~demolition~~ works commencing within the Eastern ~~and Western~~ Right of Way~~s~~, ~~at Silver Beach, on the Wharf or~~ prior to particularly loud ~~demolition~~ works occurring on the main terminal site, potentially affected residents within Kurnell would be notified in advance. Should complaints be received, the complaints register would continue to be maintained and managed in line with the existing feedback process at the Site.
G4	Noise management	Any noise complaint(s) would be investigated immediately. Reasonable and feasible measures would to be implemented to reduce noise impacts.
G6	Construction hours	**Condition C18 of SSD-5544 states that construction works should comply with following hours:** • **Monday to Sunday 7am until 10pm.** **High noise generating construction works, including works within the Eastern Right of Way (Zone 1A), would be confined to less sensitive times of the day and not undertaken on Sundays, public holidays, or outside of the hours 7am and 6pm Monday to Saturday (in line with Condition C19).**

ID	Issue	Mitigation measure
		Construction works outside of the work hours identified above would only be undertaken in the following circumstances (in line with Condition C20 of SSD 5544): • **Works that are inaudible at nearest sensitive land receivers** • **Works that are consistent with Ampol's existing maintenance procedures and are in accordance with the existing Environment Protection Licence (No. 837) (EPL)** • **Works agreed to in writing by the Environment Protection Authority or the Department of Planning, Housing and Infrastructure** • **For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons.** ~~The majority of the conversion works for the Project would typically be completed between 7.00am to 10.00pm seven days a week. Some works consistent with Caltex~~ **Ampol's** existing day-to-day operational and maintenance procedures would occur over a 24 hour period as regulated by the ~~Environment Protection Licence (No. 837) (~~EPL~~)~~ for the Site.
G7	Noise management	Construction~~/Demolition~~ staff and contractors would undergo training in environmental noise issues including: • Minimising the use of horn signals and maintaining a low volume. Alternative methods of communication should be considered • Avoiding any unnecessary noise when carrying out manual operations and when operating plant • Switching off any equipment not in use for extended periods during construction work • Ensuring works occur within approved hours.
G8	Noise and vibration management	Should any unexpected construction activities occur which could potentially generate significant noise not described in this report, monitoring would be undertaken to ensure construction noise emission levels do not exceed EPL limits.
G12	Noise management	~~Caltex~~ **Ampol** would ensure that the noise generated by the **proposed modification** ~~demolition~~ works does not exceed the criteria defined in Table 2 (from Condition of Consent C16 of SSD-5544) unless the reasonable and feasible noise mitigation strategies outlined within the ~~D~~NVMP have been implemented. Reasonable and feasible noise mitigation strategies would include appropriate respite periods during particularly noisy or prolonged activities.
G16	**Vibration**	**Vibration intensive equipment would be selected and minimum working distances, as presented in Table 4-5 of the Noise and Vibration Impact Assessment, would be adhered to. The use of less vibration intensive methods of construction or equipment would be considered where feasible and reasonable.**
G17	**Operational noise**	**Equipment associated with the relocated firewater system would be treated so that operational noise levels do not exceed the criteria defined in Condition of Consent C17 of SSD-5544. Maintenance and testing activities associated with the firewater system would be conducted during standard daytime hours only:** • **Monday to Saturday – 7am to 6pm** • **Sunday – 8am to 6pm.**

7.9 Social

A Social Impact Assessment (SIA) was prepared for the proposed modification (Appendix O). The purpose of the SIA was to understand community concerns regarding the proposed modification and the potential social impacts. This section summarises the findings of the SIA.

7.9.1 Methodology

An assessment approach was developed in accordance with the Social Impact Assessment Guidelines (DPIE, 2023a) to prepare a qualitative assessment of the potential impacts related to the proposed modification. The SIA involved:

- Phase 1: Scoping and initial assessment, which involved:
  - Defining the 'social locality' of the proposed modification and gaining an understanding of the characteristics of the communities within
  - Undertaking an initial scoping assessment to identify the key social impacts to be considered in the SIA, and the appropriate level of assessment (presented in Section 2.5 of the SIA (Appendix O).
- Phase 2: Social impact assessment, which involved:
  - Completion of a baseline study to understand the social context of the area without the proposed modification, based on the ABS 2021 Census and other relevant data
  - Predicting and analysing potential social impacts and benefits of the proposed modification, within each relevant social impact category of the SIA Guideline. This has been informed by other technical assessments including traffic and transport, noise and vibration, heritage, and air quality
  - Evaluating the potential significance of social impacts through a risk-based assessment which defines the likelihood and magnitude of each impact
  - Identification and assessment of potential cumulative social impacts
  - Development of mitigation measures for identified negative social impacts, and opportunities to enhance social benefits
  - Evaluation of the potential residual social impacts, following the application of proposed mitigation measures.

The potential magnitude and likelihood of social impacts has been determined based on the definitions provided in Table 7-41 and Table 7-42.

Table 7-41 Magnitude level definitions (DPIE, 2023b)

Magnitude level	Meaning
Transformational	Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.
Major	Substantial deterioration/ improvement to something that people value highly, either lasting for an indefinite time, or affecting many people in a widespread area.
Moderate	Noticeable deterioration/ improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
Minor	Mild deterioration/ improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
Minimal	Little noticeable change experienced by people in the locality.

Table 7-42 Likelihood level definitions (DPIE, 2023b)

Magnitude level	Meaning
Almost certain	Definite or almost definitely expected (e.g., has happened on similar projects)
Likely	High probability
Possible	Medium probability
Unlikely	Low probability
Very unlikely	Improbable or remote probability

The assessment matrix in Table 7-43 has been used to determine the significance of each social impact, as a function of the potential likelihood and magnitude levels.

Table 7-43 Social impact significance matrix (DPIE, 2023b)

		Magnitude level				
		Minimal	Minor	Moderate	Major	Transformational
Likelihood	Almost certain	Low	Medium	High	Very high	Very high
	Likely	Low	Medium	High	High	Very high
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Very unlikely	Low	Low	Low	Medium	Medium

7.9.2 Existing environment

The social locality for the proposed modification has been developed with a view to the likely direct and indirect areas of influence associated with the construction and operation of the proposed modification. Noting the potential for multiple and/or overlapping impacts, this assessment has considered the following sub-categories of the social locality:

- Primary impact area: The area immediate to the Project Area. This area would be most likely to experience the strongest and/ or greatest number of impacts (Figure 7-14)
- Secondary impact areas: These are places surrounding the primary impact area that would be expected to experience some degree of social impact (Figure 7-14)
- Region: This is defined by the overall social locality and represents the place where some of the broader social and economic impacts of the proposed modification are likely to be experienced (Figure 7-15). Although this area would experience fewer direct impacts when compared to the primary and secondary impact area, the Region is still likely to experience some direct and indirect impacts from the proposed modification. For this report, the Region includes the four ABS State Suburbs nearest to the Site: Kurnell, Greenhills Beach, Cronulla, and Woolooware. The identified suburbs are located in the Sutherland Shire Council LGA.

Key demographic indicators of relevance to the proposed modification, as derived from ABS 2021 Census data, are provided in the SIA (Appendix O). Demographic data for all of NSW has also been provided to allow for comparison with the selected demographic indicators within the social locality.

Figure 7-14 Primary and secondary impact area

Figure 7-15 Regions and suburbs in the proposed modifications social locality

Other social baseline conditions have been identified using ABS Census data and other environmental assessments presented in this Modification Report. These are discussed in Table 7-44.

Table 7-44 Other social baseline conditions

Group	Overview
Vulnerable communities	**Older and elderly people**
	Elderly people can represent potentially vulnerable groups within the community. As of 2021, 15.7% of the population within the social locality were aged 65 years and older, compared to 17.7% in NSW.
	Need for assistance
	Core activity need for assistance data measures the number of people who need assistance in their day to day lives with any or all core activities, including self-care, mobility, or communication because of a variety of reasons including disability, long term health, or old age. In 2021, an average of 8.5% of people within the social locality were identified as needing assistance with a core activity, which is higher than the NSW average (5.8%).
	Socio economic disadvantage
	The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) was used, based on 2021 Census data. A decile of 10 indicates high levels of advantage and low levels of disadvantage (representing the top 10% of areas). The IRSAD indicates the following for each suburb within the social locality: • Kurnell – A decile of eight for the suburbs ranking within Australia and a decile of 10 within the LGA ranking • Greenhills Beach – A decile of 10 for the suburbs ranking within Australia and a decile of 10 within the LGA ranking • Cronulla – A decile of 10 for the suburbs ranking within Australia and a decile of 10 within the LGA ranking • Woolooware – A decile of 10 for the suburbs ranking within Australia and a decile of 10 within the LGA ranking. Overall, Kurnell, Greenhills, Cronulla and Woolooware are reported to experience higher levels of socio-economic advantage compared to other suburbs within NSW and Australia.
	Cultural and linguistic diversity
	Culturally and linguistically diverse groups represent a small proportion of the social locality, particularly relative to NSW as a whole. Census results for 2021 indicate that 90.3% of residents within the social locality of Kurnell speak only English at home, compared to 67.6% of residents in NSW.
Aboriginal culture and values	The Project Area has been subject to a substantial amount of disturbance since the 1950s, suggesting Aboriginal items in this location would have been subject to historic disturbance or destruction. No specific Aboriginal heritage sites or cultural values were identified through database searches or discussions with RAPs as part of the ACHAR, refer to Section 7.5. Despite this, the majority of the land of which the Project Area is situated on retains moderate potential for the preservation of subsurface Aboriginal archaeological deposits.

Group	Overview
Social infrastructure	Social infrastructure comprises social services or facilities that are used for the physical, social, cultural or intellectual development or welfare of the community. Social infrastructure within 2 km of the Project Area includes educational facilities, medical facilities, sporting and recreational facilities, community halls, clubs, and services, activities and programs that operate within these facilities. The social infrastructure is shown on Figure 7-16, including the Kurnell Recreation Club, located in the north west of the Site and separated from operational infrastructure by fencing and a noise wall.
Economic characteristics	Kurnell, Greenhills Beach, Woolooware, and Cronulla all serve as local centres and contain the required services and facilities to support surrounding residential areas. Kurnell is comprised of residential, recreational, commercial and industrial areas.
Access and connectivity	A description of the existing conditions with regard to the road and freight network, public and active transport (walking and cycling) infrastructure within the vicinity of the Project Area is discussed in Section 7.7.
Construction workforce and industry	A substantial proportion of the existing workforce in LGAs within a 'reasonable commutable distance' are employed in the construction industry, ranging from 4.3% to 11.3%.

Outcomes of community consultation

Ampol and the Kurnell Terminal have a longstanding relationship with the Kurnell community. Ampol regularly provides updates on operations at the terminal, including upgrades, work being undertaken, proposed developments at the Site, and what Ampol has being doing in the community.

Through consultation undertaken as part of the proposed modification (described in full in Section 6.0 (Engagement), the following key themes have been taken into account whilst preparing the assessment:

- Noise and vibration
- Concerns of strong smells and odour.

Figure 7-16 Social Infrastructure

7.9.3 Impact assessment – Construction

A summary of the potential social impacts associated with the construction of the proposed modification is provided in Table 7-45.

Table 7-45 Assessment of impacts associated with the construction of the proposed modification

Impact	Impact summary
Way of life	
Changes to how people move around	Temporary disruptions to the regions access to work, recreation, local shops, community facilities, and essential services may occur due to temporary traffic disruptions during construction. Section 7.7 (Traffic and transport) identified that the proposed modification would cause a temporary increase in traffic generation on the surrounding key roads during construction due to delivery of materials and equipment, and offsite disposal of excavated materials. Further traffic generation would occur as a result of construction workers travelling to the Project Area. This short-term increase in the traffic generation during the construction period would not negatively affect the operational performance of the local road network. Given that potential impacts to movement would be generally limited, the magnitude of impact to different user groups (including pedestrians, cyclists, and vehicle users across different age groups) would be **minimal**. These impacts would be **unlikely** to occur. As such, the overall significance of the impact would be **low** (negative). Mitigation measures outlined in Section 7.7 (Traffic and transport) would further reduce impacts to how people move around.
Community	
Demographics and community composition	The size of the workforce would vary throughout the construction period depending on the activities being undertaken. The proposed modification is expected to support an indicative peak construction workforce of up to 100 full time equivalent jobs (direct employment). As Kurnell is a small community, the presence of construction workers at the Site would result in increases in the daytime population within Kurnell, which may be a potential cause of conflict and dissatisfaction from some local residents. However, works occurring at night (biopiling) would not require workers to be present. Considering the long-standing presence of the Kurnell Terminal and its workers within Kurnell, the presence of construction would not be unusual. Relevant construction worker behaviour codes would be implemented to help promote respectful and appropriate behaviours in the community, thereby limiting the potential for this impact to occur during construction. The magnitude of this impact is considered **minimal**. The likelihood of the proposed modification resulting in broader demographic changes during construction would be **very unlikely**. As such the overall significance of the impact would be **low** (negative). Mitigation measures outlined in Section 7.9.5 would further reduce impacts to demographics and community composition.

Impact	Impact summary
Social cohesion and sense of place	Social cohesion refers to the connections and relationships between individuals and their community. Activities that create a physical or psychological barrier between communities can affect social and/or economic interaction, potentially resulting in social isolation and an erosion of the sense of community. The presence of construction traffic on the key roads surrounding the Project Area has the potential to limit people's opportunity to socialise within the community or access key community hubs. For the proposed modification, this effect is likely to negligible, taking into consideration the small traffic volumes associated with the proposed modification and the existing traffic volumes surrounding the Project Area, and that construction vehicles would be parked within the Site only. Construction of the proposed modification could also result in minor changes to local amenity. This would be due to increases in noise levels or dust. These changes would, however, generally result in limited changes to social cohesion and sense of place given the distance the proposed modification is located from town centres and the community, thereby limiting direct amenity impacts. The magnitude of this impact is considered to be **minimal** for groups within the social locality (including vulnerable groups) given that changes to access are not expected and the Project Area is located a distance away from community centres. Overall, the likelihood of this impact occurring would be **very unlikely**. As such the overall social significance in relation to community cohesion and sense of place would be a **low** (negative) impact. Mitigation measures outlined in Section 7.9.5 would further reduce impacts to social cohesion and sense of place.
Surroundings	
Local amenity	Amenity refers to the quality of a place, its appearance, feel and sound, and the way the community experiences the place. Amenity contributes to a community's identity and its sense of place. *Traffic and access* Section 7.7 (Traffic and transport) identified that the proposed modification would cause a temporary increase in traffic generation. The presence of construction vehicles accessing the Project Area may adversely affect local amenity; however, this is not expected to substantially differ from the existing environment, as the key roads surrounding the Project Area currently accommodates relatively high volumes of traffic, particularly heavy vehicles. *Noise and vibration* Section 7.8 (Noise and vibration) identified that construction noise levels at some residential receptors are predicted to exceed the 'highly noise affected' level of 75 dB(A). This is primarily due to works occurring in close proximity to residents. Exposure to noise and vibration has the potential to create nuisance, intrude on daily activities or the enjoyment of activities, interfere with conversation and memory, disrupt sleep and rest patterns, and create or exacerbate health concerns. However, works be intermittent and staged, rather than continuous, and works in Zone 1A would last for three months. Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure 4-2). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers, and therefore not affect sleep patterns at night. *Air quality* Section 7.10 (Air quality) determined that, with standard construction mitigation measures, impacts at neighbouring sensitive receptors would be negligible.

Impact	Impact summary
	Visual amenity Section 7.12 (Other matters) identified that visual impacts would arise primarily from the presence of construction equipment, and plant/ machinery. Construction works in the main part of the Project Area (Zones 1 to 3) would be largely obscured from view of the public across the Site due to presence of existing screening on the Site boundary. Zone 1A lies adjacent to residential receptors and limited screening is present. However, visual impacts would also be minimal given the existing industrial uses in Zone 1A and that construction of the new shed would last three months only. *Summary* Overall, there would be minimal changes to amenity (traffic, air quality, and visual) in the social locality during the construction of the proposed modification. Due to increases in noise in the local area, though short-term, changes to amenity are considered to be of **minor** magnitude. The likelihood of this impact would be **possible**. The overall significance of the social impact would therefore be **medium** (negative). Mitigation measures outlined in Sections 7.7 (Traffic and transport), Section 7.8 (Noise and vibration), and 7.10 (Air quality) would reduce impacts to local amenity. Management measures to mitigate impacts relating to traffic (refer to Table 7-26) and noise (refer to Table 7-40) would include consultation with affected residences.
Culture	
Aboriginal culture and heritage	Section 7.5 (Aboriginal cultural heritage) described and assessed potential construction impacts to Aboriginal culture and values. The magnitude of potential social impacts associated with impacts to Aboriginal heritage are considered **minimal**. The likelihood of these impacts occurring would be **possible**. As such the overall significance of impact would be a **low** (negative) impact. Mitigation measures outlined in Section 7.5 (Aboriginal cultural heritage) would further reduce impacts to Aboriginal culture and heritage.
Non-Aboriginal heritage	Section 7.6 (Historic heritage) described and assessed potential construction impacts to non-Aboriginal culture and values. In summary, the Site is listed as an archaeological heritage item, the Australian Oil Refinery (A2524). Three buildings proposed to be demolished have high to moderate heritage significance under this listing. However, it is considered that their heritage significance relates to intangible characteristics related to their role in the operations of the former refinery, rather than their existing tangible characteristics. As such, the magnitude of potential social impacts associated with impacts to non-Aboriginal heritage are considered **moderate**. The likelihood of these impacts occurring would be **very unlikely**. As such the overall significance of impact would be a **low** (negative) impact. Mitigation measures outlined in Section 7.6 (Historic heritage) would further reduce impacts to non-Aboriginal heritage.

Impact	Impact summary
Livelihoods	
Business impacts	Businesses across the social locality could be affected during construction by temporary changes in passing trade, access, and travel time (for employees, customers, and deliveries), changes to parking, and impacts to local amenity. Potential impacts to the operation and viability of businesses can in turn affect people's livelihoods, including their ability to sustain themselves through employment or business opportunities. Businesses may experience temporary amenity impacts associated with increases in traffic, noise levels. Mitigation measures would be implemented to avoid or minimise these impacts. Based on the likely impacts outlined above, the overall magnitude of adverse amenity impacts to businesses would be **minor**. The likelihood of these impacts being experienced within the social locality would be **possible**, resulting in a **medium** (negative) social impact. Mitigation measures outlined in Section 7.9.5 would further reduce impacts to businesses, in addition to those outlined in Sections 7.7 (Traffic and transport), Section 7.8 (Noise and vibration), and 7.10 (Air quality). Retail, food and beverage businesses in the social locality would likely experience a temporary uplift in revenues, due to an increase in passing trade associated with the presence of construction workers in the area. Local and regional construction contractors and businesses that service or supply goods to the construction industry would also be expected to experience an increase in trade. The overall magnitude of benefits to businesses associated with increased expenditure in the social locality would be considered **minor**. The likelihood of these impacts being experienced within the social locality would be **possible**, resulting in a **medium** (positive) social impact.
Economic impacts	Construction activity can benefit the economy by injecting money into the local, regional and state economies. This can result in employment and business opportunities for people. The economic benefits of construction would include: • Increased expenditure at local and regional businesses through purchases by construction workers • Direct employment through onsite construction activities • Direct expenditure associated with onsite construction activities • Indirect employment and expenditure through the provision of goods and services required for construction. The overall magnitude of economic benefits during construction in the social locality would be considered **minor**, given that the benefits would likely be dispersed across the broader region. The likelihood of these impacts being experienced within the social locality would be **possible**, resulting in a **medium** (positive) social impact.

7.9.4 Impact assessment – Operation

A summary of the potential social impacts associated with the operation of the proposed modification is provided in Table 7-46.

Table 7-46 Assessment of impacts associated with the operation of the proposed modification

Impact	Impact summary
Way of life	Once the proposed modification works are complete, the Site would continue to operate as described in approved project. As such, there would be no changes in traffic, number of FTEs employed onsite, or visual amenity. The proposed modification would not have an effect on the way people move around their community or access social infrastructure following completion of the proposed modification. Based on the above, the likelihood of impacts to way of life is considered to a **minimal** magnitude and would be **very unlikely**. As such the overall significance of impact would be a **low** (negative) impact. No further measures are required to manage this impact.
Surroundings	**Local amenity** *Traffic and access* Section 7.7 (Traffic and transport) determined that once the proposed modification works are complete, the Site would continue to operate as described in the approved project. No changes in traffic are expected during operation of the proposed modification. *Noise and vibration* Section 7.8 (Noise and vibration) determined that the Site would continue its normal operations, with relocated infrastructure operating in their new locations. The operational assessment found that noise from the relocated FWS during monthly testing would not be discernible, but may be heard from both location options during annual testing[8]. This would only occur once per year for a limited time, and therefore it is not considered reasonable to apply noise mitigation measures. This would be further investigated during detail design to minimise the impact to the local amenity. *Air quality* Section 7.10 (Air quality) determined that operation of the diesel engines that power the pumps during annual and monthly maintenance testing of the FWS pumps would result in combustion emissions. There is potential for impacts on amenity from the release of combustion emissions during testing. In order to mitigate air quality impacts, measures would be applied to the engines and building housing the equipment. This would be further investigated during detail design to minimise the impact to the local amenity. *Visual amenity* Section 7.12 (Other matters) determined that once the proposed modification works are completed, landscape character and visual amenity at the Site would be largely consistent with the existing condition. The majority of the new or relocated infrastructure would not be visible from public viewpoints. The relocated FWS (if a location adjacent to the Captain Cook Drive/ Solander Street intersection is selected) and new storage shed in Zone 1A are likely to be visible, but their aesthetic would be in keeping with the rest of the Kurnell Terminal. Screening, including vegetation where appropriate, would be established to minimise impacts on visual amenity.

[8] Operational noise emissions from equipment in the Option 2 location would be expected to be discernible from recreational receivers in noise enhancing conditions only.

Impact	Impact summary
	Summary On the basis that noise and air quality mitigation measures would be applied if the Option 1 firewater system location is selected, there are no anticipated impacts to local amenity due to the operation of the proposed modification. The overall magnitude is considered to be **minimal**, with a likelihood of the impacts being **very unlikely**, resulting in a **low** (negative) social impact. Mitigation measures outlined in Sections 7.7 (Traffic and transport), 7.8 (Noise and vibration), and 7.10 (Air quality) would further reduce impacts to local amenity.
Culture	As described in Sections 7.5 (Aboriginal cultural heritage) and 0 (Historic heritage), there would be no anticipated impacts to Aboriginal or non-Aboriginal heritage associated with the operation of the proposed modification. Based on the above, the likelihood of negative impacts to Aboriginal or non-Aboriginal heritage and values is considered to a **minimal** magnitude and would be **very unlikely**. As such the overall significance of impact would be a **low** (negative) impact. No further measures are required to manage this impact.
Livelihoods	There are no anticipated impacts to the livelihoods of businesses and the local economy associated with the operation of the proposed modification. Once the proposed modification works are complete, the consolidation of terminal infrastructure into Zones 1 and 1A would facilitate future benefits to businesses and the local economy through various potential future use options for vacant land in Zones 2 and 3, and maintain the safe, sustained, optimised operation of the Site. Based on the above, the likelihood of negative impacts to livelihoods and values is considered to a **minimal** magnitude and would be **very unlikely**. As such the overall significance of impact would be a **low** (negative) impact. No further measures are required to manage this impact.

7.9.5 Management measures

A selection of additional or modified mitigation measures to manage potential social impacts associated with the proposed modification are outlined in Table 7-47, with the consolidated list provided in Appendix D (Consolidated mitigation measures). Other mitigation measures identified in this Modification Repot that are relevant to the management of potential social impacts include those specified in Sections 7.5 (Aboriginal heritage), 0 (Non-Aboriginal heritage), 7.7 (Traffic and transport), 7.8 (Noise and vibration), and 7.10 (Air quality).

Table 7-47 Mitigation measures – Social

ID	Issue	Mitigation measure
M1	**Employment opportunities**	**Construction workers for the proposed modification would be employed from the local area where possible to reduce the need for workers to relocate to the area during construction, and to contribute to local employment opportunities.**
M2	**Stakeholder engagement activities**	**Stakeholder engagement activities carried out during construction would be accessible to a range of groups (such as residents and businesses) in the community. This would include, at a minimum, a range of engagement methods (including options for physical copies of engagement materials). Material in relevant languages used in the local area would be made available if requested.**

7.10 Air quality

An Air Quality Impact Assessment (AQIA) was prepared for the proposed modification (Appendix N). The purpose of this assessment was to understand impact of construction and operation of the proposed modification on local air quality. This section summarises the findings of the AQIA.

7.10.1 Methodology

An assessment approach was developed in accordance with relevant guidelines to prepare a qualitative assessment of the potential impacts related to the proposed modification. Relevant guidelines included:

- *National Environment Protection (Ambient Air Quality) Measure 2021* (AAQ NEPM) (AAQ NEMP, 2021)
- *National Environment Protection (Air Toxics) Measure 2004* (Air Toxics NEPM) (Air Toxins NEPM, 2004)
- *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2022)
- *The United Kingdom (UK) Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction* (IAQM, 2024).

The AQIA assessment involved:

- Identification of key construction activities
- Undertaking a construction dust impact assessment in line with the IAQM guidance including:
    - Step 1 – Screening assessment: Identification of nearby air quality sensitive receptors potentially affected by the proposed modification, including human and ecological receptors based on their proximity to the site and construction vehicles.
    - Step 2 – Dust Risk Assessment: Using the qualitative IAQM methodology, perform a risk assessment to appraise the potential for dust impacts without the application of mitigation measures. This involves understanding dust emission magnitude, the sensitivity of the surrounding area, and the level of risk associated with potential air quality impacts.
    - Step 3 – Management strategies: Determining the level of management required to maintain dust impacts on surrounding sensitive receptors at an acceptable level
    - Step 4 – Reassessment: Determining whether there are significant residual impacts post mitigation
- Qualitative assessment of potential air quality impacts due to combustion emission (vehicle exhaust), odour, and other contaminants
- Qualitative assessment of potential operational impacts
- Qualitative assessment of cumulative impacts
- Identification of management and mitigation measures.

Criteria

For the purposes of the AQIA, the following criteria were adopted for Step 2 of the dust impact assessment.

Dust emission magnitude

Dust emission magnitudes are estimated according to the duration and scale of works being undertaken (area, volume, and height), the timing of works (seasonality), building type and construction materials, and soil type. The magnitude is classified as either small, medium, or large for each construction sub-activity. The IAQM guidance provides criteria for dust emission magnitudes during demolition, earthworks, construction, and trackout to aid classification; these are presented in Table 7-48.

Table 7-48 Classification criteria for small, medium, and large demolition and construction activities

Activity	Activity Criteria	Dust emission magnitude		
		Small	Medium	Large
Demolition	Total building volume (m^3)	<12,000	12,000 – 75,000	>75,000
Earthworks	Total site area (m^2)	<18,000	18,000 – 110,000	>110,000
	Number of heavy earth moving vehicles active at one time	<5	5-10	>10
	Soil type	Soil type with large grain size (sand)	Dusty soil type (e.g. silt)	Dusty soil type prone to suspension (e.g. clay)
	Bund Size (m in height)	<3	3–6	>6
Construction	Total building volume (m^3)	<12,000	12,000 – 75,000	>75,000
	Construction material dust release potential	Low potential (e.g. timber or cladding)	Moderate potential (e.g. concrete)	High potential (e.g. on site concrete crushing or sandblasting)
Trackout	Number of heavy vehicle movements per day	<20	20 – 50	>50
	Surface material	Low potential for dust release	Moderately dusty (high clay content)	Potentially dusty (high clay content)
	Unpaved road length	< 50 m	50 m – 100 m	>100 m

Sensitivity of the surrounding area

The IAQM separates the sensitivity of the area into three categories:

- Sensitivity of the area to dust soiling effects on people and property
- Sensitivity of the area to human health impacts
- Sensitivity of the area to ecological impacts.

Each of these categories is assessed individually via a risk matrix that takes into account a number of factors, including:

- Specific sensitivity of a receptor:
  - High sensitivity: Locations where members of the public are likely to be exposed for eight hours or more in a day. (e.g. private residences, hospitals, schools, or aged care homes)
  - Medium sensitivity: Places of work where exposure is likely to be eight hours or more in a day
  - Low sensitivity: Locations where exposure is transient, around one or two hours maximum. (e.g. parks, footpaths, shopping streets, playing fields)
- Number of receptors of each sensitivity type in the area
- Distance from source, i.e. the proposed modification
- Annual mean background particulate matter particles with a diameter of 10 micrometres or less (PM_{10}) concentration (only applicable to the human health impact matrix).

The IAQM methodology classifies the sensitivity of a receptor to dust soiling on people and property due to particulate matter effects as either high, medium, or low. The classification is determined by a matrix for both dust soiling and human health impacts (Table 7-49).

Table 7-49 Surrounding area sensitivity to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distance from the proposed modification (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

The sensitivity of the area to human health effects are partially determined by existing background PM_{10} concentrations in the region surrounding the Project Area. Table 7-50 provides the IAQM guidance sensitivity levels for human health impacts for the adjusted category of 15 to 18 µg/m^3. Receptor sensitivity has been classified as high due to the presence of residential receptors, where members of the public are expected to reside eight or more hours in a day and members of the public may potentially exposed to air pollution over a time period relevant to the air quality objective for 24-hour PM_{10}.

Table 7-50 Surrounding area sensitivity to human health impacts – adopted matrix for the proposed modification

Receptor Sensitivity	Number of Receptors	Distance from the project (m)				
		<20	<50	<100	<200	<250
High	>100	High	Medium	Low	Low	Low
	10-100	High	Medium	Low	Low	Low
	1-10	Medium	Low	Low	Low	Low
Medium	>10	Low	Low	Low	Low	Low
	1-10	Low	Low	Low	Low	Low
Low	≥1	Low	Low	Low	Low	Low

Note:

The matrix presented in this table is based on Table 3 in the IAQM guidance. Annual average PM_{10} concentration adopted as 15-18 µg/m^3.

The sensitivity of an ecological area to distance from the boundary of the construction site is identified using the criteria listed in Table 7-51. This considers the proximity of the community to the boundary of the Project Area relevant to defining an ecological community's sensitivity to dust impacts.

Table 7-51 Sensitivity of an area to ecological impacts

Receptor sensitivity	Distance from source (m)	
	<20	20 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Risk of unmitigated dust impacts

The risks assigned to each of the different construction activities are provided in Table 7-52. This matrix is applicable to all sensitivity of the area categories. This determines the risk of dust impacts with no mitigation measures applied.

Table 7-52 Risk of dust impacts (for dust soiling effect, human health impacts and ecological impacts)

Activity	Surrounding area sensitivity	Dust emission magnitude		
		Large	Medium	Small
Demolition	High	High	Medium	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Negligible
Earthworks	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Construction	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Trackout	High	High	Medium	Low
	Medium	Medium	Low	Negligible
	Low	Low	Low	Negligible

7.10.2 Existing environment

Air quality

Existing air quality at the Site was determined by gathering available data from two surrounding air quality monitors. The nearest monitor was located at Randwick (10 km north of the Site) and the second located at Earlwood (13 km northwest of the Site), providing regional context. These monitors quantified existing background levels for particulate matter (PM) including PM_{10} and $PM_{2.5}$ (particles that have a diameter of 2.5 micrometres or less).

Elevated concentrations of PM_{10} and $PM_{2.5}$ were recorded at both stations in 2019 and 2020, due to smoke from an active bushfire season. In 2023, Sydney experienced close to average rainfall and overall PM_{10} concentrations were affected by a single hazard reduction burn; as such, 2023 likely represents a typical year in terms of regional particulate concentrations. The annual average PM_{10} concentration in 2023 at Randwick was 16.6 $\mu g/m^3$, which was adopted as the existing annual background concentration for this assessment.

Sensitive receptors

Sensitive receptors include locations where anyone may work or reside surrounding the Project Area. Those identified for this assessment include:

- Residential receptors to the north of the Project Area (i.e. dwellings), within 250 m of the Project Area
- Commercial receptors to south west of the Project Area, within 250 m of the Project Area
- Ecological receptors (i.e. native bushland to the east associated with the boundary of Kamay Botany Bay National Park) within 50 m of the Project Area. Marton Park and Towra Point Nature Reserve have also been included for consideration.

The location of sensitive receptors included in this assessment are shown on Figure 7-17.

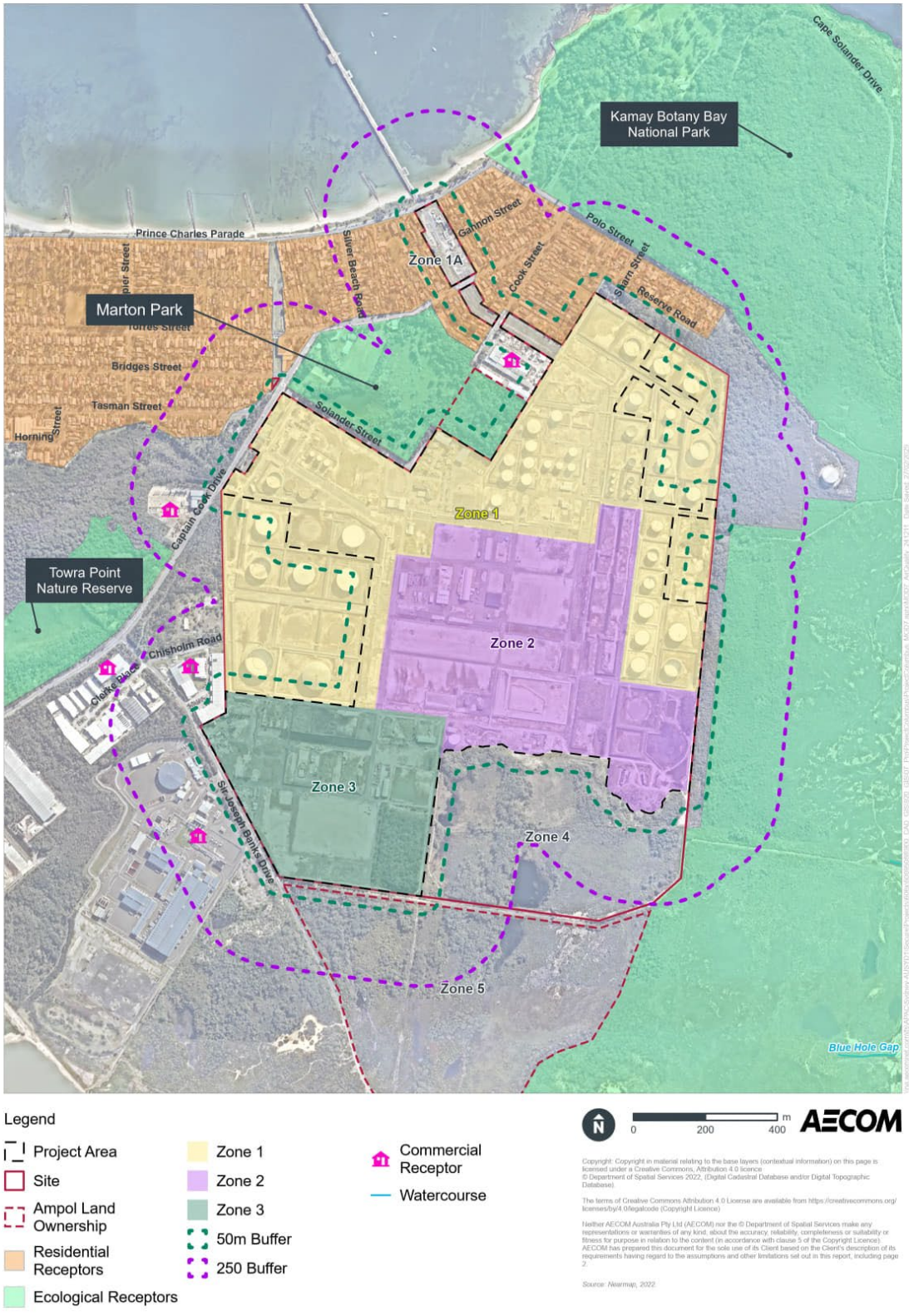

Figure 7-17 Sensitive receptors within the IAQM screening distances

7.10.3 Impact assessment – Construction

Dust risk assessment

Potential dust impacts during the construction period were determined based on the IAQM construction dust assessment guidance and the expected scale of the of construction activities.

For the purposes of the AQIA, construction activities were quantified and categorised into four activity types, being demolition, earthwork, construction, and track out. For each of the four identified construction activities, dust emission magnitudes were estimated using the classification criteria outlined in Table 7-48.

Table 7-53 Estimated dust emission magnitudes

Activity	Dust emission magnitude	Justification
Demolition	Large	• Total building volume approximately 40,000 m^3 • Onsite concrete crushing.
Earthworks	Large	• Worst case excavation of 398,295 m^3 • Up to 274,695 m^3 would be required for capping. • Up to an additional 46,600 m^3 of fill in Zone 2. • Excavation of infrastructure.
Construction	Large	• Approximately 50,000 m^3 construction volume • Onsite concrete crushing required. Moderate to high potential for construction dust.
Trackout	Small	• Maximum of six heavy vehicles moving offsite per day during all stages. • No unpaved offsite roads.

The initial screening assessment identified the surrounding sensitive receptors outlined in Section 7.10.2 (refer to Figure 7-17). The sensitivity of human and ecological receptors in the surrounding area to dust soiling and PM10 was then estimated using the classification criteria outlined in Table 7-49, Table 7-50 and Table 7-51. Sensitivity of these areas is presented in Table 7-54 and Table 7-55. As there are between 10 and 100 high sensitivity residential receptors within 20 m of the Project Area, primarily adjacent to the boundary of Zone 1A, this places the sensitivity of the area to both dust soiling and human health impacts in the “High” category. As there are sensitive ecological receptors within 50 m being native bushland to the east associated with the boundary of Kamay Botany Bay National Park, this places the distance-refined sensitivity of ecological as in the “High” category.

To determine the unmitigated risk of dust impacts, the matrix outlined in Table 7-52 was used for all of the activity types, with the results for dust soiling and human health effects presented in Table 7-54, and for ecological receptors in Table 7-55.

Table 7-54 Summary of unmitigated risk assessment for sensitive receptors

Activity	Step 2A: Potential for dust emissions	Step 2B: Sensitivity of area		Step 2C: Potential unmitigated dust impacts	
		Dust soiling	Human health (PM_{10})	Dust soiling	Human health (PM_{10})
Demolition	Large	High	High	High	High
Earthworks	Large			High	High
Construction	Large			High	High
Trackout	Small			Low	Low

Table 7-55 Summary of unmitigated risk assessment for ecological receptors

Activity	Step 2A: Potential for dust emissions	Step 2B: Sensitivity of area	Step 2C: Potential unmitigated dust impacts
		Ecological	Ecological
Demolition	Large	High	High
Earthworks	Large		High
Construction	Large		High
Trackout	Small		Low

Sensitivity of the area for demolition works has been rated 'high' due to the proximity of the Project Area boundary from nearby sensitive receptors, and is consistent with the IAQM methodology and sensitivity ratings applied to earthworks, construction and trackout activities. It is important to highlight, however, that demolition activities, as indicated in Figure 4-1, are located more than 250 m from the nearest residential receptors and more than 50 m from ecological receptors. Therefore, the sensitivity rating (and subsequent dust unmitigated risk rating) for demolition activities for dust soiling, human health and ecological impacts is considered highly conservative.

Table 7-54 and Table 7-55 indicate that the unmitigated risk of demolition, earthworks, and construction activities related to dust soiling, PM_{10}, and ecological receptors is high. As such, mitigation measures designed to minimise the generation of dust within the Project Area are recommended, as outlined in Section 7.10.5. With the implementation of the targeted mitigation measures listed in Section 7.10.5, the construction activities can achieve high degrees of dust suppression which significantly reduce dust impacts to a negligible level. Residual impacts on receptors are therefore not expected.

Combustion emissions, odour, and other contaminants

The main sources of combustion emissions during the proposed modification works would be:

- Light and heavy vehicles traveling to and from the Site
- Onsite, mobile construction equipment and stationary equipment, such as diesel generators.

Emissions from construction traffic, as well as the use of mobile and stationary plant equipment, are unlikely to make a significant impact on local air quality at nearby receptors. This is due to the relatively low number of additional offsite heavy vehicle movements and adequate buffer distances of onsite equipment from residential receptors.

If not properly managed, soil contaminants have the potential to become airborne during earthworks associated with the remediation stage of the proposed modification works, which could be inhaled or create odour.

Contaminated soil would be excavated and remediated according to the Conceptual RAP (Appendix H) and SWMP and CMP for the proposed modification. Appropriate mitigation measures, presented in Section 7.10.5, would allow for the appropriate management of potential odour and air quality impacts at or beyond the boundary.

7.10.4 Impact assessment – Operation

Once construction of the proposed modification is complete, the Site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for the approved project, with relocated infrastructure operating in their new location.

The general operation of the Site as a terminal would not change and there would be no material change to the potential for air emissions compared with the existing terminal operations. It is noted, however, that relocation of operational activities does have the potential to result in changes to existing dispersal conditions of existing sources. Specifically, the relocation of the FWS and associated diesel engines within the FWS Relocation Area.

For the purpose of the AQIA, two indicative locations have been considered for the relocation of the FWS (Figure 4-7). The specific siting of the new firewater tank and pumphouse would be selected as part of detailed design.

As outlined in Section 4.2.3 (Stage 2 – Removal and/or relocation of infrastructure), three industrial Caterpillar 3406B diesel engines are used to operate the FWS pumps housed within an enclosed area (the ‘pumphouse’). Regular monthly and annual maintenance testing of the pumps would be consistent with existing operations and include:

- Operation of all three pumps individually for approximately half an hour once a month
- One annual maintenance test conducted over a two hour period once per year, with all three pumps operating simultaneously.

Operation of the diesel engines during monthly and annual maintenance testing of the FWS pumps would result in combustion emissions. Air emissions would include nitric oxides and nitrogen dioxide (NOx), CO, PM_{10}, and $PM_{2.5}$, as well as VOCs and PAH. While combustion emissions from maintenance activities are only expected to occur intermittently, with expected scheduled maintenance operations occurring for a total of approximately 20 hours per year, there is the potential for elevated pollutant concentrations; specifically, NO_X and $PM_{2.5}$ and PM_{10} during operation. As such, measures have been proposed to mitigate this risk, which are presented in Section 7.10.5.

7.10.5 Management measures

A selection of additional or modified mitigation measures to manage potential air quality impacts associated with the proposed modification are outlined in Table 7-56, with the consolidated list provided in Appendix D (Consolidated mitigation measures). Other mitigation measures identified in this Modification Report that are relevant to the management of potential air quality impacts include those specified in Section 7.3 (Soils, groundwater, and contamination).

Table 7-56 Mitigation measures – Air quality

ID	Issue	Mitigation measure
H1	Air quality management	An Air Quality Management Plan (AQMP) would be prepared as part of the CEMP to minimise the impact of dust upon sensitive receivers. This would include: • Measures to monitor dust emissions from the construction phase, such as visual inspections • Appropriate measures to be undertaken during adverse weather conditions • Appropriate, reasonable, and feasible measures to mitigate adverse air quality impacts, such as: - Vehicles would only travel on designated roads within the Site where possible and would be limited to a maximum speed of 10 km/hr in offroad areas and 25 km/hr elsewhere - Loads would be covered, and all tailgates would be securely fastened. Vehicles would not be loaded higher than the sides and tailboard. - Concrete cutting and coring would be undertaken using “wet tools” - Water sprays would be used to dampen down soils prior to excavation, handling and/or loading/ unloading materials - All plant would be maintained and operated in line with the manufacturer’s specifications in order to minimise the emission of air pollutants and offensive odours. - Plant and construction vehicles would be turned off when not in use. ~~• Dust emissions from the construction phase of the Project and during the demolition works would be monitored by construction/demolition staff.~~ ~~• Visual inspections would be completed by demolition staff during the works.~~ ~~• Demolition staff would also complete dust deposition monitoring during the demolition works (as per AS/NZS 3580) in appropriate locations on the Site boundary and in Kurnell. Staff would also monitor dust (PM_{10}) levels using the onsite real time ambient air quality monitoring station.~~ ~~• When required, during activities likely to cause high dust levels or adverse weather conditions etc., a designated worker would continuously monitor downwind emissions to the community or local residents, using the methods described above, and call a halt to activities if sensitive receptors are likely to be affected by airborne particulate matter.~~ ~~• Should significant impacts be likely, appropriate measures would be taken to mitigate adverse air quality impacts.~~
H8	Odour	An odour reduction program would **continue to** be implemented in accordance with the existing EPL **during construction and operation.**

ID	Issue	Mitigation measure
H13	Air quality management	~~Soils or concrete with significant hydrocarbon staining or obvious hydrocarbon odours would be transported to the former CLOR area and stored appropriately.~~ **To minimise impacts related to odour, the AQMP would include the following measures:** • Stockpiles of contaminated soil stored onsite would be managed to prevent odorous VOC emissions and windblown particulate emissions • Excavation would be staged to manage potential VOC and odour emissions. Where practical, excavations would not commence prior to 8am nor after 4pm as weather conditions at these times are generally conducive to adverse odour air quality situations from fugitive emissions • In the event of an odour complaint, an evaluation would be undertaken to confirm if the **proposed modification** ~~demolition~~ works are the source of the odours. If the construction works are confirmed as a potential ongoing odour source, additional mitigation measures would be implemented which could include the use of water sprays to suppress odours and, if necessary, the use of odour suppressants. Offsite olfactory observations and VOC monitoring using equipment would also be undertaken if necessary. In the event of ongoing odour issues, excavation activities would be stopped and if necessary, the excavation covered or backfilled.
H17	Air quality management	Surface disturbance would be minimised. Exposed ground would be rehabilitated as soon as practicable.
H18	Concrete crushing	During concrete crushing: • The crusher would be located as far as practicable from the Site boundary, allowing adequate buffer distance from receptors. • Real-time dust monitoring would be undertaking during the operation of the concrete crusher. Details of this monitoring (and associated response actions) would be incorporated into the AQMP for the **construction** ~~demolition~~ works. • A number of dust suppression measures would be implemented. These could include regular watering of stockpiles, dust curtains and other measures as appropriate.
H23	Air quality management	In line with ~~Caltex~~ **Ampol's** existing procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the complaint would be provided to the affected community members.
H25	Air quality management	The onsite real time ~~ambient air quality~~ **meteorological** monitoring station would ~~continue to~~ operate throughout the **construction/**demolition works. This station **would** continuously monitor~~s, for PM_{10}~~, wind direction and speed, temperature**, air pressure,** ~~and~~ humidity and rainfall.
H30	**Operational air quality**	**Caterpillar 3406B diesel engines in the relocated firewater system would be retrofitted to improve emission performance to meet Tier 1 US EPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022).**

7.11 Biodiversity

A Biodiversity Development Assessment Report (BDAR) was prepared for the proposed modification (Appendix P). The purpose of this report was to apply the NSW Biodiversity Assessment Method (BAM) (DPIE, 2020a) to the proposed modification, and assess the potential impacts on biodiversity, and propose mitigation measures where required. This section summarises the findings of the BDAR.

7.11.1 Methodology

The terms subject land, development site, development footprint, and assessment area are used throughout the BDAR and Section 7.11, and are defined below:

- The subject land is the same as the "Project Area," as defined in Section 2.1.3 (Project Area) and shown on Figure 1-1
- The development site is the same as the "Site," as defined in Section 2.1.2 (the Site) and shown on Figure 1-1
- The development footprint comprises the area of direct impact associated with the proposed modification, which is restricted to Zones 2 and 3, as well as several discrete areas in Zones 1 and 1A which represent indicative infrastructure relocation areas, as shown in Figure 4-1
- The assessment area includes the subject land and the area of land within a 1,500 m buffer zone surrounding the subject land, as required under the BAM.

The BDAR was prepared using the following methodology, consistent with the BAM, and with reference to relevant guidelines.

Stage 1 – Biodiversity assessment (existing conditions)

Stage 1 of the BDAR identified biodiversity values of the assessment area, focusing on landscape context, native vegetation and its integrity within the subject area, and presence of flora and fauna. These were used to inform the habitat suitability for threatened species. Preparation of Stage 1 included the following methodology:

- Review relevant databases, data sets, and information within 5 km of the subject land to provide context for the assessment area and inform field investigations
- Field surveys, which involved a systematic biodiversity assessment of the subject land in accordance with the BAM in February, April, November, and December 2024, and January 2025, including:
    - Identification and mapping of Plant Community Types (PCTs) according to the structural definitions held in the BioNet Vegetation Classification database, with reference to information provided in the NSW State Vegetation Type Map (DCCEEW, 2023)
    - Undertaking floristic plots within each vegetation zone in accordance with Section 4 of the BAM (DPIE, 2020a), considering varying condition states and avoidance of ecotones, areas of disturbance, and edges
    - Identification of native and exotic plant species, according to the Flora of NSW by Harden (1992) (1993) (2000) (2002) with reference to recent taxonomic changes
    - Undertaking targeted searches for plant species of conservation significance according to Surveying Threatened Plants and their Habitats (DPIE, 2020b)
    - Undertaking incidental observations using the "random meander" method (Cropper S, 1993)
    - Identification of previous and current factors threatening the ecological function and survival of native vegetation within and adjacent to the subject land
    - Undertaking an assessment of the natural resilience of the vegetation of the subject land
    - Identifying and mapping fauna habitats, assessing their condition and value to threatened fauna species, and considering threatened species' habitat constraints
    - Undertaking observations of animal activity and searches for indirect evidence of fauna

- Undertaking targeted surveys for threatened flora and fauna species.

Stage 2 – Impact assessment (biodiversity values)

Stage 2 applied the avoid, minimise, and offset hierarchy to assess direct, indirect, and prescribed impacts[9] associated with the proposed modification in accordance with the BAM.

Environmental mitigation measures and offsets required to manage impacts were identified. Offsets were calculated using the BAM Calculator (BAM-C). The BAM-C is used to provide a scientific and repeatable calculation of how the biodiversity impacts need to be the offset for biodiversity impacts (quantified as biodiversity credits) as required to achieve a standard of 'no net loss' of biodiversity under the BAM.

7.11.2 Existing environment

Landscape context

Based on historical and existing land use, large parts of the subject land are heavily developed. Areas of native vegetation occur primarily in the southern portion of the subject land, connected to large areas of conserved vegetation residing in Kamay Botany Bay National Park (close to the eastern side of the subject land) and Towra Point Nature Reserve (approximately 500 m to the west).

Limited native vegetation is present within the subject land and development footprint, and the vegetation that is present is primarily degraded due to historic clearing and current land uses. A summary of the landscape features of the subject land is provided in Table 7-57.

Table 7-57 Landscape context

Landscape context	Description
Native vegetation cover	The total assessment area is approximately 1,718 hectares (ha). The area of native vegetation mapped within the assessment area is approximately 620 ha, with a native vegetation cover of 36%. Cleared areas and areas of non-native vegetation within the assessment area cover about 1,098 ha.
Interim Biogeographic Regionalisation for Australia (IBRA)	The assessment area occurs within the Sydney Basin IBRA bioregion and the Pittwater IBRA subregion.
Waterways	The subject land is located within the Georges River catchment. The sea inlet of Botany Bay is directly to the north of the subject land. No mapped waterways are present within the subject land, however there are numerous sunken concrete lined 'pipeways'. These pipeways flood with water following rain events. In some locations, these areas contain patches of aquatic vegetation. Key Fish Habitat is considered present within the surrounding locality, included on the *Fisheries NSW Spatial Data Portal* (NSW Department of Primary Industries and Regional Development, 2024).
Wetlands	The Towra Point Nature Reserve, which contains the Towra Point Estuarine Wetlands, is located within 500 m of the subject land. This wetland is included in the Directory of Important Wetlands (DoIW) of Australia and in the list of Wetlands of International Importance developed under the Ramsar Convention, considered a Ramsar wetland.

[9] Prescribed impacts are direct impacts that occur upon land mapped as a biodiversity value.

Landscape context	Description
Connectivity	Native vegetation is restricted to a small, degraded patch in the southern portion of the subject land within Zone 3 (RPIP Mountain), which is associated with areas of conserved vegetation in Kamay Botany Bay National Park. The subject land also contains scattered patches of planted native vegetation and numerous sunken concrete lined pipeways with patches of aquatic vegetation. Mobile species that are able to traverse roads or small cleared areas would likely be able to disperse via these fragmented patches. There are also numerous areas of exotic grass/ turf throughout the subject land.
Geological features of significance	There were no recorded karst, caves, crevices, cliffs, or other areas of geological significance within the development site or subject land.
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity value (AOBV) mapped within the development site. The closest AOBV is the '*Endangered Population of Little Penguins at Manly*' that occurs approximately 22 km north of the subject land.
NSW (Mitchell) landscape	The subject land primarily occurs within the Sydney – Newcastle Barriers and Beaches Mitchell Landscape, considered for the BAM-C. A small corner of the subject land (in the south east) occurs within the Woronora Plateau. Given the extensive land modification within this small section of the subject land, this landscape was not considered further.
Additional landscape features	No additional landscape features were identified within the subject land.
Hydrology	The subject land is mapped as being located within Environmentally Sensitive Land on the Groundwater Vulnerability Map of the Sutherland Shire LEP. Areas along the northern boundary of Zone 1, southern boundary of Zone 2, and south and eastern boundary of Zone 3 are mapped as Proximity Area for Coastal Wetlands in the Chapter 2. Coastal management mapping of the SEPP (Resilience and Hazards).
Mapped important areas	The subject land is not within a mapped Important Area. However, Migratory Shorebird Important Areas are mapped approximately 500 m to the west of the subject land, associated with Towra Point Nature Reserve.

Native vegetation

Limited native vegetation is present within the subject land, and vegetation that is present is primarily heavily degraded due to historic clearing and current land uses. Figure 7-18 provides a map of the native vegetation extent (native ground cover and areas with canopy) recorded within the subject land.

Non-native vegetation

A total of 9.02 ha of the subject land was mapped as exotic grass/ turf vegetation or exotic vegetation (with planted exotic canopy species). A further 0.08 ha of planted native vegetation was also included as non-native vegetation, due to the heavily modified nature of the vegetation. Non-native vegetation location and extent within the assessment area is presented in Figure 7-19.

Plant community types

Two PCTs of varying condition were recorded within the subject land:

- PCT 3545 Coastal Sands Bloodwood Low Forest (4.77 ha)
  - Low condition (0.35 ha)
  - Regenerating condition (4.37 ha)
- PCT 3972 Sydney Creekflat Wetland (0.51 ha) (highly modified condition).

PCT 3545 was recorded in two condition states. Low condition vegetation occurred on areas of disturbed soil, containing a high abundance of weed species. Regenerating condition occurred on areas that were historically devoid of vegetation, where subsequent natural regeneration has taken place.

PCT 3972 was recorded in a highly modified condition, restricted to sunken concrete lined pipeways that in some instances contained dense patches of fringing aquatic vegetation. These areas did not contain all levels of strata and as such were not consistent with any PCT. Instead, these areas were assigned to this 'best-fit' PCT based on the species present and PCTs known to occur in the same IBRA subregion.

The location and extent of the PCTs within the subject land is presented in Figure 7-19.

Threatened ecological communities

No TECs listed under the BC Act of EPBC Act were found to be present.

Vegetation zones and integrity assessment

PCTs within the subject land were assessed and stratified, based on broad condition state, into vegetation zones in accordance with the BAM. This resulted in six native vegetation zones identified within the subject land in low, regenerating, or modified conditions, outlined in Table 7-58.

Table 7-58 Vegetation zones within the development footprint

Vegetation zone	PCT	Condition	BAM plots completed	Area (ha)	Max. patch size development footprint
3545_Low	3545 Coastal Sands Bloodwood Low Forest	Low	1	0.35	>100 ha
3545_ Regenerating	3545 Coastal Sands Bloodwood Low Forest	Regenerating	2	4.37	>100 ha
3972_Modified	3972 Sydney Creekflat Wetland	Modified	1	0.39	<5 ha

Plot data was then entered into the BAM-C to determine the vegetation integrity score. Vegetation integrity scores for each vegetation zones are provided in Table 7-59.

Table 7-59 Vegetation zone integrity scores

Vegetation zone	Composition score	Structure score	Function score	VI score*	Hollow bearing trees present
3545_Low	45.7	22.1	54.7	38.1	1
3545_Moderate	79	43.2	62.7	59.8	0
3545_ Regenerating	45.3	30.5	38.9	37.7	0
3546_Moderate	65.7	44.6	46.4	51.4	0
3638_Moderate	68.1	48.2	58	57.5	0
3972_Modified	50	18.2	-	30.1	0
**Vegetation integrity (VI). Benchmark (pristine) condition vegetation would receive a VI score of 100.*					

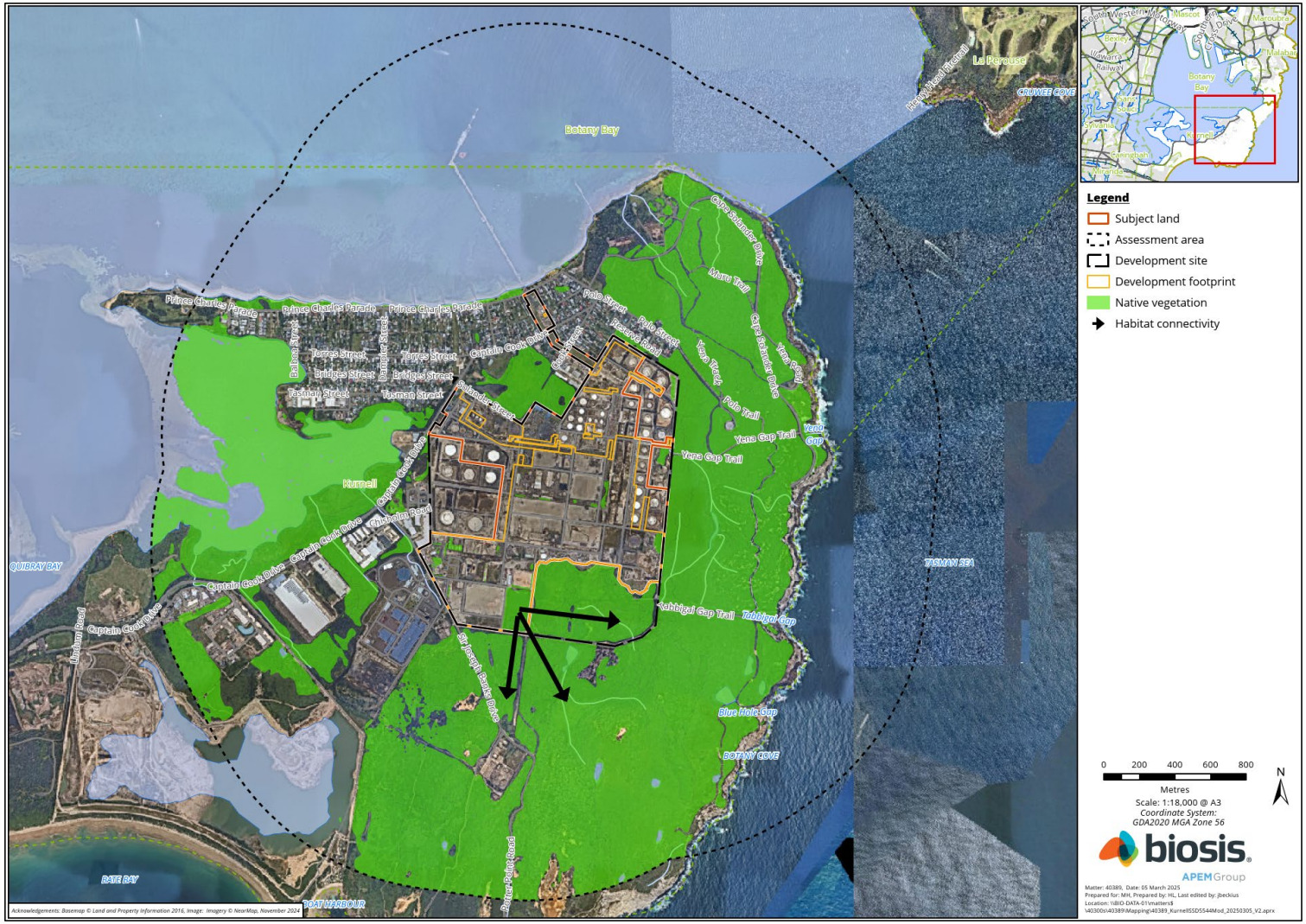

Figure 7-18 Native vegetation extent

Figure 7-19 Vegetation within the subject land

Threatened Species

Ecosystem credit *species*

A list of predicted species (ecosystem credit species) expected to occur within the subject land was generated in the BAM. Impacts to these species require assessment; however, targeted survey is not required as these species are assumed to occur, based on the occurrence of the PCTs, habitat constraints, native vegetation cover in the landscape and calculated patch sizes.

Table 7-60 lists the ecosystem credit species that could not be discounted, based on geographical restrictions or a lack of suitable habitat.

Table 7-60 Ecosystem credit species (predicted species) with potential to occur

Species name	Common name
Botaurus poiciloptilus	Australasian Bittern
Rostratula australis	Australian Painted Snipe
Limosa lapponica baueri	Bar-tailed Godwit (baueri)
Ixobrychus flavicollis	Black Bittern
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)
Limosa limosa	Black-tailed Godwit
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)
Calidris ferruginea	Curlew Sandpiper
Stagonopleura guttata	Diamond Firetail
Artamus cyanopterus cyanopterus	Dusky Woodswallow
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat
Numenius madagascariensis	Eastern Curlew
Falsistrellus tasmaniensis	Eastern False Pipistrelle
Pandion cristatus	Eastern Osprey
Petroica phoenicea	Flame Robin
Stictonetta naevosa	Freckled Duck
Callocephalon fimbriatum	Gang-gang Cockatoo
Phoniscus papuensis	Golden-tipped Bat
Calidris tenuirostris	Great Knot
Scoteanax rueppellii	Greater Broad-nosed Bat
Charadrius leschenaultii	Greater Sand-plover
Pteropus poliocephalus	Grey-headed Flying-fox
Miniopterus orianae oceanensis	Large Bent-winged Bat
Charadrius mongolus	Lesser Sand-plover
Miniopterus australis	Little Bent-winged Bat
Hieraaetus morphnoides	Little Eagle
Glossopsitta pusilla	Little Lorikeet
Pseudomys novaehollandiae	New Holland Mouse
Calidris canutus	Red Knot
Anthochaera phrygia	Regent Honeyeater

Species name	Common name
Varanus rosenbergi	Rosenberg's Goanna
Calidris alba	Sanderling
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo
Circus assimilis	Spotted Harrier
Dasyurus maculatus	Spotted-tailed Quoll
Lophoictinia isura	Square-tailed Kite
Lathamus discolor	Swift Parrot
Xenus cinereus	Terek Sandpiper
Neophema pulchella	Turquoise Parrot
Daphoenositta chrysoptera	Varied Sittella
Haliaeetus leucogaster	White-bellied Sea-Eagle
Hirundapus caudacutus	White-throated Needletail
Petaurus australis	Yellow-bellied Glider
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat

Species credit species

Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence, or components of their habitat. A targeted survey or an expert report is required to confirm the presence of these, or alternatively the species can be assumed to be present. A detailed assessment of potential for occurrence, and potential for impact, for all relevant species credit species is presented in the BDAR (Appendix P).

Threatened flora

Habitats for threatened flora species within the subject land are largely considered degraded due to the high degree of development, past vegetation clearing, and current land use. Table 7-61 provides a list of candidate flora species credit species considered in this assessment, each species' required survey period, and the relevant method of assessment.

Table 7-61 Candidate flora species credit species

Species name	Common name	Survey period	Method of assessment
Acacia terminalis subsp. *Eastern Sydney*	Sunshine Wattle	May-July	Straight line parallel transects 10 m apart
Callistemon linearifolius	Netted Bottle Brush	October-January (species surveyed outside of season)	Straight line parallel transects 10 m apart
Eucalyptus camfieldii	Camfield's Stringybark	All year	Straight line parallel transects 10 m apart
Melaleuca groveana	Grove's Paperbark	All year	Straight line parallel transects 10 m apart
Senecio spathulatus	Coast Groundsel	All year	Straight line parallel transects 10 m apart
Syzygium paniculatum	Magenta Lily Pilly	April-June	Straight line parallel transects 10 m apart

Threatened fauna

Fauna habitat assessment was undertaken to determine whether the vegetation to be impacted by the proposed modification contained microhabitats suitable to support the candidate fauna species credit species. Similar to threatened flora, habitats for threatened fauna species within the subject land are also largely considered degraded. Table 7-62 provides a list of candidate fauna species credit species considered in this assessment.

The main areas of potential fauna habitat were represented by the patch of regenerating and low condition PCT 3545 within Zone 3, as well as the scattered patches of modified PCT 3972 within concreted pipeways. Additionally, human-made structures, would be demolished throughout Zones 2 and 3; given that buildings can often provide suitable roosting habitat for microbat species, these structures were subject to survey to assess their potential as roosting sites.

Table 7-62 Candidate fauna species credit species

Species name	Common name	Survey period	Method of assessment
Cercartetus nanus	Eastern Pygmy-possum	October-March	• Camera trapping. • Spotlighting surveys (supported with thermal camera for spotting
Chalinolobus dwyeri	Large-eared Pied Bat	November to January	• Harp trapping surveys
Crinia tinnula	Wallum Froglet	All year after flooding rains	• Aural-visual survey • Call playback surveys
Litoria aurea	Green and Golden Bell Frog	November-March	• Aural-visual survey • Call playback surveys
Meridolum maryae	Maroubra Woodland Snail	All year	• Modified Spot Assessment Technique (SAT) surveys • Spotlight surveys
Myotis macropus	Southern Myotis	October-March	• Harp trapping surveys • Thermal surveys • Echometer surveys • Roost searches (human-made buildings)

Threatened species survey

Targeted threatened species surveys of the subject land were undertaken from February 2024 to January 2025. A summary of the results is provided in Table 7-63.

Table 7-63 Threatened species survey results

Survey type	Summary of results
Threatened flora	No candidate threatened flora species were detected.
Fauna habitat assessment	Several habitat features with potential to support threatened species credit species were identified, including: • One hollow bearing tree in a patch of low quality PCT 3545, containing a medium sized hollow close to the ground. As such, considered unsuitable for the candidate species credit species (i.e. cockatoos and owls). • Feed tree species (in low abundance) • A total of 14 structures, which could represent potential roosting sites, are proposed to be removed as part of the proposed modification. Surveys of these buildings confirmed that no roosts were present. • Numerous sunken concrete lined pipeways containing aboveground petroleum pipelines

Survey type	Summary of results
	• Patches of soft sandy soil, which were suitable for burrowing for small mammals and some reptiles and amphibians.
Amphibians	Targeted surveys for candidate species were undertaken and detected: • No Green and Golden Bell Frogs or Wallum Froglets • No other threatened amphibian species • Four non-threatened species.
Invertebrates	Diurnal targeting surveys and nocturnal spotlighting surveys for candidate species were undertaken and detected: • No Maroubra Woodland Snails or similar species in the *Meridolum* or *Pommerhelix* genera • During the nocturnal spotlighting surveys, a Giant Dragonfly (listed as Endangered under the BC Act) was incidentally recorded, confirming the presence of the species within the subject land. The species was located in a connected patch vegetation south of the subject land, which is not generally associated with its occurrence but occurs within 500 m of wetland environments.
Mammals	Spotlighting surveys were undertaken and remote cameras deployed for the candidate species, and detected: • No Eastern Pygmy-possums • No other threatened mammal species • General non-threatened species known to occur in the region.
Microbats	Microbat roost searches as well as harp trapping with thermal camera and echometer surveys of potential habitats were undertaken and detected: • No Large-eared Pied Bats • No microbats or secondary evidence of microbats was observed during the diurnal roost searches • No bats were captured in the harp traps • One Southern Myotis individual foraging along the eastern portion of the subject land.
Birds	Targeted surveys for threatened avifauna was not undertaken as no candidate species were identified, however ecologists were onsite for various other threatened species surveys and detected: • Two Latham's Snipe *Gallinago hardwickii* (listed as a Vulnerable, Marine and Migratory species under the EPBC Act) were incidentally flushed (i.e., driven out) from a flooded pipeway by the ecologists. Given the proximity of the subject land to extensive coastal wetlands, it is likely that the Latham's Snipe presence in the area is due to the high-quality habitats in the surrounding Towra Point Nature Reserve. A species polygon for Latham's Snipe was not generated as guidance for this species is not currently available in BioNet (profile not complete). • No other threatened bird species were detected.

7.11.3 Impact assessment – Construction

The proposed modification has the potential to result in direct and indirect impacts on biodiversity values. The majority of impacts on biodiversity would occur during construction from the clearing of native vegetation and removal of habitat for a limited range of flora and fauna. To understand these potential impacts and measures to avoid or mitigate them, this section provides:

- A description of how biodiversity impacts have been avoided, where possible
- An assessment of the potential direct, indirect, and prescribed impacts during construction.

Actions to avoid/ minimise impacts

Removal of existing infrastructure and remediation of land in Zones 2 and 3 (and Zone 1, as required), allows for new land uses within the historically cleared and contaminated development site, thereby reducing the risk of contamination. This reuse effectively results in the avoidance of impacts to new, previously unimpacted sites, by utilising this already impacted land for new purposes.

Impacts associated with the clearing of native vegetation and/or threatened species habitat have been avoided or minimised by:

- Locating the proposed modification within an area that lacks significant biodiversity values
- Avoiding areas where higher vegetation quality has been identified
- Avoiding areas that are mapped on the important habitat map
- Avoiding sensitive swamp areas that are key breeding habitats for the Giant Dragonfly, a serious and irreversible (SAII) entity[10] that was detected within adjoining vegetation
- Primarily avoiding impacts to highly cleared PCTs (PCT 3545 has an estimated cleared value of 38%, comparatively low for the region and is the largest PCT impacted by the proposed modification)
- Avoiding impacts to areas identified as breeding habitat for threatened species (such as nest trees).

A significant portion of vegetation to be removed lies in RPIP Mountain in Zone 3. This area is significantly disturbed and experienced historical land clearing since the 1980s. Soil sampling has indicated that this area contains significant asbestos contamination requiring remediation. Remediation included in the proposed modification necessitate the removal of vegetation and therefore, impacts to the low and regenerating condition native vegetation in this location are unavoidable.

Direct impacts

Direct impacts from the proposed modification would result from vegetation clearing to allow for the relocation of infrastructure assets and for ground remediation to occur, i.e. all vegetation shown within the development footprint shown in Figure 7-19. Direct, permanent impacts arising from the proposed modification include:

- Removal of 5.23 ha of native vegetation, comprising the following:
  - 0.35 ha of low condition PCT 3545
  - 4.37 ha of regenerating PCT 3545
  - 0.51 ha of modified PCT 3972
- Removal of 6.04 ha of exotic grass
- Removal of 0.55 ha of planted exotic vegetation
- Removal of 3.44 ha of habitat for Giant Dragonfly
- Removal of 4.85 ha of habitat for Southern Myotis
- Removal of one hollow-bearing tree.

A summary of PCTs and zones that would be directly impacted by the proposed modification is presented in Table 7-64. A summary the potential direct impacts to species credit species is shown in Table 7-65.

[10] An SAII listing recognises species at most risk of extinction, which has specific habitat requirements that cannot be replicated.

Table 7-64 Summary of direct impacts to vegetation

Zone	PCT	TEC	Area within subject land (ha)	Area impacted (ha)	VI Score
3545_Low	PCT 3545 Coastal Sands Bloodwood Low Forest	Nil	0.35	0.35	38.1
3545_Regenerating	PCT 3545 Coastal Sands Bloodwood Low Forest	Nil	4.37	4.37	37.7
3972_Modified	PCT 3972 Sydney Creekflat Wetland	Nil	0.51	0.51	30.1

Table 7-65 Summary of direct impacts to species credit habitat or individuals

Species	Sensitivity	Area (ha)
Giant Dragonfly	Very High Sensitivity to Gain	3.44
Southern Myotis	High Sensitivity to Gain	4.85

One hollow-bearing tree is present within the development footprint (refer to Figure 7-19) and would be removed during construction. The hollow-bearing tree is medium in size and contains one medium-sized hollow (50-149 mm), located approximately 1 m off the ground. Given the size and location of the hollow, it is not suitable as breeding habitat for cockatoo and owl species that may be present in the locality.

Indirect impacts

Potential indirect impacts arising from the construction of the proposed modification are shown in Figure 7-20 and outlined in Table 7-66.

Table 7-66 Summary of direct impacts to species credit habitat or individuals

Indirect impact	Duration	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation	Medium term	As appropriate exclusion fencing and CEMPs would be in place, inadvertent impacts on adjacent habitat or vegetation are not anticipated to occur. Measures outlined in Section 7.4 (Surface water, wastewater, and flooding) would further reduce potential inadvertent impacts via changes in water quality during construction.
Reduced viability of adjacent habitat due to edge effects	Short term	As most of the development footprint is restricted to previously developed areas, a significant increase in edge effects is not anticipated to occur at adjacent habitats. Measures outlined in Section 7.11.5 would further reduce potential edge effects.
Reduced viability of adjacent habitat due to noise, dust, or light spill	Short term	Although construction works have the potential to reduce the viability of adjacent habitat due to noise, dust, or light spill, the subject land includes an existing bulk liquid fuel terminal where these impacts are likely already occurring. Construction works are proposed during the evenings. Measures outlined in Sections 7.11.5, 7.8 (Noise and vibration), and 7.10 (Air quality) as well as the implementation of a CEMP would further reduce potential impacts.

Indirect impact	Duration	Likelihood and consequences
Transport of weeds and pathogens from the site to adjacent vegetation	Potential to be long term	Although construction works have the potential to facilitate the introduction or spread of exotic weeds and pathogens, impacts are not anticipated to be substantial given the nature of the development site and current land use. Measures to manage the spread of weeds and pathogens are presented in Section 7.11.5.
Increased risk of starvation, exposure and loss of shade or shelter	Short term	A change in the risk of starvation, exposure, and loss of shade or shelter is not anticipated as there is substantial intact vegetation to the south and east of the subject land. No further measures are required to manage this impact.
Loss of breeding habitats	Short term	The loss of breeding habitats is not anticipated as there is substantial intact vegetation to the south and east of the subject land. No further measures are required to manage this impact.
Trampling of threatened flora species	Not applicable	Trampling of threatened flora species is not anticipated as there is substantial intact vegetation to the south and east of the subject land. No further measures are required to manage this impact.
Inhibition of nitrogen fixation and increased soil salinity	Short term	As the subject land has already experienced significant development, the inhibition of nitrogen fixation and increased soil salinity is not anticipated to occur. Measures to manage other impacts to soils are presented in Section 7.3 (Soils, groundwater and contamination).
Fertiliser drift	Not applicable	No fertiliser is expected to be utilised as part of the proposed modification and as such, works are not expected to contribute to fertiliser drift into surrounding areas. Measures outlined in Section 7.11.5 and Appendix D (Consolidated mitigation measures) would further reduce the risk of fertiliser drift.
Rubbish dumping	Short term	Rubbish dumping is not anticipated to substantially increase due to the proposed modification. Further details regarding the management of waste are detailed in Section 7.12 (Other matters).
Wood collection	Not applicable	The Site is fenced and access managed by Ampol. It is unlikely that the proposed modification works would increase the likelihood of the public undertaking wood collection within the retained vegetation given the current and future land use at the Site. No further measures are required to manage this impact.
Removal and disturbance of rocks, including bush rock	Not applicable	Based on the field investigations undertaken for the proposed modification, the subject land does not support bush rock. No further measures are required to manage this impact.
Increase in predators	Medium term	Given the existing land use, the proposed modification is not anticipated to exacerbate predatory species populations in the area or “open up” large areas of habitat that may encourage predatory species to move into the area. Measures outlined in Section 7.11.5 and Appendix D (Consolidated mitigation measures) would further reduce potential presence of predators.
Increase in pest animal populations	Medium term	The proposed modification is not anticipated to result in an increase in available habitat for pest species and is unlikely to lead to an increase in pest animal populations. As such, an increase in pest animal populations is not anticipated. No further measures are required to manage this impact.

Indirect impact	Duration	Likelihood and consequences
Changed fire regimes	Potential to be long term	Given the current land use, the proposed modification would not result in an increased risk of fire upon threatened flora and fauna or change fire regimes. Further details regarding the management of fire risk are detailed in Section 7.2 (Hazards and risk).
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds	Not applicable	The proposed modification would not impact any specialist breeding or foraging habitat. Giant Dragonfly breeding habitat associated with Swamp environments would not be impacted by the proposed works. No further measures are required to manage this impact.
Fragmentation of movement corridors	Potential to be long term	The proposed modification impacts to native vegetation is not anticipated to fragment any habitat corridors or create a barrier to dispersal of species across the landscape. Measures outlined in Section 7.11.5 would further reduce potential fragmentation of movement corridors.

Prescribed impacts

Potential prescribed impacts arising from the construction of the proposed modification are shown in Figure 7-20 and outlined in Table 7-67.

Table 7-67 Identification of prescribed impacts

Prescribed impact	Nature	Extent
Occurrences of human-made structures and non-native vegetation	Removal of man-made structures and non-native vegetation that may provide habitat to threatened or non-threatened fauna species	Although evidence of roosting was not detected in man-made structures during surveys, removal of these structures has the potential to impact roosting habitat for threatened microbat species. Additionally, sunken pipeways have the potential to impact breeding, foraging or roosting habitats for non-threatened frog species or wetland birds. However, as the structures and vegetation to be removed are highly fragmented and represent a small proportion of commensurate habitats available in the immediate vicinity, removal of these areas is not anticipated to result in significant impacts.
Habitat connectivity	Removal of sunken impermeable (concrete lined) pipeways and man-made channels that create corridors or other areas of connectivity linking habitat for threatened entities	The pipeways and channels could potentially be used as a temporary ‘stop over’ roost for migratory wetland birds, such as the Australasian Bittern and Latham’s Snipe. However, as these areas are already sparse and fragmented, the removal of such corridors is unlikely to impact habitat connectivity.
Water bodies or any hydrological processes that sustain threatened entities	Removal of sunken impermeable (concrete lined) pipeways and man-made channels which provide habitat for threatened entities	The removal of sunken pipeways and man-made channels may result in impacts associated with the reduction of food resources and sheltered roost habitat. However, as there is substantial intact vegetation to the south and east of the subject land, removal of sunken pipeways and man-made channels is not anticipated to impact water bodies or processes that sustain threatened entities.

Prescribed impact	Nature	Extent
Vehicle strike	Increased vehicle movements, in particular heavy vehicles, have the potential to increase vehicle strikes with threatened or non-threatened fauna species.	As internal roadways have a posted speed limit of 20 km/hr, the risk of vehicle strike to threatened or non-threatened fauna is not anticipated.

Impacts considered uncertain

There were no impacts considered uncertain for the assessment.

Impacts to Groundwater Dependent Ecosystems (GDE)

As described in Section 7.3 (Soils, groundwater, and contamination), there are no terrestrial GDEs within the subject land. GDEs can be found within 500 m of the subject land, located in Marton Park. The closest works to Marton Park would be construction within the FWS Relocation Area. Excavation for new foundations for the firewater tank, pumps, and pipework would be limited to 1 mbgl (Section 4.2.3). There is potential for the dewatering activities to impact the GDE at Marton Park due to its proximity.

Potential impacts would be temporary and managed through a GWMP (see measures presented in Section 7.3). The requirement for an aquifer interference approval and/or approval from WaterNSW for the extraction of groundwater during excavation works would be determined during detailed design. As such the proposed modification is unlikely to result in long term risks to GDEs.

Serious and irreversible impacts

In accordance with Clause 6.7 of the BC Regulation, an impact is to be regarded as SAII if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct.

The Giant Dragonfly was detected during targeted surveys, which is a species that has been recognised as being at risk of a SAII. This species is considered an SAII entity as it is considered unlikely to respond to measures to improve its habitat (refer to Principle 4 of the BC Regulation). An SAII assessment in accordance with Section 9.1 of the BAM has been undertaken for this species and is included in Annexure E of the BDAR (Appendix P).

Figure 7-20 Indirect and prescribed impacts

Offsetting

A calculation of the nature and extent of biodiversity credits (ecosystem and species) is required due to biodiversity impacts associated with the proposed modification. This has been undertaken using the BAM Calculator.

Impacts to native vegetation (ecosystem credit)

Offsetting must be determined for all impacts of the proposed modification on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:

- ≥15 where the PCT is representative of an endangered or critically endangered ecological community
- ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or is representative of a vulnerable ecological community
- ≥20 where the PCT is not representative of a TEC or associated with threatened species habitat.

Table 7-68 provides a summary of the ecosystem credit offsets required for impacts from the proposed modification at the subject land.

Table 7-68 Offsets required (ecosystem credits)

Vegetation zone	Area (ha)	Impact	VI score	Offset required	TEC	HBTs	Credit requirement
3545_Low	0.35	Removal	38.1	Yes	Nil	Yes	5
3545_ Regenerating	4.37	Removal	37.7	Yes	Nil	No	62
3972_Modified	0.51	Removal	30.1	Yes	Nil	No	8

Impacts to threatened species and their habitat

Offsetting is also required for the impacts of the proposals on the habitat of threatened species assessed for ecosystem credits and associated with a PCT in a vegetation zone with a VI score of ≥17. Table 7-69 provides a summary of the species credit offsets required for impacts from the proposed modification at the subject land.

Table 7-69 Offsets required (species credits)

Vegetation zone	Species	Habitat condition (VI score) loss	Area (ha)	Biodiversity risk weighting	Credit requirement
3545_Low	Giant Dragonfly	38.1	0.35	3	10
3545_Regenerating		37.7	3.09	3	87
3545_Low	Southern Myotis	38.1	0.35	2	7
3545_Regenerating		37.7	4.37	2	82
3972_Modified		29.1	0.51	2	7

Staging of offsets

A staged approach to the retirement of the proposed modification's biodiversity credit liability would be undertaken, based on zone. As there is no removal of native vegetation and no impacts to species credit species habitat within Zones 1 and 1A, offsets within these zones are not required. Therefore, Zone 2 and Zone 3 would be considered two separate stages. The staged ecosystem and species credit breakdown for Zone 2 and Zone 3 are provided in Section 9.1.3 of the BDAR (Appendix P).

7.11.4 Impact assessment – Operation

Once the proposed modification works are complete, the development site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for the approved project.

Existing plans and additional management measures proposed as part of this Modification Report would be implemented to manage impacts to biodiversity following construction, including the existing OEMP and one or more EMP(s) and GMP(s).

As such, with appropriate mitigation measures, impacts within or beyond the development site are not anticipated.

7.11.5 Management measures

A selection of additional or modified mitigation measures to manage potential biodiversity impacts associated with the proposed modification are outlined in Table 7-70, with the consolidated list provided in Appendix D (Consolidated mitigation measures). Other mitigation measures identified in this Modification Report that are relevant to the management of potential biodiversity impacts include those specified in Sections 7.3 (Soils, groundwater, and contamination), 7.4 (Surface water, wastewater and flooding) 7.7 (Traffic and transport), 7.8 (Noise and vibration), and 7.10 (Air quality).

Table 7-70 Mitigation measures – Biodiversity

ID	Issue	Mitigation measure
K1	Biodiversity management	A Biodiversity and Weed Management Plan (BWMP) would be prepared in order to limit and control the spread of noxious weeds within the Site~~/demolition works area~~. It would include the following: • Wash down procedures to reduce the spread of weeds via vehicles and machinery • Measures to target potential new weed outbreaks including soil stockpiles and any other disturbed areas • Outline monitoring programs for noxious and problematic weeds on site and in the surrounding areas • Measures for strict stockpiling control to help eradicate all noxious weeds as per NSW DPI specifications for Sutherland Shire LGA • Include a list of 'frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO for the control of noxious weeds; and ensure that only amphibian friendly herbicides are used • Wash down protocols for construction/demolition vehicles and machinery to prevent the spread of root-rot fungus (*Phytophthora cinnamomi*) and noxious weeds • All personnel undertaking routine management activities of any noxious weeds should be appropriated trained and all contractors should hold the necessary permits and licences. Noxious weed information sheets would be provided to demolition contractors to help identification of relevant noxious weeds.

ID	Issue	Mitigation measure
K2	Biodiversity management	~~A BWMP would be prepared in order to limit potential impacts to existing vegetation outside of the area of proposed works, but within the Site. It would include the following:~~ ~~• Existing vegetation on Site would be clearly marked on all Site plans and construction diagrams, with clear indications of no-go zones within all vegetated areas~~ ~~• Existing vegetation would be clearly signposted and fenced off prior to the commencement of construction activities, and should remain fenced off until the completion of works (as per the Vegetation Exclusion Zones shown on Figure 17-1)~~ Absolutely all works would be limited to the ~~defined construction/ demolition footprint~~ **Project Area, as defined in Figure 4-1 of the MOD-7 Modification Report**.
K3	Impacts to native fauna species	To minimise the potential for impacts to native fauna species, the BWMP would be developed and include following measures: • Identification sheets would be provided to all construction workers on Site for the ~~two~~ threatened ~~frog~~ species predicted to occur within the Site. • Stop work procedures would be implemented during the works on the chance encounter of any dispersing threatened frogs or birds to avoid death or injury to frogs dispersing across the Site, or disturbance to nesting threatened birds. • ~~If any frogs are found within the Project Area, works would cease until frogs have been relocated to areas outside the area of impact~~ • If any threatened frogs, e.g. Green and Golden Bell Frog or Wallum Froglet, are identified within the Site, works would cease and active searching should be undertaken by a qualified zoologist experienced in the identification and management of the Green and Golden Bell Frog and Wallum Froglet • All trenches would be inspected prior to works each morning. **Exclusion fencing shall be maintained during all seasons of the year.** Any frogs that become trapped within trenches would be assessed by a suitably qualified ecologist or veterinarian and then released into the nearest suitable habitat if uninjured • Wash down protocols to prevent the spread of Amphibian Chytrid Disease (chytridiomycosis) would be implemented at relevant work areas. Protocols would be consistent with **NSW DCCEEW** ~~OEH~~ guidelines (DECC, 2008b) • 'Frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO would be used for the control of noxious weeds • If fauna are found to be utilising the Site, or a nest, den or roost is found, work in the immediate area is to stop and the animals are to be allowed to move off freely, or relocated by an authorised person to an area outside the construction footprint • **Measures to limit light spill during construction, such as strategic placement and directional lighting, and implementing motion sensor activation.**
K8	**Lighting**	**The detailed design of new buildings would include measures to manage light spill.**

7.12 Other matters

Table 7-71 summarises other environmental matters that have been considered for the proposed modification.

Table 7-71 Other potential environmental matters

Matter	Potential impact
Waste management	**Existing environment**
	The Kurnell Terminal OEMP (Ampol, 2021) is the primary document that informs how Ampol identifies and provides management solutions for waste, among other potential environmental impacts arising from Terminal operations. The Site also operates under EPL 837, which allows Ampol to treat, store, process, reprocess, transport, and dispose of wastes generated during Terminal operations. Under EPL 837, no more than 100 tonnes of chemical storage waste can be present onsite at any one time. Liquid and/or non liquid waste generated or stored at the premises must be assessed and classified in accordance with the EPA Waste Classification Guidelines. Wastes generated from Ampol's existing Terminal operations in Kurnell are sorted and recycled where possible. Wastes designated as 'regulated or trackable' by NSW EPA are sent by licenced transport to a lawfully licensed waste facility for appropriate treatment and/ or disposal, in accordance with the Terminal's Waste Management Sub-Plan of the OEMP.
	Construction impacts
	The key construction activities that would be expected to generate waste include: • Removal of parts of the OWS and firewater system infrastructure • Demolition of certain structures, including buildings and substations, and removal of their slab, foundations, and footings, where possible • Excavation of contaminated soil • Removal of temporary environmental controls and structures during demobilisation. Mismanagement of waste may lead to impacts associated with odour generation, decreased visual amenity and creation of environments that attract animals/ pest species (e.g. rats and mice). Furthermore, leaks from unsealed wastes may contaminate underlaying soils and migrate into groundwater or stormwater. A waste management area would be established in the north west corner of Zone 2, as shown on Figure 4-1. Once material is removed or excavated, it would be sorted and stockpiled separately based on type of waste in this area prior to processing or removal. The waste management area would remain for the duration of the proposed modification. It is estimated that the proposed modification would involve the processing of approximately 40,000 m^3 of concrete predominantly from slabs and asphalt. Concrete would be crushed within the waste management area (shown on Figure 4-1) and where appropriate, used as backfill during Stages 3 and 4 to reduce the soil deficit and to improve the geotechnical stability of the land. Treated excavated material would be validated for onsite reuse or, where the treated material does not meet validation and/or re-use criteria, it would be classified for offsite sale, recycling, or disposal in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Contaminated soil management is discussed in Section 7.3 (Soils, groundwater, and contamination). Measures to manage potential waste impacts associated with construction of the proposed modification construction are outlined in Section 7.12.1.

Matter	Potential impact
	Operational impacts
	Once the proposed modification works are completed, waste management at the Site would be consistent with the approved project and managed in accordance with existing Ampol waste management protocols.
Landscape and visual	**Existing environment**
	The Project Area is located within the Kurnell Terminal, comprised entirely of an industrial landscape character zone. The Site's surrounding landscape character zones include: • Industrial zones to the south west (such as Sydney Desalination Plant, data centre, and commercial facilities) • Recreational zones to the north (Marton Park), east and south (Kamay Botany Bay National Park), and west (Towra Point Nature Reserve) • Residential zones to the north (the Kurnell township). Views of the Site from industrial zones are largely screened by vegetation and are in line with the surrounding industrial land zoning. Views from residential zones and the local road network are also largely screened by existing vegetation; furthermore, any views from the local road network would be transient in nature. Views from recreational zones, including Marton Park and Kamay Botany Bay National Park are screened by vegetation; topography of the land contributes to the lack of views from the National Park as the Site is set in a depression below the level of the surrounds. As there are no public footpaths in Towra Point Nature Reserve, there are no views from this recreational zone to the Project Area. The surrounding landscape character zones for Zone 1A include: • Residential zones to the east and west (the Kurnell township). Views from residential zones and the surrounding road network are somewhat screened by property fences and vegetation; however, existing infrastructure is largely visible within Zone 1A. Existing infrastructure is in line with the industrial land zoning of Zone 1A.
	Construction impacts
	The presence of construction plant and vehicles on the Site would not be dissimilar to activities that already occur at the Kurnell Terminal. Construction works would be largely obscured from view of the public across the Site due to presence of existing screening on the Site boundary, and distances from receptors due to the large size of the Site. Zone 1A lies adjacent to residential receptors in the Kurnell township and limited screening is present. The construction of the new storage shed located in Zone 1A would involve excavation and installation of foundations, laying a slab, installation and connection to Site utilities, construction of the structure, and internal fit out. However, potential visual impacts of these works to nearby residential receptors is considered negligible given that: • The southern extent of Zone 1A is zoned for Heavy Industrial usage • The southern extent of Zone 1A is currently used by Ampol for material storage • The new shed would be less than 4 m tall • Construction of the new shed would last three months only. Mitigation measures are not considered necessary to manage these negligible impacts.

Matter	Potential impact
	Operational impacts
	Once the proposed modification works are completed, equipment would operate in their new locations in line with Figure 4-1. New operational equipment would be located within Zones 1, 1A, and 2. New equipment operating within Zones 1 and 2 would be surrounded by existing terminal infrastructure and consistent with the industrial landscape character of the Site. Views of new infrastructure are not anticipated to be visible to from industrial or recreational zones due to the screening of vegetation and Site topography. The relocated FWS (tank and pumphouse) would lie adjacent to Solander Street. The Option 1 location would lie slightly closer to Captain Cook Drive than Option 2. Views of the relocated FWS may be visible from nearby residences and the road network. Whilst the aesthetic of the relocated FWS would be consistent with the industrial landscape character of the Site, a negligible change in views would be anticipated. The new storage shed in Zone 1A, approximately 252 m^2 and up to 4 m tall, would be surrounded by existing terminal infrastructure and storage equipment, and be consistent with the industrial landscape character of the Site. Whilst views of the new storage shed may be visible from residential receivers and the surrounding road network, changes to views from residential or road receivers are not anticipated. As such, negligible landscape character or visual impacts are anticipated from the operation of additional equipment in Zone 1A. No measures are required to manage these negligible changes.

7.12.1 Management measures

A selection of additional or modified mitigation measures to manage potential waste impacts associated with the proposed modification are outlined in Table 7-72, with the consolidated list provided in Appendix D (Consolidated mitigation measures).

Table 7-72 Mitigation measures – Waste

ID	Issue	Mitigation measure
E1	Waste management	The ~~Project~~ **proposed modification** would be integrated into existing resource efficiency, waste management and handling, emergency response and preparedness plans for the existing Site.
E2	Waste management	Construction and Operation Waste and Resource Management Plans (WRMP) ~~and Demolition Waste and Resource Management Plans (DWRMP)~~ would be compiled prior to ~~the~~ each phase commencing. ~~The DWRMP would be updated to include reference to management of waste generated by the ACS Modification works prior to construction works commencing.~~

ID	Issue	Mitigation measure
E3	Waste management	The WRMPs ~~and DWRMP~~ would: • Identify requirements consistent with the waste and resource hierarchy • Ensure resourcing efficiency is delivered through the design and responsible construction, demolition and operational practices • Ensure procurement of pre-fabricated materials to eliminate off-cuts on-site, and the re-use of materials where possible • Provide consistent clear direction on waste and resource handling, storage, stockpiling, use and reuse management measures (consistent with current management practices relating to ~~Caltex~~ **Ampol's** Kurnell Waste Management System) • Provide separate waste containers/ skips to ensure waste material segregation and maximise the opportunities for re-use and recycling • Set out procedures for management of recyclable wastes, including storage in suitable containers and designated waste management areas, to be transferred by a licensed waste contractor to an appropriate recycling facility where possible. • Identify disposal and management routes consistent with current management practices as adapted for the ~~Project~~ **proposed modification** • Set out clear requirements for meeting legislative and regulatory requirements • Ensure safe storage and disposal of waste ensuring least amount of harm to surrounding environment • Define requirements to support ~~Caltex~~ **Ampol's** sustainable procurement objectives through effective, design, construction, operation and procurement • Set out processes for disposal, including onsite transfer, management and the necessary associated approvals • Set out procedures for analysing new waste streams and determining the most suitable management measures to use when handling, storing, transporting and disposing of the waste • Set out procedures for management of unidentifiable waste streams. Unidentifiable waste streams would be analysed and sent for testing in an accredited laboratory to assess the risks associated with handling and disposal of the waste.
E4	Waste and resource hierarchy	The WRMP ~~and DWRMP~~ would incorporate the requirements of the waste and resource hierarchy and cleaner production initiatives.
E5	Waste reporting	The WRMP ~~and DWRMP~~ would include a process for auditing, monitoring and reporting, which would include regular inspections offsite activities and the waste management area(s). The WRMP ~~and DWRMP~~ would be subject to regular auditing and a system would be used to record and report the types, volumes and management measures for all waste and resource arising from/used for the works.
E7	Waste management	~~Caltex~~ **Ampol's** existing procedures for the disposal of sewage, greywater, hazardous materials, general waste and recyclable materials would be adopted for the ~~Project~~ **terminal (as modified)** ~~(and modified if required)~~. This would include using licensed contractors to remove and transport waste from the Site.

ID	Issue	Mitigation measure
E8	Waste register	A Waste Register would be prepared, used and maintained by the ~~Demolition~~ Contractor to track all wastes generated from ~~Project~~ **the proposed modification**. The ~~Demolition~~ Contractor would retain waste receipts to indicate evidence of waste disposal. The database would also be used to track all materials reused at the premises including its reuse location, type of waste and classification. ~~A Waste Register would be prepared, used and maintained by the Contractor to track all wastes generated from the ACS Modification works and used to record and report the types, volumes and management measures for all waste and resources arising from/used for the works. This would be subject to regular auditing.~~
E9	Stockpiled wastes	Stockpiled wastes would be: • Appropriately segregated to avoid mixing and contamination • Clearly labelled • Contained in bunded areas and if necessary on an appropriate lining • Less than 5 m in height • Located >40 m away from any sensitive receivers, heritage, ecological areas and watercourses.
E12	Asbestos waste	The Site's existing Asbestos Waste Register would be amended as appropriate, implemented and maintained to track asbestos wastes generated during the works.
E13	Asbestos waste	If stored onsite, asbestos wastes would be located away from operational areas and properly sealed and contained to minimise human exposure and clearly labelled. Signage and barriers/ fencing would be installed to ensure all employees, contractors and visitors would keep away from the area at all times.
E16	Waste management	Wastes (both liquid and non-liquid) generated from the works would be assessed, classified and managed. Where it is not feasible to remediate soils or where onsite management is not practicable, the soil would be classified and disposed off-Site in accordance with Waste Classification Guidelines (NSW EPA, 2014) to an appropriately licenced facility. ~~Wastes would be disposed of at an appropriately licenced facility.~~

7.13 Cumulative impacts

7.13.1 Methodology

Cumulative impacts have the potential to occur when benefits or impacts from a project overlap or interact with those of other projects, potentially resulting in a larger overall impact (positive or negative) on the environment or local communities. Cumulative impacts may occur when projects are constructed or operated concurrently or consecutively.

The extent to which another development or activity could interact with the construction and/ or operation of the proposed modification would depend on its location, scale, and/ or timing of construction. The methodology for this cumulative impact assessment was derived from these criteria, in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022). The methodology is illustrated in Figure 7-21 and described in more detail in the following sections.

Figure 7-21 Overview of cumulative impact assessment methodology

Identification of potential projects

Projects identified for consideration in the cumulative impact assessment included those that met the following screening criteria:

- Spatially relevant (i.e., the development or activity overlaps with, is adjacent to or within two kilometres of the Site)
- Scale (i.e., large-scale major development or infrastructure projects that have the potential to result in cumulative impacts with the proposed modification, as listed on the NSW Government Major Projects website, the Transport for NSW project website and the Sutherland Shire Council DA tracker websites)
- Timing (i.e., the expected timing of its construction and/or operation overlaps or occurs consecutively to construction and/or operation of the proposed modification)
- Status (i.e., projects in development with sufficient publicly available information to inform this environmental impact statement and with an adequate level of detail to assess the potential cumulative impacts).

The long-list of projects considered as part of the cumulative impact assessment are presented in Appendix R. The potential overlap between the impacts of the proposed modification on assessment matters and the impact of other projects on the same assessment matters was also considered.

Projects included in the cumulative impact assessment

Short-listed projects identified for consideration in the cumulative impact assessment that met the criteria above are listed in Table 7-73 and shown on Figure 7-22.

For the purposes of this assessment, it is assumed that mitigation measures presented in the publicly available documentation for the other projects are implemented and remain effective.

The Kurnell Energy and Industry Precinct (KEIP) has been identified as having potential for cumulative impacts It would be constructed in Zone 2 and 3, with remediation and grading works undertaken as part of the proposed modification staged to allow for its construction; as such, construction programs for both projects would overlap. Cumulative hazards and risk would also be related to the operation of the battery energy storage system (BESS) component of the project and the operational terminal (consistent with the development consent for the approved project). A review of cumulative construction and operational impacts for the KEIP and operational terminal would be included in the KEIP EIS, which is being prepared for exhibition in August 2025. As such, this project has been screened out of this cumulative impact assessment.

Table 7-73 Projects considered in the cumulative impact assessment

Project and description	Spatial relevance	Scale	Timing	Status
Onsite Projects				
Kurnell Stormwater Separation Improvement Project (DA24/0008[11]) Construction of improved stormwater infrastructure around the OWS at the Site to help prevent stormwater pollution during heavy rainfall events	Located onsite	Local industrial construction project	Construction to complete in mid-2025. Operational overlap with proposed modification construction	Approved (2024). DA is publicly available
Offsite projects				
Breen Resource Recovery Facility (SSD-10412[12]) Construction and operation of a new integrated Resource Management Facility and demolition of the existing Resource Management Facility	Located approximately 2 km west of the Site from the closest point	Large-scale SSD project	Construction overlap: Construction expected to continue until 2028.	Under assessment. EIS and Submissions Report are publicly available
Kamay Ferry Wharves (SSI-10049[13]) Construction of two ferry wharves in Botany Bay on Kurnell Peninsula and La Perouse	Located approximately 350 m north of the Site from the closest point	Large-scale State Significant Infrastructure (SSI) project	Potential construction overlap: Under construction until early 2025.	Approved (2022). EIS, Submissions Report, and project website are publicly available

[11] Additional detail on the Kurnell Stormwater Separation Improvement Project can be found at https://propertydevelopment.ssc.nsw.gov.au/T1PRProd/WebApps/eProperty/P1/eTrack/eTrackApplicationDetails.aspx?r=SSC.P1.WEBGUEST&f=$P1.ETR.APPDET.VIW&ApplicationId=DA24%2f0008

[12] Additional detail on the Breen Resource Recovery Facility can be found at https://www.planningportal.nsw.gov.au/major-projects/projects/breen-resource-recovery-facility

[13] Additional detail on the Kamay Ferry Wharves can be found at https://www.planningportal.nsw.gov.au/major-projects/projects/kamay-ferry-wharves

Project and description	Spatial relevance	Scale	Timing	Status
Woolooware to Kurnell Tower Replacement Project[14] Ausgrid is planning the replacement of 26 existing transmission towers with poles and moving the existing cables onto the new poles between Woolooware and Kurnell.	Located approximately 120 m south east of the Site from the closest point, along Captain Cook Drive	Local utility provider maintenance project	Potential construction overlap: Expected to commence in late 2024 and be completed late 2028.	Review of Environmental Factors (REF) published and publicly available on Ausgrid's website.
Kurnell Planning Proposal[15] Construction of a suburban community of around 210 ha, with a mix of residential housing, including seniors and aged care accommodation options, and a range of commercial, tourism, recreational, and cultural opportunities.	Located approximately 800 m south west of the Site from the closest point	Large scale urban-residential development	Potential construction overlap: if approved, construction would be expected to start in 2026 and would be completed in a phased manner in 10-20 years.	A planning proposal was submitted to Council in December 2023; however, in September 2024 Council was advised by the DPHI that the Planning Proposal is of State significance. As such, it will progress as a State Assessed Planning Proposal with the Secretary of the Department as the Planning Authority, rather than Council. It is currently in the preliminary assessment stage with documents publicly available on the Sutherland Shire Council website.

[14] Additional detail on the Woolooware to Kurnell Tower Replacement Project can be found at https://www.ausgrid.com.au/In-your-community/Major-Projects/Sydney-South-West-Region-Construction-Projects/Woolooware-to-Kurnell-Tower-Replacement#:~:text=Project%20details&text=Ausgrid%20is%20planning%20to%20install,towers%2C%20covering%20about%207%20kilometres.

[15] Additional detail on the Kurnell Planning Proposal can be found at https://www.sutherlandshire.nsw.gov.au/plan-and-build/Planning-considerations/planning-proposals/planning-proposal-kurnell

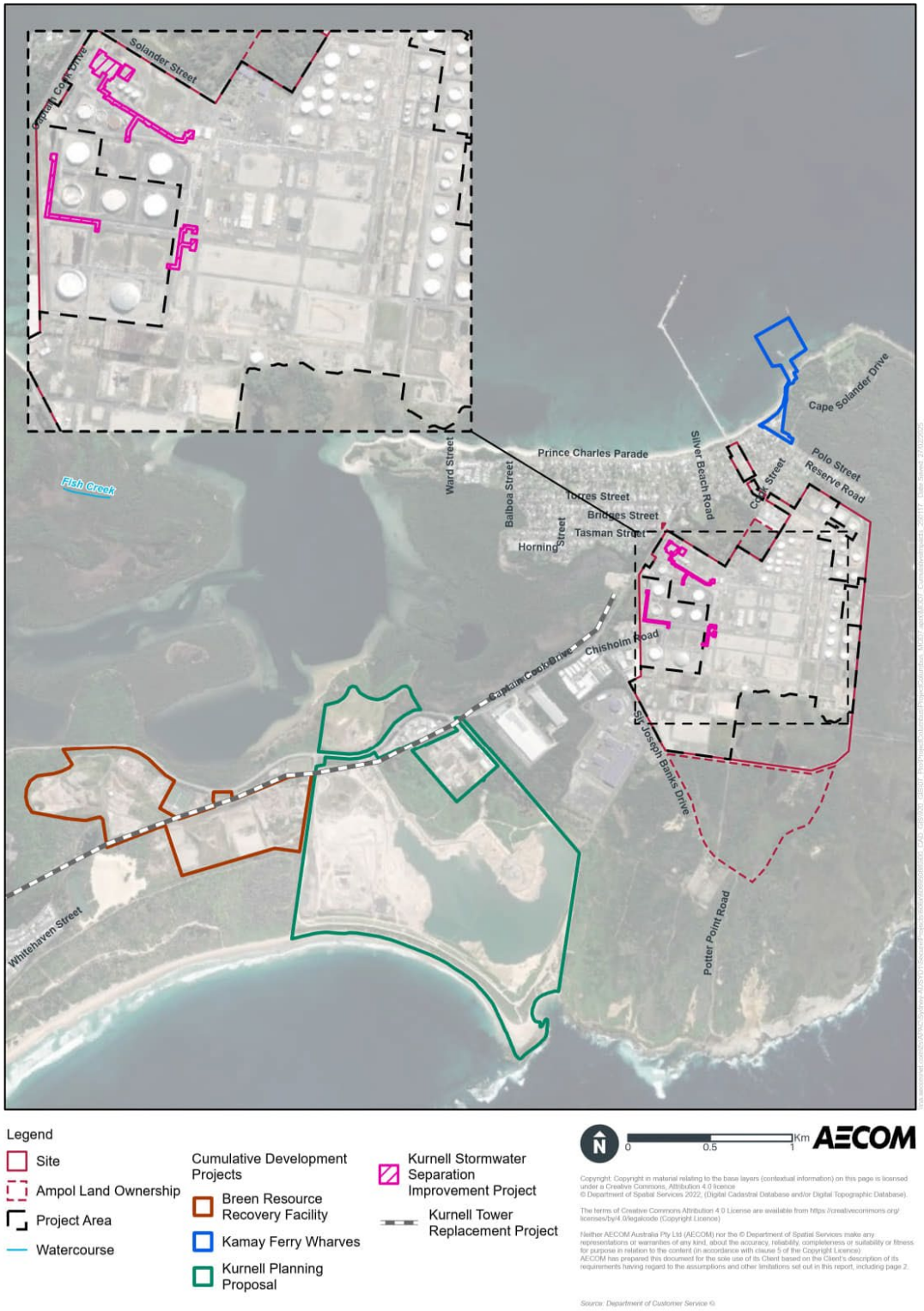

Figure 7-22 Projects considered in the cumulative impact assessment

Scoping of matters

The construction works associated with the proposed modification and the operation of the terminal have the potential to cause a number of environmental impacts. These have been assessed in the technical reports (Appendix F to P) and discussed in Sections 7.2 (Hazards and risk) to 7.12 (Other matters). For the majority of these matters, there are not expected to be adverse residual impacts as a results of the proposed modification on sensitive receptors, provided the proposed mitigation measures are implemented and remain effective (refer to a consolidated list of measures in Appendix D (Consolidated mitigation measures)). Therefore, in most cases, a cumulative impact assessment is not required.

Table 7-74 identifies relevant environmental matters where potential cumulative impacts during have the potential to occur during construction and operation from the projects listed in Table 7-73. A description of potential impacts is provided in Section 7.13.2.

Table 7-74 Nature of potential cumulative impacts

Key construction matters	Key operational matters
Traffic and transport Social	Noise and vibration

Depending on the environmental matter, the cumulative impact assessment may be quantitative, qualitative, or a combination of both. For this assessment, a qualitative assessment has been undertaken for potential cumulative construction and operation impacts across all key matters.

7.13.2 Impact assessment – Construction

Traffic and transport

Potential cumulative impacts related to traffic and transport were identified for the Breen Resource Recovery Facility and Kurnell Planning Proposal during construction.

Both these projects may have overlapping construction periods and anticipated shared use of Captain Cook Drive for construction vehicle routes. This indicates there may be an overlap with the proposed modification's construction peak in 2025 resulting in potential cumulative traffic and transport impacts along Captain Cook Drive.

Where overlaps in program are anticipated, to avoid potential cumulative traffic and transport impacts, consultation with TfNSW, Sutherland Shire Council, and other regional project proponents would be undertaken (refer to mitigation measure I2) to understand the interaction of the proposed modification and the projects identified in Table 7-73.

Social

Potential cumulative social impacts were identified for the Kamay Ferry Wharves, the Breen Resource Recovery Facility, the Woolooware to Kurnell Tower Replacement Project, and the Kurnell Planning Proposal during construction.

As these projects may have overlapping construction periods, construction fatigue may be experienced by people living and working in areas affected by these projects due to the combined impacts (e.g. traffic impacts from one project and noise impacts from another), or simply from the concurrent or consecutive nature of disruptions in the area. Noting the proposed construction start and duration for each, as well as their proximity, this impact is likely to be most felt by residents and businesses in Kurnell.

Engagement with affected residents and businesses would be carried out during construction (refer to mitigation measure M2). This would allow for coordination and communication between the proposed modification and projects identified in Table 7-73 to understand specific project timeframes and impacts and seek to avoid concurrent or immediately consecutive construction activities in close proximity, where feasible. Additionally, consultation with Transport for NSW, Sutherland Shire Council, and other regional project proponents would take place as relevant through the delivery of the proposed modification works (refer to mitigation measure I2). Communication with the community would be clear, frequent, and coordinated with other projects to ensure that similar projects retain consistent messaging and complaint mechanisms.

7.13.3 Impact assessment – Operation

Noise and vibration

Potential operational cumulative impacts related to noise and vibration were identified for the Kurnell Stormwater Separation Improvement Project during operation. The Kurnell Stormwater Separation Improvement Project equipment would include pumps that are proposed to only operate during adverse weather events, i.e. during storms or other high precipitation events.

As described in Section 7.8 (Noise and vibration), the FWS equipment would subject to regular (monthly and annual) testing, and exceedances of noise criteria would be expected during the annual testing. Without mitigation, sensitive receivers may experience noise impacts associated with the operation of stormwater equipment and the operation of relocated FWS infrastructure associated with the project modification, as they would be located in close proximity in the north of Zone 1 (Figure 4-1).

It is noted that this testing only occurs once per year for a limited time. Furthermore, as the Kurnell Stormwater Separation Improvement Project equipment would only operate during adverse weather events, the background noise levels in the area would be higher than in non-noise enhancing conditions, and may provide additional noise suppression.

FWS equipment specifications and noise mitigation measures would be verified at the detailed design stage. As such, cumulative impacts from other projects are not expected to significantly impact the same nearby noise sensitive receivers during typical operation of the proposed modification.

7.13.4 Management measures

No measures specific to cumulative impacts were identified. Other mitigation measures identified in this Modification Report that are relevant to the management of potential cumulative impacts include those specified in 7.7 (Traffic and transport), 7.8 (Noise and vibration), and 7.9 (Social).

8.0 Justification of the proposed modification

This section provides:

- Consideration of the consistency of the proposed modification with the objects of the EP&A Act
- An assessment of the proposed modification against the principles of Ecologically Sustainable Development (ESD)
- An evaluation and justification of the proposed modification and the outcomes of this Modification Report.

8.1 Objects of the Environmental Planning and Assessment Act 1979

Consideration has been given to the consistency of the proposed modification with the objects of the EP&A Act as outlined below.

a. To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources

The proposed modification would support the continued safe and reliable operations at the Site in line with existing land use designations. The proposed modification would support the ongoing use of the Site for heavy industrial purposes and would not significantly impact upon areas of ecological importance.

b. To facilitate ecologically sustainable development by integrating relevant economic, environmental, and social considerations in decision-making about environmental planning and assessment

This Modification Report identifies the likely impacts of the proposed modification on the environment and surrounding community and identifies additional mitigation measures to be applied to the approved project, where required, to effectively minimise potential impacts (Section 7.0). The proposed modification would support the objectives of continuing the safe and reliable operations at Kurnell.

c. To promote the orderly and economic use and development of land

The Sutherland Shire LEP 2015 provides for the land use and zoning for the Site and surrounding area. Pursuant to the Sutherland Shire LEP, the Site is designated as E5 Heavy Industrial.

The proposed modification works would support the existing and permissible land uses at the Site and therefore is in line with orderly and economic use and development of land.

d. To promote the delivery and maintenance of affordable housing

The proposed modification would not affect the provision or maintenance of affordable housing.

e. To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats

The mitigation measures outlined within this Modification Report (refer to the consolidated list in Appendix D (Consolidated mitigation measures)) would protect the environment, including the protection and conservation of native animals and plants, threatened species, populations, and ecological communities, and their habitats.

f. To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)

The proposed modification supports the sustainable management of built and cultural heritage through supporting the objective of the Site remaining as a finished product terminal.

g. To promote good design and amenity of the built environment

The proposed modification would not result in a change in use of the Site, which would continue to operate as a finished product terminal.

h. To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants

The proposed modification would not involve the construction or maintenance of any buildings.

i. To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State

The proposed modification is to be assessed as modification to SSD-5544 under Part 4 of the EP&A Act by DPHI. Ongoing consultation has occurred with Sutherland Shite Council regarding the conversion of the Site and would continue through the proposed modification works and as other activities at the Site continue (refer to Section 6.0).

j. To provide increased opportunity for community participation in environmental planning and assessment.

Ampol have and will continue to consider the local community needs, as well as the value of the unique environment and cultural significance of Kurnell during the design, assessment, and development of the proposed modification. As the proposed modification progresses, Ampol would engage and share information with stakeholders and the Kurnell community through various forums and provide opportunities for the community to submit feedback and ask questions to help inform Ampol's decisions.

8.2 Ecologically sustainable development

8.2.1 The principles

This section provides a review of the proposed modification against the principles of ESD in accordance with the EP&A Regulation. The principles, as listed in the Section 193 of the EP&A Regulation, are as follows:

1. *The precautionary principle* – Namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
2. *Inter-generational equity* – Namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
3. *Conservation of biological diversity and ecological integri*ty – Namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration
4. *Improved valuation, pricing and incentive mechanisms* – Namely, that environmental factors should be included in the valuation of assets and services.

These principles are discussed in the below sections.

8.2.2 Precautionary principle

The precautionary principle deals with certainty in environmental and technical decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

A modification application undergoes a public process that allows for better examination of the potential effects of proposed activities or development. Thus, the assessment process can be defined as precautionary in nature. The requirement to consider the potential impacts of the proposed modification works is a form of regulation designed to identify and address uncertainty about the effects of these activities.

Ampol has commissioned specialists to conduct detailed assessments on several environmental aspects identified during the scoping assessment process, as presented in Section 7.1. These assessments provide sufficient scientific understanding of the proposed modification, their interactions with the surrounding environment, and implications they may have to enable a decision to be made that is consistent with this principle. Where there has been uncertainty in the prediction of impacts through the impact assessment process, a conservative approach has been adopted to allow for the worst-case scenario to be predicted in the assessment of impacts. For example, the traffic and transport impact assessment has conservatively assumed that all construction personals would arrive to Site during the AM Peak Hour and depart during the PM Peak hour to assess a precautionary worst-case scenario. In addition, the noise levels presented in the construction noise assessment is representative of the worst case 15-minute period of construction activity and do not represent the ongoing day to day noise impact at noise sensitive receptors for an extended period of time.

The precautionary principle has driven the development of a number of management and mitigation measures presented within this Modification Report, which are provided in Appendix D (Consolidated mitigation measures).

8.2.3 Inter-generational equity

Inter-generational equity requires that the present generation pass onto the next generation an environment that does not limit the ability of those future generations to attain a quality of life at least equal to that of the current generation.

The proposed modification would maintain inter-generational equity by ensuring components of the existing bio-physical, social, and economic environment would also be maintained for future generations. Aspects of the proposed modification that would assist in achieving inter-generational equity include the following:

- Maintaining the safe, viable, and reliable operation of the Site
- Addressing legacy refinery contamination issues
- Making vacant land available for future land uses
- Maintaining agreed environmental limits during construction works
- Employing the avoid, minimise, and offset hierarchy to reduce direct and indirect impacts to biodiversity
- Undertaking consultation and engagement with the local community to provide an opportunity to ask questions and identify and manage areas of concern.

Through the implementation of mitigation and management measures for avoiding and minimising short-term or long-term environmental impacts, inter-generational social equality impacts have been addressed.

8.2.4 Conservation of biological diversity and ecological integrity

Biological diversity relates to the breadth and variety of life. Ecological integrity refers to maintenance of the relationships, dependencies and services supplied by all lifeforms and the physiochemical environment to each other. The conservation of these elements is critical to the proper functioning of natural environments and the biosphere in general. This principle requires that conservation of biological diversity and ecological integrity should be a fundamental consideration for a project.

This Modification Report includes an assessment of the potential ecological impacts of the proposed modification (see Section 7.11 (Biodiversity) and the BDAR (Appendix P)). There are direct impacts to 5.36 ha of native vegetation or habitat for threatened species. These impacts would be compensated through the implementation of biodiversity offsets.

The proposed modification would not cause significant ecological impacts provided that certain mitigation measures are followed. These measures are outlined in Section 7.11 (Biodiversity) and Appendix D (Consolidated mitigation measures) and would be implemented to avoid or mitigate potential ecological impacts.

8.2.5 Improved valuation and pricing of environmental resources

This principle is premised on an assumption that all resources should be appropriately valued and that the value of environmental resources should be considered alongside any economic or cost benefit analysis for a project's full life cycle.

The benefits of the proposed modification are considered to outweigh the costs. The proposed modification would generate up to 100 jobs during peak construction and would continue to support the continued safe, viable, and reliable operations at Kurnell. Remediation of the land would provide long-term benefits by reducing the risk of contamination, and reuse of the land would support the economic use and development of industrial land.

The value placed by Ampol on environmental resources is evident from the extent of site-specific investigations. The proposed modification incorporates a range of management and mitigation measures to minimise potential impacts on the environment. The costs associated with these measures have been incorporated into the capital investment and operating costs of the proposed modification.

8.3 Justification

The proposed modification would be a continuation of the approved project, which converted the Kurnell Refinery to a "Finished Product Terminal." The primary function and purpose of the Site to operate as a finished product fuel terminal would be supported by works associated with the proposed modification.

The primary objective of the approved project, was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*." The proposed modification would meet this objective by continuing to remove redundant infrastructure and relocating or augmenting operational infrastructure, and subsequently remediating the land, thereby continuing the safe, viable, and reliable operation of the Kurnell Terminal, and preparing the land for future uses.

8.3.1 Avoidance or minimisation of impacts

Appendix D (Consolidated mitigation measures) presents the consolidated list of measures that would assist in avoiding, mitigating, or managing the anticipated construction and operational impacts associated with the proposed modification works. These measures would be incorporated into the modified conditions of consent for the proposed modification.

Measures would be implemented during construction through a Construction Environment Management Plan (CEMP) and during operation through an Operational Environmental Management Plan (OEMP). The CEMP and OEMP would also have sub-plans summarised in Section 8.3.6 (Future monitoring and communication) to further avoid, mitigate, or manage impacts.

8.3.2 Consistency with the strategic context

The proposed modification is consistent with the relevant local, regional and state strategic planning context. Section 2.0 (Strategic context) describes the proposed modifications alignment with relevant strategic plans including the State infrastructure Strategy, Greater Sydney Regional Plan, Sutherland Shire Local Strategic Planning Statement, Land Use Safety Study, and the Kamay Botany Bay National Park Master Plan.

8.3.3 Compliance with relevant statutory requirements

The proposed modification is consistent with the relevant local, state and Commonwealth environmental planning instruments. Section 5.0 (Statutory context) describes the proposed modifications compliance with the relevant statutory requirements including the EP&A Act, SEPPs, LEP, and Commonwealth legislation.

8.3.4 Consideration of community views

Consultation conducted for the proposed modification is described in Section 6.0 (Engagement). Ampol have and will continue to consider the local community needs, as well as the value of the unique environment and cultural significance of Kurnell during the design, assessment, and development of the proposed modification.

As the proposed modification progresses, Ampol will engage and share information with stakeholders and the Kurnell community about the proposed modification through various forums, and provide opportunities for the community to submit feedback and ask questions to help inform Ampol's decisions.

8.3.5 Summary of economic, social, environmental, and cumulative impacts

Economic

The proposed modification works would allow the continued safe, viable, and reliable operations of the Site and the existing heavy industrial land use and, therefore, continue to support the economic use and development of industrial land.

Economic impacts of the proposed modification were identified in Section 7.9 (Social) and Appendix O (Social Impact Assessment). Potential negative economic impacts were identified during construction for businesses experiencing temporary amenity impacts associated with changes in noise and vibration, traffic and transport, air quality, and visual amenity. Potential positive impacts identified during construction were associated with direct or indirect employment opportunities and increases in expenditure at local businesses resulting in temporary uplift in revenues and injection of money into the local economy. Potential impacts identified during operation were largely consistent with the approved Project.

Management measures have been proposed for identified potential economic social impacts to minimise negative consequences and to maximise economic benefits for the local community (refer to Section 7.9.5).

Social

The social impacts of the proposed modification were assessed in Section 7.9 (Social) and Appendix O (Social Impact Assessment).

Potential negative impacts identified during construction were associated with local amenity and businesses impacts, due to changes in amenity associated with construction noise and vibration, traffic and transport, air quality, and visual amenity reduction. Potential positive impacts during construction were associated with the local economy and business, due to direct or indirect employment opportunities and increases in expenditure at local businesses.

Potential impacts identified during operation were associated with a minor change in visual amenity and noise from relocated equipment, but were consistent with the approved Project once mitigation was applied.

Management measures have been proposed for identified potential social impacts to minimise negative consequences and to actualise social benefits for the local community (refer to Section 7.9.5). The implementation of mitigation measures would help ensure adverse impacts upon social receivers are effectively managed.

Environmental

An assessment of potential impacts relating to the proposed modification was undertaken and are summarised in Table 8-1. Additional mitigation measures have been proposed alongside existing measures to manage these potential impacts.

Table 8-1 Environmental assessment summary

Matter	Summary
Hazards and risk	The PHA (Appendix F) identified potential impacts during construction and operation related to capping works in Zone 2 and augmentation of the existing FWS in Zone 1. All construction safety hazards identified, including the potential loss of containment of hydrocarbons, were assessed as having potential impacts to workforce safety only, and would be managed through existing WHSMPs. The implementation of mitigation measures would help ensure impacts identified are reduced to a tolerable level.

Matter	Summary
Soils, groundwater and contamination	The Soils, Groundwater, and Contamination Report (Appendix G) identified potential impacts during construction relating to spills and leaks, importation of soils, and disturbance of existing contamination and Potential Acid Sulfate Soils (PASS), resulting in potential exposure of the Site and construction workers to contamination present in the soil and groundwater, creation of nuisance odours, and migration of contaminants into groundwater or stormwater. However, the completion of remediation works as part of the proposed modification would have an overall positive environmental impact by reducing ground contamination, and presents a framework for future management of remaining contaminants. Potential impacts identified during operation were consistent with the approved project. Following soil remediation, and for the ongoing operation of the terminal, ongoing management of residual contaminated soil and/ or groundwater would continue to be undertaken. The implementation of mitigation measures would help ensure adverse impacts relating to soils, groundwater and contamination are effectively managed.
Surface water, wastewater and flooding	The Surface Water, Wastewater and Flooding Report (Appendix I) identified potential impacts during construction relating to general construction activities disturbing the surfaces across the Site resulting in pollution or erosion and sedimentation of the surrounding environment. To prevent loss of existing flood storage and to avoid offsite flooding impacts, earthworks and capping would be completed in a manner that does not significantly alter existing surface levels. During operation, there would be some potential risk of erosion and sedimentation on the capping area immediately after construction ceases, when surface/ vegetative cover is not yet fully established and these surfaces and loose soils remain exposed. The implementation of mitigation measures would help ensure adverse impacts relating to surface water, wastewater, and flooding are effectively managed.
Aboriginal cultural heritage	The ACHAR (Appendix J) identified potential impacts during construction related to the potential for Aboriginal objects to be located in buried soil profiles and impacted during intrusive works. Considering that the proposed modification works are contained wholly within previously disturbed areas within the Site boundary, no impacts to Aboriginal heritage values are expected once the proposed modification works are completed. The implementation of mitigation measures would help ensure that adverse impacts upon Aboriginal heritage values are effectively managed.
Historic heritage	The HIA (Appendix K) identified potential impacts during construction relating to the demolition of three buildings in Zone 2 that retain high or moderate heritage significance associated to the archaeological heritage listing, Australian Oil Refinery (A2524). Today, these buildings are isolated from the operational terminal infrastructure and are used for non-essential storage by Ampol. As such, they do not retain practical value, and, following the demolition of refinery infrastructure, these buildings are now decontextualised remnants of the former refinery's operation. The implementation of mitigation measures would help ensure adverse impacts upon historic heritage are effectively managed.

Matter	Summary
Traffic and transport	The total number of construction vehicle movements (heavy vehicles) would be 136 per day and up to 14 per hour. The TTIA (Appendix L) concluded that the increase in vehicle trip movements associated with this proposed modification is not expected to change the operational performance of the road network in the study area. The Site would continue to operate as previously approved, with minimal changes in terms of operational vehicle traffic movements, beyond a small number of additional trips to access the proposed storage shed in Zone 1A. Given this negligible increase, traffic volumes in the study area during the operational scenario are expected to remain consistent with the forecast traffic levels, without the proposed modification. The implementation of mitigation measures would help ensure adverse impacts upon traffic and transport are effectively managed.
Noise and vibration	The NVIA (Appendix M) identified potential impacts during construction relating to construction noise levels at some residential receivers predicted to exceed the 'highly noise affected' level of 75 decibels (dB(A)). This is primarily due to works occurring in close proximity to residents (i.e. Zone 1A during construction of a warehouse, and along the north east boundary of the Site during augmentation of the firewater system). However, these works are expected to be minimal in duration (up to three months in Zone 1A) and intermittent. Potential impacts identified during operation relate to relocated infrastructure operating in their new locations. Specifically, the FWS would be relocated to the FWS Relocation Area in the north western end of the Site; two indicative location options have been assessed. Equipment associated with the relocated FWS would be sufficiently treated so that operational noise levels do not exceed the criteria defined in the approved project. The implementation of mitigation measures would help ensure adverse impacts relating to noise and vibration are effectively managed.
Air quality	The AQIA (Appendix N) identified potential impacts during construction related to unmitigated dust impacts associated with demolition, earthworks, and construction activities, resulting in dust soiling upon sensitive human and ecological receptors. Potential impacts identified during operation relate to relocated infrastructure operating in their new locations. Specifically, the relocated FWS and its associated diesel pumps during maintenance testing, which would result in combustion emissions. The implementation of mitigation measures would help ensure adverse impacts relating to air quality are effectively managed.

Matter	Summary
Biodiversity	The BDAR (Appendix P) identified potential impacts during construction included direct impacts to 5.36 ha of native vegetation, including one endangered ecological community; exotic grass; planted exotic vegetation; habitat for the threatened species (Giant Dragonfly and Southern Myotis); and the removal of one hollow bearing tree. Various indirect and prescribed impacts were also identified, such as trampling of threatened flora species and vehicle strike. Finally, Serious and Irreversible Impacts (SAII) were identified for the Giant Dragonfly, considered a SAII entity. Both ecosystem credit and species credit offsetting are required for the proposed modification. A staged approach to the retirement of the proposed modification's biodiversity credit liability would be undertaken, based on zone. During operation, existing plans and additional management measures proposed as part of this Modification Report would be implemented to manage potential impacts to biodiversity following construction. The implementation of mitigation measures would help ensure adverse impacts upon biodiversity values are effectively managed.
Waste	Potential impacts identified during construction were associated with the generation of waste from the demolition and removal of infrastructure, excavation of contaminated soil and removal of temporary environmental controls and structures during demobilisation. Further information is provided in Section 7.12 (Other impacts). The implementation of mitigation measures would help ensure adverse impacts relating to waste are effectively managed.
Landscape and visual	Potential negligible impacts upon views of the Site may be experienced during construction and operation by local residential and recreational zones, and the local road network. Further information is provided in Section 7.12 (Other impacts). No measures are required to manage these negligible changes.

Cumulative

The cumulative impacts of the proposed modification were assessed in Section 7.13 (Cumulative Impacts) and Appendix R (Cumulative Projects Long List).

Potential cumulative impacts during construction were identified for traffic and transport related to the shared use of Captains Cook Drive for construction vehicles. Traffic and transport cumulative impacts would be managed by the carrying out of consultation with Transport for NSW (TfNSW), Sutherland Shire Council, and other regional project proponents to understand the interaction of the proposed modification and other projects. Cumulative impacts during construction were also identified for social impacts related to construction fatigue of people living and working in areas affected by multiple projects. Social cumulative impacts would be managed by the carrying out of stakeholder engagement activities to a range of groups (such as residents and businesses) in the community.

Potential cumulative impacts during operation were identified for noise and vibration due to tandem operation of noise generating pumps from other onsite projects and the proposed modifications relocated FWS infrastructure. FWS equipment specifications and noise mitigation measures would be verified at the detailed design stage. As such, cumulative impacts from other projects are not expected to significantly impact the same nearby noise sensitive receivers during typical operation of the proposed modification.

Mitigation and management strategies have been proposed for identified potential cumulative impacts in Section 7.7.5 (Traffic and transport), 7.8.5 (Noise and Vibration) and 7.9.5 (Social). The implementation of mitigation measures would help ensure adverse cumulative impacts are effectively managed.

8.3.6 Future monitoring and communication

Throughout construction, management measures would be implemented through the adoption of a CEMP, supported by the following sub-plans:

- One or more Detailed Remediation Action Plans (RAP)
- One or more Site Audit Statements (SAS) and Site Audit Reports (SAR)
- Soils and Water Management Plan (SWMP)
- Groundwater Management Plan (GWMP)
- Contamination Management Plan (CMP)
- Acid Sulfate Soils Management Plan (ASSMP)
- Asbestos Management Plan (AMP)
- Waste and Resource Management Plan (WRMP)
- Aboriginal Cultural Heritage Management Plan (ACHMP)
- Construction Traffic Management Plan (CTMP)
- Noise and Vibration Management Plan (NVMP)
- Air Quality Management Plant (AQMP)
- Biodiversity and Weeds Management Plan (BWMP).

Following completion of the construction works, Ampol's existing OEMP would be updated to include the proposed modification, to continue Ampol's approach to monitoring and managing environmental compliance. This would be supported by the following sub-plans:

- One or more Environmental Management Plans (EMP)
- One or more Waste and Resource Management Plans (WRMP)
- One or more Groundwater Monitoring Plans (GMP).

A summary of planned future consultation with agency and community stakeholders is outlined in Section 6.0 (Engagement).

8.3.7 Key uncertainties

Due to the extent of technical studies undertaken to inform the proposed modification and the mitigation measures proposed to address impacts of the development, there are no notable uncertainties with the proposed modification. Identified impacts would be mitigated through the implementation of management measures and monitoring.

8.4 Conclusion

Ampol intends to consolidate operational infrastructure, remove redundant assets, and undertake remediation and grading. Completion of these works (the 'proposed modification') would continue the safe, viable, and reliable operation of the Kurnell Terminal, whilst preparing the land for future uses.

The proposed modification has the potential to result in economic, social, environmental, or cumulative impacts as identified throughout this Modification Report. Potential impacts would be managed through the mitigation and management measures described in Appendix D (Consolidated mitigation measures). The implementation of the identified mitigation measures would help ensure that adverse impacts from the proposed modification are negligible.

On the basis of the discussion within this Modification Report, the proposed modification is considered to be justified.

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Appendix A

Statutory compliance

Appendix A Statutory compliance

Environmental Planning and Assessment Regulation 2021 requirements

The proposed modification's compliance with the requirements of Sections 99 and 100 of the EP&A Regulations is provided in Table A-1 and Table A-2.

Table A-1 EP&A Regulations Section 99 requirements

Section	Requirement	Reference
1	A modification application must:	This Modification Report contains all the information and documents required, and will be made available on the NSW planning portal.
(a)	be in the approved form, and	
(b)	contain all the information and documents required by— i. the approved form, and ii. the Act or this Regulation, and	
(c)	be submitted on the NSW planning portal.	
2	If the modification application is for State significant development—	Section 5.1 of this Modification Report outlines the need and the nature of the proposed modification in relation to the requirements contained under Section 4.55(2) of the EP&A Act.
(a)	the application must also include particulars of the nature of the modification, and	
(b)	the applicant must have regard to the *State Significant Development Guidelines* in preparing the application.	This Modification Report has been prepared having regard to the SSD guidelines.
3	The fees payable for a modification application are specified in Schedule 4 and determined in accordance with Part 13.	Fees for the modification application will be paid in accordance with the EP&A Regulation.
4	A modification application is lodged—	The proposed modification application will be lodged in accordance with the EP&A Regulation.
(a)	on the day on which the fees payable for the modification application under this Regulation are paid, or	
(b)	if the applicant is notified under Part 13 that no fee is payable—on the day the applicant submitted the application on the NSW planning portal.	
5	A fee is not payable for an application for the modification of a development consent granted by the Court on appeal from a consent authority.	Not applicable.

Table A-2 EP&A Regulations Section 100 requirements

Section	Requirement	Reference
1	A modification application must contain the following information—	
(a)	The name and address of the applicant.	Section 1.2
(b)	A description of the development that will be carried out under the development consent.	Section 3.0
(c)	The address and folio identifier of the land on which the development will be carried out.	Section 1.1
(d)	A description of the modification to the development consent, including the name, number and date of plans that have changed, to enable the consent authority to compare the development with the development originally approved	Section 4.0
(e)	Whether the modification is intended to— (i) merely correct a minor error, misdescription or miscalculation, or (ii) have another effect specified in the modification application.	Section 1.4
(f)	A description of the expected impacts of the modification.	Section 7.0
(g)	An undertaking that the modified development will remain substantially the same as the development originally approved.	Section 5.1.1
(h)	For a modification application that is accompanied by a biodiversity development assessment report—the biodiversity credits information.	Appendix P and summarised in Section 7.11
(i)	If the applicant is not the owner of the land—a statement that the owner consents to the making of the modification application	The owner is Ampol Refineries (NSW) Pty Ltd (previously Caltex Refineries (NSW) Pty Ltd).
(j)	Whether the modification application is being made to— (i) the Court under the Act, Section 4.55, or (ii) the consent authority under the Act, Section 4.56.	Section 1.4
2	Subsection (1)(i) does not apply if the consent of the owner is not required under Section 98.	Not applicable
3	If a modification application under the Act, Section 4.55(1A) or (2) relates to BASIX development, or BASIX optional development if the development application was accompanied by a BASIX certificate, the application must be accompanied by—	Not applicable
(a)	The BASIX certificate, or	
(b)	A new BASIX certificate if the current BASIX certificate is no longer consistent with the development.	

Appendix B

Statutory context

Appendix B Statutory context

This section provides a detailed review of:

- The permissibility of the proposed modification under the EP&A Act
- The proposed modification's compliance with:
  - Other relevant NSW legislation
  - Relevant Commonwealth legislation
  - SEPPs
  - Sutherland Shire LEP.

Environmental Planning and Assessment Act 1979

Permissibility

The EP&A Act regulates development in NSW. The EP&A Act is supported by EP&A Regulation and a number of Environmental Planning Instruments (EPIs), which include State Environmental Planning Policies (SEPPs) and LEPs. Part 4 of the EP&A Act establishes a framework for assessing development, categorising it as either 'exempt development,' 'complying development,' 'development that requires consent,' or 'prohibited development.' The term 'development' is defined under Section 1.5 of the EP&A Act.

The approved project was classified as SSD under Part 4 of the EP&A Act because it involved development with a capital investment value of more than $30 million for a liquid fuel depot, as such meeting the criteria in Section 10(2) of Schedule 1 in *State Environmental Planning Policy (State and Regional Development) 2011* (now *State Environmental Planning Policy (Planning Systems) 2021 (*SEPP (Planning Systems)). On 7 January 2014, SSD-5544 was approved under Section 89E (now Section 4.38) of the EP&A Act by the Planning Assessment Commission of NSW (now the Independent Planning Commission), as delegate of the Minister for Planning and Public Spaces (under delegation executed on 23 December 2013).

This proposed modification constitutes development as defined by Section 1.5 of the EP&A Act and therefore requires consent under Part 4 of the same Act. Modifications to development consents are obtained under Section 4.55 of the EP&A Act.

The limits regarding modifications to development consents are outlined in Section 4.55 of the EP&A Act. This section of the EP&A Act provides three pathways for modification applications:

- Section 4.55(1) – Modifications involving minor error, misdescription, or miscalculation
- Section 4.55 (1A) – Modifications involving minimal environmental impact
- Section 4.55 (2) – Other modifications.

Given the anticipated impacts associated with the proposed modification works, Ampol is seeking to modify development consent SSD-5544 under Section 4.55(2) of the EP&A Act.

Section 4.55(2) of the EP&A Act states that a consent authority may modify a development consent if:

a. "*It is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all)*

b. *It has consulted with the relevant Minister, public authority, or approval body in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent*

c. *It has notified the application in accordance with:*

  i. *The regulations, if the regulations so require*

ii. A development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent

d. *It has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be*."

The leading guidance on the *substantially the same development* test is Vacik v Penrith City Council [1992] NSWLEC 8 (**Vacik**) and Moto Projects (No 2) Pty Ltd v North Sydney Council (1999) 106 LGERA 298 (**Moto**). In *Vacik*, Stein J held that the term "substantially" means "essentially have the same essence."

In *Moto*, Bignold J set out the following principles for consideration in satisfying the precondition of substantially the same:

a. "The requisite factual finding obviously requires a comparison between the development, as currently approved, and the development as proposed to be modified…" (at [55]).

b. "The result of the comparison must be a finding that the modified development is 'essentially or materially' the same as the (currently) approved development" (at [55]).

c. The comparative task involves a quantitative as well as qualitative appreciation of the differences – a numeric or quantitative evaluation of the modification when compared to the original consent absent any qualitative assessment will be "legally flawed" (at [52]).

d. "The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified where that comparative exercise is undertaken in some type of sterile vacuum. Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted)" (at [56]).

e. "The comparative task needs to assess the physical features as well as the environmental impacts of the changes" (at [57]-[62]).

f. "Consideration should be given to any feature of the development, which is important, material or essential. A change to such a feature is likely to mean that it is not substantially the same development" (at [64]).

The proposed modification is substantially the same development as the approved project in that:

- The proposed modification is considered to be a continuation of the approved project, which aimed to convert the Kurnell Refinery to a "Finish Product Terminal." The primary function and purpose of the Site to operate as a finished product fuel terminal would be supported by works associated with the proposed modification.
- The objective of the approved project was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*." The proposed modification would meet this objective by removing redundant infrastructure and relocating or augmenting operational infrastructure, and subsequently remediating the land, thereby continuing the safe, viable, and reliable operation of the Kurnell Terminal, whilst preparing the land for future uses.

On this basis, Ampol is seeking to modify the development consent for SSD-5544, pursuant to Section 4.55 of the EP&A Act.

Section 4.55(2) applies where a modification would have more than minor environmental impact. As demonstrated within this Modification Report, the proposed modification is likely to involve a greater than minimal environmental impact on environmental matters such as soils, contamination and groundwater, biodiversity and noise. The relevant management and mitigation measures that were approved for the Kurnell Refinery Conversion project (SSD-5544, as modified) would continue to apply should the modification be consented.

In order to comply with the requirements for assessing this type of modification, a Modification Report (this document) has been prepared and is submitted alongside the modification application. The application is being made to the consent authority, the Minister for Planning and Public Spaces (or delegate). In accordance with Section 2.7(1)(c) of SEPP (Planning Systems) 2021, as a reportable political donation was made by the Applicant in the past two years, the final determination for this modification application would be made by Independent Planning Commission.

The Project Area is located in the Sutherland Shire LGA and therefore the planning controls contained in the Sutherland Shire LEP 2015 are relevant. In addition, the following EPIs are considered relevant to the modification and have been considered:

- SEPP (Transport and Infrastructure) 2021
- SEPP (Resilience and Hazards) 2021
- SEPP (Biodiversity and Conservation) 2021
- Sutherland Shire LEP 2015.

Each relevant EPI and matter for consideration as identified under Section 4.15 of the EP&A Act are discussed in further detail in the sections below.

State Environmental Planning Policies

SEPPs relevant to the proposed modification, and how their requirements have been addressed, are discussed in Table B-3.

Table B-3 SEPPs relevant to the proposed modification

Relevant SEPP	Comment
SEPP (Transport and Infrastructure) 2021	The aim of Chapter 2 of SEPP (Transport and Infrastructure) is to facilitate the effective delivery of infrastructure across the State. As the works are associated with the Kurnell Terminal, a liquid fuel depot, the proposed modification is not considered “infrastructure” under the Act, and therefore relevant sections of the SEPP (Transport and Infrastructure) are related to controls near infrastructure. Part 2.3, Division 17, Subdivision 2, Section 2.122 applies to traffic generating development. The proposed modification is not considered traffic generating development as there are no anticipated changes to traffic movements (compared to the approved project) during operation. Thus, a Traffic and Transport Impact Assessment (TTIA) has been prepared to assess the impact of traffic during construction (Appendix L), which is summarised in Section 7.7.
SEPP (Resilience and Hazards) 2021 – Chapter 2. *Coastal management*	The aim of this chapter is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objectives of the *Coastal Management Act 2016 (NSW)*. Some isolated parts of the Project Area, in proximity to Marton Park in the north, Towra Point Aquatic Reserve in the west, and the vegetated areas in the south of the Site, fall within the Proximity Area for Coastal Wetlands and Coastal Use Areas (refer to Figure B-1). Under Section 2.8 of the SEPP (Resilience and Hazards), development must not have a significant impact on the biophysical, hydrological, or ecological integrity of the adjacent coastal wetland or the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland. The proposed modification is unlikely to result in a significant impact on coastal wetlands adjacent to the Site (refer to Sections 7.3 and 7.4 for further details). Subsequently, in relation to Chapter 2 of the SEPP (Resilience and Hazards), there would be no impediment to the consent authority granting development consent for this modification application.

Relevant SEPP	Comment
SEPP (Resilience and Hazards) 2021 – Chapter 3. *Hazardous or offensive development*	The aim of this chapter is to consider any development application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact (among others). Chapter 3, Part 2 of the SEPP (Resilience and Hazards) requires consideration of the following in this modification application: *a.* "*Current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, and* *b. Whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply, and* *c. In the case of development for the purpose of a potentially hazardous industry – a PHA prepared by or on behalf of the applicant, and* *d. Any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and* e. *Any likely future use of the land surrounding the development*." A PHA was completed for the proposed modification and is attached as Appendix F. The PHA is summarised in Section 7.2 and includes a review of current circulars and guidelines published by DPHI, and a review of likely future uses of the land surrounding the Site. Primarily, the PHA identifies the potential impacts of the proposed modification on the existing simultaneous terminal operations and whether these potential risks change the conclusions of the PHA for the approved project. The PHA concluded that the proposed modification would not substantially change the hazards and risks assessed in the approved project. Consultation requirements and the results of consultation undertaken for the proposed modification are discussed in Section 6.0. Alternatives to the proposed modification that were considered are discussed in Section 1.3.4.
SEPP (Resilience and Hazards) 2021 – Chapter 4. *Remediation of land*	The objective of Chapter 4 is to provide a state-wide planning approach to the remediation of contaminated land, where the purpose of remediation of contaminated land is to reduce the risk of harm to human health or other aspect of the environment. Pursuant to section 4.6(1), a consent authority must not consent to a development unless it has considered whether the land where the development is proposed is contaminated, whether if it is contaminated, whether it would be suitable in its current state or whether it requires remediation. Remediation at the Site is considered Category 1 remediation under Section 4.8(e)(ii), Chapter 4 of the SEPP (Resilience and Hazards). Category 1 remediation incudes remediation carried out on land with a 'heritage conservation' designation. The Site is designed as an 'Archaeological Site' under the Sutherland Shire LEP (#A2524), which aligns with the 'heritage conservation' designation. Section 4.7(2) of the SEPP (Resilience and Hazards) notes that Category 1 remediation requires development consent. Section 4.14(1)(c) of the SEPP (Resilience and Hazards) requires a remediation plan to be prepared in accordance with contaminated land planning guidelines for the proposed modification. A Conceptual Remedial Action Plan (RAP) has been prepared (Appendix H).

Relevant SEPP	Comment
	Sections 4.14(2) and (3) of the SEPP (Resilience and Hazards) also requires a notice of completion to be provided to Sutherland Shire Council and (the IPC or the Minister for Planning and Public Places) within 30 days after completion of remediation work. Notification on completion of the remediation activities as part of the proposed modification would be provided to the relevant public authorities, as required.
SEPP (Biodiversity and Conservation) 2021 – Chapter 2. *Vegetation in non-rural areas*	The aims of Chapter 2 of SEPP (Biodiversity and Conservation) are the protection of the biodiversity values of trees and other vegetation in non-rural areas of the State and the preservation of the amenity of non-rural areas of the State through preserving trees and other vegetation. The SEPP (Biodiversity and Conservation) applies to Sutherland Shire LGA, and land use zones contained under clause 2.3, which includes land zoned E5 Heavy Industrial. Clause 2.6(1) of this SEPP states that "*a person must not clear vegetation in any non-rural area of the State to which Part 3* (now Part 2.3) *applies without the authority conferred by a permit granted by the council.*" Part 2.3 of the Biodiversity and Conservation SEPP applies to vegetation in any non-rural area of the State that is declared by a development control plan to be vegetation to which Part 2.3 applies. As detailed in the presiding section related to the Planning Systems SEPP, the proposed modification constitutes SSD and as such the development control plan does not apply. As such, the provisions of this Chapter of the SEPP do not apply to SSD or their modifications. Regarding the potential impact of the proposed modification upon biodiversity values, including trees and other vegetation, a BDAR has been prepared to meet the requirement of the BC Act. The BDAR for the proposed modification is provided in Appendix P and summarised in Section 7.11.

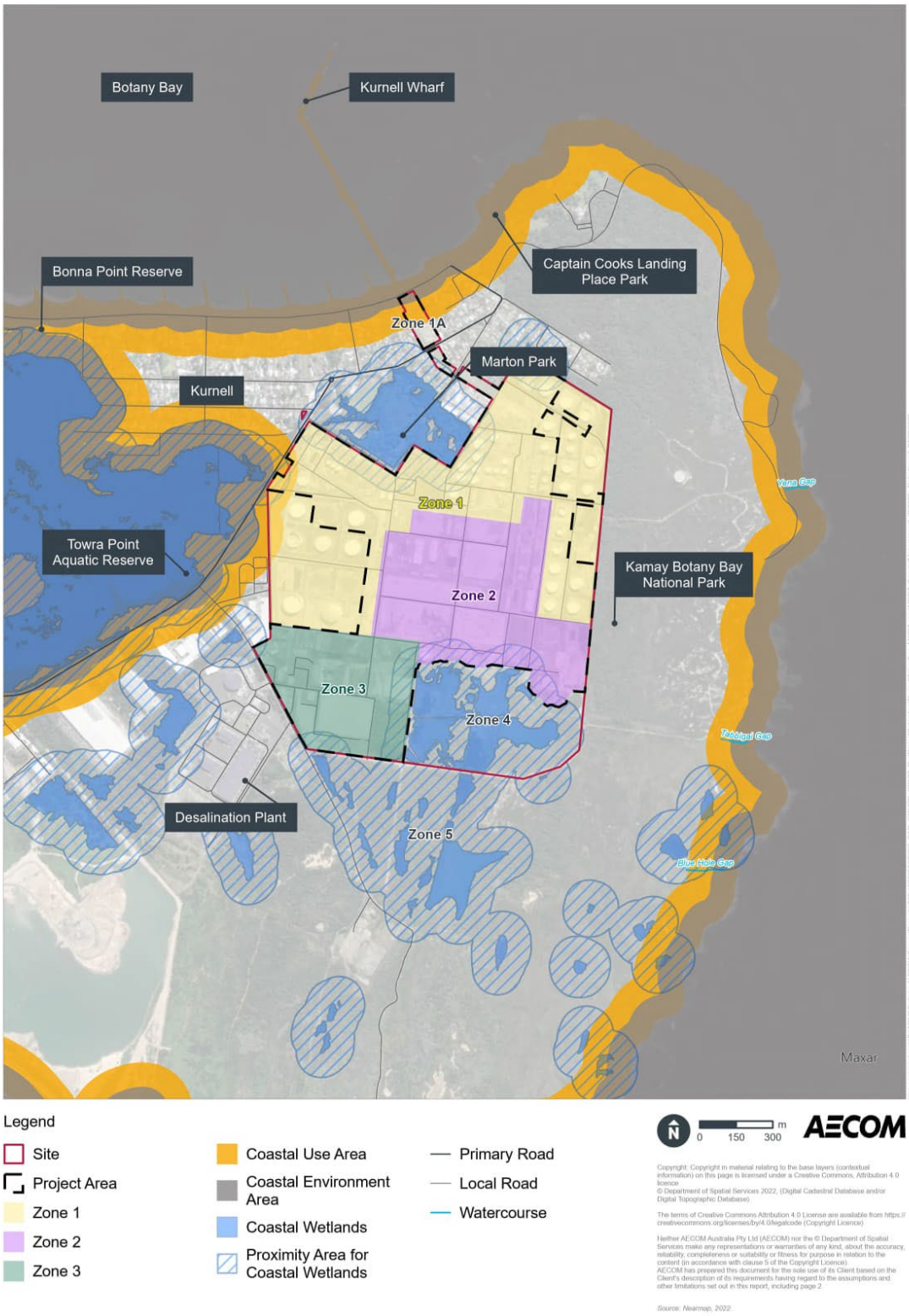


Figure B-1 SEPP (Resilience and Hazards) 2021 – Chapter 2. Coastal management mapping

Local Environmental Plan

The Project Area is located in the Sutherland Shire LGA and therefore the planning controls contained in the Sutherland Shire LEP 2015 are relevant. The LEP aims to make local environmental planning provisions for land in Sutherland Shire in accordance with the relevant standard environmental planning instrument under Section 3.20 of the EP&A Act.

The Site and Project Area are located on land that is zoned is zoned *E5 Heavy Industrial* (Figure B-2). The objectives of the *E5 Heavy Industrial* land use zone under the LEP are:

- *To provide areas for industries that need to be separated from other land uses.*
- *To ensure the efficient and viable use of land for industrial uses.*
- *To minimise any adverse effect of industry on other land uses.*
- *To encourage employment opportunities.*

Under the land use definitions provided in the 'Dictionary' of the LEP, the proposed modification would be considered supporting development for the Kurnell Terminal, a 'liquid fuel depot,' which is classed as a 'heavy industrial storage establishment.' 'Liquid fuel depots' and 'heavy industrial storage establishments' are not specifically mentioned in the LEP as land uses that are either permitted without consent, permitted with consent, or prohibited under *E5 Heavy Industrial*. However, the land uses listed under 'permitted with consent' include "*Any other development not specified in item 2 (permitted without consent) or 4 (prohibited)*." Additionally, permissibility for the proposed modification is achieved through Section 4.55(2) of the EP&A Act (Sections 1.4 and 5.1.1).

The LEP aims to promote an appropriate balance of development and management of the environment that would be ecologically sustainable, socially equitable and economically viable. As discussed in Section 8.0, the proposed modification is consistent with the principles or ecologically sustainable development.

A number of principal development standards and local provisions under the LEP have been considered. A discussion of these provisions and the relevance to the proposed modification is provided in Table B-4.

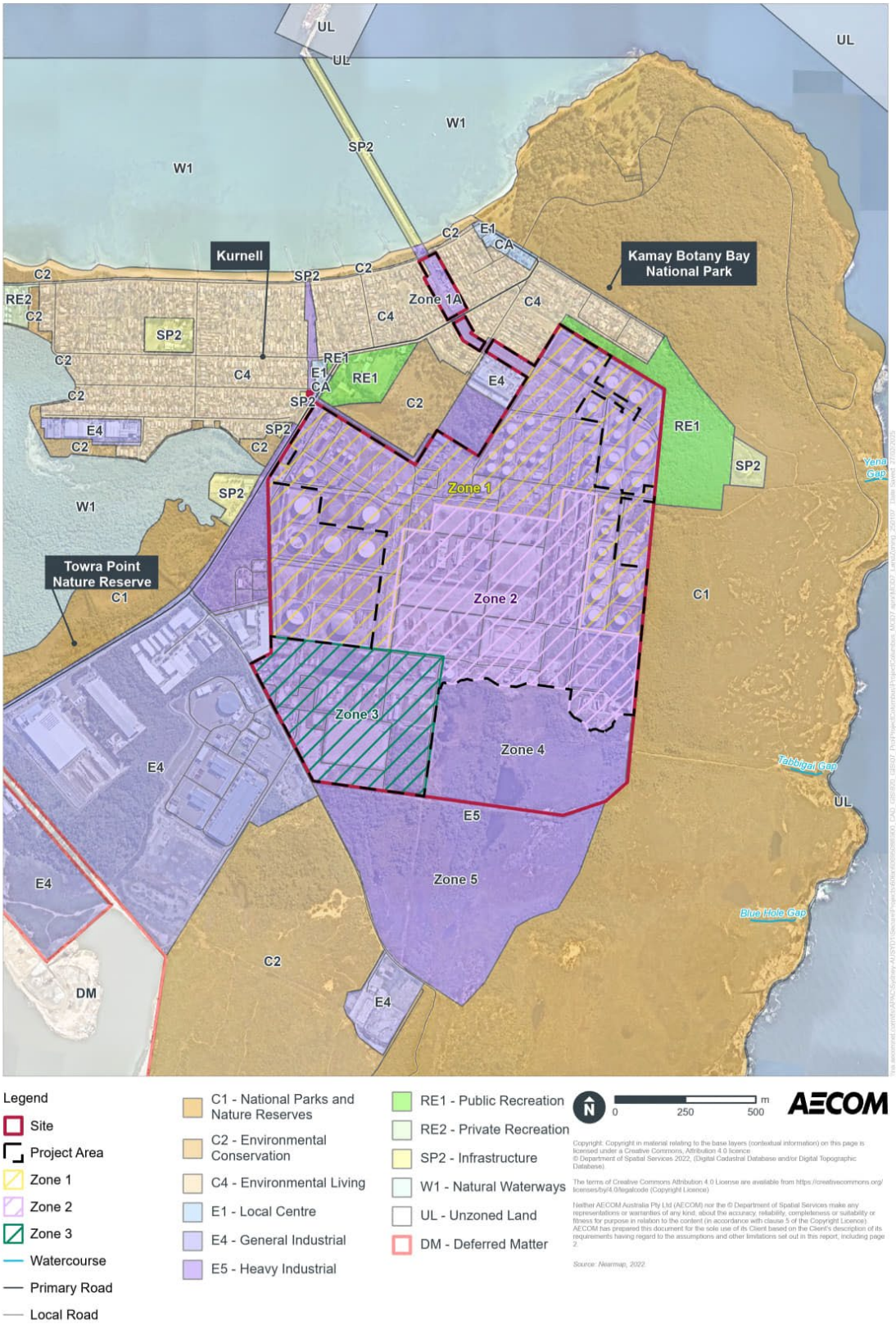


Figure B-2 Land Zoning map

Table B-4 LEP provisions

LEP provision	Compliance
Clause 4.1 – Minimum subdivision lot size	The Site has a minimum lot size of 5 ha under the LEP (Figure B-3). The proposed modification does not involve subdivision. As such, the matters of consideration contained under clause 4.1 of the LEP will not apply to the proposed modification.
Clause 4.3 – Height of buildings	The majority of the Site does not have a maximum building height under the LEP; relatively small areas in western and southern parts of the Site have a maximum building height of 15 to 16.9 metres (Figure B-4). Any new warehouse constructed as part of the proposed modification would be in accordance with the maximum building height.
Clause 4.4 – Floor space ratio	The Site has a floor space ratio of 1:1 under the LEP.
Clause 5.10 – Heritage conservation	Two items of local importance listed within the LEP are located within the Site: Australian Oil Refinery (#A2524) and Four wheel drive track (#A2523). No sites, objects, or items of Aboriginal heritage importance have been recorded within the Site, but a number can be found within 500 metres. An ACHAR (Appendix J and summarised in Section 7.5) and a Heritage Impact Assessment (Appendix K and summarised in Section 7.6) have been prepared to support the Modification Report.
Clause 5.21 – Flood planning	The Site is considered to be flood prone land with medium risk, however the Council flood modelling did not include the Site and this flood mapping layer has been provided in a precautionary manner as the higher parts of the Site to the east have no history of flooding. The north eastern section of the Site has been subject to recent flooding. Section 7.4 provides further discussion regarding the flood risks at the Site. A Surface Water, Wastewater, and Flooding Report is provided in Appendix I.
Clause 6.1 – Acid sulphate soils	Review of the NSW ASS risk mapping indicates that the Project Area across the majority of Zone 1, Zone 2, and the northern portion of Zone 3 is mapped as disturbed terrain above 4 mAHD. The north and north west boundary of Zone 1 and Zone 1A are mapped as having low probability of soils between 1-3 mbgl to contain ASS. The southern portion of Zone 3 is mapped as low probability above 3 mbgl (Figure B-5). Section 7.3 provides further discussion regarding the soils and contamination risks at the Site. A Soils, Groundwater and Contamination Report is provided in Appendix G.
Clause 6.5, 6.6, and 6.7 – Environmentally sensitive land	The Project Area is mapped to reside within the following areas: • Terrestrial biodiversity values map • Groundwater vulnerability map • Riparian Lands and Watercourses Map. All of these clauses provide considerations for the consent authority. Refer to the BDAR (Appendix P) for further information.
Clause 6.19 – Kurnell peninsula	The Site is located within the Kurnell Peninsula and the Refinery Risk Area. This clause limits certain land uses within the Refinery Risk Area and requires the consent authority to consider certain matters prior determining a development application including risk assessment, transportation, and dangerous goods. Refer to the PHA (Appendix F) for further information.

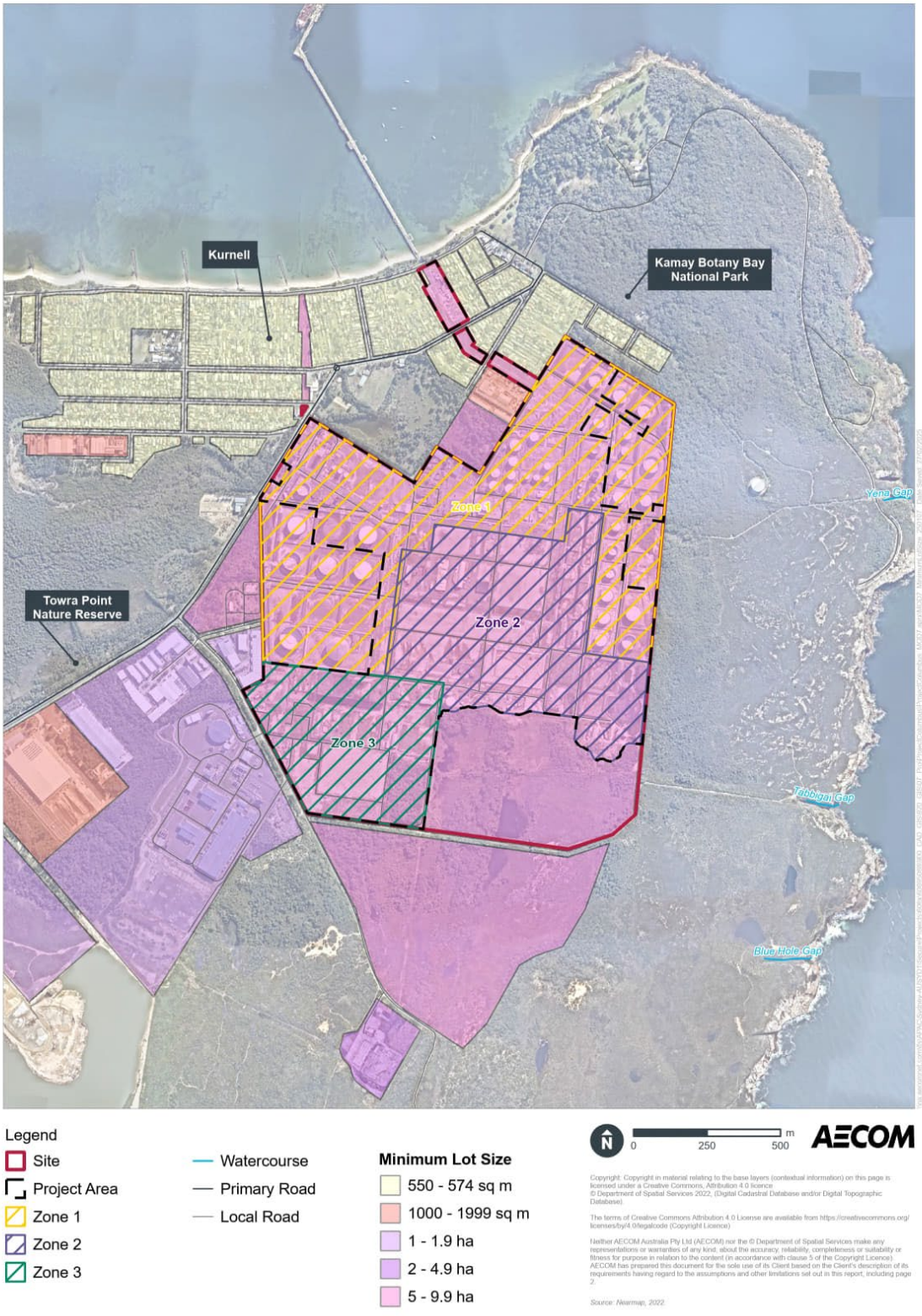


Figure B-3 Minimum subdivision lot size

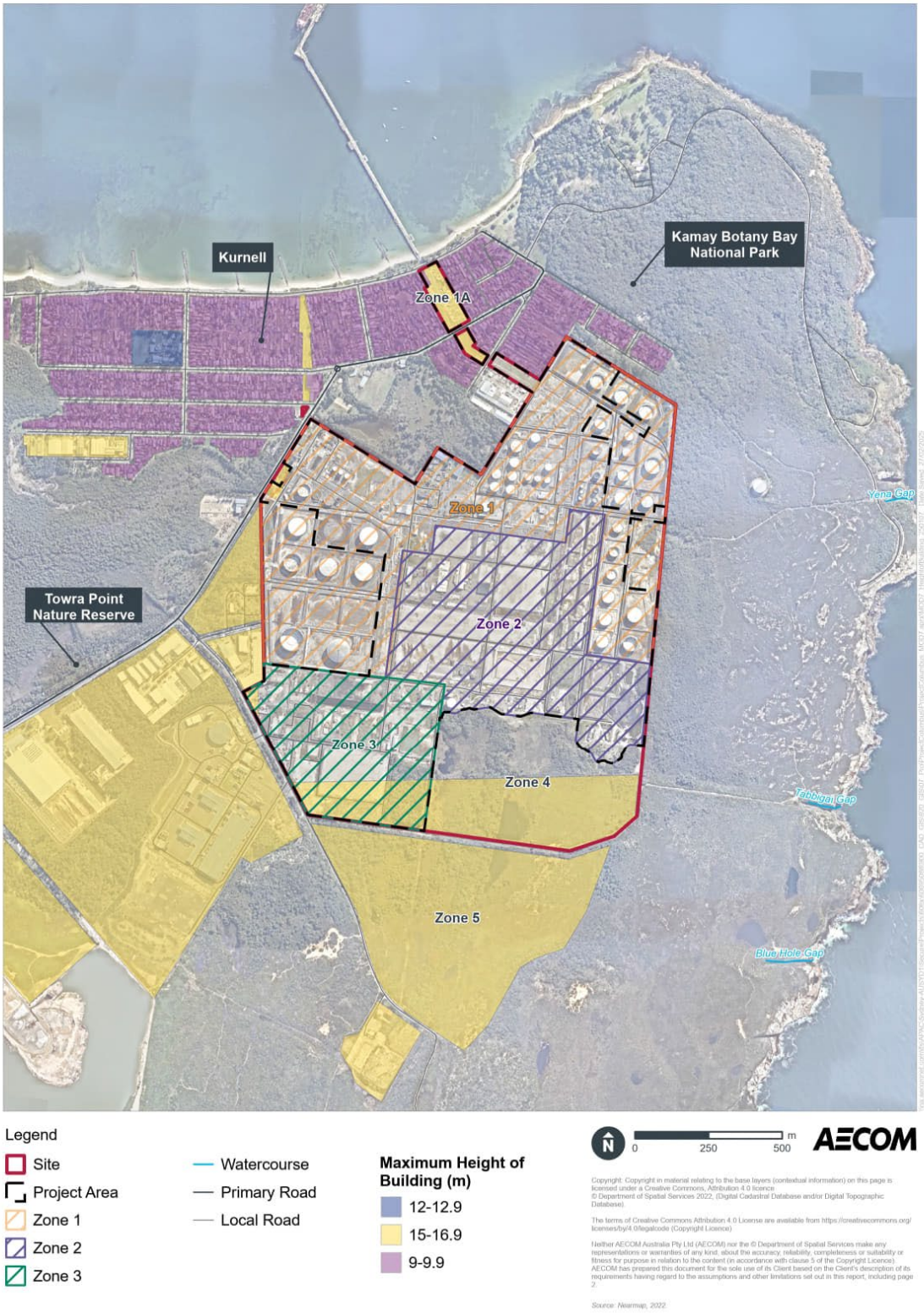


Figure B-4 Height of buildings

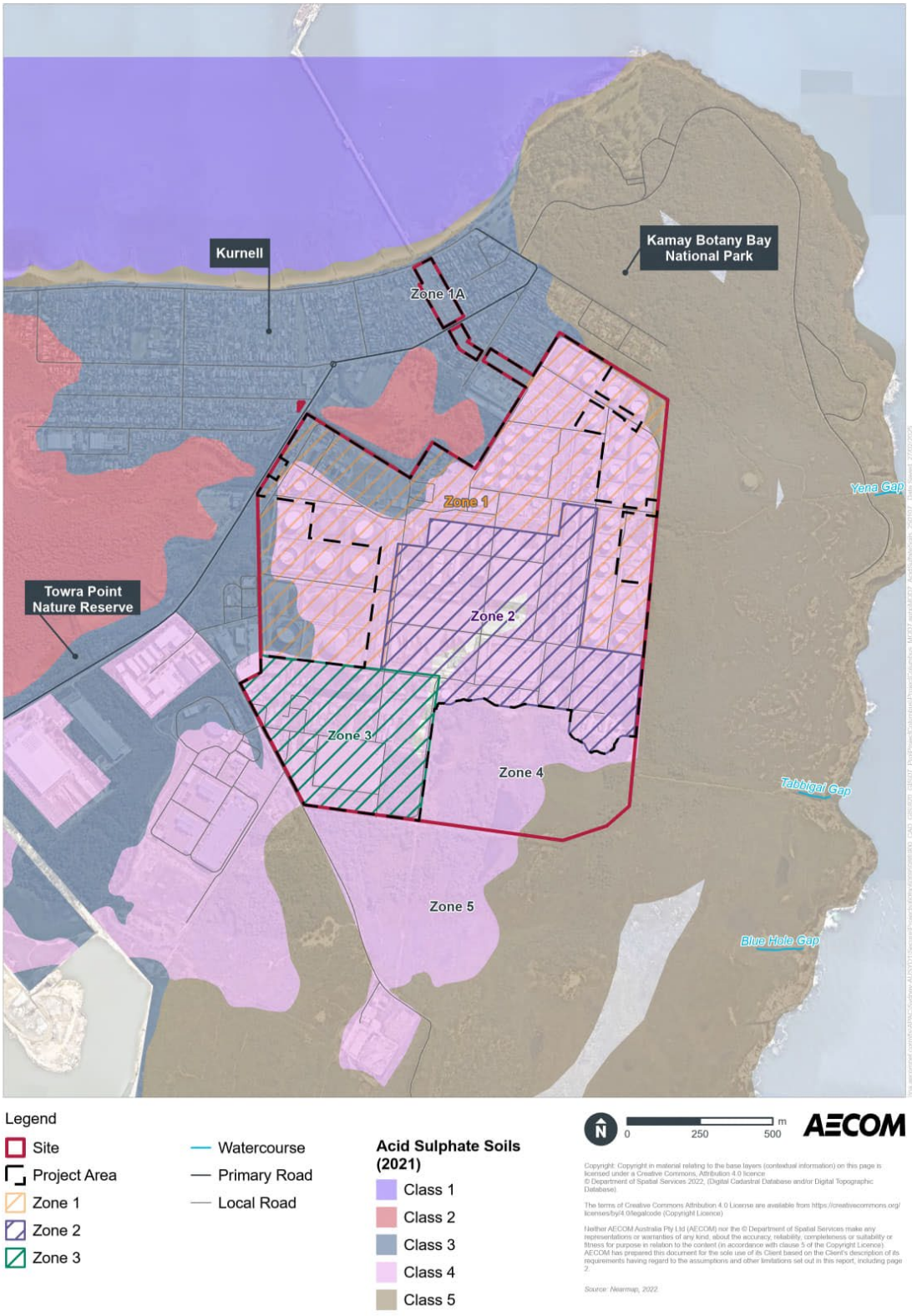


Figure B-5 Acid sulphate soils

Other relevant NSW legislation

Australian Oil Refining Agreements Act 1954

The *Australian Oil Refining Agreements Act 1954* (AORA Act) was gazetted to facilitate the construction and operation of the Kurnell Refinery. The Act also allows for Ampol to maintain its asset (i.e. the Kurnell Terminal) at the Site.

Protection of the Environment Operation Act 1997

The *Protection of the Environment Operations Act 1997* (PoEO Act) provides for the issue of an Environment Protection Licence (EPL) for scheduled activities pursuant to Section 48 of the PoEO Act, in relation to pollution and waste disposal caused by development or operation of developments. Activities requiring an EPL are listed in Schedule 1 of the Act.

Activities relating to chemical storage are listed in clause 9 of Schedule 1. These include Petroleum Products Storage with a capacity to store more than 200 tonnes (liquefied gases) or 2,000 tonnes (chemicals in any other form). The proponent has an existing EPL (No. 837)[16] that licenses a number of activities for Kurnell, including Petroleum Products Storage. EPL 837 would not need to be updated to accommodate the proposed modification.

The PoEO Act also provides for the management of water, air, and noise pollution and the control of wastes. The proposed management and mitigation measures outlined in Section 7.0 would be implemented through a CEMP or modified EMPs to minimise the potential of the proposed modification resulting in pollution of the environment.

The PoEO Act also allows the EPA to assess chemicals under the Act and declare substances to be chemical wastes for the purposes of the Act. With respect to assessed chemicals or declared chemical wastes, the EPA may make chemical control orders (CCOs) that regulate activities such as the manufacture, processing, conveying, buying, selling, or disposal of the chemical or declared waste.

A CCO is in place for Polychlorinated Biphenyls (PCBs)[17], which the Kurnell Terminal must comply with, in accordance with EPL 837.

Contaminated Land Management Act 1997

The primary objective of the *Contaminated Land Management Act 1997* (CLM Act) is to establish a process for investigating and remediating land where contamination presents a significant risk of harm to human health or another aspect of the environment. Where land is identified as potentially contaminated, consultation with the NSW EPA should be undertaken to remediate the land.

The Site is listed as a NSW Contaminated Site under the CLM Act. A Conceptual RAP has been developed in consultation with the EPA and Council and can be found in Appendix H.

Work Health and Safety Act 2011

The *Work Health and Safety Act 2011* (WH&S Act) and its supporting *Work Health and Safety Regulation 2011* (WH&S Regulation) defines MHFs, regulates their operation, and includes measures to prevent accidents occurring at MHFs. They also include specific provisions regarding the management of asbestos and asbestos containing materials.

The Site is classified as an MHF. Any works to or modifications of a MHF need to be discussed with SafeWork NSW as the administrators of the WH&S Act.

Ampol has discussed the proposed modification with the MHF unit of SafeWork NSW. Outcomes of this consultation are outlined in Section 6.0 and addressed in Section 7.2.

[16] Found at: https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=243212&SYSUID=1&LICID=837
[17] Chemical Control Order in Relation to Materials and Wastes Containing Polychlorinated Biphenyl, 1997

Roads Act 1993

The *Roads Act 1993* (Roads Act) regulates a range of activities undertaken on public roads. Section 138 of the Roads Act requires that a person obtain the consent of the appropriate roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a public road. The proposed modification would not require any of the works listed above. Accordingly, an approval under Section 138 of the Roads Act would not be required for the proposed modification.

Water Management Act 2000

The *Water Management Act 2000* (WM Act) establishes a framework for managing water in NSW. The Act creates:

- Mechanisms for protecting and restoring water sources and their dependent ecosystems
- Improved access rights to water
- Partnership arrangements between the community and the Government for water management.

Section 91 of the WM Act discusses activity approvals and notes that there are two types of approvals, namely controlled activity approvals and aquifer interference approvals.

A controlled activity approval for this proposed modification would not be required by virtue of Section 4.41 of the EP&A Act. This section of the EP&A Act specifies certain approvals that are not required for SSD, including an activity approval under section 91 of the WM Act.

Despite this provision, this section of the EP&A Act does not remove the requirement for obtaining an aquifer interference approval. Separate exemptions under the *Water Management (General) Regulation 2018* may apply to the requirement for an aquifer interference approval or water access licence.

During a 2023 geotechnical assessment at the Site, groundwater was found between approximately 0.7 and 2.65 mbgl across Zones 2 and 3 (WSP, 2023). Excavation from the proposed modification would extend to 3 mbgl. Therefore, groundwater is likely to be encountered during construction works.

Minor and temporary dewatering activities that are estimated to take less than 3 ML/yr of groundwater generally do not require a licence or approval due to exemptions in the *Water Management (General) Regulation 2018 (*Water Management Regulation). The requirement for a licence or approval related to the NSW *Water Management Act 2000* (Water Management Act) would be determined during detailed design in consultation with relevant agencies.

Water Act 1912

The WM Act is gradually replacing the planning and management frameworks within the Water Act 1912.

The Project Area is located within land mapped under the water sharing plan for the Greater Metropolitan Region Groundwater Sources, 2023. Specifically, the Project Area is located in the Botany Sands Groundwater source, under Botany Management Zone 2.

Where the proposed modification works are likely to intercept groundwater, a licence under Part 5 of the Water Act 1912 would be required. Groundwater is likely to be encountered due to the shallow depth to groundwater; previous civil works at Kurnell have indicated that groundwater was almost always encountered in excavations greater than 1 mbgl. As such, a permit under the WM Act would be expected for excavations works at depths greater than 1 mbgl.

Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides legal status for biota of conservation significance in NSW. The Act aims to ‘maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.’

A BDAR has been prepared to support the Modification Report, presented in Appendix P and summarised in Section 7.11. The requirements of the BC Act have been incorporated, through assessment of potential impacts of the proposed modification on biodiversity values, such as species, populations, and communities listed under the BC Act. This assessment has concluded that the proposed modification would not result in significant impacts to the values protected by the BC Act.

Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for the identification and control of biosecurity risks. The Act stipulates that an occupier of land must take steps to control biosecurity measures on their land. The Act also provides for the monitoring of and reporting on the effectiveness of the management of biosecurity risks in NSW. Appropriate methods for controlling noxious weed species are defined under the control category or categories for particular species of weeds.

The impact of the proposed modification on noxious weeds and their management on the Site has been assessed as part of the BDAR, which is presented in Appendix P and summarised in Section 7.11. The assessment concluded that weeds are common in the area, though substantial transport of exotic weeds and pathogens is not expected given the nature of the Site and current land use. A Biodiversity and Weed Management Plan (BWMP) would be prepared in order to limit and control the spread of noxious weeds within the Site

Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) was established to provide land rights to Aboriginal persons, as well as provide for representative Aboriginal Land Councils to vest land in those Councils. The ALR Act is administered by the NSW Department of Aboriginal Affairs and establishes a compensatory regime, which recognises that land is of spiritual, social, cultural, and economic importance to Aboriginal people. The ALR Act established the NSW Aboriginal Land Council (NSWALC) and a network of over 120 Local Aboriginal Land Councils (LALCs) and requires these bodies to:

- *"Take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law*
- *Promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area."*

The closest LALC office to the Site is in La Perouse. LALCs constituted under the ALR Act can make claims in respect of 'claimable Crown land.' The Registrar of the ALR Act must maintain the Register of Aboriginal Land Claims under section 166 of the ALR Act. All land claims that have been made under the ALR Act are recorded in the Register. As part of the ACHAR consultation process, LALCs have had the opportunity to inform and review the ACHAR, which is presented in Appendix J and summarised in Section 7.5.

Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides for the conservation of environmental heritage defined as places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance that are at least 50 years old. The Act provides for the listing of heritage structures on the State Heritage Inventory and Orders can be made under the Act to protect relics from removal or alteration. This Act applies to non-Aboriginal relics only. Aboriginal relics are protected under the *National Parks and Wildlife Act 1974* (see below section).

The Site is listed as an archaeological heritage item, the Australian Oil Refinery (A2524). Another item, the Four-Wheel Drive Track (A2523) passes through the Site.

Section 4.41(1) of the EP&A Act outlines approvals and legislation that do not apply to SSD projects, such as approval under Part 4, or an excavation permit under Section 139, of the Heritage Act. As the approved project was an SSD, these approvals under the heritage act are not required for the proposed modification.

Nevertheless, a Heritage Impact Assessment has been prepared to support the Modification Report, as presented in Appendix K and summarised in Section 7.6. This assessment concludes that the proposed modification is unlikely to have an adverse impact on the heritage items listed above.

National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974* (NP&W Act), the NSW National Parks and Wildlife Service (NPWS) (part of NSW Environment and Heritage) is responsible for the care, control, and management of all national parks, historic sites, nature reserves, Aboriginal areas, state conservation areas and regional parks. Two relevant aspects of this Act that relate to the proposed modification are discussed below.

Protection of Flora and Fauna

The NP&W Act administers the protection of flora and fauna. It makes it an offense to harm any animal, threatened species, population, or community that is protected under this Act within a licence or development consent. It also enables the creation of State-protected sites of ecological value. The relevant provisions of this Act and relevant State-protected sites of ecological value have been considered in the BDAR, which is presented in Appendix P and summarised in and Section 7.11. This assessment concluded that the proposed modification would not have a significant impact on threatened species, population, or community protected under this Act.

Protection of Aboriginal Heritage

The NP&W Act also provides for the conservation of objects, places, or features of Aboriginal cultural value. It makes it an offence to knowingly destroy, deface, or damage, or cause or permit the destruction, defacement of, or damage to, an Aboriginal object or place without the necessary consent. Aboriginal places and objects protected under this Act are registered on the Aboriginal Heritage Information System (AHIMS).

The Aboriginal heritage provisions of the NP&W Act have been considered in the ACHAR, which is presented in Appendix J and summarised in Section 7.5. No sites, objects, or items of Aboriginal heritage importance have been recorded within the Site. There remains a risk that Aboriginal objects located in buried soil profiles could be impacted during intrusive works, and mitigation measures have been proposed to mitigate this risk. Furthermore, the proposed modification's status as SSD precludes the requirement for an AHIP under Section 4.41(1) of the EP&A Act.

Pipelines Act 1967

The *Pipelines Act 1967* (Pipelines Act) specifies provisions relating to the construction, operation, and maintenance of pipelines and purposes connected therewith. Pursuant to Section 5(1)(a) of the Pipelines Act, subject to Section 5A, a licence is not required to be held in respect of a pipeline constructed or to be constructed under, or under an approval or other authority granted under, any Act, other than this Act or the EP&A Act. Accordingly, the proposed modification does not require a licence pursuant to the Pipelines Act for the minor pipeline works to be undertaken on the Site.

Commonwealth legislation

Airports Act 1996 and Airports (Protection of Airspace) Regulations 1996

The *Airports (Protection of Airspace) Regulations 1996* applies to activities that could penetrate the protected airspace of leased federal airports (i.e. airports regulated under the *Airports Act 1996*). The regulation requires the Department of Infrastructure, Transport, Regional Development Communications and the Arts (DITRDCA) to assess applications to carry out controlled activities and to impose conditions on the approval, if granted. The Project Area is within the vicinity of Sydney Airport.

The proposed modification would involve the potential use of cranes during construction. Guidance related to the operation of cranes and tall structures in the vicinity of Sydney Airport is provided by the Civil Aviation Safety Authority (CASA), pursuant to *AC 139-07(2) – CASA Advisory Circular – Reporting of Tall Structures* (Advisory Circular). The Advisory Circular provides instructions to seek approval from the Air Base Command Post (ABCP) to erect a crane or tall structure (exceeding 30 m above ground level) within 15 km of Sydney Airport. The Project Area is located approximately 5 km south of Sydney Airport. As such, the requirements of the Advisory Circular would be considered.

Ampol will consult with CASA and ABCP with respect to the use of cranes at the Site during detailed design of the proposed modification.

Environment Protection and Biodiversity Conservation Act 1999

Section 18 of the *Environment Protection and Biodiversity Act 1999* (EPBC Act) requires a proponent of a development or activity to obtain approval from the Commonwealth Minister for the Environment when undertaking an activity which is likely to cause a significant impact to a Matter of National Environmental Significance (MNES). MNES include threatened species or ecological communities listed under the EPBC Act.

If the proposed modification is likely to significantly impact on a MNES, a referral to the Commonwealth Minister for the Environment and Water would be required to determine whether the proposed modification is a controlled action or can be undertaken in a particular manner to adequately mitigate potential impacts. If the proposed modification constitutes a controlled action the activity will be subject to further assessment before a determination is made by the Commonwealth Minister for the Environment and Water regarding whether the activity can be carried out, generally subject to conditions.

A search of the EPBC Act Protected Matters Search Tool was undertaken for a 5 km buffer around the Project Area. The search identified one Wetland of International Importance, nine threatened ecological communities, 106 threatened flora and fauna species, and 82 listed migratory species with potential to occur within 5 km of the Project Area.

The results of the Protected Matters search for MNES within 5 km of the Project Area is provided in Table B-5 and Figure B. The Protected Maters search report can be viewed in Appendix Q.

Table B-5 MNES within 10 km of the Project Area

MNES	MNES within 5 km of the Project Area
World Heritage Properties	None
National Heritage Place	2
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	9
Listed Threatened Species	106
Listed Migratory Species	82

A review of the potential impacts of the proposed modification on nearby MNES has been undertaken. It is unlikely that the construction or operation of the proposed modification would result in a significant direct or indirect adverse impact on MNES.

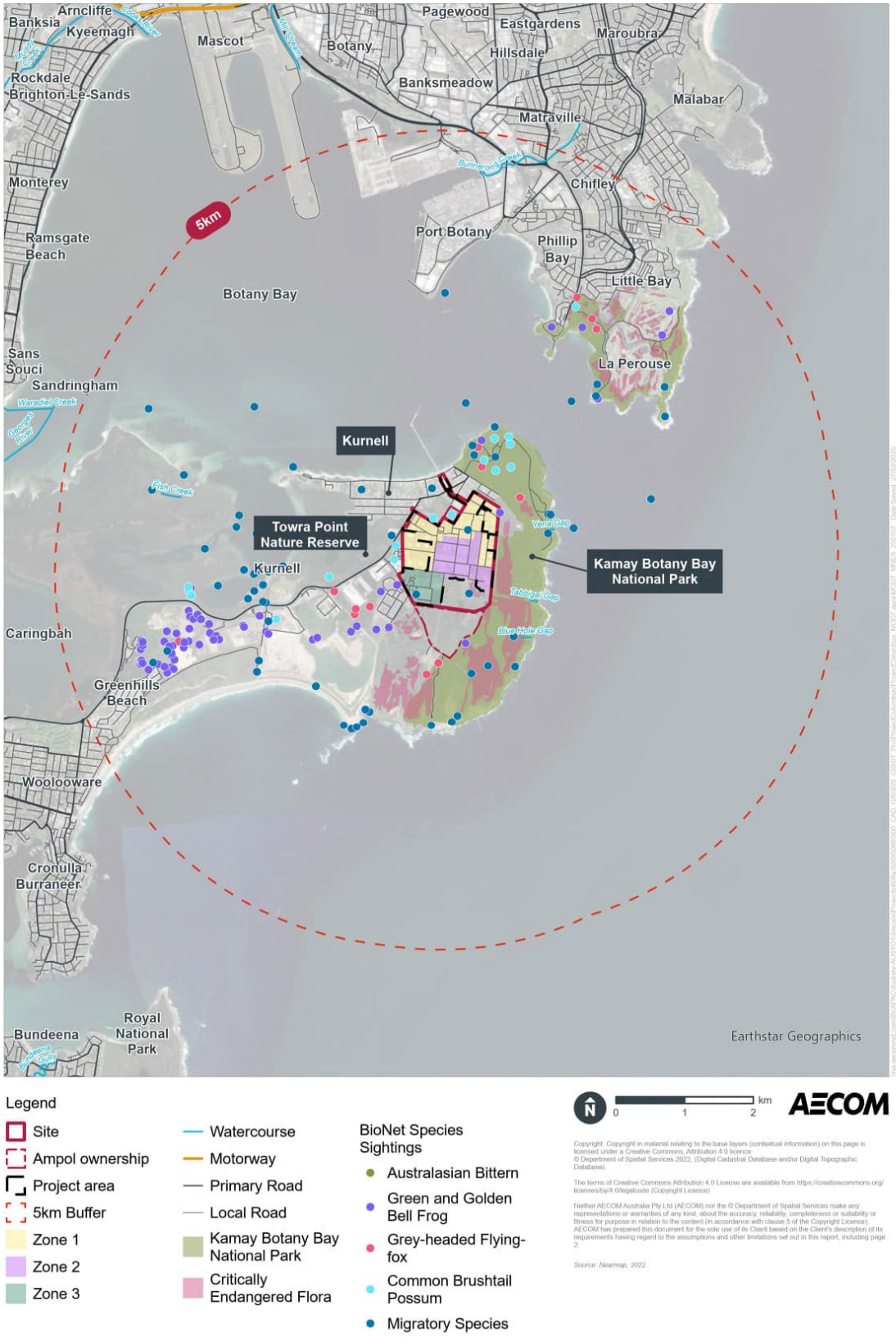


Figure B-6 Matters of National Environmental Significance within 5 km

Native Title Act 1993

The *Native Title Act 1993* (NT Act) provides for the recognition and protection of native title for Aboriginal peoples and Torres Strait Islanders. The NT Act recognises native title for land over which native title has not been extinguished and where persons are able to establish continuous use, occupation or other classes of behaviour and actions consistent with a traditional cultural possession of those lands. The NT Act also makes provision for Indigenous Land Use Agreements (ILUA) to be formed, as well as a framework for notifying native title stakeholders for certain future acts on land where native title has not been extinguished.

A search of the *National Native Title Tribunal Register* was undertaken using the National Native Title Tribunal online system. The search returned no active or historic claims associated with the Project Area. As all land within the Project Area is either freehold or the subject of a 'previous exclusive possession act,' native title rights will not be impacted by the proposed modification.

Appendix C

Consolidated project description

C. Consolidated project description

This appendix presents the revised project description for the approved project, including all seven modifications:

- The conversion works, consented 7 January 2014
- Modification 1 – Demolition works (MOD-1), consented 10 August 2015
- Modification 2 – Asbestos contaminated soil (ACS) management works (MOD-2), consented 27 October 2017
- Modification 3 – Tank 101 demolition (MOD-3), consented 17 November 2017
- Modification 4 – Timing of demolition works (MOD-4), consented on 9 August 2018
- Modification 5 – Increased the capacity of the ACS Containment Cell, extended the duration of ACS management works and allowed for the retention of a portion of the cooling water outlet pipeline beneath Prince Charles Parade and adjacent dune area of Silver Beach (MOD-5), consented on 10 July 2019
- Modification 6 – Extension of the ACS management works period (MOD-6), consented 21 January 2020
- Modification 7 – Supporting the continued safe, viable, and reliable operation of the Site, whilst preparing the land for future uses (MOD-7).

These modifications have been laid out in largely chronological order and separated by the following themes:

- Conversion works
  - Includes the conversion works
- Demolition works
  - Includes MOD-1 and MOD-3
- Asbestos Containment Cell management works
  - Includes MOD-2, MOD-5, and MOD-6
- Supporting the continued safe and reliable operation of the Site and to facilitate the future use of the Site
  - Includes MOD-7.

Where works have been superseded, new text has been made **bold** and former text has been ~~struck out~~. The tense has also been updated to reflect project status at the time of writing.

C.1 Conversion works

C.1.1 Introduction

~~Caltex~~ **Ampol** ~~is seeking~~ **sought** development approval to convert the existing Kurnell Refinery into a Finished Product Terminal (the '**Conversion** Project'). The conversion ~~would involve~~ **involved** the continued use of parts of the **Conversion** Project Area, in a manner similar to that ~~currently~~ **previously** in place, for the storage and distribution of petroleum products. A number of existing crude oil tanks ~~would be~~ **were** cleaned and modified to allow for the storage of refined product (i.e. conversion to finished product tanks). A small number of other tanks already storing one type of refined product ~~would be~~ **were** converted to store another. New pumps, pipes and electrical infrastructure ~~would be~~ **were** installed within the **Conversion** Project Area. A range of ancillary works ~~would also be~~ **were also** undertaken to improve efficiency and to facilitate the conversion of the refinery into a terminal. These ancillary works ~~include~~ **included** upgrades to and consolidation of the utilities, transportation and management systems on the Site. The **Conversion** Project ~~is~~ **was** expected to be undertaken over a 54 month period and would cost approximately $230 million.

The refinery plant ~~would~~ **was** also ~~be~~ shut down, depressurised, de-inventoried and left in situ. ~~Caltex~~ **Ampol** shut down, depressurise and de-inventory the refinery plant during routine maintenance activities as part of the existing operation. Therefore approval ~~is~~ **was** not being sought or required to complete this action as these works ~~would be~~ **were** completed in line with the Environment Protection Licence (EPL) for the Site.

No demolition, dismantling or remediation works ~~would be~~ **were** undertaken on the Site as part of ~~this~~ **the Conversion** Project. ~~Should it be~~ **If** required, this work would **have been** ~~be~~ subject to separate approvals at a later stage.

C.1.2 Proposed Works

Overview

The **Conversion** Project ~~would~~ **included** modifications to the existing Kurnell Refinery (the 'Site') to convert it to a working finished product terminal. The Site ~~would have~~ **has** a nominal maximum storage capacity of 925 Ml of refined product and by products. The proposed terminal ~~would manage~~ **manages** the following products:

- Gasoline – Unleaded Petrol (ULP), Premium Unleaded Petrol (PULP) and Super Premium Unleaded Petrol (SPULP);
- Diesel;
- Jet Fuel; and
- Fuel Oil.

The terminal ~~would~~ also **manages** the following by-products:

- Slop; and
- Wastewater.

The **Conversion** Project ~~would involve~~ **involved** the conversion of tanks and installation of pumps and associated pipelines within the **Conversion** Project Area to allow for the expansion of terminal operations. These works ~~would all~~ **occurred** within the **Conversion** Project Area outlined on ~~Figure 4-1~~ **Figure C-1.**

No works ~~are~~ **were** proposed within the pipeline right of way (refer to ~~Figure 4-1~~ **Figure C-1**).

During the initial conversion activities the Site ~~would~~ still ~~operate~~ **operated** in its ~~current~~ **existing** mode as both a refinery and a terminal. Cessation of refinery operations ~~would occur~~ **occurred** in in the second half of 2014 and ~~would be~~ **was** followed by the continued conversion of some tanks within the **Conversion** Project Area to hold finished products. Eventually the Site ~~would operate~~ **operated** wholly as a terminal. Construction staging is described in greater detail in Section ~~4.3.1~~ **C.1.3**.

An overview of the modifications required for the **Conversion** Project are summarised below.

Gasoline

Gasoline Products, including ULP, PULP and SPULP, ~~would be~~ **were** stored within tanks in the Eastern Tank Area. Two existing dedicated gasoline pipelines **were** extend**ed** from the Kurnell Wharf to the Eastern Tank Area along Pipeline Easement 1 (refer to ~~Figure 4-1~~ **Figure C-1**). Gasoline products ~~would be~~ **were** distributed along these pipelines to a total of sixteen existing finished product tanks within the Eastern Tank Area. Twelve of these tanks ~~are currently~~ **were** in use for storage of gasoline or similar service. Four tanks ~~would be~~ **were** converted from other services to ULP/PULP/SPULP service.

Diesel

Two existing dedicated diesel pipelines **were** extend**ed** from the wharf to the Eastern Tank Area within Pipeline Easement 1 (refer to ~~Figure 4-1~~ **Figure C-1**). Diesel product ~~would be~~ **was** distributed along these lines to twelve finished product tanks within the Eastern Tank Area. ~~At present all~~ **All** of these tanks ~~already~~ **previously** store**d** diesel, excluding one that ~~is currently~~ **was previously** used for fuel oil.

The two existing diesel pipelines ~~would be~~ **were** extended from the Oil Movements Centre (OMC) (refer to ~~Figure 4-1~~ **Figure C-1**) along Pipeline Easement 2 to supply four large tanks within the Western Tank Area that ~~would be~~ **were** converted from crude oil storage to the storage of diesel products. These pipelines ~~would be~~ **were** installed low to the ground, along pipe racks in line with the existing pipework on the Site.

The existing diesel additives injection system at the OMC manifold ~~would be~~ **was** duplicated at a new location within the Western Tank Area (refer to ~~Figure 4-1~~ **Figure C-1**). This system ~~would be~~ **was** used to dose diesel as it ~~is~~ **was** received into the terminal from the wharf to ensure that the finished product ~~meets~~ **met** the required specification.

Jet Fuel

Two existing dedicated jet fuel pipelines **were** extend**ed** from the wharf to the Eastern Tank Area within Pipeline Easement 1. Jet fuel ~~would be~~ **was** distributed to six existing finished product tanks within the Eastern Tanks Area.

The two existing jet fuel pipelines ~~would be~~ **were** extended from the OMC along Pipeline Easement 2 to supply four large tanks within the Western Tank Area that ~~would be~~ **were** converted from crude oil to jet fuel service. These pipelines ~~would be~~ **were** installed low to the ground, along pipe racks as per the existing pipework on the Site.

A small chemical drum and dosing pump ~~would be~~ **was** installed at Gate 5 (refer to ~~Figure 4-1~~ **Figure C-1**). This system ~~would be~~ **was** attached to the jet fuel pipeline and used for dosing an additive into the jet fuel as it ~~is~~ **was** received into the Site from the wharf.

Fuel Oil

Two existing dedicated fuel oil pipelines **were** extend**ed** from the wharf to the **Conversion** Project Area within Pipeline Easement 1. Fuel oil product ~~would be~~ **was** distributed to four existing finished product tanks within the Eastern Tank Area. No proposed conversion works ~~would be~~ **were** associated with these tanks as they are already used for fuel oil storage.

Slop Oil

An existing pipeline within Pipeline Easement 1 ~~would be~~ **was** transferred from its current usage to transfer Slop oil. This ~~would involve~~ **involved** flushing the existing pipeline. No intrusive works ~~would~~ occur**red** within Pipeline Easement 1. Slop produced from normal terminal transfers ~~would be~~ **was** stored within five existing tanks within the Eastern Tank Area. Two of these tanks require**d** minor piping and tank nozzle modifications to change their service to storage of slop.

It ~~is~~ **was** proposed that a tank within the Western Tank Area ~~would be~~ **was** changed from crude oil into slop service. No changes ~~are~~ **were** required to this tank to facilitate this change of service. The existing pipelines that connect this tank to the existing slop tanks ~~would be~~ **were** replaced in kind.

Wastewater

The existing Oily Water Management System (OWMS) at the Site collects process effluent and stormwater from areas of the Site where there is potential for interaction of water flows with petroleum products. Oily water from a range of sources is collected in the Site's oily water sewer system and is transferred to the wastewater treatment plant (WWTP) (refer to ~~Figure 4-1~~ **Figure C-1**).

Oily water is treated in the WWTP. The treatment process utilises physical, chemical and biological treatment to treat the oily water. Treated effluent is discharged to the Tasman Sea via the Yena Gap outfall under conditions of the Site EPL.

The WWTP ~~would remain~~**remained** in service as part of the **Conversion** Project, operating in line with the EPL for the Site.

Utilities

The existing air, potable water, firewater, natural gas and nitrogen utilities ~~would~~ **remained** in place on the Site. Demand for these utilities ~~would~~ significantly decrease**d** as a result of the **Conversion** Project. Some minor relocation and consolidation of utilities equipment ~~would be~~ **was** required. These relocation works ~~would~~ include**d** moving certain compressors and pipework within the **Conversion** Project Area (refer to ~~Figure 4-1~~ **Figure C-1**).

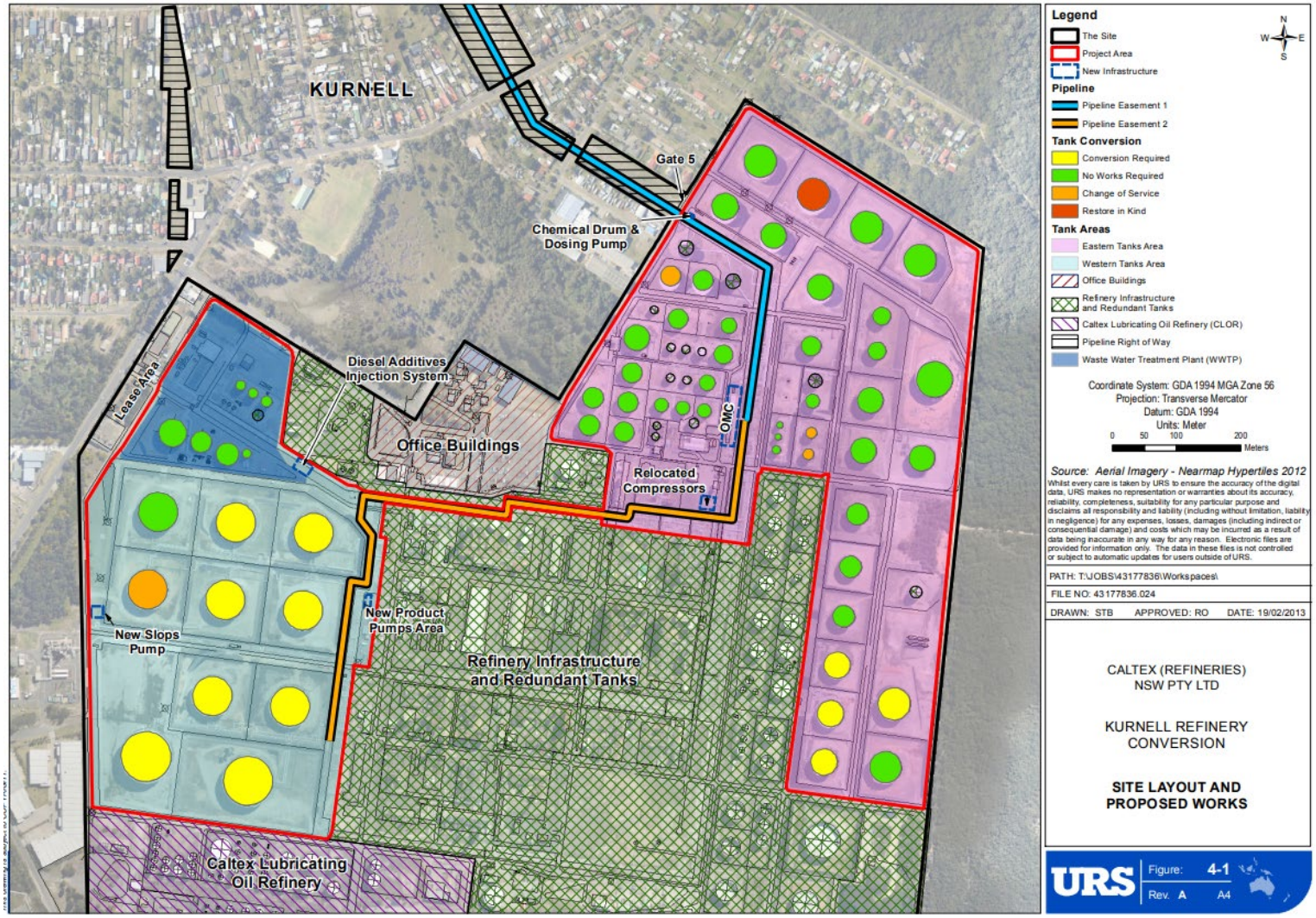


Figure C-1 Site Layout and Proposed Works

Tanks

Overview

The existing Site ~~has~~ **had** over 100 tanks used for storing crude oil, refined or finished product, other petroleum intermediate products and effluent water. Some of these tanks ~~would~~ remain**ed** in current service, some ~~would~~ change**d** service with no modifications required and some ~~would be~~ **were** modified to contain finished product when the refinery ~~is~~ **was** converted to a terminal.

Tanks that ~~do~~ **did** not require modification in order to change service ~~would have~~ **had** the tank levels drawn down to minimum and, in cases where product specifications would not **have** be**en** compromised, the new product ~~would be~~ **was** added to the tanks. In cases where product specifications could be compromised, the tank heel ~~would be~~ **was** safely emptied using a vacuum truck. The material removed ~~would be~~ **was** relocated to another product tank and the tank ~~would be~~ **was** filled with new material.

For tanks which require**d** modification in order to change service or ~~have~~ **had** reached their statutory inspection date (Turnaround and Inspection (T&I)) the works may **have** involve**d** some or all the following activities:

- shutdown of the tanks and associated infrastructure;
- removal of the existing product from the tanks;
- draining the excess product from the pipes connecting to the tanks;
- isolating and making safe any infrastructure and instrumentation that ~~is~~ **was** no longer required;
- upgrading control systems to improve efficiency; and
- modifications to the tanks including upgrades to the tank internals, roofs, nozzles, floors, manifolds and finished product distribution pipework where **it was** required.

Other works associated with the tank modifications (where required) include:

- installation of additional product quality controls; and
- upgrading safeguard systems.

The specific works required for those tanks that ~~would be~~ **were** converted to contain gasoline, diesel and jet fuel are outlined below.

Gasoline

The changes required for the conversion of heavy oil tanks to gasoline tanks involve the following works:

- The water draw-off system for the tank ~~would be~~ **was** evaluated and where required replaced.
- Installation of an internal floating roof (with air scoops, hinged covers and stainless mesh screens) and an external cone roof. These ~~would be~~ **were** installed where required. This arrangement ~~protects~~ **protected** gasoline from external contaminants, e.g. water, and ensures safer operation.
- Internal painting ~~would be~~ **was** undertaken for entire floor and shell up to the first strake only unless additional protection ~~is~~ **was** required. The external side of the tank ~~would be~~ **was** painted where required.
- Vent systems ~~would be~~ **were** designed and installed on the gasoline tanks in line with API 2000, API1650 and API1653.
- A sleeve on the slotted guide pole ~~would be~~ **was** installed on all converted EFRTs.
- Fire systems ~~would be~~ **were** modified as required to meet fire foam and water volume requirements.
- New power and signal cables, cable ladders, switchgear, instrumentation and electrical motors ~~would be~~ **were** installed where required.

No new mixers ~~would be~~ **were** installed in these tanks. Tank mixers ~~would be~~ **were** modified or replaced to meet requirements.

Diesel

The changes required for the conversion of crude oil tanks to diesel tanks involve**d** the following works:

- The water draw-off system for the tank ~~would be~~ **was** evaluated and where required replaced.
- The tank floor ~~would be~~ **was** evaluated and where required repaired or replaced.
- Vent systems ~~would be~~ **were** designed and installed on the diesel tanks in line with API 2000.
- Internal painting ~~would be~~ **was** undertaken for the entire floor up to 600 mm. The external side of the tank ~~would be~~ **was** painted where required.
- New power and signal cables, cable ladders, switchgear, instrumentation and electrical motors ~~would be~~ **were** installed where required.

No new mixers ~~would be~~ **were** installed in these tanks. The existing mixers ~~would be~~ **were** retained.

The roofs of all the tanks ~~would~~ remain**ed** as an external floating roof.

Jet Fuel

The changes required for the conversion of crude oil tanks to jet fuel tanks involve**d** the following works:

- The tank floor ~~would be~~ **was** replaced with a cone down floor.
- A fast flush system ~~would be~~ **was** installed to remove free water from the Jet Fuel.
- The tanks ~~would be~~ **were** fully painted internally to minimise the possibility of product contaminations due to shell/floor corrosion.
- New power and signal cables, cable ladders, switchgear, instrumentation and electrical motors ~~would be~~ **were** installed where required.
- Fire systems ~~would be~~ **were** modified as required to meet foam and water volume requirements.

No new mixers ~~would be~~ **were** installed in these tanks. The existing mixers ~~would be~~ **were** retained.

The fixed roof ~~would be~~ **was** retained on all of the tanks.

Tank Replacement

A tank in the Eastern Tank Area (refer to ~~Figure 4-1~~ **Figure C-1**) ~~is~~ **was** due for routine inspection and ~~would be~~ **was** restored in kind for service. This tank ~~currently sits~~ **sat** at ground level on a concrete ring beam pad. The restoration ~~would~~ involve**d**:

- dismantling the existing tank; and
- preparing a foundation for the new tank (which ~~would be~~ **was** the same size and shape as the existing tank) in the same location as the ~~current~~ **existing** base. This ~~would be~~ **was** prepared for a cone up tank floor. This type of tank floor ~~does~~ **did** not require major excavation works. Excavation depth ~~would~~ **did** not extend past half a metre below ground level.

Tank Conversion Summary

The tank conversion works described above ~~would~~ commence**d** in advance of recommissioning the tanks to receive imported finished product. These works ~~would be~~ **were** conducted throughout the construction phase. At the end of the conversion works there ~~would be~~ **was** a reduction in the total number of tanks required for the storage of finished product imports and terminal operations when compared to the number ~~currently~~ **previously** required for refinery operations. The tanks that are not required for terminal operations are shown on ~~Figure 4-1~~ **Figure C-1**. These tanks ~~would be~~ **were** emptied, isolated, cleaned and left with all manhole covers removed. The dismantling and remediation of the redundant tanks, if required, ~~would be~~ **was** subject to a separate approval process in consultation with Sutherland Shire Council and the NSW Environmental Protection Authority.

~~Table 4-1~~ **Table C-1** provides a summary of the final tankage use within the **Conversion** Project Area.

Table C-1 Terminal Tank Changes Summary

Proposed Tank Service	No. of Tanks Requiring Conversion*	No. of Tanks Requiring Change of Service
Gasoline	5	-
Diesel	4	1
Jet Fuel	4	-
Fuel Oil	0	0
Waste Water and SLOP	0	3
Total	13	4

Note: One tank in the Eastern Tank Area ~~would be~~ **was** restored in kind

Where it ~~has been~~ **was** identified that either a change of service or no works ~~are~~ **were** required for a tank, a T&I would be carried out for remaining tanks at a date which complies with statutory requirements for that tank. This ~~is~~ **was** a normal operating procedure at the Site. A T&I involves the following high level activities:

- removing the tank out of service and moving the product to another location;
- internally cleaning the tank to allow accurate inspection of the tank walls, floor and roof;
- preparing a scope of works based on the results of the inspection and taking into account the service period since the last tank T&I;
- undertaking repair works as required which may include tank repair, painting or further testing; and
- returning the tank to service with the proposed finished product.

Bunding

Bund Capacity

~~Caltex~~ **Ampol** ~~has~~ committed that the bunding capacity for tanks retained in service ~~would~~ ~~comply~~ **complied** with the requirements of AS1940.

The ~~current~~ **existing** inspection programs at the Site monitor**ed the** external bund walls and identify if repairs are required. The routine tank T&I program ~~(refer to Section 4.2.2)~~ ~~would~~ continue**d** through the conversion phase and into the operational phase of the **Conversion** Project. This program ~~includes~~ **included** inspections of and repairs to tank internal bund walls. The current tank T&I program ~~results~~ **resulted** in the inspection and required repairs of approximately 8 – 10 tanks per year.

Tank and Bund Floors

Of the tanks which ~~would~~ remain**ed** in hydrocarbon service, there ~~are~~ **were** some bund areas which ~~are~~ **were** of natural ground construction.

Any tank floors that ~~are~~ **were** rebuilt during the **Conversion** Project and during the ongoing operation of the terminal ~~would~~ incorporate**d** a tank underfloor liner. Four tanks ~~are currently~~ **were** scheduled as part of the **Conversion** Project to include new installation of tank underfloor liners.

Protection Measures

~~Caltex~~ **Ampol**'s focus during the construction and operation of the **Conversion** Project ~~would be~~ **was** on inspections, maintenance and spill prevention within the tank and tank bund areas. Extensive spill prevention measures ~~would continue to be~~ **were** incorporated into the operation of the **Conversion** Project.

The measures for tanks containing low flash materials include**d**:

- explosive vapour detectors within the bunds;

- triple infrared scanners on tank roofs; and
- CCTV in conjunction with infrared cameras as a confirmation for alarms.

All tanks on-site ~~would be~~ **were** subject to:

- an automated high level shut off system; and
- continuance of a comprehensive inspection/repair program.

In addition, in the unlikely event of a spill, the Site ~~has~~ **had** significant contingency arrangements, including tertiary containment capacity available within the oily wastewater system.

Pumps

Five new product transfer pumps ~~would be~~ **were** installed in the Western Tank Area. These pumps ~~would~~ service**d** the newly converted large diesel and jet fuel product tanks (refer to ~~Figure 4-1~~ **Figure C-1**). The product transfer pumps ~~would~~ consist**ed** of three jet fuel product pumps and two diesel pumps. They ~~would be~~ **were** located on the eastern side of the Western Tank Area (refer to ~~Figure 4-1~~ **Figure C-1**).

One new product transfer pump ~~would be~~ **was** located within the Western Tank Area to transfer Slop Oil. This pump ~~would be~~ **was** located on the western side of the Western Tank Area (refer to ~~Figure 4-1~~ **Figure C-1**).

Two new product transfer pumps ~~would be~~ **were** installed at the OMC to transfer slop oil and jet fuel respectively across the Site.

For each set of pumps new concrete foundations ~~would be~~ **were** installed.

Electrical / Instrumental Facilities

The instrumentation within the **Conversion** Project Area ~~would be~~ **was** upgraded as part of the **Conversion** Project. This work ~~would~~ include**d** upgrades to the:

- wharf and tank instrumentation and control systems to enable remote and automated control;
- electrical tracing would be implemented to maintain fuel oil temperatures;
- oil movements manifold systems and remote valves with segregated product distribution piping to respective tanks;
- power supplies to new pumps; and
- consolidated site electrical systems.

These works ~~would~~ all ~~occur~~ **occurred** within the existing Site footprint.

Refinery Infrastructure and Redundant Tanks

The **Conversion** Project ~~would~~ **did** not include the plant associated with the refining process. The tanks and refining infrastructure (in the area marked Refinery Infrastructure and Redundant Tanks shown on ~~Figure 4-1~~ **Figure C-1**) ~~would be~~ **was** shut down, depressurised, de-inventoried and left in situ in a staged manner.

The shut down, depressurisation, emptying, isolating and cleaning of the refinery plant ~~is~~ **was** a process that occurs as part of the T&I program on a continuous rotating basis as part of the maintenance program for the Site. ~~Caltex~~ **Ampol** has extensive documented procedures which are used routinely during T&I activities. These procedures enable all safety and environmental aspects (for example, air and noise emissions) of ~~this~~ **the** process to be monitored and managed in compliance with the EPL. Therefore, it is ~~Caltex~~ **Ampol**'s understanding that they ~~do~~ **did** not require approval to shut down, depressurise and de-i**n**ventory the refinery. The refinery infrastructure ~~would be~~ **was to be** shut down, depressurised, de-inventoried and left in situ in the second half of 2014.

The tanks that ~~are~~ **were** not required (i.e. the tanks located in the area marked Refinery Infrastructure and Redundant Tanks shown on ~~Figure 4-1~~ **Figure C-1**) ~~would be~~ **were** emptied, isolated, cleaned and left in situ with all manhole covers removed. As above, this process already ~~occurs~~ **occurred** as part of the T&I program on a continuous rotating basis as part of the maintenance program for the Site. This work ~~would~~ **was to** start in the second half of 2013 and be completed by the end of 2016.

The dismantling and remediation of the refinery infrastructure, redundant tanks (and any redundant ancillary infrastructure), if required, ~~would be~~ **was** subject to a separate approval process in consultation with Sutherland Shire Council and the NSW Environmental Protection Authority.

C.1.3 Construction Staging and Programme

Construction Programme

Following **the Conversion** Project Approval, construction works ~~are~~ **were** proposed to begin in Q3 2013. During the construction phase, the Site ~~would~~ still operate**d** as both a refinery and a terminal. Cessation of refinery operations ~~would occur~~ **occurred** in the second half of 2014. This ~~would be~~ **was** followed by continued conversion of some tanks and associated piping within the **Conversion** Project Area to hold finished products.

A high level schedule for conversion activities is shown in ~~Table 4-2~~ **Table C-2** below.

Table C-2 Proposed Construction Schedule

Task	Date
Detailed Engineering & Design Start	Mid 2012
Engineering & Design Completed	Q2 2013
Tank Conversions Start	Second half 2013
Installation of Piping, Pumps and Associated Infrastructure	Second half 2013
Construction on Piping Completed	Q2 2014
Kurnell Refinery Shutdown	Second half 2014
Continued Tank Conversions	End 2014 – end 2016
CONVERSION TO TERMINAL COMPLETED	December 2016

Working Hours

The majority of the conversion works ~~would be~~ **were** typically completed between 7.00 am to 10.00 pm seven days a week. However, some works consistent with ~~Caltex~~ **Ampol's** existing maintenance procedures ~~would need to occur~~ **needed to occur** over a 24 hour period.

The nature of the proposed works ~~are~~ **were** the same as the activities that ~~Caltex~~ **Ampol** carries out as part of their ongoing maintenance and T&I work. For the latter, the Site's existing Environmental Protection Licence (No. 837) (EPL) asks that ~~Caltex~~ **Ampol** ensure that any operational or maintenance activities on Site do not exceed 70 dB (A) between 7.00am and 10.00pm, and do not exceed 65 dB (A) between 10.00 pm and 7.00 am. The working hours for ~~any~~ **all** construction works that are the same as ongoing maintenance activities ~~would be~~ **were** governed by the noise limits presented in the relevant EPL for the Site.

Potential noise impacts related to the **Conversion** Project ~~are~~ **were** discussed further in Chapter 12 Noise and Vibration and Appendix F Noise and Vibration Impact Assessment **of the Conversion Project's Environmental Impact Statement (EIS)**.

Construction Traffic

The traffic generated by the **Conversion** Project ~~would~~ incorporate**d** a mix of construction plant vehicles, delivery vehicles and construction personnel movements. A summary of the construction vehicles and associated staff numbers that ~~would be~~ **was** required during the construction of the **Conversion** Project is summarised in ~~Table 4-3~~ **Table C-3**. Further detail ~~is~~ **was** provided in Chapter 16 Transport and Access **of the Conversion Projects EIS**.

Table C-3 Staff and Plant Requirements for Construction

Description		Daily Movements (return trips)	Peak Hour Trips
Heavy Vehicles	Construction Vehicles (Cranes/ semi-trailers etc.)	10	2
	Equipment/ Material Delivery Vehicles	10	2
Private vehicles	Construction Personnel*	140	140
Total		**160**	**144**
Heavy vehicle proportion		13%	3%

1 All personnel would arrive to site during the AM Peak Hour and depart during the PM Peak Hour;

2 Personnel would utilise their own private vehicle with no use of car-pooling or public transport;

3 Heavy vehicle movements would be evenly distributed throughout the hours of operation (10 hour workdays); and

4 All plant delivery vehicles are assumed to occur on the same day in order to produce a 'worst-case' scenario.

**Max number of construction staff (refer to ~~Table 4-4~~*

Table C-4*).*

C.1.4 Workforce

~~Table 4-4~~ **Table C-4** provides the workforce profile for the **Conversion** Project, including ~~current~~ **existing** and projected numbers during the construction and operation of the **Conversion** Project.

The ~~current~~ **existing** workforce, including ~~Caltex~~ **Ampol** employees and contractors ~~is~~ **was** approximately 885. This increases by up to 500 people during maintenance shutdown periods. These periods range from 8-12 weeks in duration.

During the peak construction year of the **Conversion** Project (2014), the workforce ~~would include~~ **was proposed to include** up to an additional 140 people on Site.

Following all construction works, and when the **Conversion** Project ~~is~~ **was** fully operational, there ~~would be~~ **were** approximately 100 people on Site, with an addition 90 people during maintenance shutdown periods.

Table C-4 Workforce Numbers (Current and Projected)

Workforce Numbers (Current and Projected)						
	2012[2]	2013	2014[3]	2015	2016	2017
~~Caltex~~ **Ampol** Employees	410	400	450[4]	40	45	45
Contractors	475	475	475	40	55	55
Original Project Construction	-	140	140	100	90	-
Total	**885**	**1,015**	**1,065**	**180[5]**	**190**	**100**
Maintenance Shutdown Periods[1]	500	0[6]	0[6]	0[6]	90	90
Total including Maintenance Activities	**1,385**	**1,015**	**1,065**	**180**	**280**	**190**

*1 Maintenance shutdown periods ~~are~~ **were** periodic and for short time frames (8-12 weeks).*

*2 ~~Current~~ **Previous** employee numbers at the Site.*

*3 2014 ~~would be~~ **was** the peak construction period. Additional personnel brought to the Site for the **Conversion** Project construction ~~would be~~ **were** a maximum of 140 personnel.*

*4 Additional ~~Caltex~~ **Ampol** Employees in 2014 ~~would be~~ **were** staff hired for terminal operations.*

5 The large reduction in numbers between 2014 and 2015 follows the cessation of refining at the Site. The increase in workforce numbers between 2015 and 2016 represents a gradual stabilisation of the terminal operational workforce.

*6 No maintenance shutdown periods ~~will occur~~ **occurred** during 2013 and 2015.*

C.1.5 Operation

Operation as a Terminal

Once the conversion ~~is~~ **was** complete, ~~Caltex~~ **Ampol** ~~would import~~ **imported** finished products (gasoline, jet fuel, diesel and fuel oil) through the two fixed berths at the existing wharf and the additional sub berth located in Botany Bay. These products ~~would be~~ **are** stored in existing and converted tanks.

The major product distribution systems would continue to operate in line with ~~current~~ **existing** practice, i.e. product would be pumped under Botany Bay to the Banksmeadow Terminal, the Sydney/ Newcastle pipeline or the Joint User Hydrant Installation (JUHI) at Sydney Airport for further distribution. Slop ~~would be~~ **is** out loaded to the wharf and transported via ship to be sold for reprocessing. Under typical operation, road transport of products from the Site ~~would~~ cease**d**. However, in exceptional circumstances some road transport of product ~~may be~~ **is** required.

With the cessation of the refining operation at the Site and the high levels of automation of the terminal, the number of employees on Site ~~would reduce~~ **reduced** (as described in Section ~~4.4~~ **C.1.4)**. These employees ~~would~~ operate in a shift arrangement 24 hours a day, 7 days a week.

Ongoing operational activities ~~would be~~ **are** undertaken on the Site. As described ~~in Section 4.2.2~~ **above** this ~~would~~ include**s** Tank T&I's.

C.1.6 Ancillary Facilities and Infrastructure

Electricity

The existing electricity infrastructure on Site ~~would be~~ **was** used to service the new terminal. Electricity usage ~~would~~ reduce**d** significantly following the shutdown of the refinery operations. However, some power ~~would~~ **was** still ~~be~~ required for operation of the terminal assets and general amenities.

Water and Stormwater / Wastewater management

The ~~current~~ **existing** Site operations consume approximately 6 megalitres (ML) of potable water per day. Approximately 90% of this consumption ~~would cease~~ **ceased** following shutdown of the refinery operations at the Site.

A further 1 Ml of potable water per day ~~is~~ **was** consumed for amenities. This volume ~~would reduce~~ **reduced** over time as the work force ~~declines~~ **declined**. The long term demand at the Site following the completion of the **Conversion** Project ~~is~~ **was** expected to reduce the overall potable water consumption by approximately 90%.

The drainage arrangements for the existing process plants ~~would be~~ **was** kept in service during the **Conversion** Project. Storm water runoff from paved areas ~~would~~ continue**d** to be routed to the Waste Water Treatment Plant (WWTP) on Site. No changes ~~are~~ **were** proposed to this system. Tank bunded areas and tank water draws ~~would~~ remain**ed** unchanged and flow from these sources ~~would~~ continue**d** to be processed through the WWTP.

Issues regarding water management on Site ~~are~~ **was** discussed further in Chapter 11 Surface Water, Wastewater and Flooding **of the Conversion Projects EIS**.

Sewers

Existing sewerage infrastructure ~~would~~ continue**d** to be used. It ~~is~~ **was** expected that the amount of sewerage generated by the Site would decrease significantly.

Road Access

Road access to the Site ~~would~~ remain**ed** unchanged. Vehicle (car and truck) usage ~~may~~ increase**d** marginally during initial conversion activities (2013-2014), but ~~would~~ decrease**d** following the termination of refining. Vehicle movements to and from the Site ~~would~~ continue**d** to decrease until full terminal operation ~~is~~ **was** established reflecting reduced employees, service groups, deliveries and tanker loading activities on Site. The changes to traffic movements ~~are~~ **was** discussed further in Chapter 16 Transport and Access **of the Conversion Projects EIS**.

Shipping Movements

The upgrade to the Port and Berthing Facility (SSD-5353) ~~would~~ allow**ed** flexibility in the size of the ships able to berth at the Kurnell Wharf. This flexibility ~~would see~~ **resulted in** an anticipated reduction in ships arriving at the facility by approximately 40% in 2020 (compared to 2011 figures). This reduction ~~would~~ occur**ed** progressively over the life of the **Conversion** Project.

C.1.7 Decommissioning

~~At this stage the~~ **The Conversion** Project ~~is~~ **was** unlikely to be decommissioned whilst there ~~is~~ **was** still a demand for finished petroleum products.

Continued maintenance and upgrade works ~~are likely to occur~~ **were anticipated to occur** over the ~~coming~~ **following** years which ~~would mean that~~ **allowed** the **Conversion** Project ~~would~~ **to** remain viable into the future. ~~These~~ **The** upgrade works ~~would be~~ **were** subject to relevant approvals and permits which ~~would be~~ **were** applied for prior to the works being undertaken as required.

In the event that the terminal ~~is~~ **was** no longer required, all decommissioning and restoration activities would be in accordance with applicable federal, state, and local permits, approvals and regulatory requirements and would be completed in accordance with existing licences and the relevant legislation and safeguards at the time. These works ~~are~~ **would be** subject to certain environmental approvals and safeguards, which would help ensure that any related work would be completed in a safe and appropriate manner.

C.2 Demolition works

C.2.1 Overview

The demolition works **(MOD-1)** ~~would~~ broadly involve**d** the following activities within the ~~demolition~~ **MOD-1** works area presented on ~~Figure 4-1~~ **Figure C-2**:

- Demolition, dismantling or removal of:
  - Refinery process units and associated infrastructure;
  - Redundant tanks and associated infrastructure;
  - Redundant pipe ways and above and underground pipelines; and
  - Redundant buildings and services
- Associated civil works with works outlined;
- Waste management activities including concrete crushing; and
- Returning the works areas to ground level

~~Figure 4-1~~ **Figure C-2** also shows the location of the ~~demolition~~ **MOD-1** works. The majority of the ~~demolition~~ **MOD-1** works ~~would be~~ **were** completed within the boundary of the Site (as defined by the EIS for SSD-5544). The exceptions of this include**d**:

- The removal of the Continental Carbon Pipeline which ~~is~~ **was** also located on land owned by ~~Caltex~~ **Ampol** to the south of the Site;
- Sections of the redundant pipelines that ~~run~~ **ran** through the western and eastern ROWs that ~~are~~ **were** located outside of the Site (i.e. under the roads that cross the ROWs and under Silver Beach); and
- The removal of the cooling water intake pipelines and associated infrastructure from the Kurnell Wharf

Landowners consent ~~is~~ **was** required for the works within the road reserves and Silver Beach (refer to Chapter 5 Legislation, Planning Policy and Approvals of **the MOD-1 Statement of Environment Effects (SEE))**. These works ~~would be~~ **were** completed following the shutdown, deinventorisation, and cleaning of redundant infrastructure.

The buildings and equipment ~~to be~~ **that were** demolished ~~have been~~ **were** determined with consideration of the Heritage Management Strategy (HMS). Refer to Section 16 Heritage and Appendix F Heritage Impact Assessment for more detail **the MOD-1 SEE**.

Following ~~the demolition~~ **MOD-1** works, the Site ~~would operate~~ **operated** as a finished product terminal. The ~~demolition~~ **MOD-1** works ~~would~~ support**ed** the operation of Site as a finished product import terminal, as approved by SSD-5544.

The Site ~~would not be~~ **was not** remediated as part of ~~this Project~~ **MOD-1**. Remediation work ~~would occur~~ **occurred** in consultation with relevant stakeholders and the relevant approvals ~~would be~~ **and was** sought at a later stage **(refer to Section C.3 and Section C.4)**.

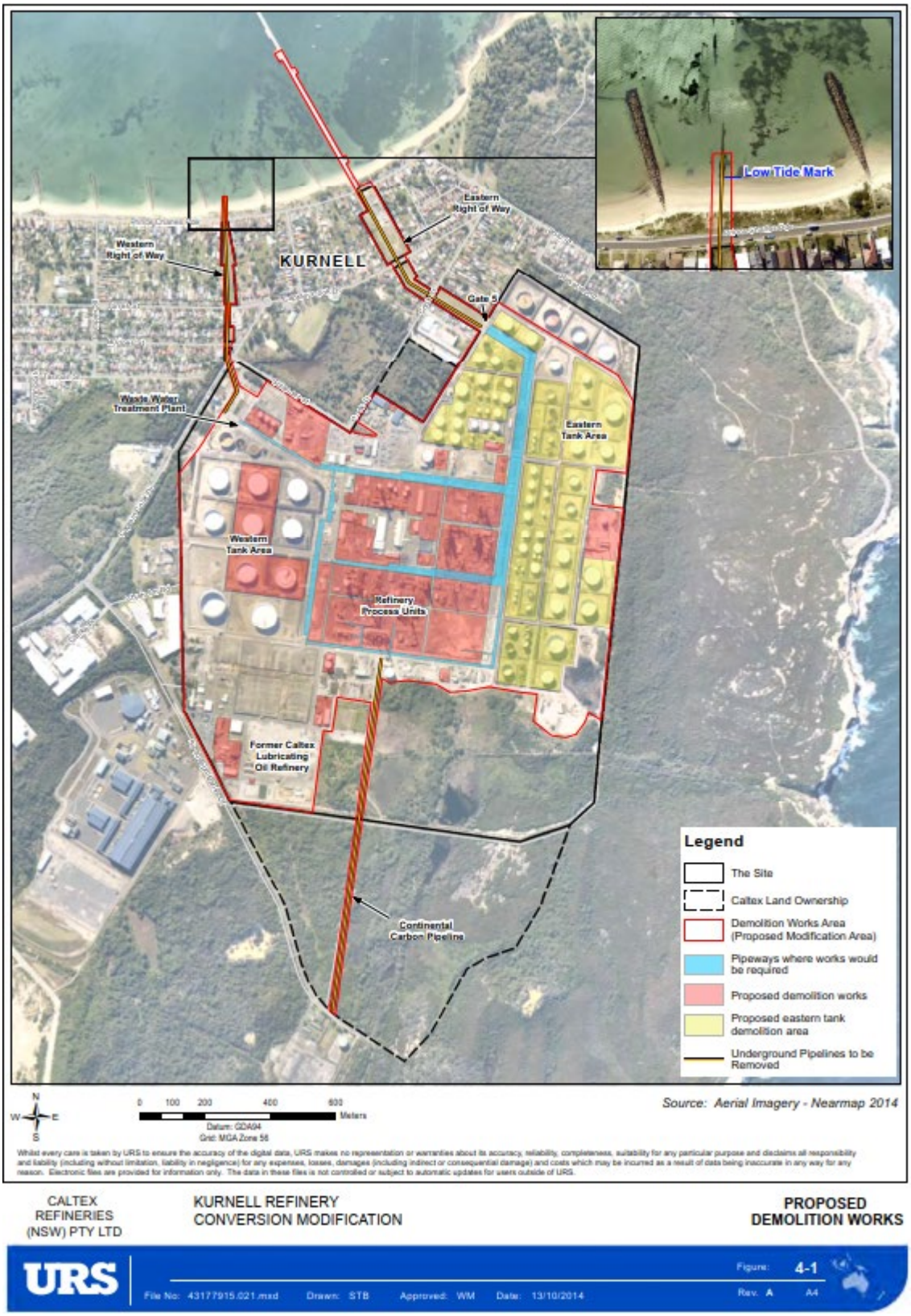


Figure C-2 Proposed ~~demolition~~ MOD-1 works

C.2.2 Refinery Process Units and Associated Infrastructure

~~This is the~~ **The** first stage of the ~~demolition~~ **MOD-1** works ~~and would~~ involve**d**:

- disconnection and removal of pipelines from the process units area;
- removal of insulation, corrosion protection materials and other building materials prior to demolition taking place;
- demolition of the refinery process units by lowering to a level where they can be more easily cut up using heavy machinery;
- intermediate storage of demolished material on the former Caltex Lubricating Oil Refinery (CLOR) as required prior to disposal, recycling or divestment;
- removal of the foundations and slabs below the process units; and
- removal of redundant cabling and some underground services including the Oily Water Sewer from the area beneath the refinery process units.

These demolition works ~~would~~ require**d** excavation work which ~~may~~ **had potential to** extend down to 2 metres below ground level (mbgl).

C.2.3 Tanks and Associated Infrastructure

~~This is the~~ **The** second stage of the ~~demolition~~ **MOD-1** works ~~and would~~ involve**d**:

- disconnection and removal of a number of tanks and vessels from both the eastern and western tank areas;
- demolition of the tanks using heavy machinery to cut them up;
- intermediate storage of the demolished material at the former CLOR prior to disposal or recycling; and
- removal of redundant infrastructure associated with the tanks (such as water draw equipment and pipelines).

~~These~~ The ~~demolition~~ **MOD-1** works ~~may require~~ **potentially required** excavation work which may extend down to 1 mbgl. The bunds associated with the demolished tanks ~~would~~ remain**ed** intact and in situ. Bund drainage ~~would be~~ **was** by manual drain valve actuation.

Within the Western Tank Area all of the tanks highlighted on ~~Figure 4-1~~ **Figure C-2** ~~would be~~ **were** demolished. Four tanks in the Western Tank Area that were approved under SSD-5544 for conversion, ~~are now~~ **were now** proposed for demolition **under MOD-1** (refer to ~~Figure 4-1~~ **Figure C-2**).

Within the Eastern Tank Area a maximum of 64 of the 77 tanks within the yellow highlighted area ~~would be~~ **were proposed to be** demolished (refer to ~~Figure 4-1~~ **Figure C-2**).

Following the tank demolition works, the fuel throughput ~~would be~~ **was anticipated to be** less than or equal to the approved throughput under the approved Project SSD-5544.

Tank 101 Demolition

The tank 101 demolition **(MOD-3)** works ~~are~~ **were** in addition to the **MOD-1** works described ~~in Chapter 3.0 Approved Project and ACS Management~~ **above**.

Tank 101 ~~is~~ **was** located on the north eastern corner of the Site (refer to ~~Figure 4-1~~ **Figure C-3**). The demolition of this tank ~~would be~~ **was** undertaken using the same approach used for the demolition of the other tanks under the approved demolition works (SSD-5544 MOD-1). The tank ~~has~~ **had** already been cleaned and ~~is currently~~ **was** empty awaiting demolition. The tank ~~is~~ **was** predominantly made of metal.

The **MOD-3** works to remove the tank include**d** the following activities:

- disconnection of the tank from the existing pipework;
- demolition and dismantling of Tank 101 and associated infrastructure;

- associated civil works with the works outlined above;
- intermediate storage of the demolished material at the former Caltex Lubricant Oil Refinery (CLOR) prior to disposal or recycling; and returning the works areas to ground level.

The works ~~are~~ **were** planned to be completed over a four week period in Q4 2017 as part of the wider program of the approved demolition works.

These works ~~may require~~ **potentially required** excavation extending down to 1 meter below ground level. The bund associated with the demolished tank ~~would remain~~ **remained** intact. Bund drainage ~~would~~ **was** not be affected by the works. The bund ~~would~~ still drain**ed** to the Site's oily water sewer.

The following equipment and plant ~~would be~~ **was** required to demolish Tank 101:

- Large Shearer
- Oxycutter
- Mobile 130T Crane
- Vacuum Truck or Trucks
- Concrete Crusher
- Excavator
- Jackhammer.

The majority of the work to demolish the tank itself ~~would be~~ **was** completed by an excavator and shear. ~~Figure 4-2, Figure 4-3 and Figure 4-~~**4 Figure C-4, Figure C-5 and Figure C-6** below show an excavator and shear demolishing a tank. No additional equipment or plant ~~would~~ **was** need**ed** to be bought to Site to complete these works. No additional staff ~~would be~~ **was** required on Site. ~~The demolition of Tank 101~~ **MOD-3** ~~would be~~ **was** completed by the contractors who ~~are currently~~ **were previously** completing the other demolition works. ~~The demolition of Tank 101~~ **MOD-3** ~~would be~~ **was** undertaken within the boundary of the Site. The presence of the relevant equipment and personnel at the Site means that an increase in traffic as a result of these works ~~is~~ **was** not anticipated. Traffic impacts ~~are~~ **were** discussed further in Section 12.4 **of the MOD-3 SEE**.

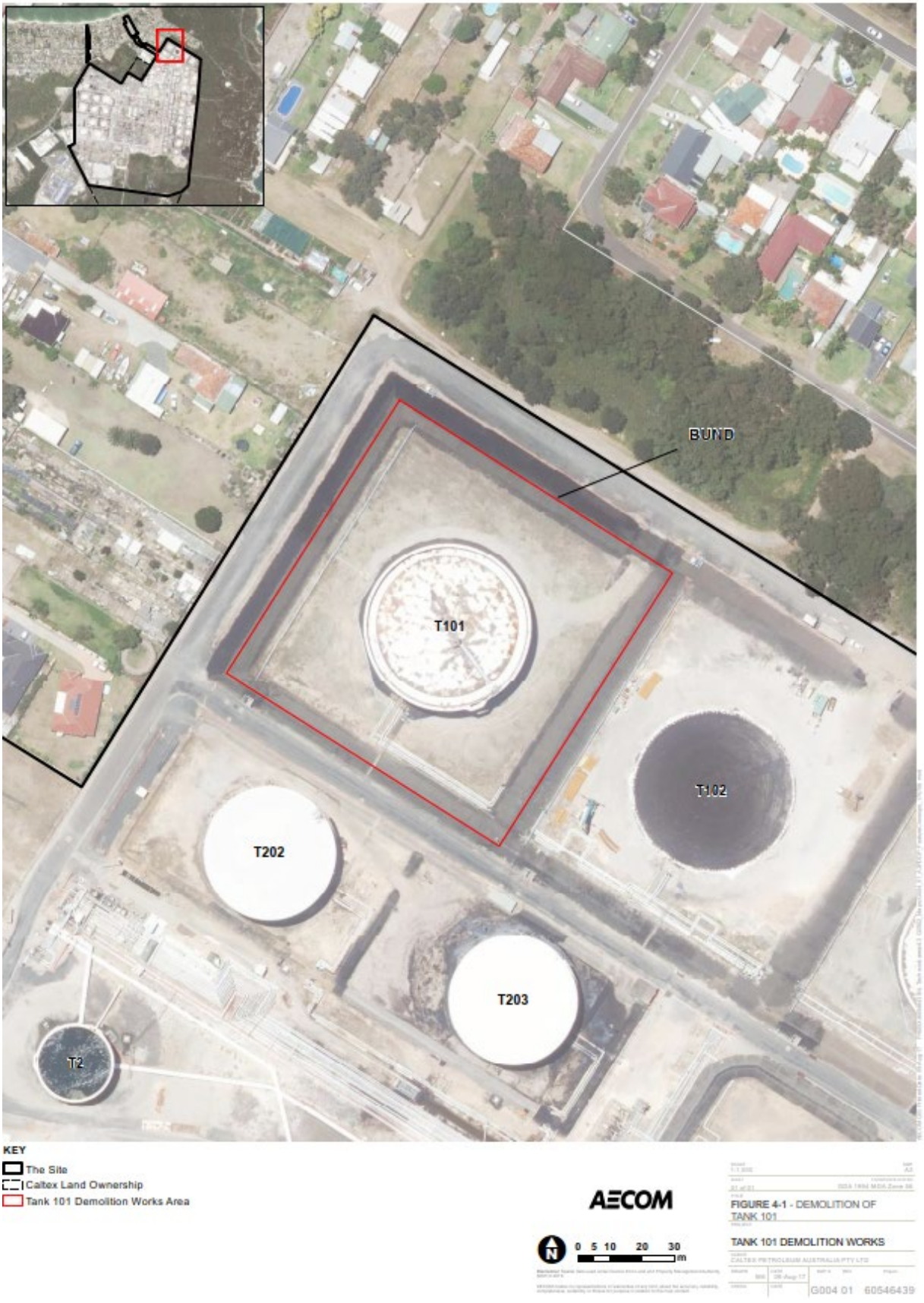


Figure C-3 Demolition of Tank 101

Figure C-4 Excavator/ shear Part 1

Figure C-5 Excavator/ shear part 2

Figure C-6 Excavator/ shear part 3

The ~~Tank 101 demolition~~ **MOD-3** works ~~would be~~ **were** completed in line with the Conditions of Consent for SSD-5544 and SSD-5544 MOD-1, in particular Conditions C18, C19 and C20. In summary:

- Construction to be undertaken between 7.00 am and 10.00 pm seven days a week (Condition C18);
- High noise generating construction and demolition works would be confined to less sensitive times of the day, and shall not be undertaken on Sundays or public holidays or outside the hours of 7.00 am to 6.00 pm Monday to Saturday (Condition C19); and
- Construction outside those hours would only be undertaken in certain circumstances as defined in Condition C20.

Given the proximity of Tank 101 to residential areas of Kurnell, ~~Caltex~~ **Ampol** ~~has~~ committed to completing these works during daytime hours in line with Condition 19. Potential noise impacts related to the Tank 101 demolition works ~~are~~ **was** discussed further in Chapter 9.0 Noise and Vibration and Appendix A Demolition Noise Assessment **of the MOD-3 SEE**.

Environmental Management

The ~~Tank 101 demolition~~ **MOD-3** works ~~would be~~ **were** undertaken in accordance with the existing Demolition Environmental Management Plan (DEMP) and associated sub-plans where applicable.

Operation

The operation of the Kurnell Terminal ~~would remain~~ **remained** as described in the Kurnell Refinery Conversion EIS **detailed above** ~~(URS, 2013)~~ and ~~would be~~ **was** consistent with the development consent for SSD-5544. The demolition of Tank 101 ~~would~~ **was** not **anticipated to** affect the operation of the terminal.

C.2.4 Pipelines/ Pipeways

The ~~demolition~~ **MOD-1** work ~~would~~ also include**d** the removal of seven underground pipelines. These pipelines include**d** the following:

- the cooling water outlet (CWO) running from the refinery through the Western Right of Way (ROW), under Silver Beach and into Botany Bay **(excluding approximately 35 meters of the CWO pipeline beneath the road reserve of Prince Charles Parade and the Silver Beach dune area, as consented under MOD-5 discussed below)**
- two cooling water intake lines running from the pumphouse on Kurnell Wharf through the Eastern ROW to the refinery;
- three redundant product lines running through the Eastern ROW; and
- the Continental Carbon pipeline running south from the Site.

The locations of these underground pipelines ~~are~~ **is** shown in orange on ~~Figure 4-1~~ **Figure C-2**. This figure also shows a close up of Silver Beach and the associated demolition works area.

Some pipeways ~~would~~ **were** also ~~be~~ removed as part of the ~~demolition~~ **MOD-1** works. This work ~~would~~ **was** all ~~be~~ above ground and within the refinery process area.

Once removed, redundant pipes and materials from the pipeways ~~would be~~ **was** stored at the former CLOR site prior to recycling or disposal.

The works to remove the underground pipelines ~~is~~ **are** discussed in more detail below.

Cooling Water Outlet

The cooling water outlet ~~would be~~ **was** removed from the Site, the Western ROW, the roads under which it passes in Kurnell, Silver Beach and part of Botany Bay (refer to ~~Figure 4-1~~ **Figure C-2**). This pipeline ~~is~~ **was** 1.8 m in diameter and ~~is~~ **was** made of reinforced concrete.

Within the Site and the Western ROW, the pipeline ~~would be~~ **was** excavated, removed and the surface returned to grade. Where the pipeline crosses Captain Cook Drive, Bridges Street, Torres Street and Prince Charles Parade, the roads ~~would be~~ **were** excavated, the pipeline removed and the roads restored in kind. The depth of excavation required for the removal of this pipeline ~~would be~~ **was** approximately 2 mbgl.

In addition to removing the pipeline from beneath the ROW and roads, the cooling water outlet pipeline ~~would~~ **was** also **proposed to** be removed from beneath Silver Beach north of Prince Charles Parade up to 20 m seaward from the low tide mark into Botany Bay. As noted, not all of the Cooling Water Pipeline ~~would be~~ **was** removed. Beyond 20 m from the low tide mark the rest of the pipeline ~~would be~~ **was proposed to be** left in situ. The remaining pipeline ~~is~~ **was** approximately 400 m in length.

The following works ~~are~~ **were** proposed to remove the cooling water outlet pipeline from Silver Beach.

- The pipeline would be excavated where it is covered with sediment/sand. The pipeline would be cut or dismantled at the original construction joints prior to lifting and removal. Where the pipeline needs to be cut into sections, excavations may be deeper (i.e. as deep as the pipe) than elsewhere (possibly only half the pipe height). Two divers ~~may be~~ **were potentially** required to complete the cutting.
- Once dismantled or cut, sections of the pipe would be lifted out of the sea bed. The preferred technique for lifting sections of pipe would be using a terrestrial backhoe with a lifting attachment given the shallow waters.
- Sections of pipe would be moved to the Western ROW for storage prior to being loaded onto a truck and transported to the main refinery site.
- Following removal of the pipeline, the backhoe would backfill the excavated area with suitable material to restore the sea bed profile. A gabion and geotextile material would be placed inside the landward end of the redundant pipe that would remain in Botany Bay to prevent sediments moving down into the pipe over time.

~~It is anticipated that the~~ **The** ~~proposed~~ **MOD-1** works at Silver Beach ~~would be~~ **were proposed to be** completed before the rest of the cooling water pipeline ~~is~~ **was** removed. This ~~would allow~~ **allowed** the ~~demolition~~ **MOD-1** contractor access to Silver Beach at the point where the Cooling Water Pipeline ~~is currently~~ **was** located, prior to it being removed.

Suitable backfill material ~~to be~~ **was** sourced and brought to Silver Beach to return the dunes, beach, intertidal and sub tidal areas to grade. The beach and dune areas ~~would~~ **were** also ~~be~~ rehabilitated (refer to Chapter 18 Coastal Processes **of the MOD-1 SEE**).

Retention of CWO

However~~, Caltex~~ **Ampol then** ~~are proposing~~ **proposed** to retain approximately 35 meters of the CWO pipeline beneath the road reserve of Prince Charles Parade and the Silver Beach dune area **(MOD-5). Refer to Figure C-7 for the location of the section of CWO to be retained.** Condition B16A of the Conditions of Consent for SSD-5544 (as modified) ~~requires~~ **required** ~~Caltex~~ **Ampol** to remove the CWO pipeline from beneath Silver Beach north of Prince Charles Parade and up to 20 metres (m) seaward from the low tide mark in Botany Bay. ~~Caltex~~ **Ampol** ~~has~~ **had** removed the majority of the CWO pipeline within this area including within the Western ROW to the south of Prince Charles Parade and to the north of the dune area beneath Silver Beach, however a portion ~~remains~~ **remained** beneath Prince Charles Parade and the dune area of Silver Beach.

The pipeline is 1.8 meters in diameter and ~~is~~ located approximately 4 metres below the ground surface. Works to remove the pipeline would require significant excavation of approximately 6 m in depth to facilitate its removal. This level of excavation in sandy soils creates a number of technical challenges. Essentially in order to complete the works concrete piles would be required to shore the excavation and remove the pipe. In essence concrete would be used to replace concrete, except that by removing this section of pipe the road and beach would also be affected.

It ~~has been~~ **was** agreed with Council that this approach ~~is~~ **was** impractical and as such, ~~Caltex~~ **Ampol** ~~has~~ capped this section of the pipeline, filled it with a flowable concrete grout and sealed it. This was completed as other parts of the pipeline were removed to ensure a large void was not left in the ground.

To allow for the retention of this section of pipeline, ~~Caltex~~ **Ampol** ~~are requesting~~ **requested** that Condition B16A be removed to allow for the retention of this part of the CWO pipeline.

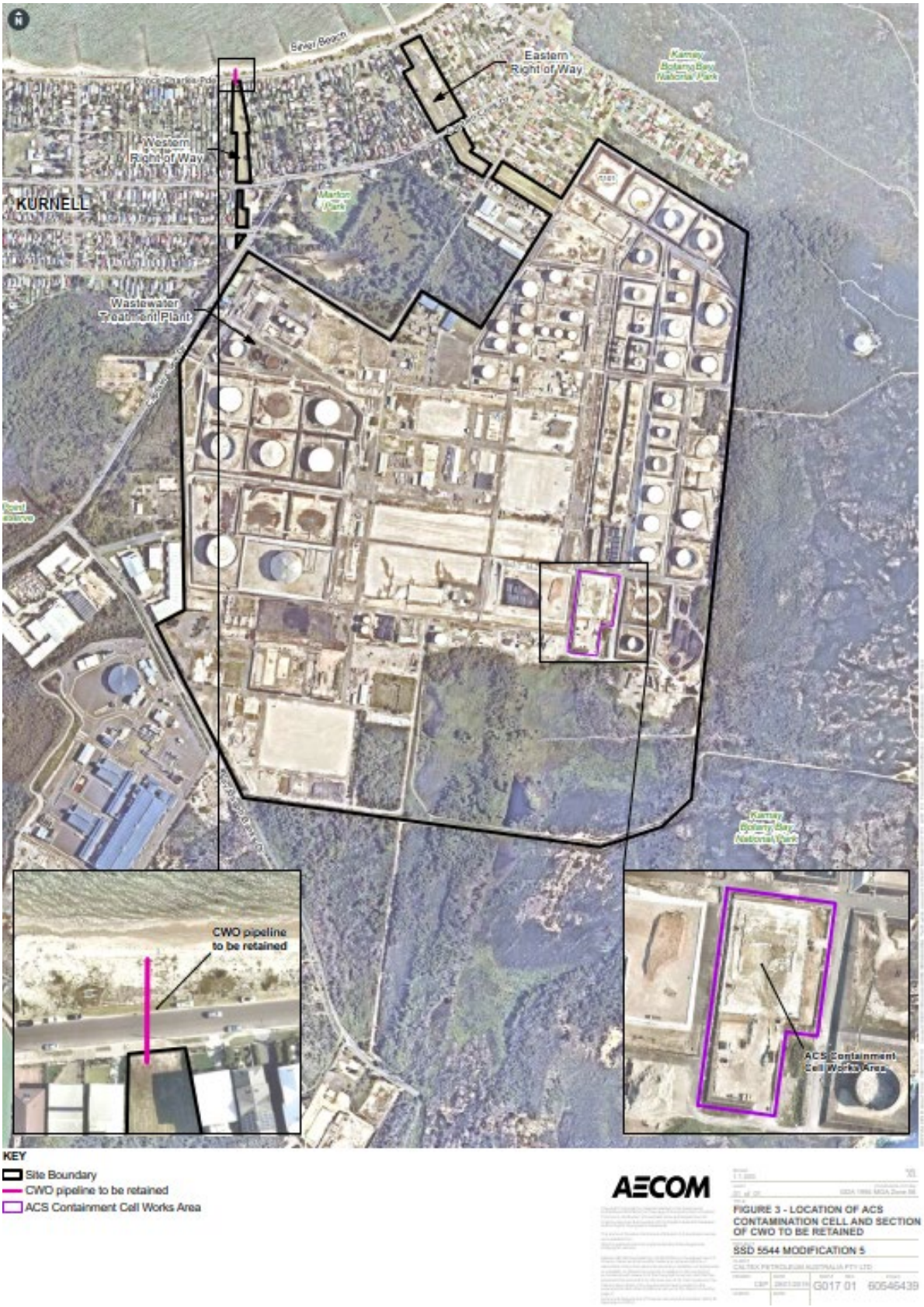


Figure C-7 Location of ACS contamination cell and section of CWO to be retained

Cooling Water Intakes and Product Pipelines

There ~~are~~ **were** five redundant pipelines to be removed from the Eastern ROW (refer to ~~Figure 4-1~~ **Figure C-2**). Two of these pipes ~~are~~ **were** the redundant cooling water inlet pipes which ~~are~~ **were** made from cement lined steel, and the other three ~~are~~ **were** redundant product pipelines ~~which are~~ fabricated from carbon steel pipe. These pipelines ~~run~~ **ran** from Gate 5 to Kurnell Wharf and are of varying diameters.

The removal of these pipelines ~~would require~~ **required** works on land owned by ~~Caltex~~ **Ampol** (including the Kurnell Wharf), and the road reserves associated with Cook St, Captain Cook Drive and Prince Charles Parade. In the Eastern ROW and in the road reserves, the six redundant pipelines ~~would be~~ **were** excavated, the pipelines removed and the surface returned to grade or the roads repaired in kind. The depth of excavation required for the removal of these pipelines ~~would be~~ **was** approximately 2 mbgl.

To the north of Prince Charles Parade, where the pipelines move from underground to aboveground and onto the wharf, only the two cooling water intake pipelines ~~would be~~ **were** removed. The four redundant product pipelines ~~would~~ remain**ed** on the wharf. The cooling water intake pipelines ~~would be~~ **were** removed from their supports, cut into sections and moved by a barge crane on to a truck located on the wharf.

Continental Carbon Pipeline

The Continental Carbon Pipeline ~~would be~~ **was** removed from the southern section of the Site and within Lot 2 DP215818. This land is owned by ~~Caltex~~ **Ampol**.

This redundant pipeline ~~would be~~ **was** excavated, removed and the surface returned to grade. The depth of excavation required for the removal of this pipeline ~~would be~~ **was** approximately 2 mbgl.

C.2.5 Buildings

The **MOD-1** building demolition work ~~would be~~ **was** likely to commence later than the other demolition activities. This work ~~would~~ involv**ed**:

- the demolition and removal of a number of redundant buildings on Site related to the operation of the refinery as shown on ~~Figure 4-1~~ **Figure C-2**;
- demolition ~~would be~~ **were** undertaken using heavy machinery such as bulldozers and hydraulic excavators;
- intermediate storage of the demolished material at the CLOR prior to disposal or recycling; and removal of foundations and services associated with the redundant buildings.

These demolition works ~~may~~ **potentially** require**d** excavation work which may extend down to 1 mbgl.

C.2.6 Services

Redundant cabling and underground services associated with the redundant infrastructure in the refinery process area and redundant buildings across the Site ~~would~~ **was** also ~~be~~ removed. These services include**d**:

- connection points and underground pipes to the Oily Water Sewer beneath the refinery process units; and
- redundant sewer lines and cabling from redundant buildings that included amenities.

C.2.7 Demolition Staging and Program

Demolition Program

~~Caltex is planning~~ **Ampol planned** to commence the ~~demolition~~ **MOD-1** works during the second half of 2015. The ~~demolition~~ **MOD-1** works ~~are~~ **were** ~~likely~~ **anticipated** to be completed by the end of 2017.

The interaction between the conversion works program and the ~~demolition~~ **MOD-1** works program is presented in ~~Table 4-1~~

Table C-5. By the time that the ~~demolition~~ **MOD-1** works commence, the only conversion works **anticipated to** still ~~being~~ **be** completed ~~will~~ **were** relate**d** to the conversion of certain tanks across the Site.

Demolition Program extension

However, **due to the** uncertainty regarding the future butane assets and the confirmation regarding their proposed removal ~~has resulted in~~ a delay to ~~demolition~~ **the MOD-1** works program **occurred**. ~~Caltex~~ **Ampol** ~~has~~ **had** removed or demolished the majority of above ground redundant infrastructure and ~~is~~ **was** in the process of demolishing certain buildings, completing various civil works (e.g. below ground infrastructure removal, grading land etc.) and waste management activities across the Site to finalise the demolition works prior to 10 August 2018. **However,** the need to ~~now~~ demolish the butane assets ~~has~~ meant that these assets ~~now need~~ **needed** to be removed prior to the remaining works at the Site being completed. Completing these works **was** required to remove these assets safely ~~and then~~ **indicating that** completing the remaining civil works ~~is~~ **was** not possible prior to 10 August 2018 in line with Condition B7A of SSD-554.

On this basis ~~Caltex~~ **Ampol** ~~is now seeking~~ **sought** consent for a further modification of SSD-5544 to extend the duration of the demolition period by an additional ten months **(MOD-4).** The proposed extension ~~would~~ accommodate**d** both the demolition of the butane assets as well as the remining activities consented under MOD-1. This ~~would allow~~ **allowed** for the most orderly, safe and economic programming of demolition works across the Site. This proposed change would be considered ~~modification four (~~MOD-4~~)~~ to the original consent SSD-5544.

~~The modification would involve~~ **MOD-4 involved** amending condition of consent B7A of SSD-5544. ~~This~~ **The** condition ~~currently states~~ **previously stated**:

"B7A. The demolition works associated with the development shall not extend beyond three (3) years from the date of consent for MOD-1"

~~We~~ **Ampol** ~~are seeking~~ **sought** consent to amend ~~this~~ **the** condition to state:

"B7A. The demolition works associated with the development shall not extend beyond fort-six (46) months from the date of consent of MOD-1"

The proposed schedule to complete the demolition works **(including MOD-1 and MOD-4)** is provided in ~~Table 1~~

Table C-5 below.

Table C-5 Proposed conversion and demolition schedule

Task	Timing
Conversion Works	
Detailed Engineering & Design Start	Mid 2012
Engineering & Design Completed	Second half 2013
Tank Conversions Start	Q1 2014
Installation of Piping, Pumps and Associated Infrastructure	Q1 2014
Construction on Piping Completed	Q2 2014
Kurnell Refinery Shutdown	Q4 2014

Task	Timing
Kurnell Refinery Decommissioning Process Units	First half 2015
Kurnell Refinery Decommissioning Tanks and lines	2015 – Mid 2016
Continued Tank Conversions	End 2014 – end 2016
CONVERSION TO TERMINAL COMPLETED	December 2016
Demolition Works*	
Demolition of refinery process units **(excluding butane assets)**	~~Mid 2015 – Mid 2017~~ **Complete**
Demolition of **redundant** tanks **(excluding butane assets)**	~~Mid 2016 – End 2017~~ **Complete**
~~Pipeline~~ Removal **of redundant pipelines**	Start 2016 ~~– End 2017~~ **to Mid 2018**
Demolition and removal or butane assets	**May 2018 to September 2018**
Demolition **of remaining** buildings	~~Mid 2016 – End 2017~~ **July 2018 to December 2018**
~~Concrete Crushing~~	~~End 2017~~
Final tank removals (last three tanks)	**January 2019 to February 2019**
Final waste processing (scrap, concrete, etc.)	**October 2018 to March 2019**
Final civil works (currently 50% complete)	**November 2018 to April 2019**

*Depending on timing of development consent.

C.2.8 Working Hours

The working hours ~~would be~~ **were** in line with the Conditions of Consent for SSD-5544, in particular Conditions C18, C19 and C20. In summary:

- Construction to be completed between 7.00 am and 10.00 pm seven days a week (Condition C18);
- High noise generating construction works would be confined to less sensitive times of the day and not outside the hours of 7.00 am to 6.00 pm Monday to Saturday (Condition C19); and
- Construction outside those hours would only be undertaken in certain circumstances as defined in Condition C20.

As the pipeline removal works within the ROWs ~~would occur~~ **occurred** close to residential receptors these works ~~would be~~ **were** confined to 7.00 am to 6.00 pm Monday to Saturday as per Condition C19.

Potential noise impacts related to the ~~demolition~~ **MOD-1** works ~~are~~ **were** discussed further in Chapter 13 Noise and Vibration and Appendix E Noise and Vibration Impact Assessment **of the MOD-1 SEE**.

C.2.9 Demolition Traffic

The traffic generated by the ~~demolition~~ **MOD1** works ~~would~~ incorporate**d** a mix of construction plant vehicles and construction personnel movements. Access ~~would~~ remain**ed** the same as for the conversion works with access to the main refinery site only undertaken from Solander Street, Kurnell.

In addition to construction personnel movements, the ~~demolition~~ **MOD-1** works ~~are~~ **were** likely to result in approximately 2,675 additional heavy vehicle movements to and from the Site between 2015 and 2017. This equates to approximately 6 heavy vehicle movements a day on average with a peak of 30 additional movements on any one day. Further detail is provided in Chapter 15 Transport and Access **of the MOD1 SEE**.

C.2.10 Workforce

The ~~demolition~~ **MOD-1** works ~~would~~ result**ed** in an increase of approximately 230 employees at the Site in 2015 and 130 contractors for 2016 and 2017. These workers ~~would be~~ **were** in addition to the workforce numbers presented in Section ~~3.3.4~~ **C.1.4** for these three years and shown in ~~Table 3-4~~ **Table C-4.** As demonstrated in ~~Table 3-4~~ **Table C-6** the cumulative number of workers at the Site for 2015 to 2017 (410 maximum) ~~would~~ **were** still ~~be~~ significantly lower than the workforce present in 2012 (1,385 maximum).

Table C-6 Workforce Numbers (Current and Projected) – Conversion and Demolition Works

Workforce Numbers (Current and Projected)							
	2012[2]	2013	2014[3]	2015	2016	2017	2018
~~Caltex~~ **Ampol** Employees	410	400	450[4]	40	45	45	45
Contractors	475	475	475	40	55	55	55
Conversion works construction numbers	-	140	140	100	90	-	
Demolition works construction numbers				230	130	130	
Total	**885**	**1,015**	**1,065**	**410[5]**	**320**	**230**	**100**
Maintenance Shutdown Periods[1]	500	0[6]	0[6]	0[6]	90	90	90
Total including Maintenance Activities	**1,385**	**1,015**	**1,065**	**410**	**410**	**320**	**190**

*1 Maintenance shutdown periods ~~are~~ **were** periodic and for short time frames (8-12 weeks).*

2 Employee numbers at the Site in 2012.

*3 2014 ~~would be~~ **was** the peak construction period. Additional personnel brought to the Site for the **Conversion** Project construction ~~would be~~ **were** a maximum of 140 personnel.*

*4 Additional ~~Caltex~~ **Ampol** Employees in 2014 ~~would be~~ **were** staff hired for terminal operations.*

5 The large reduction in numbers between 2014 and 2015 follows the cessation of refining at the Site. The increase in workforce numbers between 2015 and 2016 represents a gradual stabilisation of the terminal operational workforce.

*6 No maintenance shutdown periods ~~will occur~~ **occurred** during 2013 and 2015.*

C.2.11 Demolition Material Management

The ~~demolition~~ **MOD-1** works ~~would~~ result**ed** in the production of a number of waste streams. ~~Caltex's~~ **Ampols** target ~~is~~ **was** to recycle as much waste material as possible and where possible reuse it at the Site. As demolition works progress**ed**, materials ~~would be~~ **were** classified in line with the Waste Classification Guidelines (DECCW, 2009) and stored in identified areas on Site prior to being reused, recycled or disposed.

Demolition materials ~~would be~~ **were** managed and stored on Site at the former CLOR prior to being either recycled (e.g. steel, alloys, copper etc.) or disposed offsite.

Further detail on the management of this process is provided in Chapter 11 Waste Management **of the MOD-1 SEE**.

C.2.12 Concrete Crushing

Concrete that ~~is~~ **was** produced during the ~~demolition~~ **MOD-1** works ~~would be~~ **was** reused on Site where possible and appropriate. The concrete ~~would be~~ **was** crushed at the end of the ~~demolition~~ **MOD-1** program on the former CLOR site (refer to ~~Figure 4-1~~ **Figure C-2**) and used as an aggregate to cover areas where structures and buildings ~~have been~~ **were** removed.

Further detail on the management of this process is provided in Chapter 11 Waste Management and Chapter 14 Air Quality and Odour **of the MOD-1 SEE**.

C.2.13 Spoil Management

As the works progress**ed**, the soil removed during the excavation work ~~would be~~ **was** stockpiled and, where appropriate, reused as backfill. Along pipeline routes, excavation ~~would occur~~ **occurred** in discrete sections, so that the length of time temporary stockpiles are required is minimised.

Soils ~~would be~~ **were** checked for contamination and odour as they ~~are~~ **were** excavated. Soils considered contaminated ~~would be~~ **were** stored at the former CLOR site. These soils ~~would be~~ **were** placed in stockpiles and appropriately bunded and managed.

Where no contamination issues ~~are~~ **were** identified, excavated material ~~would be~~ **was** used as backfill to bring the excavated area back to grade as soon as practicable. If required, Virgin Excavated Natural Material, Excavated Natural Material or appropriately remediated soils ~~would be~~ **was** brought to the ~~demolition~~ **MOD-1** works area and used to provide additional backfill material.

Chapter 9 Soils, Groundwater and Contamination **of the MOD-1 SEE** provides further detail on the mitigation measures that ~~would be~~ **were** implemented to minimise impact related to the excavation works.

C.2.14 Operation

The operation of the Kurnell Terminal ~~would be~~ **was** as described in the Kurnell Refinery Conversion EIS (URS, 2013) and ~~would be~~ **was** consistent with the development consent for SSD-5544 **(refer to Section C.1.5)**.

C.3 Asbestos Containment Cell management works

C.3.1 Overview

The **Asbestos Containment Cell (**ACS**)** Modification works **(MOD-2)** ~~would~~ broadly involve**d** the following activities within the ACS Modification works area presented in ~~**Figure 1-2**~~ **Figure C-8**:

- Construction:
  - Additional soil sampling within the pipeways to further improve the accuracy of waste classification of the soil prior to placement in the Containment Cell or ACS biopile;
  - Construction of the Containment Cell base and leachate collection system in the proposed cell location;
  - Installation of ground water monitoring wells down gradient of the proposed cell location;
  - Excavation and transportation of ACSs that ~~have been~~ **were** classified as general or restricted solid waste directly to the Containment Cell location for emplacement;
  - Excavation and transportation of ACSs from the pipeways that ~~have been~~ **were** classified as hazardous waste to be managed in one of the following ways:
    - Biopile the soil to process it until it ~~can be~~ **was** classified as 'restricted solid waste' at a minimum and added to the Containment Cell; or
    - Removal off-site for treatment and disposal at an appropriately licenced facility in the event that biopiling ~~does~~ **did** not effectively reduce the level of contaminants to a restricted level in the required timeframe.
  - Filling and compaction of the ACSs into the Containment Cell;
  - Environmental management of both the Containment Cell and the temporary ACS biopile areas;
  - Verifying the removal of ACS from the pipeways; and
  - Closure of the Containment Cell.
- Operation:
  - Managing and monitoring the closed Containment Cell.

The preferred approach to managing the ACSs that are classified as hazardous waste ~~would be~~ **was** to biopile them on Site in order to reduce the level of hydrocarbons by biodegradation to a level where the soils can be classified as restricted solid waste. Whilst this method ~~is~~ **was** expected to be successful based on previous examples, this assessment has included the option of removing these soils from the Site to a licenced waste facility as a contingency measure.

It ~~is~~ **was** proposed that the Containment Cell would predominantly be used to dispose of ACSs from the pipeways in order to remove the hygiene risk and remove the WHS Regulation Exemption. However, ~~Caltex~~ **Ampol** ~~are~~ also ~~proposing~~ **proposed** to dispose of ACSs from other parts of the Site if there is available capacity following disposal of the pipeway ACSs. These ACSs ~~would~~ need**ed** to be classified as either Special General Solid Waste or Special Restricted Solid Waste. All soils that ~~would be~~ **were** placed within the Containment Cell or in the ACS biopile ~~would~~ **were** only ~~be~~ sourced from the Site. No material from off site ~~would be~~ **was** accepted in either the Containment Cell or in the ACS biopile.

Equally, it's important to note that SSD-5544 MOD-1 provided consent for the excavation, handling, management and transport of ACS at the Site. As such, the modification for the ~~ACS Modification~~ **MOD-2** works ~~does~~ **did** not require consent for the excavation, handling and transport of ACS from other parts of the Site (i.e. outside of the pipeways) to the Containment Cell. Indeed, as the ~~demolition~~ **MOD-1** works assessed the management of contaminated soils and ACS, the DEMP that ~~is being~~ **was** used to manage these works ~~contains~~ **contained** a large number of measures that ~~would be~~ **were** relevant to the ~~ACS Modification~~ **MOD-2** works.

The **MOD-2** works to construct, fill and close the cell ~~are~~ **were** estimated to take approximately 18 months. The ACS biopiling works ~~are~~ **were** expected to take approximately 11 months.

The capital investment value for the ~~ACS Modification~~ **MOD-2** works ~~is~~ **was** $13.5 million.

Concept design drawings for the Containment Cell are provided in **Appendix B of the MOD-2 SEE**.

C.3.2 Investigations and design

Soil

Soil Classification

Prior to the commencement of the construction works, further soil sampling ~~would be~~ **was** undertaken to:

- to further improve the accuracy of waste classification of the soil for ongoing management, either to be placed into the cell directly, or to be processed in the ACS biopile; and
- to confirm the volume of soil classified as hazardous for processing at the ACS biopile and the characteristics of the soil to determine the appropriate biopiling process.

Section 4.4.3 **of the MOD-2 SEE** outlines the different management options for hazardous waste.

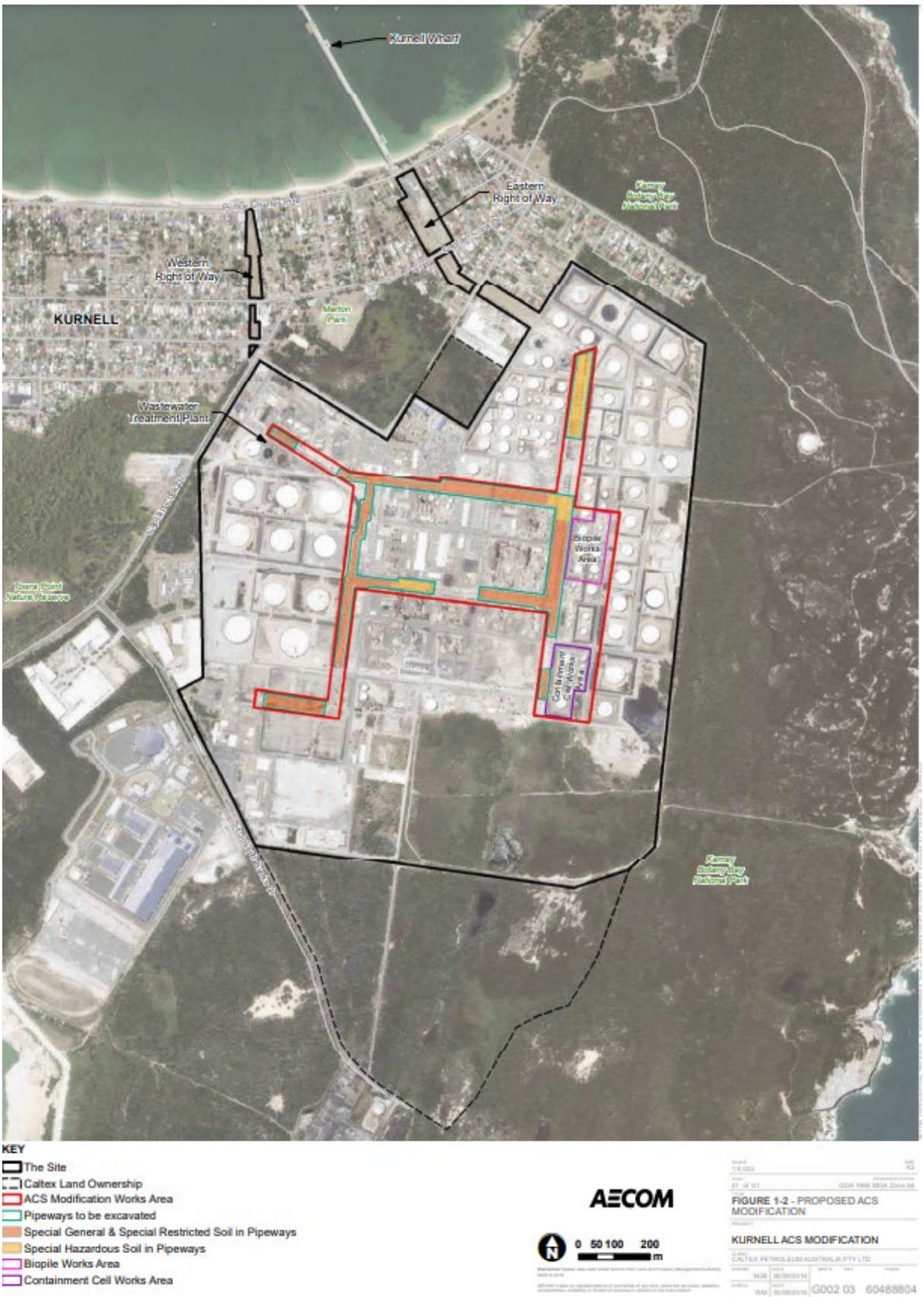


Figure C-8 Proposed ~~ASC Modification~~ MOD-2

Soil Volumes

Based on the review of the data provided in the *Pipeways Waste Classification Report* (AECOM, 2016a), the soils within the pipeways were classified in accordance with the Waste Classification Guidelines. The extent of each of these areas is shown on ~~**Figure 1-2**~~ **Figure C-8**. The calculated volumes are listed in ~~**Table 1-4**~~ **Table C-7** below.

Table C-7 Kurnell Pipeways – Waste Classification and Estimated Waste Volume***

Soil Category*		Area (ha)	Volume[1] (m^3)	Mass (tonnes)**
1	Soil - asbestos not detected	3.48	6,955	-
2	Special Waste (Asbestos)/ General Solid Waste	3.57	7,960	10,600
3	Special Waste (Asbestos)/ Restricted Solid Waste	1.15	2,308	3,100
4	Special Waste (Asbestos)/ Hazardous Waste	1.44	2,880	3,850

**Waste Classification based on the Waste Classification Guidelines (EPA, 2014).*

***The conversion density used for soil from m^3 to tonnes is 1.34 t/m^3 based on the average minimum dry density tests carried out for soils located at the proposed asbestos Containment Cell area and assuming a moisture content of 5%.*

****Testing was focused on the pipeways as this was subject to the WHS Exemption. However other parts of the Site are also known to contain asbestos.*

Proposed Cell Location

In order to determine the most suitable location for the proposed Containment Cell an options analysis was undertaken (AECOM, 2016b). The proposed ~~located~~ **location**, as shown in ~~**Figure 1-2**~~ **Figure C-8** and ~~**Figure 1-3**~~ **Figure C-10,** was identified as the preferred location based on the following characteristics:

- The area is bunded area:
- . has an area of 11,398 m^2;
- is 268 m away from Kamay Botany Bay National Park;
- is 931 m away from residential dwellings;
- is 540 m away from commercial offices;
- is 650 m away from the SSRF (reducing cross contamination risks); and
- is within 13 m from the pipeways containing ACS

Furthermore, the area ~~provides~~ **provided** easy access from all sides and ~~is~~ **was** within the same area as the land farm, aligning with the current waste management use of this part of the Site.

The proposed cell location ~~is~~ **was** contained within the existing tank bunds for tanks 224 and 225 and the majority of the bunded area for tanks 333, 334 and 335. The tanks ~~have been~~ **were** demolished and associated infrastructure removed as part of the ~~demolition~~ **MOD-2** works.

The Kurnell Terminal Geotechnical / ESA (AECOM, 2016c) identified that the geotechnical and environmental ground conditions ~~would be~~ **were** suitable for construction of a Containment Cell within this location. Constraints associated with the shallow groundwater and bedrock preclude constructing a below ground Containment Cell. As such an aboveground Containment Cell ~~is~~ **was** proposed.

Cell Design and Capacity

Based on review of the data provided in the *Pipeways Waste Classification Report* (AECOM, 2016a), the Containment Cell ~~has been~~ **was** designed to create a maximum airspace capacity for up to 24,500 tonnes of ACS.

The 24,500 tonnes ~~has been~~ **was** determined based on the following:

- 10,600 tonnes of Special General Solid Waste;
- 3,100 tonnes of Special Restricted Solid Waste;
- 3,850 tonnes of Special Hazardous Waste (assuming this volume ~~can~~ **could** be successfully treated to allow re-classification as Special Restricted Solid Waste); and
- A 40% contingency which allows for sensitivity in soil density, potential use of daily cover soils during waste placement and space for other ACS from other parts of the Site if required.

Based on an average maximum wet density of 1.6 t/m^3; a 24,500 tonne capacity Containment Cell ~~would require~~ **required** a waste containment volume of approximately 15,300 m^3. This airspace volume ~~has been~~ **was** allowed between the top of the leachate barrier system and the underside of the capping layer.

The highest classification of waste to be contained within the Containment Cell is Special Restricted Solid Waste, and therefore the Containment Cell ~~has been~~ **was** designed in accordance with the requirements for a restricted landfill cell. The concept design of the proposed Containment Cell ~~has been~~ **was** prepared generally in accordance with the NSW *EPA Environmental Guidelines: Solid Waste Landfills, second edition 2016* (the Landfill Guidelines) (refer to **Appendix B of the MOD2 SEE**).

Increase in ASC Containment Cell Capacity

The lowest point within the ASC Containment Cell is the base of the leachate sumps. The original design **(MOD-2)** set the base of the leachate slumps at the approximate existing ground level. **However,** during detailed design it was confirmed that this approach would ~~however~~ require a significant volume of subgrade fill to be placed to create suitable grades to drain leachate to the sumps in accordance with the *Environmental Guidelines for Solid Waste Landfills* (EPA, 2016) (EPA Guidelines).

To reduce the volume of subgrade fill required, the base level of the leachate sumps was set below the existing ground level but above the limit of consent of 500 mm below ground surface (refer to Section 8.3.4 of the ~~ASC Management Project~~ **MOD-2** SEE (AECOM, 2016)). This limit was put in place to ensure that the base of the cell ~~does~~ **did** not interact with groundwater.

Setting the base level of leachate sumps below the existing ground level allowed the existing soil at the cell to be used to grade the base of the cell. ~~This~~ **The** lowering of the base of leachate sumps did not include a change in the grade of leachate drainage surfaces which continue**d** to comply with EPA guidelines.

~~The result of this~~ **This** change ~~has~~ resulted in an increase in the volumetric capacity of the cell from 15,300 m^3 to approximately 22,240 m^3 **(MOD-5),** as the final cap levels remain as per the original **MOD-2** design**.**

The as built design of the ASC Containment Cell, including the lowered leachate sumps, was approved by the EPA site auditor as part of the review of the Remedial Action Plan (RAP) for the ~~ACS management~~ **MOD-2** works.

This change ~~does~~ **did** not involve a modification to the conditions of consent. The design and works to fill and close the cell ~~will~~ remain**ed** as presented in the SEE and RAP for the ~~ASC management~~ **MOD-2** works. The only change ~~will be~~ **was** an increase in the time the cell ~~is~~ **was** open as it ~~will take~~ **was anticipated to take** longer to fill. ~~Should this modification be approve~~d, **M**inor updates to the relevant managed plants ~~would be~~ **were** required ~~but~~ **however** the majority of content ~~would~~ remain**ed** the same.

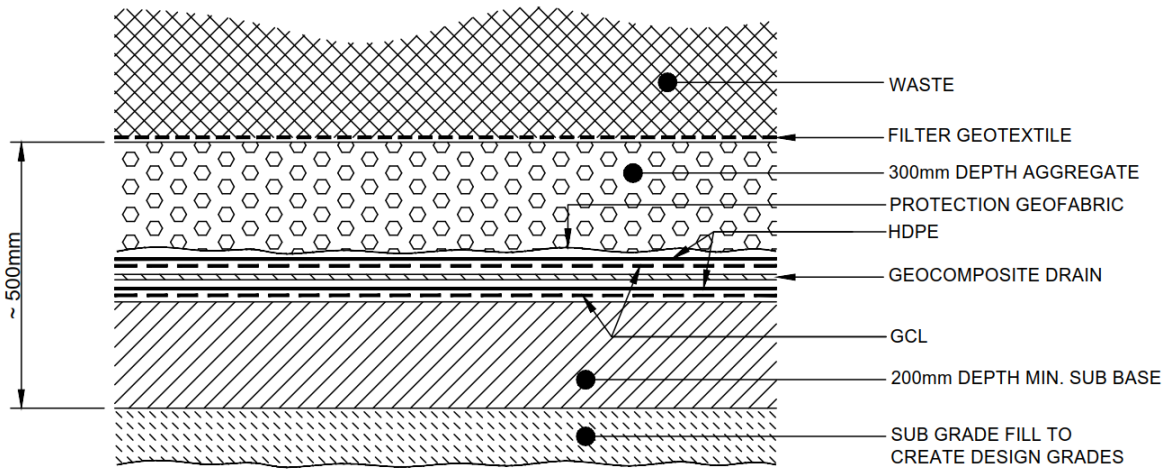
C.3.3 Construction

Cell Construction

The Containment Cell ~~would be~~ **was** constructed in accordance with the Landfill Guidelines and in the following manner:

- Minor excavation ~~in~~ **of** the existing ground surface for sump bases. Sump bases ~~would be~~ **were** designed to be depressed to create a storage volume to minimise continuous pumping of leachate and/or inundation of large areas of the liner with leachate. The sump base ~~is~~ **was** depressed approximately 500 mm into the existing surface in the area of the two sumps.
- Placement of sub-base fill to mirror the top of the liner. Liner surface grades ~~would be~~ **were** designed in accordance with the Landfill Guidelines.
- Installation of the lining system, including leachate collection layer, to extend for the full extent of the footprint area to the top of the surrounding bunds. The proposed lining system is presented in ~~**Figure 4-1**~~ **Figure C-9**.
- The leachate barrier system would be a dual barrier system for containment of Restricted Solid Waste.
- Installation of a leachate storage tank within bund for tank 226.

The approximate extent of the Containment Cell is 80 metres in the east-west direction and 114 metres north-south. The proposed Containment Cell footprint for construction is shown in ~~**Figure 4-1**~~ **Figure C-9**.



Notes: HDPE - High Density Polyethylene
GCL - Geosynthetic Clay Liner

Figure C-9 Proposed Containment Cell Liner

Excavation and Transport of ACSs

ACS from within the pipeways ~~would be~~ **were** excavated by a licenced contractor. ACS classified as General Solid Waste and Restricted Solid Waste, as per ~~**Figure 1-2**~~ **Figure C-8**Figure C-8, ~~would be~~ **was** excavated into a truck and dog and transported to the Containment Cell. ACS ~~would be~~ **were** progressively excavated to align with the filling rate of the Containment Cell to minimise stockpiling.

A water truck ~~would be~~ **was** used to wet down areas during excavation to minimise dust emissions. In the event that stockpiling ~~is~~ **was** required, stockpiled soils would be wetted down to minimise dust emissions, placed on impermeable sheeting and covered, if being left overnight or unattended.

Following excavation, validation of the excavated areas ~~would be~~ **was** undertaken to certify that asbestos is no longer present (refer to **Section 8.5 of the MOD-2 SEE** for further detail). Where required, the pipeways ~~would be~~ **were** graded and backfilled with an appropriate material to protect against erosion.

ACS Preparation

5,390 tonnes (around 3,600 m^3) of Special Hazardous Waste ~~has been~~ **was** determined to be present within the pipeways based on the following:

- 3,850 tonnes of Special Hazardous Waste being calculated as being present (AECOM 2016a); and
- A 40% contingency on this amount which allows for variations in soil density.

This means that the amount of Special Hazardous Solid Waste being assumed to require on-site processing, or disposal off-site ~~is~~ **was** a conservative estimate.

Based on ~~Caltex's~~ **Ampols** previous experience at the Site, biopiling ~~has been~~ **was** determined as an appropriate way to treat the hydrocarbon contaminated ACS to allow ~~it~~ **them** to be contained within the Containment Cell. The proposed approach to biopiling outlined in this section ~~is~~ **was** based on the key learnings from the Kurnell Pilot Sustainable Soil Remediation Facility (PSSRF) (EPS, 2015), as well as the key learnings from consultation with the NSW EPA for the permanent facility (the 'Caltex Soil Remediation Facility' (CSRF)).

The objective of biopiling ~~would be~~ **was** to reduce the concentrations of hydrocarbons (C_{10}-C_{36}) to a level below the upper threshold for Restricted Solid Waste before placement into the Containment Cell, whilst protecting the Site personnel and the community. Only ACS classified as Special Hazardous Waste from the pipeways ~~would be~~ **were** biopiled.

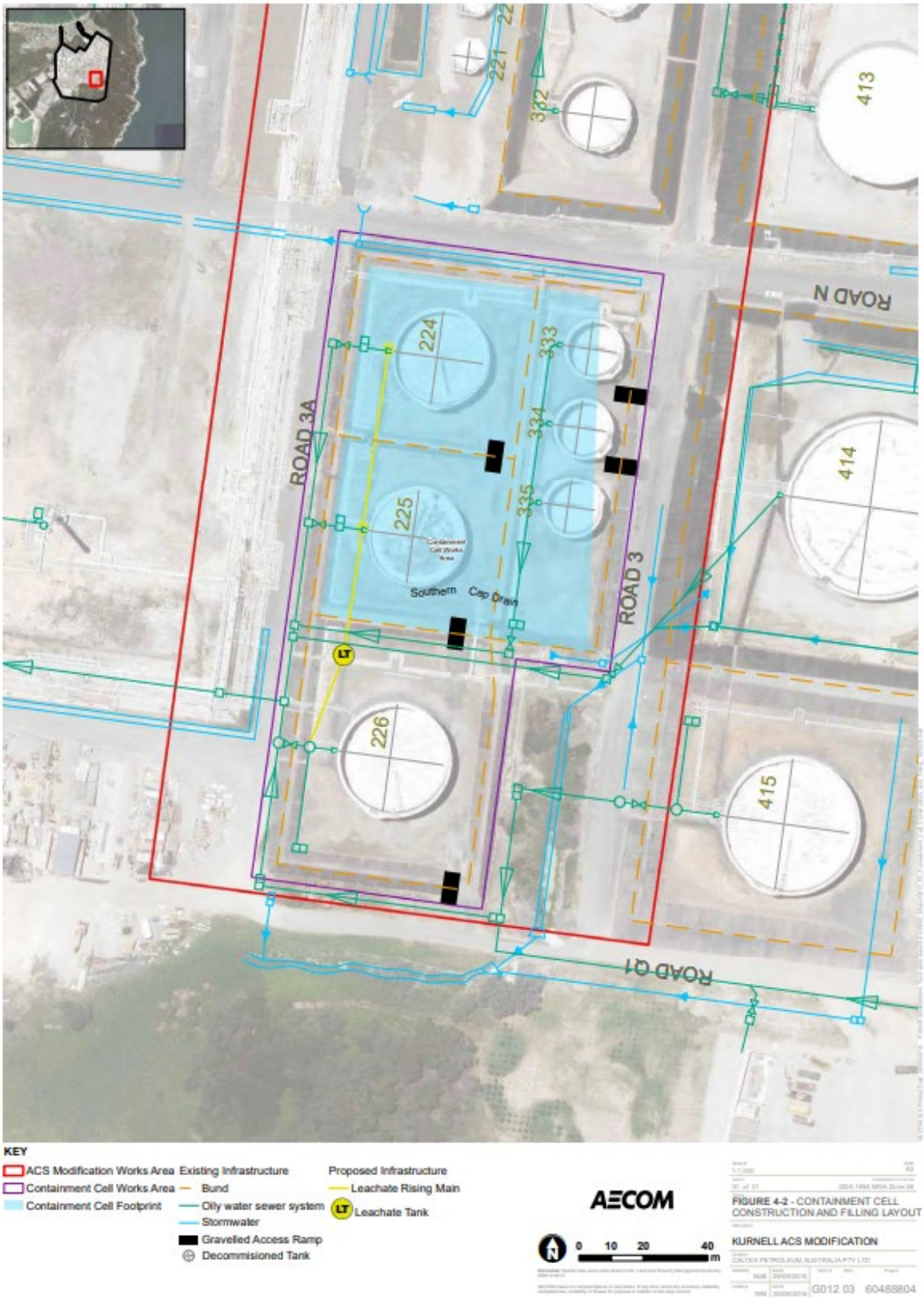


Figure C-10 Containment Cell construction and filling layout

Overview

Biopiling the Special Hazardous Solid Waste ~~would~~ broadly involve**d** the following works:

- establishment of the Biopile works area;
- excavation of soils from the pipeways for immediate transport to the bipopile pads, or to the soil homogenisation area;
- construction of the biopiles;
- bio-remediation of the impacted soil;
- testing of the treated soil; and
- transport to the Containment Cell.

These aspects are discussed in more detail below.

Biopile Works Area Construction and Biopiling Process

The biopiling area ~~would be~~ **was** constructed within the former bunds of tanks 213, 214, 215, 327, 328, 353 and 354 (refer to ~~Figure 4-4~~ **Figure C-12)**. The existing bunds ~~would be~~ **were** utilised to prevent surface water flowing into or out of the biopiling works area.

To prepare the biopiling works area, the biopile pads and soil homogenisation area ~~would be~~ **were** lined with a geosynthetic clay liner or 1.5 mm thick HDPE liner. These ~~would be~~ **were** aligned and connected to the existing oily water sewer system (OWSS) which ~~still services~~ **continued to service the** bunded area. Although production of leachate from the material ~~is~~ **was** considered unlikely, the ACS biopile ~~would be~~ **was** designed to dispose of leachate through the Oily Water Sewer System (OWSS).

Crushed concrete ~~would be~~ **was** utilised to stabilise vehicle access locations.

An ‘active’ biopiling process ~~is~~ **was** proposed due to the need to minimise the risk of release of asbestos fibres from the soil. Active biopiling is a covered aerated system retained under negative pressure. The aeration system uses blowers and a pipe network to introduce air to the system. Air and vapour leaving the system ~~are~~ **is** directed to a carbon filtration drum. This drum captures and negates the release of odours and remaining volatile organic compounds (VOCs) to the airshed. This ~~is~~ **was** preferable to an “intensive” bioremediation method which would involve frequent mechanical turning of the material.

~~**Figure 4-3**~~ **Figure C-11** provides a schematic of a typical active biopiling aeration system, which ~~would be~~ **was** a similar system to what would be used for the ~~ACS Modification~~ **MOD-2 Works**. As shown in ~~**Figure 4-3**~~ **Figure C-11,** each active biopiling system ~~would~~ **was** ~~normally~~ comprise**d** the following:

- a network of perforated PVC piping connected via gathering system;
- a phase separation tank, where extracted water is collected (either due to the presence of water in the biopile, or the condensation of water vapour in the aeration system);
- two Granular Activated Carbon (GAC) canisters in series;
- a vacuum blower; and
- a short exhaust vent which can be monitored using a Photo-ionisation Detectors to determine the presence or absence of VOCs.

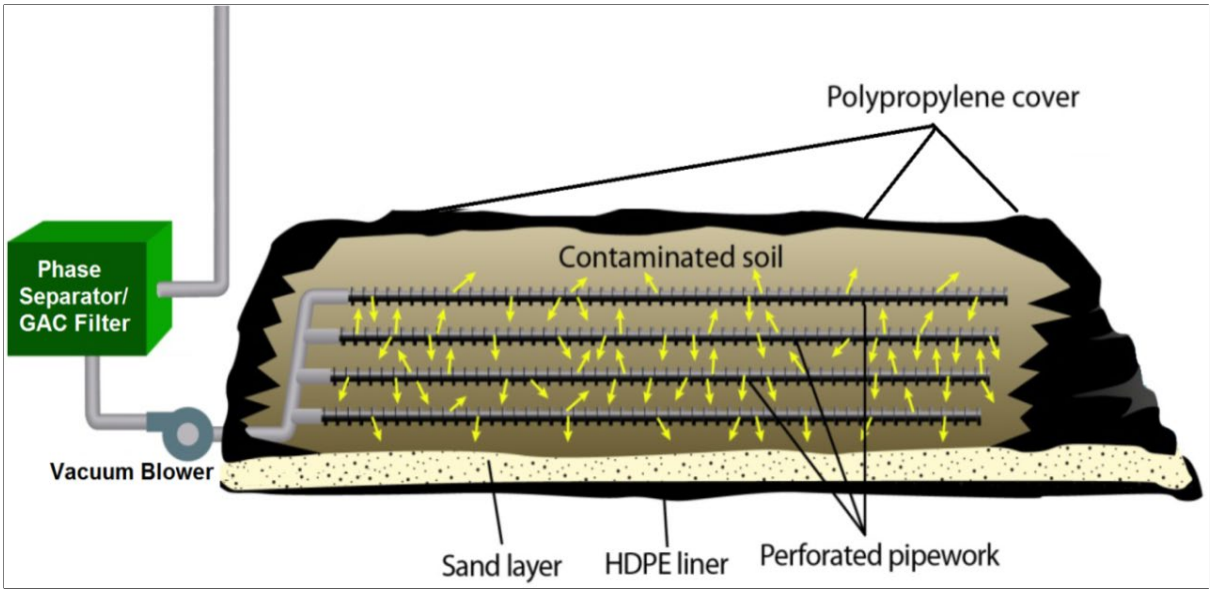


Figure C-11 Schematic of Typical Biopile Aeration System (adapted from NSW EPA 2012)

The maximum height of the biopile ~~would be~~ **was** 2.5 m. The volume of the biopile ~~would be~~ **was** finalised following further classification and pending the volume of impacted soils needing to **be** homogenised (described further below). ~~For current purposes it is~~ **It was** assumed that the total volume of ACS for biopiling would be approximately 4,000 m^3 which ~~is~~ **was** comparable to the conservative estimate. This volume ~~would be~~ **was** divided into four biopiles each of 1,000 m^3. For a 2.5 m high biopile holding a volume of 1,000 m^3 this ~~would require~~ **required** a basal footprint for each biopile of approximately 20 m x 30 m, ~~allowing~~ **to allow** for a stable slope at the perimeter of the material.

Granular activated carbon drums ~~would be~~ **were** placed in series to capture VOCs, although they are anticipated to be minimal. Photo-ionisation Detectors ~~would be~~ **were** utilised to confirm the absence of VOCs following construction. The biopiles ~~would be~~ **were** covered at all times following placement of soils.

Soil Characteristics

The soil to be processed ~~is~~ **was** classified as 'Special Hazardous Waste' as per the NSW Waste Classification Guidelines (EPA, 2014) based on the presence of elevated concentrations of petroleum hydrocarbons and asbestos fibres. Analysis ~~has shown~~ **showed** that the hydrocarbons generally ~~occur~~ **occurred** in the carbon band range C_{15} – C_{36} which is generally non-volatile or semi-volatile. With reference to petroleum hydrocarbons in the range C_{10} – C_{36} the Waste Classification threshold values ~~are~~ **were** as follows:

- for General Solid Waste, max concentration of 10,000 mg/kg;
- for Restricted Solid Waste, max concentration of 40,000 mg/kg; and
- concentrations greater than 40,000 mg/kg: classifies as Hazardous Waste.

The measured concentrations in the C_{10} – C_{36} range ~~are~~ **were** between less than 50 mg/kg to 106,000 mg/kg with a mean of 19,087 mg/kg and a median of only 915 mg/kg, indicating that the higher concentrations ~~are~~ **were** sporadic and that the material ~~is~~ **was** not homogeneous (AECOM, 2016a).

Further, asbestos fibres also ~~occur~~ **occurred** in the soils sporadically. Their presence does not correlate with the presence or absence of hydrocarbon contaminants in the soil.

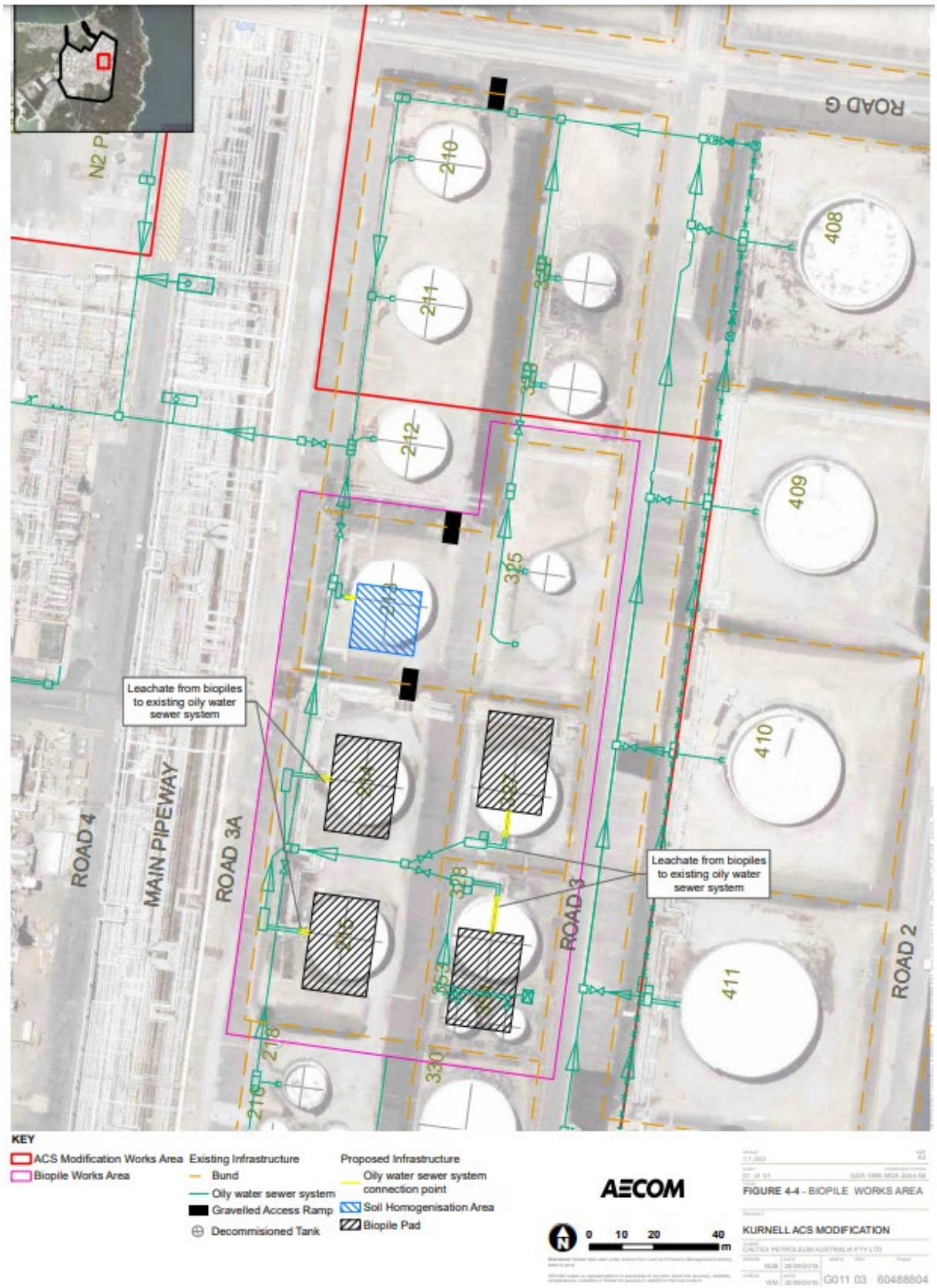


Figure C-12 Biopile Works Area Layout

Homogenisation Process

Active biopiling for hydrocarbons in the C_{10}-C_{36} range can only be effective if the typical hydrocarbon concentration**s** ~~is~~ **are** no greater than 50,000 mg/kg, and homogenous. Homogenisation is necessary to lower peak concentrations so as to promote microbe activity. The process of excavating the soils and placement within a truck prior to placement in the ACS biopile ~~is~~ **was** expected to result in some homogenisation of the material. However, until the actual excavation works ~~take~~ **took** place the level of soil mixing through this process ~~is~~ **was** unknown. Therefore a separate homogenisation process as described below ~~is~~ **was** proposed when required.

If necessary the soil ~~would be~~ **was** homogenised by blending the material with elevated hydrocarbons (> 50,000 mg/kg) with excavated material from the pipeways classified as general solid waste to bring the hydrocarbon levels below 50,000 mg/kg prior to placement within the ACS biopile. The excavated material ~~would be~~ **was** placed in a controlled stockpile next to the proposed biopiles where homogenisation ~~is~~ **was** applied (refer to ~~Figure 4-4~~ **Figure C-12**). The material ~~would be~~ **was** homogenised in batches using a screening bucket such as the Allu Screener Crusher bucket (or similar) attached to the dipper arm of an excavator. The crusher screener bucket and the controlled stockpile ~~shall be~~ **were** kept wet whenever active to minimise the generation of dust.

Monitoring of the ACS Biopile

During the construction and operation of the ACS biopile(s), the following ~~would be~~ **was** monitored:

- Prior to the commencement of excavations for biopiling, dust and aerosol monitoring stations ~~would be~~ **were** placed at a minimum of six locations around the working area with the objective of monitoring prevalent upwind and downwind locations.
- During operation of the ACS biopile these stations ~~would be~~ **were** used to monitor for particulate matter being mobilised from the biopile works area. The monitoring ~~would be~~ **was** focused on identifying dust and asbestos emissions from this area to ensure that the ACS biopile ~~is~~ **was** operating effectively and not resulting in asbestos and dust emissions.
- Carbon: nitrogen: phosphate: potassium ratios ~~would be~~ **were** tested during the operation of the ACS biopile to determine the need, or otherwise, for additives such as straw, farm manure, Urea and fertilizer products such as diammonium phosphate.
- Soil sampling at ‘time zero’ ~~would be~~ **was** undertaken (i.e. following construction and prior to covering of the biopiles) to confirm hydrocarbon concentrations at a rate of one sample per 100 m^3 of biopile. Subsequent samples from soil auger sampling beneath the cover ~~would be~~ **occurred** every two weeks for the first month and every month for the following six months at a rate of one sample per 200 m^3 of biopile to determine and to maintain where necessary the appropriate levels of moisture content, oxygen and temperature. ACS Biopile soils ~~would be~~ **were** tested to determine the rate of degradation of hydrocarbons and to allow forward projection of the necessary residence time in the ACS biopile prior to placement in the Containment Cell.

The specifics of this testing, including frequency, based on ~~Caltex’s~~ **Ampol’s** knowledge from the demolition works, PSSRF, and CSRF ~~would be~~ **was** outlined in an ACS Biopile Management Plan specific to ~~the~~ ~~ACS Modification~~ **MOD-2**.

Once the soils meet the restricted waste thresholds (40,000 mg/kg) or less, the biopiles ~~would be~~ **were** deconstructed and the soils ~~would be~~ **were** excavated and placed in the Containment Cell.

The soils to be biopiled ~~have~~ **had** a mixture of the lighter and heavier hydrocarbon fractions dominated by aliphatics which would be relatively more amenable to degradation. A conservative period of treatment of up to 10 months ~~is~~ **was** estimated for the treatment of the homogenised soils prior to placement in the Containment Cell. One month ~~would be~~ **was** required for deconstruction of the ACS biopile.

ACS Disposal

It ~~is~~ **was** expected that the biopiling approach would be effective in bringing the hazardous ACS within the ‘Restricted Solid Waste’ classification. In the event that ~~this~~ **the** approach ~~is~~ **was** unsuccessful, this material ~~would be~~ **was** transported to a licenced waste facility for treatment and disposal.

This material ~~would have been~~ **was** moved to the biopile works area by this point. From here it ~~would be~~ **was** carefully loaded into truck and dogs, securely covered, and transported by a licenced waste contractor to a licenced waste facility for treatment and disposal.

Cell Filling and Temporary Management

ACS classified as General or Restricted Soil Waste ~~would be~~ **were** transported from the pipeways or biopile works area via truck. These soils ~~would~~ **were** then be placed in the Containment Cell at the same rate as the ACSs ~~are~~ **were** excavated from the pipeways. General and restricted soils ~~will be~~ **were** placed first, followed by the soils from the ACS biopile once suitable. Once soils ~~are~~ **were** placed into the cell a dozer and compactor ~~would be~~ **was** used to fill in the cell in the appropriate sequence and grade.

It ~~is~~ **was** proposed to use temporary plastic sheeting which ~~would be~~ **was** placed immediately over the ACS after it is placed in the Containment Cell. The use of suitably rigid plastic sheeting ~~would minimise~~ **minimised** the generation of dust from the placement of ACS. Prior to placement of the next load of ACS and at the start of each day's filling works, the plastic sheeting ~~would be~~ **was** stripped back to allowing filling operations to continue. At the end of each day's filling operation the plastic sheeting ~~would be~~ **was** secured in place to prevent it being lifted or displaced due to wind.

As discussed **Chapter 10 Surface Water, Wastewater and Flooding of the MOD-2 SEE** the Containment Cell ~~is~~ **was** located within a bunded area. During filling of the Containment Cell stormwater from within the bunded area ~~would be~~ **was** treated as leachate and directed to the Site's WWTP via the OWSS. Stormwater outside of the Containment Cell area ~~would~~ continue**d** to be managed in accordance with the existing processes at the Site.

Cell Closure

The Containment Cell capping layer ~~would be~~ **was** designed to meet the minimum requirements of the Landfill Guidelines. At the completion of the filling the final cap ~~would be~~ **was** installed and meet the following requirements:

- The top of the cap ~~would meet~~ **met** the outer crest of the surrounding bunds except for the eastern side where the cap is limited to the boundary shown in ~~**Figure 4-2**~~ **Figure C-10.**
- The existing eastern bund ~~would be~~ **was** removed to allow surface water flows from the final cap to drain to the Site's stormwater drainage system.
- The final height of the cap ~~would be~~ **was** determined during waste placement and ~~would be~~ **was** dependent on the final volume of waste generated from the ACS excavation works.
- To facilitate runoff and minimise ponding of water, the cap ~~would have~~ **had** a gradient of greater than 5% to defined drainage points. However, to reduce the risk of erosion, the cap ~~has been~~ **was** restricted to a gradient of ≤20%.
- The cell ~~would be~~ **was** revegetated as soon as practicable following civil works with native grasses.

The Landfill Guidelines and *Protection of the Environment Operations (Waste) Regulation 2014* (Waste Regulations) ~~require~~ **required** 3 m of VENM cover over asbestos contaminated waste however they ~~do~~ **did** not require a geosynthetic liner in the cap. The proposed cap design, as described above, ~~includes~~ **included** 1.6 m of soil and aggregate layers and two layers of geosynthetic including a GCL and an HDPE, as shown in ~~**Figure 4-3**~~ **Figure C-11**. The detailed design ~~would include~~ **included** the design of the connection between the capping and liner layers, in particular the welding of the upper and lower HDPE liners, thereby fully containing the waste within HDPE and other layers. The 3 m of VENM over asbestos containing waste ~~is~~ **was** prescribed in the Waste Regulations to ensure no friable particles ~~are~~ **were** released from waste. The 1.6 m of soil and aggregate and the two layers of geosynthetic ~~are~~ **were** considered an appropriate alternative to 3 m of VENM to contain asbestos fragments. In addition a marker layer ~~would be~~ **was** included as a separation geotextile to reduce the risk of the cap being removed.

The proposed cell cap is presented in ~~Figure 4-5~~ **Figure C-13**.

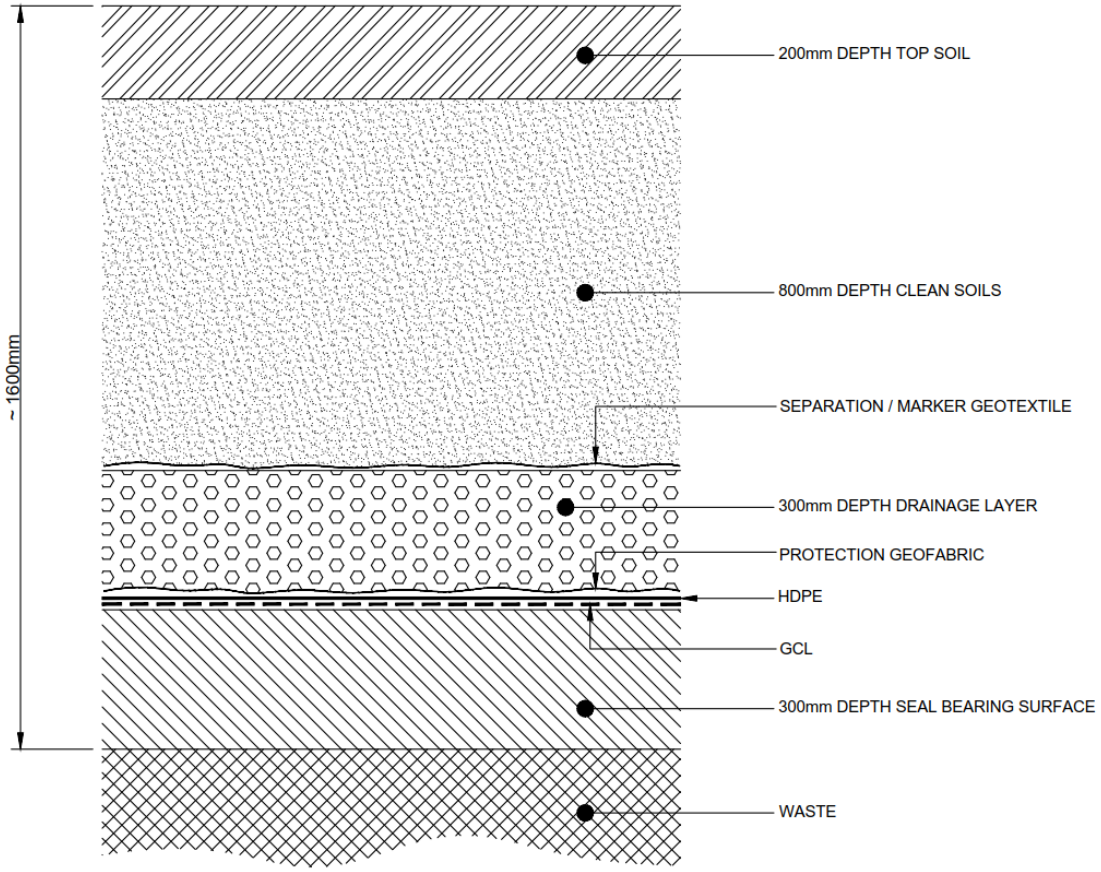


Figure C-13 Proposed Containment Cell Capping Layer

Program

The ACS Modification works ~~would be~~ **were** undertaken over an 18 month period starting in January 2017, **presented in Table C-8.**

Table C-8 Proposed ACS Modification Works Schedule

Task	Indicative Date*
Containment Cell Construction	~~Start 2017 – Mid 2017~~ **Late 2017 – Mid 2018**
~~Excavation of ACS (hazardous waste) from Pipeways~~	~~Start 2017 – Q2 2017~~
~~Excavation of ACS (general and restricted solid waste) from Pipeways~~	~~Mid 2017 – End 2017~~
~~Preparation of ACS Hazardous Waste via Biopiling~~	~~Q1 2017 – Q4 2017~~
~~Filling of Containment Cell with ACS~~	~~Mid 2017 – End 2017~~
Excavation of ACS from Pipeways and Filling of Containment Cell	Late 2017 – Mid 2019
Closure of Containment Cell	~~Start 2018 – Mid 2018~~ **Mid 2019 – Early 2020**
On-going Management of Closed Containment Cell	-

*Depending on timing of approval.

Program extension

However, ~~Caltex~~ **Ampol** ~~are proposing~~ **proposed** to amend Condition B7B of the conditions of consent to extend the duration of ASC management works to 30 November 2019 **(MOD-5).**

The extension in duration of ASC Management Works ~~is~~ **was** proposed due to a number of project delays, including adverse weather, ongoing discussions with the EPA, excavation of the ASC taking longer than expected and auditor discussions and requirements resulting in the works falling behind the anticipated program. These various delays meant that the excavation of the ACS from the pipeways did not start until mid-2018 instead of the anticipated late-2017 timescale presented in ~~Table 3-1~~ **Table C-8**.

It ~~is~~ **was** expected that the excavation work in the pipways ~~will~~ **would** finish mid-2019 and then the cell ~~will~~ **would** be closed. It ~~is likely~~ **was anticipated** that the cell will be closed before November but ~~this~~ **the** date would provide enough contingency to ensure that the works could be completed.

However~~, Caltex~~ Ampol ~~are proposing~~ **proposed** Condition B7B of the conditions of consent for SSD-5544 to extend the timescale allowed to complete the ACS management works **(MOD-6).** ~~Currently this~~ **The** condition ~~states~~ **stated** the following:

B7B. Notwithstanding Condition B7A, the ACS management work shall not extend beyond 30 November 2019

~~Caltex are seeking~~ **Ampol sought** development consent to modify this condition to extend the duration of ACS management works from 30 November 2019 to 31 March 2020. An amendment of Condition B7B ~~is~~ **was** required to allow the ACS management works to be completed within an approved timescale. Originally the ACS management works were expected to be completed by 30 April 2019. This deadline was conditioned under SSD-5544 MOD-2. The deadline was extended to 30 November 2019 under SSD-5544 MOD-5.

~~Until recently it~~ **It** was expected that this revised deadline would be met. The works to move ACS from the Site and bring them to the Containment Cell ~~have now~~ **had previously** been completed. In addition, the initial capping layers for the cell ~~have~~ **had previously** been put in place, effectively closing the cell. The location of the Containment Cell works area is shown on ~~Figure 1~~ **Figure C-14.**

Figure C-14 SSD-5544 Modification 6

The cap design ~~includes~~ **included** 1.6 m of soil and aggregate layers and two layers of geosynthetic including a Geosynthetic Clay Liner (GCL) and a High Density Polyethylene (HDPE), as shown in ~~Figure 2~~ **Figure C-16**. There ~~will be~~ **were** connections between the capping and liner layers, in particular the upper and lower HDPE liners ~~will be~~ **were** welded together, thereby fully containing the waste within HDPE and other layers. A marker layer ~~will be~~ **was** included as a separation geotextile to reduce the risk of the cap being removed.

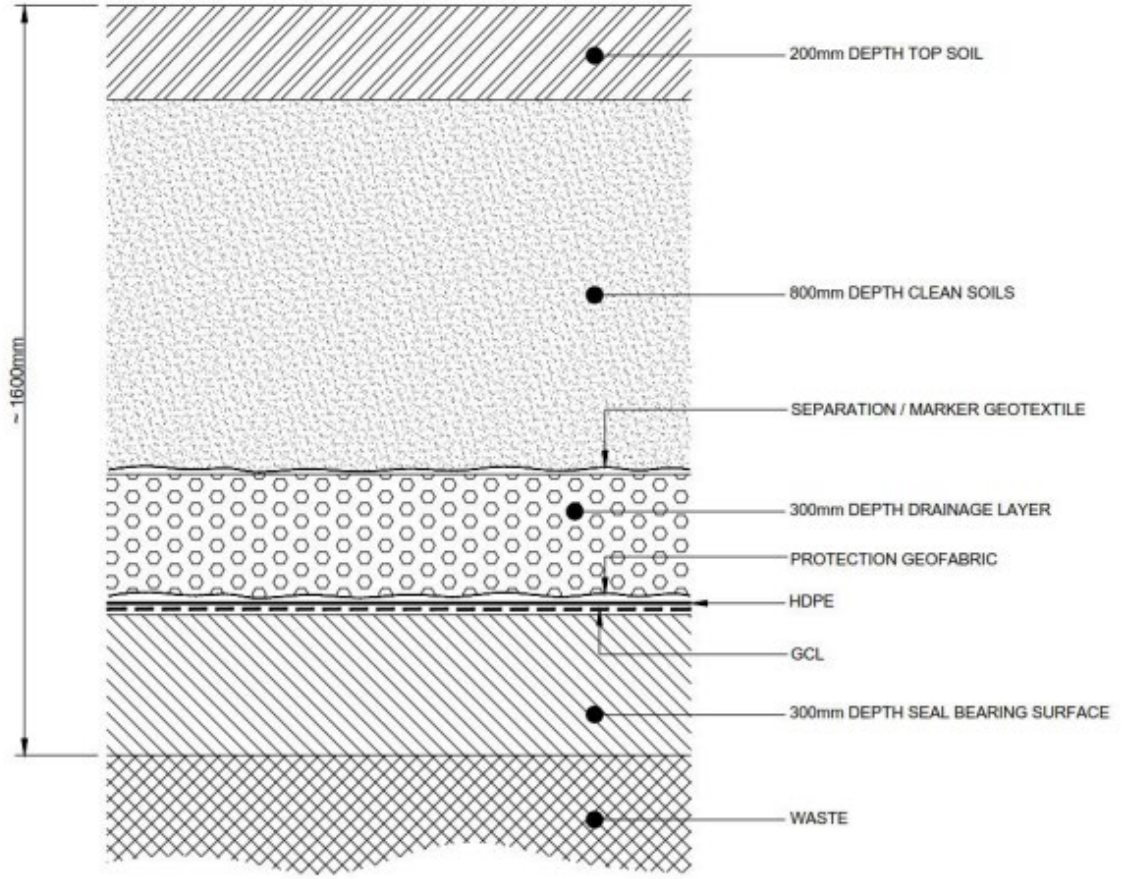


Figure C-15 Containment Cell Capping Layer (as shown in SSD-5544 MOD-2)

The next capping layer to be installed ~~involves~~ **involved** placing an HDPE layer over the whole of the cell and welding it to the HDPE liner layers. This work ~~can~~ **could** only be completed by specialist contractors. Due to delays on another project the selected contractors ~~cannot~~ **were unable to** complete the necessary HDPE liner work until late November 2019 which in turn ~~means~~ **meant** that the remaining civil works to cap the Containment Cell (installing a drainage layer, marker layers, clean soil and top soil) ~~will~~ **could** not be completed until December or January (weather depending).

Consequently, the ACS works ~~will~~ **would** take longer than expected resulting in the works falling behind the anticipated program. It ~~is likely~~ **was anticipated** that the cell ~~will~~ **would** be closed before March 2020, however ~~Caltex~~ **Ampol** believes that this date would provide enough contingency to ensure that the works ~~can~~ **would** be completed.

Therefore, ~~Caltex are seeking~~ **Ampol sought** development consent to modify Condition B7B to the following:

B7B. Notwithstanding Condition B7A, the ACS management work shall not extend beyond 31 March 2020 (emphasis added)

No additional or amended physical works ~~are~~ **were** proposed as part of ~~this modification~~ **MOD-6**. The revised ACS management works program is provided in ~~Table 4 below~~ **Table C-8 above**.

Working Hours

The working hours ~~would be~~ **were** in line with the Conditions of Consent for SSD-5544 and SSD-5544 MOD-1, in particular Conditions C18, C19 and C20. In summary:

- Construction to be completed between 7.00 am and 10.00 pm seven days a week (Condition C18);
- High noise generating construction and demolition works would be confined to less sensitive times of the day, and shall not be undertaken on Sundays or public holidays or outside the hours of 7.00 am to 6.00 pm Monday to Saturday (Condition C19); and
- Construction outside those hours would only be undertaken in certain circumstances as defined in Condition C20.

Potential noise impacts related to the ~~ACS Modification~~ **MOD-2** works ~~are~~ **were** discussed further in **Chapter 11 Noise** and **Appendix A Noise Impact Assessment of the MOD-2 SEE**.

Equipment and Plant

The following equipment and plant ~~would be~~ **was** required for the ~~ACS Modification~~ **MOD-2** works:

- Water truck
- Truck and dog
- Compactor
- Manitou Forklift
- Excavator
- Small Excavator (5 tonne)
- Dozer
- 360 degree 30 tonne crawler mounted back actor-excavator
- Hydraulic breaker
- Power mixer / Allu bucket
- Water bowser with spray feed
- Forklift
- Welding tools
- Wheel mounted front end loader
- Light weight wheel mounted tractor with narrow (600mm) back hoe)
- Tank and spray feed to apply nutrients.

Workforce

The ~~ACS Modification~~ **MOD-2** works ~~would require~~ **required** approximately 50 contractors at the Site over the program with a maximum of 30 staff on Site at any one time, **refer to Table C-9**. A number of these staff ~~are~~ **were** already based at the Site.

Table C-9 ACS Modification Workforce

Stage	Workforce Numbers
Cell Construction	10
Excavation and Transport of ACSs	6
ACS Preparation	16
Cell Filling & Management	8
Cell Closure	10

*Truck movements to and from the site have not been included in the workforce numbers.

For comparison, ~~Table 4-4~~ **Table C-10** presents the workforce numbers for the other activities that ~~have~~ **were** previously, currently and are projected to take place at the Site

Table C-10 Kurnell Terminal Workforce

Workforce Numbers (Previous, Current and Projected)								
	2012[2]	2013	2014[3]	2015	2016	2017	2018	2019
Caltex Employees	410	400	450[4]	40	45	45	45	45
Contractors	475	475	475	40	55	55	55	55
Conversion works construction numbers	-	140	140	100	90	-	-	-
Demolition works construction numbers	-	-	-	230	130	130	-	-
Caltex Soil Remediation Facility	-	-	-	-	10	5	5	5
ACS Modification works	**-**	**-**	**-**	**-**	**-**	**30**	**30**	**-**
Total	**885**	**1,015**	**1,065**	**410[5]**	**330**	**265**	**135**	**105**
Maintenance Shutdown Periods[1]	500	0[6]	0[6]	0[6]	90	90	90	90
Total including Maintenance Activities	**1,385**	**1,015**	**1,065**	**410**	**420**	**355**	**225**	**195**

1 Maintenance shutdown periods are periodic and for short time frames (8-12 weeks).
2 Employee numbers at the Site in 2012.
3 2014 will be the peak construction period. Additional personnel brought to the Site for the conversion works would be a maximum of 140 personnel.
4 Additional Caltex Employees in 2014 would be staff hired for terminal operations.
5 The large reduction in numbers between 2014 and 2015 follows the cessation of refining at the Site. The increase in workforce numbers between 2015 and 2016 represents a gradual stabilisation of the terminal operational workforce.
6 No maintenance shutdown periods will occur during 2013 and 2015

~~ACS Modification~~ MOD-2 Works Traffic

The traffic generated by the ~~ACS Modification~~ **MOD-2** Works would depend on whether the hazardous ACS are successfully biopiled or disposed offsite.

Based on previous experience it ~~is~~ **was** likely that the biopiling process would be successful and as such the traffic movements associated with the ~~modification~~ **MOD-2** works ~~would incorporate~~ **were comprised of** a mix of construction plant vehicles and personnel movements. Under this scenario, traffic movements required for the ~~ACS Modification~~ **MOD-2** works ~~are~~ **were** likely to be minimal. Certain equipment ~~would be~~ **was** required to construct and manage the Containment Cell and the biopiling area. Equally, up to 30 personnel ~~would come~~ **came** to Site each day in private vehicles.

If the hazardous ACS need to be disposed offsite, then approximately 5,390 tonnes of Special Hazardous Waste would need**ed** to be transported to a licensed waste facility. This would conservatively require 180 truck and dogs or 360 truck and dog movements.

Access ~~would remain~~ **remained** the same as for the conversion ~~and demolition~~ works **(SSD-5544)** with access to the Site predominantly undertaken from Solander Street.

Environmental Management

The ~~ACS Modification~~ **MOD-2** works ~~would be~~ **were** undertaken in accordance with the existing Demolition Environmental Management Plan (DEMP) and associated sub-plans where applicable. A large number of the measures and controls documented within the DEMP and its subplans ~~are~~ **were** relevant to the management of the ~~ACS Modification~~ **MOD-2** works. This ~~is~~ **was** particularly the case for the excavation of the ACSs from the pipeways.

The ACS biopile works and Containment Cell works constitute**d** additional activities beyond the scope of works covered within the DEMP. To address these additional activities two additional subplans to the DEMP ~~would be~~ **were** produced, one for the Containment Cell and one for the ACS biopile. These two subplans ~~would~~ reference other parts of the DEMP as necessary ~~but would~~ **and** also include specific measures for these works. These subplans ~~would be~~ **were** called:

- Containment Cell Management Plan
- ACS Biopile Management Plan.

C.3.4 Operation

The on-going management of the Containment Cell ~~would be~~ **was** incorporated into the Site's Operational Environmental Management Plan (OEMP). A relevant section of the OEMP ~~would be~~ **was** developed and ~~would include~~ **included** measures in line with the Landfill Guidelines. The OEMP ~~would include~~ **included** the post-closure management and monitoring measures for leachate, stormwater, landfill gas, odour, dust, litter and final cap integrity. Refer to ~~Figure 4-6~~ **Figure C-16** for the Containment Cell Footprint layout during operation.

Leachate from the closed Containment Cell ~~would be~~ **was** treated at the Site's Wastewater Treatment Plant (WWTP), in accordance with EPL 837. Stormwater ~~would be~~ **was** directed to the existing stormwater catchments at the Site.

Following closure of the Containment Cell, post closure monitoring ~~would include~~ **included**:

- Regular inspections for deterioration of the capping's condition, including erosion, cracking, dead or stressed vegetation, ponding, differential settlement, slope stability, and damage to any pipes, drains and other works installed on the final capping;
- Repair and/ or replacement of portions of the final capping found to be damaged;
- Monitoring of leachate and rainfall volumes; and
- Groundwater monitoring.

The Containment Cell ~~would~~ **was** not **anticipated to** have an effect on the operation of the rest of the terminal.

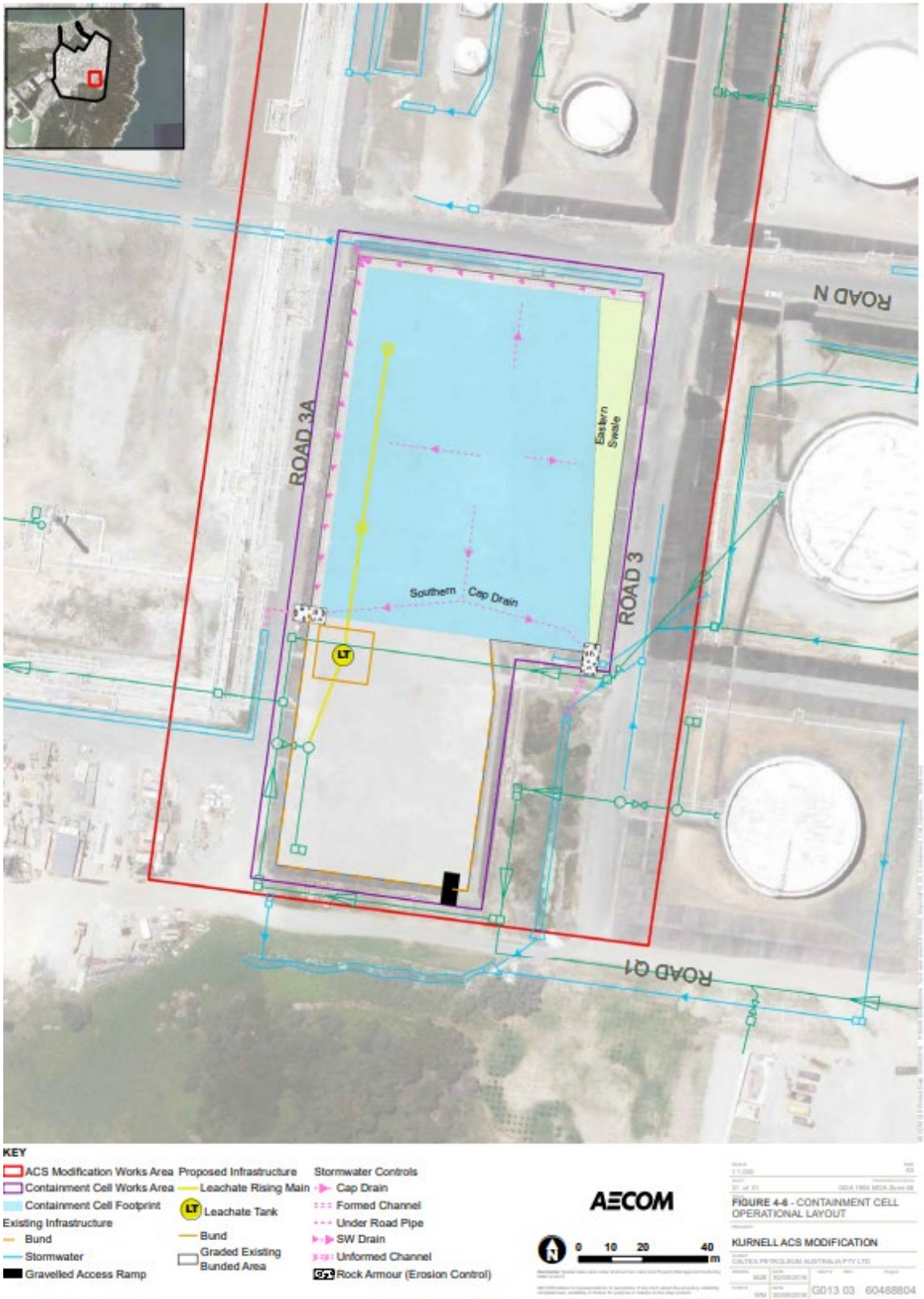


Figure C-16 Containment Cell Operation Layout

C.4 The proposed modification: Supporting the continued safe, viable, and reliable operation of the Site, whilst preparing the land for future uses

This section of the consolidated project description presents the works involved in the proposed modification. All works should be considered additional to the approved project.

C.4.1 Overview

To support the continued safe, viable, and reliable operation of the Site and to facilitate the future use of the Site, the MOD-7 works involve:

- ***Stage 1 – Preparation works*: Preparing the MOD-7 Project Area for the MOD-7 works.**
- ***Stage 2 – Removal, relocation and/or augmentation of infrastructure*, including:**
  - **Relocation and/or augmentation of FWS and OWS systems and construction of new operational facilities, including replacement warehouses**
  - **Decommissioning and removal of non-operational assets, redundant structures and electrical assets.**
- ***Stage 3 – Remediation*: Addressing legacy ground contamination, including asbestos-contaminated soil (ACS).**
- ***Stage 4 – Grading*: Landforming the Project Area following removal of infrastructure and ground remediation activities and preparing Zones 2 and 3 for future use.**
- ***Stage 5 – Demobilisation*: Demobilisation of construction and remediation equipment.**

Depending on where different works are required across the Site these stages may be completed sequentially or concurrently.

A summary of project elements requiring modification and how they relate to the approved project is provided in Table C-11. A detailed description of the works is provided in Sections C.4.2 to C.4.6. The MOD-7 works would be undertaken within the MOD-7 Project Area shown on Figure C-17. All activities would adhere to the Kurnell Terminal permit to work system to ensure compliance with environmental and safety protocols.

Table C-11 Modified project summary table

Stage	Element	Approved project	Modified project
Stage 1	Project Area	Project Area delineation	• Prepare the MOD-7 Project Area for the proposed modification works required under Stages 2, 3 and 4 and exclude other parts of the Site from modification works.
Stage 2	Oily water sewer (OWS)	Maintain location in Zones 2 and 3	• Divert surface water runoff from potentially contaminated areas in Zone 2 to Zone 1 via new OWS interception pits/ lines until Stage 3 remediation is complete. • Divert potential leachate from ACS Containment Cell in Zone 2 to Zone 1 OWS system. • Remove all redundant OWS infrastructure.

Stage	Element	Approved project	Modified project
	Firewater systems (FWS)	Maintain location in Zone 2 and 3	• Augment existing FWS in Zone 1 with a new firewater tank and pipework to service the terminal infrastructure. • Locate the new firewater tank and pumphouse within the FWS Relocation Area (specific siting selected during detailed design). • Augment or remove FWS infrastructure from Zones 1, 2 and 3.
	Electrical assets	Maintain location in Zone 2 and 3	• Remove redundant electrical assets in Zones 2 and 3, including five substations.
	Structures	Maintain location in Zone 2 and 3	• Demolish structures in Zones 2 and 3. • Construct new 'fit for purpose' warehouse and Oil Spill Equipment Storeroom within Zone 1. • Construct new storage shed in Zone 1A.
Stage 3	Remediation	Removal of ACS from pipeways and containment onsite	• Remediate land in Zones 2 and 3 as necessary. • Remediate land in Zone 1 where infrastructure is relocated and/ or augmented as necessary. • Conduct remediation to a commercial/ industrial land use under the ASC NEPM (2013).
Stage 4	OWS	Maintain location in Zones 2 and 3	• Disconnect and remove remaining underground OWS lines from Zones 2 and 3, except for lines connecting to the ACS Containment Cell. • Install a new pump adjacent to the ACS Containment Cell. Two site options have been identified (specific siting selected during detailed design).
Stage 4	Grading	Grading following demolition of structures and removal of infrastructure across the Site and relevant project areas	• Construct new onsite detention (OSD) basins in Zone 3 to attenuate runoff and maintain pre-construction surface water flow rates. • Grade Zone 2 following Stage 2 and Stage 3 activities to manage stormwater and prepare for future land uses. • Grade Zones 1 and 3 as necessary.
Stage 5	Demobilis-ation	Demobilisation of construction equipment.	• Demobilisation of construction and remediation equipment.

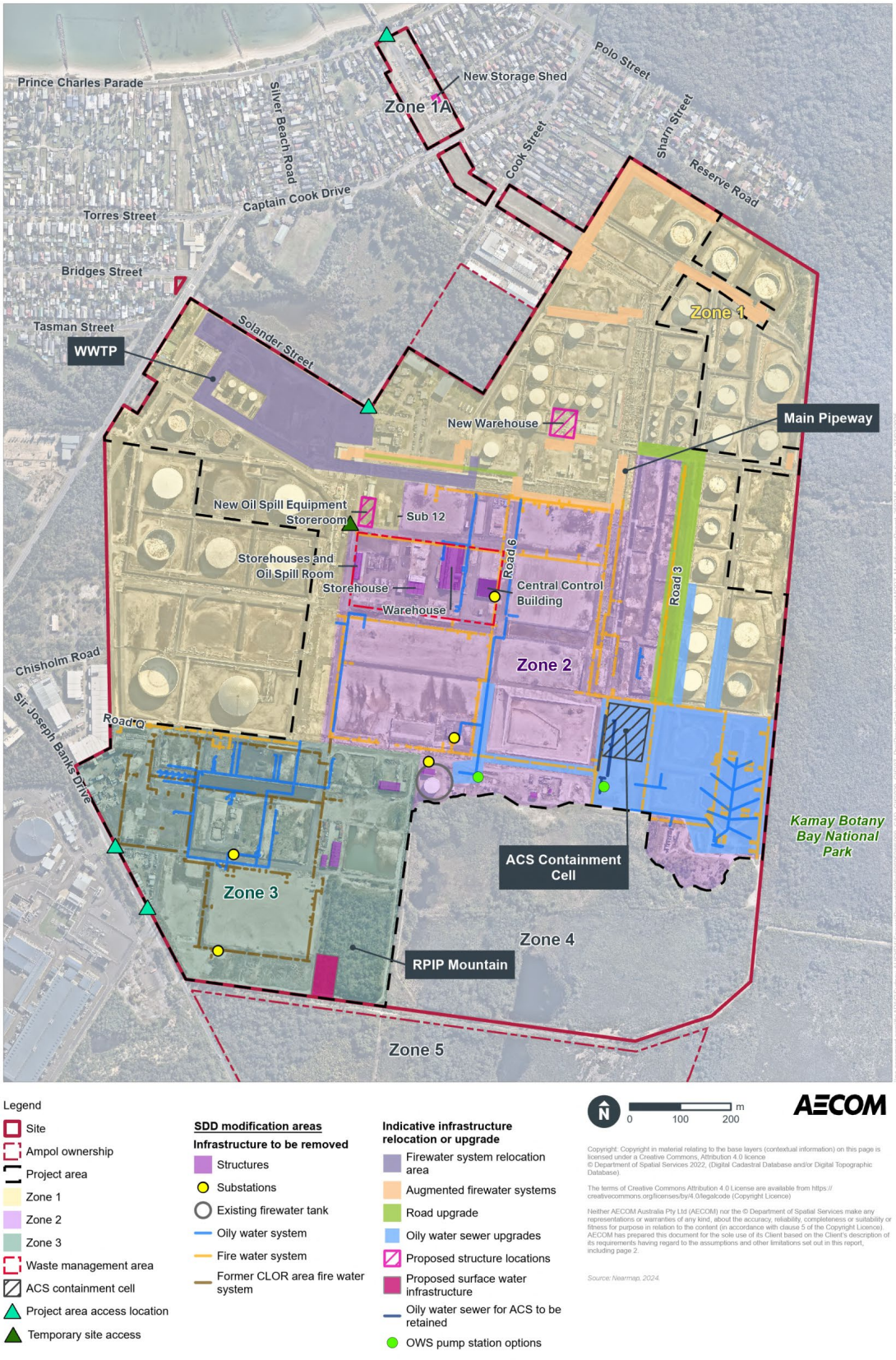


Figure C-17 ~~Proposed modification~~ MOD-7

C.4.2 Stage 1 – Preparation works

In order to prepare the relevant parts of the Site for the MOD-7 works the following activities would be completed:

- **Installation of fencing and signage to separate terminal activities and parts of the Site outside the Project Area from MOD-7 works**
- **Establishment of temporary facilities (e.g. site offices) and parking for construction workers within the Site**
- **Removal of vegetation, where permitted and required**
- **Installation of temporary erosion and sediment controls for the MOD-7 works**
- **Establishment of access to services/ utilities**
- **Service locating would be undertaken across the MOD-7 Project Area to confirm the location and type of active services.**

Where necessary these activities are discussed in more detail below.

Establishment of fencing and signing

Prior to the MOD-7 works commencing, cyclone fencing (or suitable equivalent) would be installed where necessary to isolate the MOD-7 Project Area from the terminal operations and vegetated areas to the south. Gates would be installed at appropriate locations (e.g. between Zone 1 and Zone 2), to allow access for contractors and Ampol staff during the modification works and to allow for the movement of staff or emergency services across the Site. This fencing would be used to exclude contractors from certain parts of the Site where modification works are not proposed.

Some parts of Zones 1, 2, and 3 would also be excluded from the MOD-7 Project Area. These exclusion zones would be established to either protect key infrastructure or sensitive land uses (e.g. ACS Containment Cell).

Establishment of temporary facilities and access

A temporary access point and temporary project office would be established at the proposed entrance for Zones 2 and 3 (shown on Figure C-17 as "MOD-7 Project Area Access Location"). The entrance for Zone 2 would be to the south of the existing terminal gatehouse at the border of Zone 1 and Zone 2. The entrance for Zone 3 would be at the existing Site access point off Sir Josephs Banks Drive.

Each entry points would be used at different times during construction depending on the staging and location of work within the Site. It is likely that following temporary facilities would be located close to the entrance being used as the primary access point at any given time:

- **First aid office**
- **Stores**
- **Personnel decontamination area**
- **Amenities**
- **Wheel washing facilities.**

Other temporary facilities similar to those listed above may also be located throughout Zones 1, 2 and 3 as needed to allow the MOD-7 works to occur.

Zone 1A would be accessed via the existing access point on Prince Charles Parade. A secondary access point is available on Captain Cook Drive for smaller vehicles.

Removal of vegetation

Limited native vegetation is present within the MOD-7 Project Area, and the vegetation that is present is heavily degraded due to historic clearing and current land uses.

Vegetation clearance would occur, where required, to allow for the relocation of infrastructure and remediation.

Establishment of erosion and sediment controls

Erosion and sediment controls would be established, as required, across the MOD-7 Project Area in accordance with 'The Blue Book' *Managing Urban Stormwater - Soils and Construction Volume 1 and 2* (Landcom, 2004). These controls would be checked periodically throughout the delivery of the modification works and if necessary changed or revised. The objective of the temporary erosion and sediment controls would be to manage sediment and contamination that may be mobilised by surface water flows from the modification works.

Service location

Service locating would be undertaken across the MOD-7 Project Area to confirm the location of and identify active services. If necessary additional service investigations would be completed ahead of ground disturbance works commencing alongside consultation with utility companies and/or Ampol staff.

C.4.3 Stage 2 – Removal and/or relocation of infrastructure

Following preparation works, certain structures and infrastructure would either be permanently demolished and removed or reconstructed in Zones 1 and 1A, or augmented. Demolition would involve removal of the above ground elements of the infrastructure first, followed by the removal of at grade and subsurface infrastructure. At grade and subsurface infrastructure would only be removed where required (e.g. concrete slabs may be retained for construction, geotechnical or dust management reasons). Where structures or infrastructure need to be relocated it is likely that new fit for purpose and/or upgraded infrastructure would be provided.

The subsequent sections detail the proposed removal, relocation and/or augmentation works.

Oily water sewer

The purpose of the OWS is to capture, manage, and treat potentially contaminated stormwater and wastewater from the terminal before directing it to the onsite Waste Water Treatment Plant (WWTP) for treatment and subsequent discharge in line with EPL 837. The OWS predominantly services Zone 1 but it also services parts of Zone 2 and Zone 3. In particular the OWS has a connection to the wastewater sump from the ACS Containment Cell.

The MOD-7 works include the removal of the OWS (including all pits and pipework) from Zones 2 and 3 except for a connection to the ACS Containment Cell wastewater sump and a diversion line from west of the ACS Containment Cell and along the northern boundary of Zone 2. These works are likely to be undertaken progressively to help manage potential contaminated surface water flows from other Stage 2 works or Stage 3 remediation activities (described further in Section C.4.13 (Ancillary facilities and infrastructure) of the MOD-7 Modification Report). As such, some sections of the OWS in Zones 2 and 3 may only be removed following certain remediation activities (Stage 3).

Prior to the removal of the relevant sections of the OWS from Zones 2 and 3, the surface water flows from areas serviced by this infrastructure would be managed in line with the contamination and erosion risks present. Where the relevant area is still likely to contaminate surface water, this water would either be:

- **Intercepted or diverted to the remaining sections on OWS for treatment at the WWTP or**
- **Captured/ contained and transported to the WWTP for treatment.**

Intercepting or diverting contaminated stormwater flows could include modifying interception infrastructure (such as existing pits, manholes, storages) and the installation of temporary pipes, pits, and pump stations to direct flows towards existing OWS infrastructure.

Where the relevant area is unlikely to result in contaminated surface water (e.g. due to remediation activities being complete), these surface water flows would be redirected to the Site's existing Stormwater System (SWS).

The redirection of 'clean' stormwater flows to alternative infrastructure would allow redundant OWS infrastructure in Zones 2 and 3 to be removed progressively and would help to continue to safely manage contaminated run-off from remediation areas (described in Section C.4.4 (Stage 3 – Remediation)). Following completion of the remediation activities proposed during Stage 3, the land within Zones 2 and 3 would be at a commercial/ industrial standard and would no longer need to be serviced by the OWS. At this time, any remaining OWS infrastructure would be removed from Zones 2 and 3 except for a connection to the ACS Containment Cell wastewater sump and the diversion line from west of the ACS.

A new permanent pump would be installed following disconnection from the existing OWS infrastructure in Zone 2. The pump would operate intermittently, following periods of heavy rainfall, to transfer potentially contaminated stormwater to the OWS system. Two options for the location of the new pump are being considered. Construction would be limited to one option, selected as part of detailed design.

The pump would be installed in a sealed chamber below the existing ground level, at a minimum water level and therefore permanently submerged. Excavations of approximately 4.5 mbgl would be required, based on a 4 m deep pit, and an additional 0.5 m concrete slab, which would be installed at the base of the pit.

The removal of OWS infrastructure may require excavation work of up to 3 mbgl for removal of below ground pipework and pits. Where complete removal is not feasible due to proximity to existing infrastructure or other considerations (e.g. geotechnical), existing pipes and/or pits would be cleaned, infilled with stabilised sand, cement slurry, or equivalent, and left in-situ.

Once removed, redundant pipes and materials from the OWS would be sent offsite for recycling or disposal based on material type and waste classification.

Firewater systems

The FWS at the Site currently operates via a network of fire hydrants, monitors, fixed and semi-fixed foam systems, and underground and aboveground firewater pipelines running through the Site, as well as a firewater tank and pump system in the southern part of the Zone 2. Following the removal of refinery infrastructure in Zones 2 and 3, the FWS within these zones are no longer required.

In order to align the FWS with the current terminal footprint, the FWS infrastructure in Zones 2 and 3 would be removed or augmented and, where necessary, replaced or augmented in Zone 1 (as shown in Figure C-17). These works would include:

- **Augmentation or disconnection and removal of the FWS infrastructure in Zones 2 and 3.**
- **If removed from Zone 2, installation of new firewater pipelines, relocated pumps, and the construction of a new 3 megalitre (ML) firewater tank in Zone 1**
- **Augmentation of other FWS infrastructure within Zone 1**

If required, the FWS would be relocated to one of the two siting options (refer to Figure C-17) within the FWS Relocation Area in Zone 1. Works to relocate the FWS would last approximately eight months. These works would include:

- **Excavation and remediation, where required (in line with the approach set out in Section C.4.4 Stage 3 – Remediation)**
- **Construction of new foundations for the firewater tank, pumps, and pipework**
- **Construction and installation of the new FWS infrastructure:**
    - **The new tank would be approximately 12 m in height and 22 m in width and built in accordance with AS 2304-2011 *Standard Water storage tanks for fire protection systems***

  - **The pumphouse would be built like-for-like with its existing counterpart, with three adjoining walls of around 5 m in height**
  - **Existing pumps would be relocated and installed in the new pumphouse.**
- **Connection of the existing and new firewater infrastructure (including the connection of pipes from the new tank to the main header).**

To minimise the downtime of the FWS, new lines would be constructed parallel to the existing lines. The process to connect the new infrastructure with the existing system would occur during a FWS shutdown period, and last approximately two weeks. FWS shutdown periods are planned, permitted, and managed in line with existing terminal procedures.

This modification application is seeking development consent for two siting options for the new FWS infrastructure within the FWS Relocation Area, shown on Figure C-17. Construction would be limited to one option, selected as part of detailed design. This is discussed further in Section C.4.12 (Operation).

Augmentation of existing FWS infrastructure would involve replacement of some of the existing pipes (as shown in Figure C-17) with pipes of a larger diameter (between 400 to 600 mm diameter). Where these pipes are underground, excavations of up to 1 mbgl would be required to access and replace the infrastructure.

The FWS pipework through Zone 2 would be disconnected and removed. The FWS in Zone 3 has already been disconnected from the main system but has been left in position. The pipes would be removed, and excavations up to 1 mbgl may be required to remove the pipework, footings, and foundations.

Once removed, redundant pipes and materials from the FWS would be sent offsite for recycling or disposal based on material type and waste classification.

Electrical assets

During the closure of the Kurnell Refinery, high voltage electrical substations, power distribution rooms, and electrical infrastructure (such as buried cables) were redesigned to meet the requirements of the terminal. Following an electrical audit, existing substations / switchboard rooms in Zones 2 and 3 have been deemed to be no longer required and are therefore proposed for demolition.

All above-ground redundant electrical assets in Zones 2 and 3 would be decommissioned and removed. Below ground cables would be de-energized and either retained for potential future use or removed in accordance with AS/NZS 3000:2018 *Electrical installations*.

Once removed, redundant electrical cables and materials from the electrical assets would be sent offsite for recycling or disposal based on material type and waste classification.

Structures

A number of buildings and other structures are located within Zones 2 and 3 (Figure C-17). These include small storage structures and larger buildings such as the storehouse, main warehouse, central control building, and the Oil Spill Room. Many of these buildings are no longer fit for purpose for the Terminal and are relatively isolated from the terminal footprint. On this basis, and to facilitate the future use of Zones 2 and 3, Ampol are proposing to remove these structures as part of the modification works.

Each structure proposed for demolition would be demolished to ground level and, where possible, their slab, foundations, and footings removed. The foundations of buildings and structures previously demolished as part of the approved project within Zones 2 and 3 would be also excavated and removed, where they haven't already been removed and where practicable. These activities would require excavation works up to 2 mbgl, depending on depth of footings (generally focused within 1 mbgl).

Once removed, building waste materials from the demolition would be sent offsite for recycling or disposal based on material type and waste classification. Concrete would be crushed within the waste management area and where appropriate, used as backfill during Stages 3 and 4 to

reduce the soil deficit and to improve the geotechnical stability of the land. Concrete waste that cannot be used would be taken offsite for sale, recycling or disposal.

A new 'fit for purpose' warehouse would be constructed within Zone 1 to house maintenance supplies and small-scale terminal maintenance activities currently undertaken in part of the oversized existing main warehouse building in Zone 2. This new warehouse would be approximately 32 m by 25 m, with an awning of 35 m by 10 m, and up to 8 m tall. The new warehouse would also include space adjacent to the structure for semi-trailer parking and an extension of the wet store area of 25 m by 10 m. The proposed location for the new warehouse is to the north of Pipeway A.

A new Oil Spill Equipment Storeroom, approximately 18 m by 14 m and up to 8 m tall, would also be constructed in Zone 1. The location of the new Oil Spill Equipment Storeroom would be adjacent to the existing Firehouse near Substation 12.

A new storage shed would be constructed in Zone 1A to store boats and emergency aquatic spill response kits. This would be approximately 18 m by 14 m and less than 4 m tall.

Construction of the new warehouse, Oil Spill Equipment Storeroom and storage shed would involve excavation and installation of foundations of up to 1 mbgl, laying a slab, installation and connection to Site utilities, construction of the structure and internal fit out.

Waste management

Redundant infrastructure would be cleaned, processed, and stored prior to reuse or removal from Site. Infrastructure and waste materials would be tracked in line with a Material Tracking Plan (see measure C5 in the Consolidated Mitigation Measures (Appendix D of the MOD-7 Modification Report))

A waste management area for surface and subsurface materials removed (e.g. concrete, metals/ reinforcement bar, drainage lines, electrical equipment) would be established in an area shown on Figure C-18. Once material is removed or excavated it would be sorted and stockpiled separately in this area prior to processing. The waste management area would remain for the duration of the modification works.

It is estimated that the MOD-7 would involve the processing of approximately 40,000 m^3 of concrete predominantly from slabs and asphalt. Concrete would be crushed within the waste management area and where appropriate, used as backfill during Stages 3 and 4 to reduce the soil deficit and to improve the geotechnical stability of the land. Concrete waste that cannot be used would be taken offsite for sale, recycling, or disposal.

Where soils are brought from other sites, the material should be classified as virgin excavated natural material (VENM), excavated natural material (ENM) as defined by the ENM Order, 2014, or material covered under an NSW EPA specific Resource Recovery Order (RRO). The soils would be managed in line with this order as well as a specific Validation Plan, which would outline acceptance criteria, and sampling and analytical requirements. Once material is validated (using the criteria outlined in the Validation Plan), the soil would be reused onsite under an NSW EPA approved Resource Recovery Exemption. The imported fill would be stockpiled and tracked separately to the onsite materials and tested/ validated to confirm they have been remediated for reuse on the Project Area.

Contaminated soils encountered during Stage 2 would be managed in line with the processes outlined in Section C.4.4 (Stage 3 – Remediation). If contaminated liquids are encountered (for example potentially where pipework is being removed), appropriate containment/ spill mitigation measures would be employed as part of the approved Spill Response Plan (see measure B4 in the Consolidated Mitigation Measures (Appendix D of the MOD-7 Modification Report) and the Soils and Water Management Plan (see measure C18). Light non-aqueous phase liquid (LNAPL) and/or impacted water would be directed to the wastewater treatment plant (WWTP) or contained and disposed offsite by a licensed contractor as discussed below.

C.4.4 Stage 3 – Remediation

Background

Significant soil and groundwater investigations have been conducted on the Site since the 1990s. An Environmental Site Assessment Data Gap Assessment (WSP, 2018) was undertaken to reduce data gaps within the former refinery process unit areas, pipeways of the site and redundant tank bunds. Additional investigations conducted between 2018 and 2023 have been completed to understand the type, location, concentration, depth, volume, and risk associated with contaminants of potential concern (COPC). Primary COPCs in soils and groundwater at the Site comprise the following:

- **Asbestos**
- **Petroleum related hydrocarbons (PHC)**
- **Per- and polyfluoroalkyl substances (PFAS).**

In 2019, Ampol collated the ground investigation works completed to that point and developed the Kurnell Remediation Action Strategy (Ampol, 2019), which identified areas of potential ground and groundwater contamination, and provided information on areas identified for remediation with the context of continued terminal use. Since 2019, additional ground investigation and remediation activities have been competed to further define and manage areas impacted by contamination.

Conceptual Remedial Action Plan

A Conceptual RAP (Appendix I) has been prepared to support the proposed modification, and to:

- **Provide a summary of historical environmental characterisation studies**
- **Identify the scope of necessary remedial activities potentially required**
- **Identify the remedial strategy(ies) to be adopted**
- **Document the proposed remediation methodology**
- **Establish validation criteria relevant to the commercial/ industrial land use and detail the validation program as part of a future Validation Sampling and Analysis Quality Plan (SAQP).**

The Conceptual RAP has been prepared in accordance with the NSW EPA Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2020). It would be updated to one or a number of Detailed RAPs following further investigations within the Project Area and receipt of relevant conditions of consent for Modification Application SSD-5544 MOD-7. The differences between this version (the Conceptual RAP) and the future final version(s) (the Detailed RAP(s)) are presented in the Conceptual RAP.

The Conceptual RAP has been reviewed by an EPA accredited Site Auditor (Site Auditor). Future Detailed RAP(s) would also be reviewed by an EPA accredited Site Auditor prior to commencement of remedial activities to facilitate future validation of the site and Site Auditor sign-off in the form of a Site Audit Statement and Site Audit Report. Validation requirements are further discussed in the following sections.

The Conceptual RAP outlines management of the remediation works across the Project Area and identifies the remediation approach and proposed remediation technologies to be utilised for the proposed modification. This is described below.

Remediation approach

Overview

Remediation and/ or management of contaminated materials would be required across Zones 2 and 3, and parts of Zone 1, should the soil and groundwater quality does not currently meet the commercial/ industrial land use standard, as defined by ASC NEPC (2013).

As part of this proposed modification, where ground disturbance is proposed within Zone 1, contaminated material would be managed in accordance with the terminal's existing OEMP (Ampol, 2021) and Kurnell RAS (Ampol, 2019) and subsequent progress reports, last updated in November 2023 (Ampol, 2023) Excavation works in Zone 1 would be limited to shallow excavations related to installation of footings and foundations. Excess soil or fill material generated during these works would be categorised and either disposed offsite to landfill (consistent with the OEMP) or potentially incorporated into Zone 2 and 3 remediation activities.

To remediate identified areas of impacts within the Zone 2 and 3 within the Project Area (referred to as 'remediation areas'), contaminated soils would either be:

- **Excavated (Figure C-18), and treated onsite for reuse (i.e. through biopiling or stabilisation), or disposed offsite; or**
- **Managed in situ and capped (Figure C-19).**

The primary technologies that would be used to remediate identified contamination would be based the matrix provided in Table C-12. A description of the remediation technologies required for the modification works, their indicative location within the Project Area and relevant environmental controls is provided the sections below.

Table C-12 Remediation options matrix

Contaminant	Excavation and onsite biopiling	Excavation and onsite stabilisation	Capping (in situ management)	Offsite disposal
Asbestos	N/A	N/A	Yes	Yes
Hydrocarbons	Yes	No	Yes	Yes
PFAS	N/A	Yes	Yes	Yes

Where soil in the Project Area has been assessed as not requiring remediation, this is because the soil and groundwater quality either:

- **Already meets the commercial/ industrial standard (refer to Appendix I); and/ or**
- **The remaining contamination impacts either do not pose a risk to human health or the environment, or can be managed and mitigated by implementation of existing environmental management procedures for the Site.**

Where residual concentrations are assessed to still be present above criteria after soil remediation activities, remediation capping works would be undertaken to address residual impacts.

Two types of capping would be used depending on the types of contamination present:

- **Type 1 capping: A soil capping layer underlain by a geotextile marker layer or equivalent highly visible marker to separate contaminated and non-contaminated soils. The primary remediation strategy to address asbestos contamination in soils.**
- **Type 2 capping: Layers of structural fill, a geotextile separation marker and impermeable HDPE or low permeability layer. Primarily used in areas with residual PFAS and/ or hydrocarbon impacts**

Capping works would be undertaken underneath active pipelines, where required, in order to maintain access to pipelines for operational and maintenance purposes.

Key areas requiring either capping to address asbestos and residual PFAS and/ or hydrocarbon impacts have been identified, as per Figure C-19, which shows the indicative locations where the Type 1 and Type 2 capping may be required across the Project Area. During the remediation works, if the remaining Zone 2 and 3 areas are found to require capping, it is assumed that this would be Type 1 (shown in Figure C-19 as "contingency").

Stage 3 (Remediation) would commence concurrently with Stage 2 (Removal and/ or relocation of infrastructure).

Based on the analytical data obtained from previous site investigations, the soil remediation works would be limited to less than 4 mbgl and would be generally focused within 1 mbgl.

For hydrocarbon (PHC), asbestos, and/or PFAS impacted soils, Figure C-18 shows the approximate areas that would require excavation for either onsite treatment or disposal offsite. As presented in the Conceptual RAP (Appendix I), the volume of hydrocarbon, asbestos and/or PFAS impacted soil that would require excavation and either treatment or offsite disposal has been estimated at 83,000 m^3. This area of contamination may require "chasing" during remediation works, which involves the process of continuing to remove/excavate contamination that extends beyond the initially identified areas. Therefore, for the purpose of the assessment within this Modification Report, an approximate contingency soil volume of 40,600 m^3 (50%) has also been included for assessment (i.e. a total of 123,600 m^3).

To prevent loss of existing flood storage and to avoid offsite flooding impacts, earthworks and capping would be completed in a manner that does not significantly alter existing surface levels. For example, areas requiring up to 300 mm of capping that are within areas of flood storage would need to be initially excavated by 300 mm before the capping occurs. Areas requiring excavation prior to capping are shown on Figure C-19. Additional excavation (approximately 183,130 m^3 of excavated soil, with 91,565 m^3 contingency) would be required in these areas to allow for the capping layer.

The estimate of 266,130 m^3 (with contingency allowance for 132,165 m^3) is comprised of the following excavation areas, soil volume estimates, and contingency volumes.

Table C-13 Excavations

Name	Excavation volume (m^3)	Contingency excavation volume (m^3)	Total volume (m^3)
Zone 1 (Infrastructure construction works)	13,000	6,500	19,500
Zone 2 and 3 (OWS removal)	11,800	5,000	16,800
Excavation 1 (PHC)	4,000	2,000	6,000
Excavation 2 (PHC)	15,550	7,775	23,325
Excavation 3 (PHC)	2,450	1,225	3,675
Excavation 4 (PFAS)	10,000	5,000	15,000
Excavation 5 (PFAS)	2,550	1,275	3,825
Asbestos Excavation	23,650	11,825	35,475
Capping Excavation	183,130	91,565	274,695
Total	266,130	132,165	398,295

Figure C-18 Excavation and excavated material management

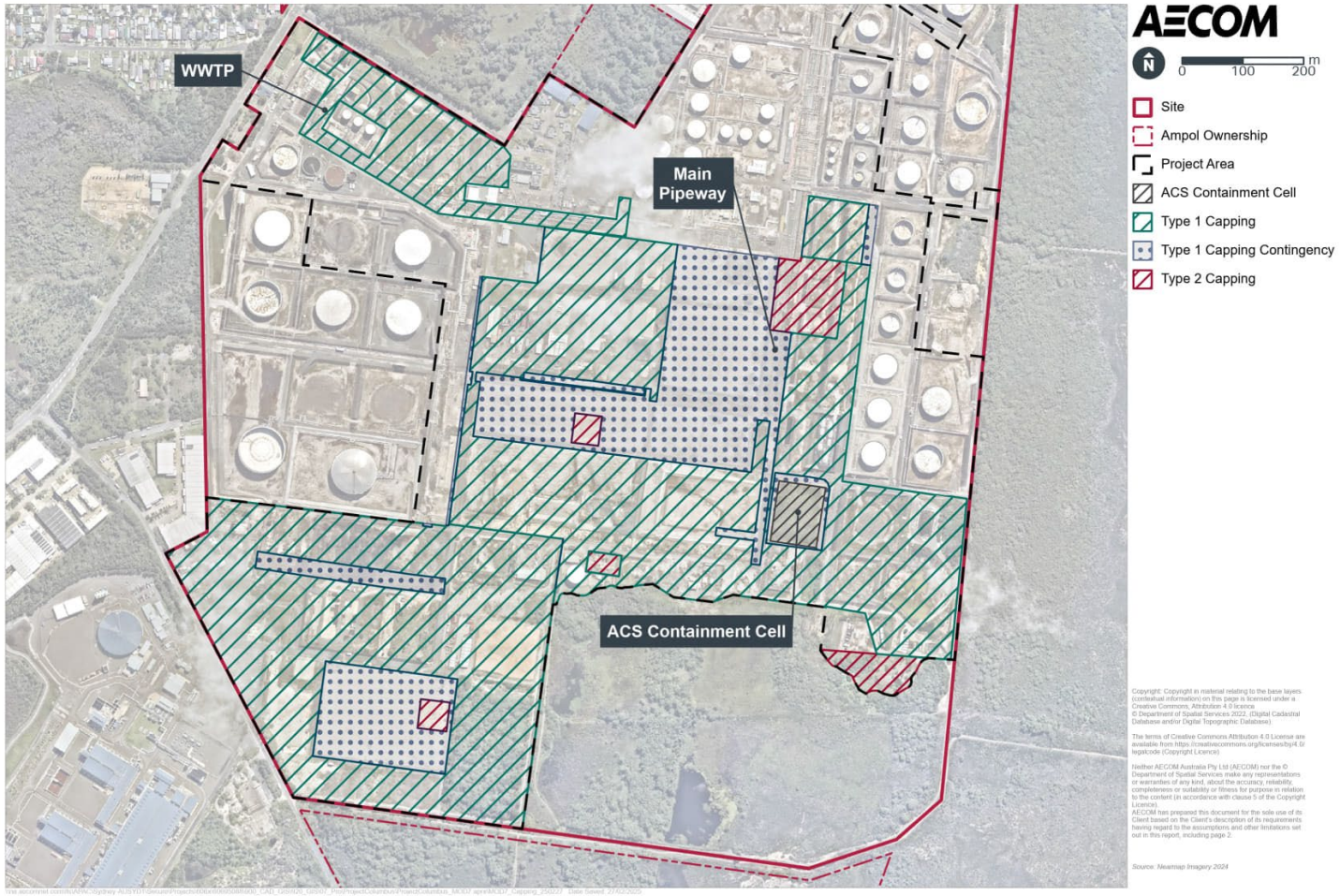


Figure C-19 Capping areas

Once contaminated soils are excavated, soil sampling and analytical testing would occur within the excavations to validate the remaining soil against a pre-determined validation criteria and in accordance with the specific Validation SAQP.

Impacted soils to be treated ex-situ would be excavated and stockpiled based on visual and olfactory evidence, field screening, and laboratory data. Contaminated soils would be stockpiled separately depending on the type and concentrations of contamination present and the remediation technology required within the waste management area.

Where it is not feasible to remediate the soils with the technologies above, they would be disposed offsite (untreated, and in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014a)) to an appropriately licensed facility.

Figure C-18 also shows the indicative locations where the excavated soils would be stored, managed, and treated, which is discussed further in the Biopiling and Stabilisation sections below.

Biopiling

Following testing, soils requiring remediation due to hydrocarbon impacts, but not impacted by asbestos or PFAS, would be remediated by biopiling, where practicable. Under normal conditions, naturally occurring bacteria in the ground slowly degrade hydrocarbon contamination to compounds that do not pose a risk to human health or the environment. Biopiling promotes and facilitates this natural process (through the addition of nutrients etc.) expediting the remediation process. Based on ground investigations it is estimated that approximately 10,000 m^3 of hydrocarbon contaminated soil from the Project Area would be remediated by biopiling, however a contingency soil volume of 5,000 m^3 has also been included for this assessment (i.e. a total of 15,000 m^3).

Biopiles would be established within areas shown on Figure C-18. Prior to setting out the biopiling areas, these areas would be remediated and/or managed (if required) prior to being prepared with a base clay or HDPE liner, where suitable concrete slabs are not present. A compacted sand base would be established over the liner to enable adequate air exchange into the biopile. The soils would be mixed with nutrients or other soil amendments and placed in the biopile area. The biopiles would be covered with an impermeable material to reduce stormwater ingress and dust creation. Measures to minimise the creation of dust and odour emissions during the construction of the biopiles would include:

- **Covering surfaces**
- **Minimising exposed area**
- **Wetting down exposed soils**
- **Dust monitoring or observations.**

The biopile would be maintained under negative pressure with blowers to mitigate fugitive gas emissions to the atmosphere. Off-gas from the process would be passed through air filters to remove volatile hydrocarbons and regular air monitoring of the air emissions would confirm when exchange of air filters is required. Moisture, temperature, nutrients, oxygen, and pH would be monitored regularly and controlled to enhance biodegradation.

The addition of nutrients/ amendments, compost, microbes, and moisture (as appropriate) to the biopile and the movement of air with a blower through the material would stimulate aerobic microbial activity within the soils and promote the biodegradation of hydrocarbons.

The biopiling base would be graded towards a collection point. Leachate from the biopiles would be sent to the WWTP (via the OWS system) for treatment prior to being discharged in line with the EPL 837.

Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure C-18). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers.

Regular testing of the soil in the biopiles would occur to confirm when the soil has been remediated to an industrial/ commercial standard. Once the soil is remediated to this standard, the biopiles would be deconstructed and the soil would be reused onsite as backfill or for capping.

Stabilisation

Excavated soils from the former Fire Training Area and small quantities of soil impacted by PFAS from other areas would be disposed offsite; however, should larger volumes of contaminated soil be present in a specific location, or if the concentrations result in the soils being classified as Restricted Soil Waste (RSW) or higher, ex-situ stabilisation maybe required. The decision to either dispose of the contaminated soils offsite or to use stabilisation would be based on a cost benefit analysis.

Stabilisation involves the use of a binding reagent (typically activated carbon) to encapsulate contaminants). To confirm the appropriate approach for soil stabilisation, bench scale trial testing would be undertaken to:

- **Confirm the optimal treatment application (i.e. additive ratios)**
- **Demonstrate longer-term effectiveness of the treatment**
- **Demonstrate that the treated material has been appropriately stabilised and is suitable to be reinstated into excavations and/or accepted by an appropriately licenced landfill.**

Following the completion of the bench scale trial, the results would be confirmed and the full-scale stabilisation works would commence.

Once excavated, PFAS impacted soils would be stockpiled separately to non-contaminated soils and other contaminated soils in the waste management area. Stabilisation works would progress in a sequential manner with progressive validation testing conducted to confirm the remediation objectives have been achieved.

The stabilisation works would require setup of the stabilisation process (preparation and construction of treatment areas) and related environmental controls.

Following set up the stabilisation process involves the thorough mixing of the selected additives into the soil. This would be undertaken in a segregated area as shown in **Figure C-18**. **This may be achieved using either an excavator fitted with at grid bucket, or mixing plant/trommel including a feed hopper, mixing apparatus and an additive hopper depending on the volume of soils to be treated and the associated scale of mixing operation required.**

Once complete, the treated material would be validated for onsite reuse or classified for offsite disposal.

Capping

Onsite *in-situ* containment by capping would be carried out where soils have residual COPC concentrations that pose a potential risk for direct contact.

Capping would be considered in the areas proposed on Figure C-19. The need for capping in these areas would be confirmed following additional sampling to be conducted as part of the data gap assessment and Detailed RAP(s) planning.

Capping of soil would be conducted sequentially in a staged manner. Following remediation of one area, soils would be validated in accordance with a specific SAQP (further described below). During validation of one area, remediation of the next area would commence, with the first area being clearly marked to avoid potential cross-contamination from other parts of the Project Area. Capping of soil could occur concurrently in different spatial areas where cross-contamination is not a concern.

Two types of capping would be used depending on the types of contamination present. These two capping approaches (Type 1 and Type 2) are described in detail below. Capping thickness would meet the requirements of an industrial/ commercial land use and would be designed to meet the final landform grade. The thickness may be reduced if contaminated materials are situated under building slabs, roadways and other hardstand surfaces.

Type 1 capping

The primary remediation strategy to address asbestos contamination in soils is to cap the contamination by creating a physical barrier that would prevent exposure to asbestos (this is referred to herein as Type 1 capping). It is estimated that approximately 60 ha across Zones 2 and 3 would be capped with a Type 1 capping layer. The Type 1 capping layer would typically comprise a standard 300 mm clean fill cap underlain by a geotextile marker layer to delineate areas which still contain asbestos. Capping thickness would meet the requirements of a industrial/ commercial land use and would be designed to meet the final landform grade (refer to Section C.4.5 (Stage 4 – Grading)).

A schematic for a typical Type 1 capping layer is shown in Figure C-20 below. The precise depth, design and extent of the Type 1 capping across the Project Area would be agreed with the Site Auditor and outlined in the relevant Detailed RAP.

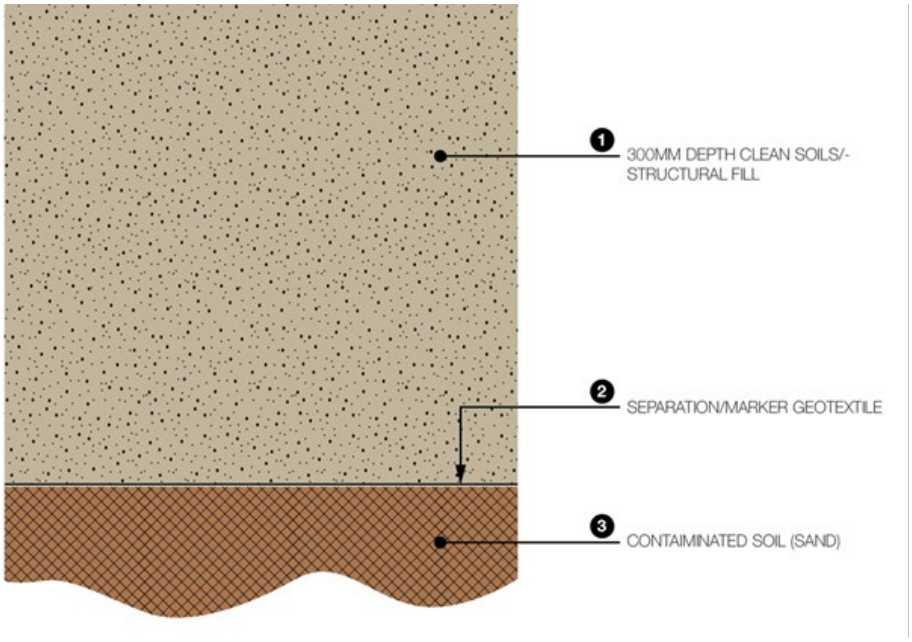


Figure C-20 Schematic for typical Type 1 capping layer

Type 2 capping

If required, an impermeable cap would also be constructed in areas with residual PFAS and/ or hydrocarbon impacts (Type 2 capping). The Type 2 capping layer has been designed both as a vapour barrier to prevent migration of volatile vapours and also as an impermeable barrier to mitigate further migration of PFAS into groundwater. The typical construction of the Type 2 capping layer would comprise 200 mm structural fill over a geotextile separation marker followed by 100 mm of clean soil/ structural fill followed by protection geofabric and impermeable HDPE or low permeability layer.

A schematic for typical Type 2 capping layer is shown in Figure C-21. The precise depth, design and extent of the Type 2 capping across the Project Area would be agreed with the Site Auditor and outlined in the relevant Detailed RAP.

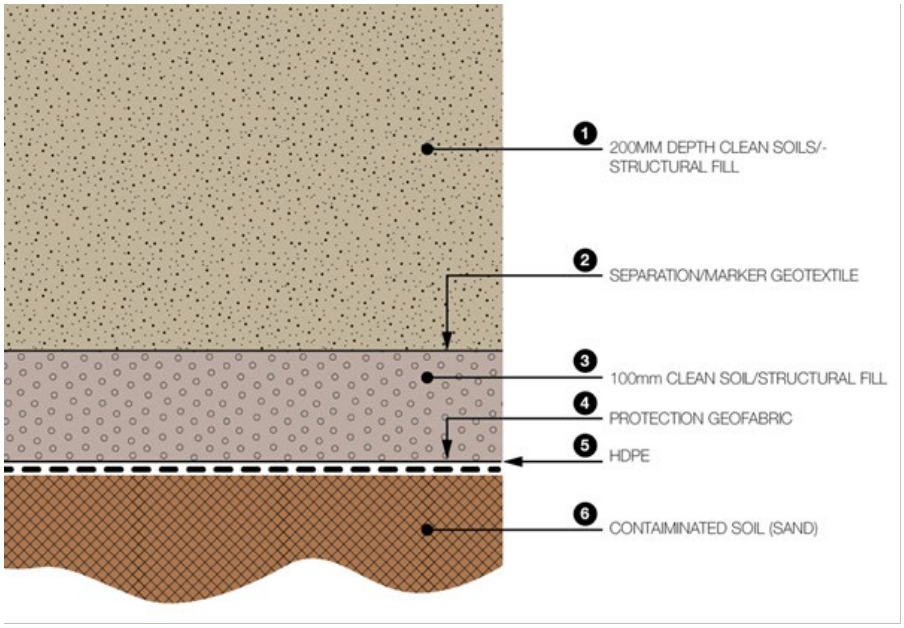


Figure C-21 Schematic for typical Type 2 capping layer

Offsite disposal (untreated soils)

Where contaminated soils or sludges cannot be treated and reused or managed in situ, they would be disposed offsite to an appropriately licenced facility by licenced contractors. Up to 40,000 m^3 of contaminated soil, fill, or sludge material may require offsite disposal. This untreated material may be petroleum or non-petroleum impacted soils or sludges.

Soils to be disposed offsite would be excavated and transported to a dedicated section of the waste management area for temporary storage or containment (depending on their characteristics). Further testing and waste classification in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014a) would be undertaken prior to disposing of these materials offsite.

Groundwater

Based on existing investigations, as presented in the Conceptual RAP (Appendix I of the MOD-7 Modification Report), groundwater contaminants are present above commercial/ industrial criteria; however, where these residual concentrations are assessed to still be present above criteria after soil remediation activities, remediation capping works would be undertaken to prevent exposure to future commercial/ industrial site users. Furthermore, the groundwater conditions are likely to improve further based on the following:

- **Primary sources: Various primary sources have been removed previously from Zone 2 and 3, with the majority of remnant subsurface infrastructure (such as below ground pipework) to be removed during the MOD-7 works.**
- **Secondary sources: Shallow hydrocarbon impacts would be addressed as part of the soil remediation works by the excavation of impacted soils to the extent practicable. As part of these works, impacted water may accumulate in these excavations either from groundwater ingress or stormwater flows. Impacted groundwater in these excavations would be removed, captured, and tested. In the majority of cases, it is expected that this groundwater would be treated through the WWTP, however it may also be disposed offsite if required.**
- **Ongoing monitoring: Following soil remediation, groundwater monitoring would continue to confirm groundwater conditions in the short term. The soil remediation process itself is likely to significantly improve groundwater conditions over the long term, assisted by natural attenuation (this process involves allowing naturally occurring micro-organisms in the ground to biodegrade hydrocarbon contamination).**

Active remediation of groundwater is not anticipated to be required; should it be warranted based on a risk assessment, in-situ treatment with injection of chemical oxidants or colloidal carbon would be undertaken.

Following soil remediation, ongoing management of contaminated groundwater would continue to be undertaken. As recommended in the Conceptual RAP, a Groundwater Monitoring Plan (GMP) would be prepared for Zones 2 and 3 to confirm residual COPCs in groundwater are being appropriately managed in the MOD-7 Project Area. The GMP would be reviewed and approved by the Site Auditor as part of their review and approval of the final validation report and the Environmental Management Plan (EMP).

Validation

Following treatment, soils would be subject to validation testing against a pre-determined validation criteria and in accordance with a specific SAQP. Soils which have been validated to meet the commercial/ industrial standard (including any validated imported materials) would be stockpiled separately from soils requiring remediation.

Validated soils, or validated soils mixed with the crushed concrete, would be placed in excavations as soon as practicable following removal of contaminated soils and subsurface infrastructure.

At the completion of the remediation works, areas used for stockpiling contaminated soils would be validated appropriately in accordance with a specific SAQP. Tracking documentation would be completed for each excavation and stockpile in accordance with the Material Tracking Plan.

Following the completion of the remediation works, one or more (depending on the staging approach for the remediation works) Validation Report(s) would be prepared in accordance with the NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and reviewed and approved by the Site Auditor, confirming that the area(s) are suitable for future commercial/ industrial land uses. The Validation Report may include progressive validation reports for separate portions of the MOD-7 Project Area to enable progressive validation of these areas.

One or more LTEMP(s) would be prepared for implementation across the MOD-7 Project Area to appropriately manage residual contaminated soil and/ or groundwater impacts that do not meet commercial/ industrial standards. The LTEMP(s) would include GMP(s), which would detail groundwater monitoring requirements for the MOD-7 Project Area. The LTEMP(s) would be provided to the Site Auditor for endorsement.

Once the remediation works are complete, a Site Audit Statement and Site Audit Report would be prepared by the Site Auditor in accordance with the *Guidelines for the NSW Site Auditor Scheme* (3rd edition).

C.4.5 Stage 4 – Grading

Following remediation works, the Project Area would be graded to facilitate the ongoing management of the Kurnell Terminal and/ or future land uses in the western half of Zone 2 and northern part of Zone 3 (refer to Figure C-22). The levels across the rest of the Project Area would remain the same as existing. Grading would allow stormwater flows across Zones 2 and 3 to be directed to the existing SWS at the Site and for flows in Zone 1 to be managed by either the SWS or the OWS, as required.

Surface treatments, such as grassing or temporary pavement, would be provided to help mitigate soil erosion and limit sediment discharging into the existing drainage network.

The grading works would consist of the following activities:

- **Placement and compaction of fill to required levels over remediated surface**
- **Forming the finished design surface through grading**
- **If required, placement of an additional surface layer (typically topsoil) and surface treatment (grassing, spray grass or temporary pavement).**

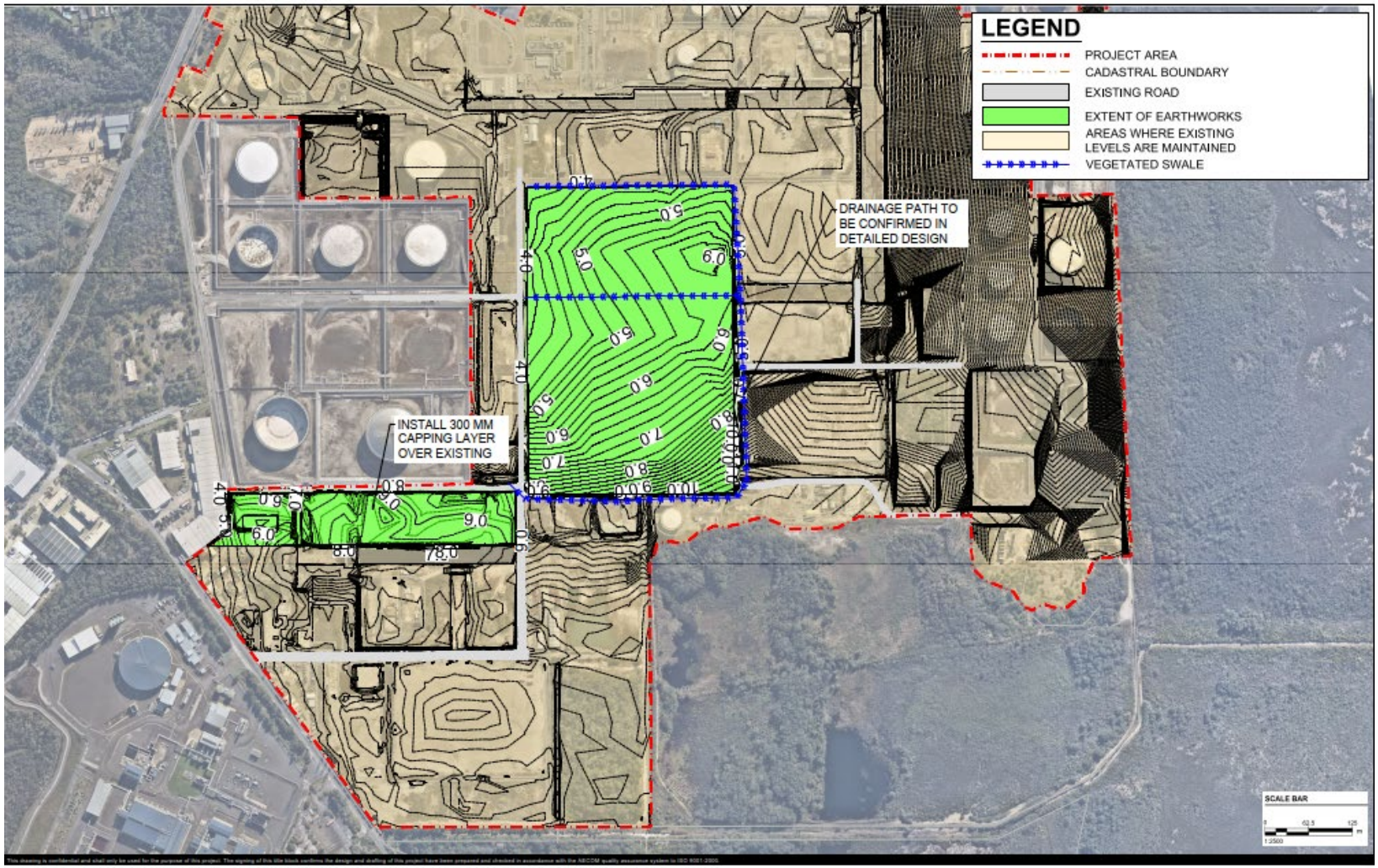


Figure C-22 Concept Landform Plan

C.4.6 Stage 5 – Demobilisation

Demobilisation from the MOD-7 Project Area would include:

- **Removal of plant and equipment**
- **Securing Zones 2 and 3**
- **Removal of temporary environmental controls and waste management areas**
- **Removal of offices, temporary structures etc. installed within the MOD-7 Project Area as part of Stage 1.**

C.4.7 Construction program

MOD-7 works are planned to commence in August 2025 and would continue for about 12 months for infrastructure removal scopes and up to four years for remediation works in accordance with the schedule in Table C-14.

Table C-14 MOD-7 program

Stage	Indicative timeframe
Stage 1 – Preparation works	August 2025
Stage 2 – Removal and/or relocation of infrastructure[1]	August 2025 – August 2026
Stage 3 – Remediation	August 2025 – July 2029
Stage 4 – Grading	Zone 2: August 2026 – December 2026 Zone 3: up to July 2029
Stage 5 – Demobilisation	September 2026 (for all works except remediation)
[1] Construction in Zone 1A expected to last 3 months.	

C.4.8 Working hours

In line with Condition C18 of SSD-5544, construction works would comply with following hours:

- **Monday to Sunday – 7am to 10pm.**

High noise generating construction works, including works within the Eastern Right of Way (Zone 1A), would be confined to less sensitive times of the day and not undertaken on Sundays, public holidays, or outside of the hours 7am and 6pm Monday to Saturday (in line with Condition C19).

Construction works outside of the work hours identified above would only be undertaken in the following circumstances (in line with Condition C20):

- **Works that are inaudible at nearest sensitive land receivers**
- **Works that are consistent with Ampol's existing maintenance procedures and are in accordance with EPL 837**
- **Works agreed to in writing by the Environment Projection Authority (EPA) or the Department of Planning, Housing, and Infrastructure (DPHI)**
- **For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons**
- **Where it is required in an emergency to avoid the loss of lives, property and/ or to prevent environmental harm.**

Biopiling blowers may operate on a 24 hour basis in identified Biopiling and Stabilisation Areas (see Figure C-18). Given their location within the Site, noise from the blowers would be inaudible at the nearest noise sensitive receivers.

C.4.9 Construction plant and equipment

Plant and equipment that would be used to deliver the MOD-7 works is shown in Table C-15.

Table C-15 Indicative plant and equipment

Plant/ equipment	Maximum number required per day (all stages except Stage 3)	Maximum number required per day (Stage 3)
Front end loader	6	6
20 t excavator	6	6
Dump truck	6	6
Grader (up to 7 m blade)	-	4
Large crane (60 t)	4	-
Elevated work platform	6	-
Franna crane (30 t)	6	-
Cement truck	6	-
Bobcat	6	2
Water cart	6	6
Concrete crusher	2	-
Telehandler	6	-
Truck and dog (offsite disposal)	6	6
Truck and dog (imported fill)	-	12
Generator	2	2
Biopiling blower	-	8

C.4.10 Construction traffic

The traffic generated by the MOD-7 would incorporate a mix of construction plant vehicles, delivery vehicles, and construction personnel movements that would scale up and down throughout construction. A summary of the construction vehicles and associated staff numbers that would be required during the works is summarised in Table C-16.

Table C-16 Workforce and plant requirements for construction

Description		Maximum daily movements (return trips)	Peak hour trips[1]
Heavy vehicles	Construction vehicles (cranes, semi-trailers, etc.)	10	0
	Truck and dog (offsite disposal and imported fill)	120	12
	Equipment/ material delivery vehicles	6	2
	Subtotal	*136*	*14*
Private vehicles	Construction personnel[2]	200	100
Total		336	114
Heavy vehicle proportion		40%	12%

Description	Maximum daily movements (return trips)	Peak hour trips[1]
[1] Assumptions: • Conservatively, it has been assumed that all personnel would arrive to Site during the AM Peak Hour and depart during the PM Peak Hour • Personnel would utilise their own private vehicle with no use of car-pooling or public transport • Heavy vehicle movements would be evenly distributed throughout the hours of operation (10-hour workdays) • All plant delivery vehicles are assumed to occur on the same day in order to produce a 'worst-case' scenario. [2] Max number of construction staff (refer to Table C-17).		

During the three-month construction period in Zone 1A, the number of heavy vehicles accessing the Site would remain the same, but about three construction vehicles (cranes, semi-trailers, etc.), six truck and dog (off-site disposal and imported fill), and three equipment/ material delivery vehicles return trips would be expected to access Zone 1A. Vehicles to be used for this work will be selected to ensure suitability on the local road network and will not be Oversize and Overmass Vehicles (OSOM).

C.4.11 Workforce

Table C-17 provides the workforce profile for the MOD-7, including current and projected numbers during construction and operation. The current workforce, including Ampol employees and contractors is approximately

Table C-17 Workforce numbers (current and projected)

Type	2025	2026	2027	2028	2029
Ampol employees	30[1]	30	30	30	30
Contractors	100[1]	100	100	100	100
Workforce for MOD-7	100	25	25	25	25
Total	230	155	155	155	155
Notes: *1. Current employee numbers at the Site.*					

C.4.12 Operation

Once the modification works are complete, the Site would continue to operate as described in the approval documentation for the approved project and would be consistent with the development consent for SSD-5544 and the requirements of EPL 837.

Relocated equipment would operate in their new locations, as shown on Figure C-17.

As discussed in Table C-11, the FWS would be relocated within the FWS Relocation Area in Zone 1, including a new firewater tank and pipework to allow it to service the terminal infrastructure, with specific siting selected during detailed design.

For the purpose of assessment in this Modification Report, two indicative locations have been assessed for the relocation of the FWS, which have been selected based on optioneering completed in the concept design phase in consultation with key stakeholders, including Firewater and Process Safety Subject Matter Experts. The location of each option is shown in Figure C-23.

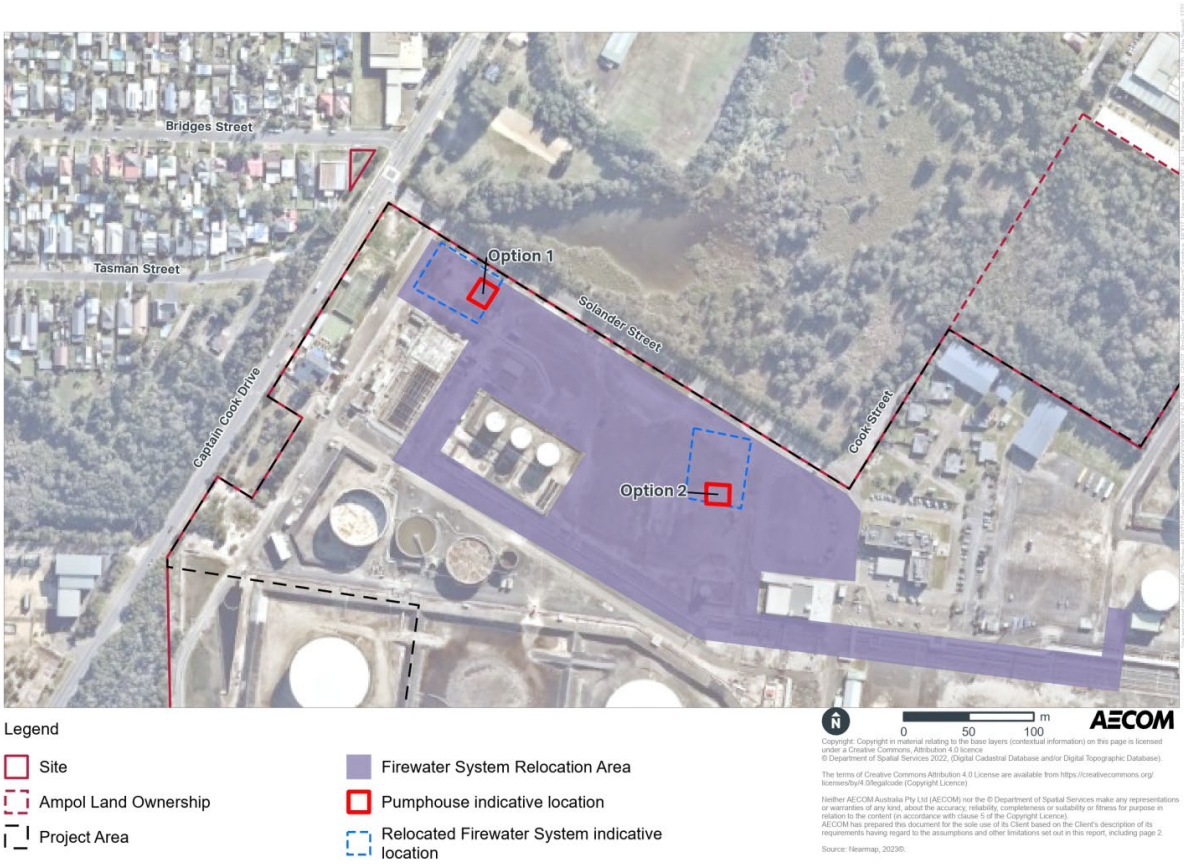


Figure C-23 Relocated FWS – Indicative locations

Operation and maintenance of the relocated FWS would be consistent with existing operations. The FWS would include three diesel engines used to operate FWS pumps housed within an enclosed area. Regular maintenance testing of the pumps would include:

- **Operation of all three pumps individually for approximately half an hour once a month**
- **One annual maintenance test conducted over a two-hour period once per year.**

C.4.13 Ancillary facilities and infrastructure

Electricity

Construction

Electricity would be required for the duration of construction. Coordination would be required between the decommissioning of electrical assets across Zones 2 and 3 and other construction works requiring electricity. To manage this, electricity would be routed from existing substations in Zone 2 and 3, prior to demolition, or from Zone 1 as required for the duration of construction. Following modification works, electricity for terminal operations would be supplied by substations in Zone 1.

Construction works would use electricity from within the Site, with the exception of Stage 3 biopiling works, which would require generators.

Operational

As noted in Section C.4.3 (Stage 2 – Removal and/ or relocation of infrastructure), both above and below ground electrical infrastructure were retained at the Site during the original Kurnell Refinery Conversion works. Given Ampol's intent to consolidate site operations, no electrical infrastructure would be required in Zones 2 and 3 once the modification works are complete.

Water, stormwater, and wastewater management

Construction

The Site includes seven main stormwater sub-catchments. An underground pipe network and above ground open drains are present throughout the Site. Stormwater and wastewater from the Site are currently managed through the SWS and the OWS respectively.

Stormwater from the Site, inflows, and runoff generally flows from east to the west, with the higher point close to Kamay Botany Bay National Park. Key Site stormwater outlets include Quibray Bay, Botany Bay, and Marton Park Wetland. Modification works are not proposed to the SWS, except where required for remediation as discussed below. Modification works to the OWS are detailed in Section C.4.3 (Stage 2 – Removal and/or relocation of infrastructure).

During the remediation works, the existing surface water management system (pipeways and box drains) would continue to operate.

As the remediation progresses, the stormwater and wastewater systems would be progressively isolated where remediation works are occurring, with excavation pits being bunded temporarily to minimise the impact on surface water from contact with contaminated soils. Stormwater would be diverted around the work areas using temporary drainage channels. Surface water runoff would continue to follow existing drainage patterns, unless temporary diversion from active remediation areas is warranted.

The approach to managing water within remediation areas and disturbed areas is as follows:

- **Minimise the volume of potentially contaminated water during construction of the MOD-7 works wherever possible by directing surface water away from excavations, depressions, pits, and stockpiles by the construction of drainage works such as bunds and diversion drains. These measures would minimise the flow of surface water into parts of the MOD-7 Project Area that contain potentially contaminated materials**
- **Capturing uncontaminated surface water where possible and using it during the works for various activities, e.g. dust suppression, wheel washing, etc. To assist in the collection of surface water, a temporary sediment basin may be constructed in a suitable location to be determined during detailed design**
- **Capturing potentially contaminated water (e.g. in bunded remediation areas) and directing it to the WWTP, if appropriate, or disposing of it at an appropriately licensed facility.**

The generation of impacted surface water would be minimised by:

- **Covering biopiles and contaminated soil stockpiles to reduce the amount of contaminated water produced**
- **Completing the remediation in a staged manner so as to minimise the extent of excavations at any one time that could collect water and require dewatering and treatment at the WWTP.**

Liquids and water that is produced or collected during the works would be directed through the existing OWS system and, where possible, to the WWTP. If it is not practical for the liquids and water to be sent via this system, it would be collected (e.g. in a tanker, vacuum truck) and be transported to the WWTP for subsequent treatment and discharge in line with EPL 837, or taken offsite for disposal at appropriately licensed facility. Accumulated groundwater in excavated areas would be tested to confirm that it can be appropriately treated in the WWTP.

Operational

Stormwater generated on the Site would continue to be collected in the SWS from areas that have been designated as having low risk of interaction with petroleum products. Stormwater would continue to be discharged offsite into the three receiving water bodies: Quibray Bay, Botany Bay, and Marton Park Wetland.

Where disconnection and removal of OWS is proposed, controls to limit peak discharge and ensure appropriate water quality is achieved would be put in place once areas have been remediated, stabilised and disconnected from the OWS system. Runoff from catchments within Zone 2 are partially managed by pumps and splitter pits to only allow clean water to be discharged and the peak flow rate to be controlled. This system would continue to operate post remediation such that no additional infrastructure is required for Zone 2.

Two additional detention basins are required to manage Zone 3 discharges: one would be located within existing pipeway infrastructure, and one would require construction of a new temporary detention basin/ swale within Zone 3 (refer to Figure C-17).

Sediment control measures would be required until remediated areas are stabilised. Short term monitoring would likely be required to confirm that these areas are functioning as expected.

Where water may have been impacted by petroleum products, the OWS would continue to handle this water. This water is treated at the WWTP prior to being discharged to the Tasman Sea under EPL 837.

Sewers

Sewerage management would continue to operate as described in the Kurnell Refinery Conversion EIS (URS, 2013) and would be consistent with the development consent for the approved project.

Road access

Road access arrangements would continue to operate as described in the Kurnell Refinery Conversion EIS (URS, 2013) and would be consistent with the development consent for the approved project.

Access to Zone 1A would continue to be primarily from Prince Charles Parade. A secondary access point is available on Captain Cook Drive for smaller vehicles.

C.4.14 Environmental management

Construction

The current operations at the terminal are managed under the Operational Environmental Management Plan (OEMP) Kurnell Terminal, Final Stage 2 (Ampol, 2021) (as approved by DPE, now DPHI). This OEMP helps Ampol comply with its requirements under the development consent for the Kurnell Terminal (SSD-5544), Environment Protection Licence No. 837 (EPL 837), and the Major Hazard Facility (MHF) licence for the terminal. This is the primary document that informs how the Site identifies and provides management solutions for potential environmental impacts arising from Terminal operations.

In order to maintain compliance with relevant legislative and regulatory requirements, Ampol also implements an Environmental Management System (EMS). The EMS consists of a suite of internal policy documents and plans. The EMS is overseen by a dedicated member of the Ampol Environment Team.

Appendix D (Revised mitigation measures table) of the MOD-7 Modification Report presents the consolidated list of measures that would assist in avoiding, mitigating, or managing the anticipated impacts associated with the MOD-7 works. These measures would be incorporated into the modified conditions of consent for MOD-7 and, during construction, would be implemented through a Construction Environment Management Plan (CEMP).

The CEMP would cover all environmental aspects associated with the construction of MOD-7 and would include the mitigation measures and controls identified in Sections 7.2 (Hazards and risk) to 7.13 (Cumulative impacts) of the MOD-7 Modification Report.

The CEMP would help ensure that:

- **All work complies with all relevant environmental legislation, regulations, and standards**
- **Environmental factors are taken into account for each activity**
- **Maintenance of environmental compliance and performance is achieved through ongoing environmental monitoring and reporting**
- **Regular audits are performed to confirm compliance with environmental policies and standards.**

For the MOD-7 works, a Work Health and Safety Management Plan (WHSMP) would be developed and implemented.

Operation

The OEMP would continue to be active for MOD-7 following construction. Updates required to address issues identified are presented in Appendix D (Revised mitigation measures table) of the MOD-7 Modification Report.

Appendix D

Consolidated mitigation measures

Appendix D Consolidated mitigation measures

Management and mitigation measures for SSD-5544 (including MOD-1, MOD-2, MOD-3, MOD-4, MOD-5, MOD-6, and MOD-7) are consolidated in the table below. Additional and/ or modified environmental safeguards and management measures to those presented in the approved SSD-5544 are shown in **bold**. Deleted measures, or parts of measures, have been ~~struck out~~. Where approved measures have been consolidated to reduce duplication, previously agreed text that has been brought into existing or new measures has been underlined.

As the works associated with SSD-5544 and MOD-1 to MOD-6 are either completed or ongoing (and not relevant to the proposed modification), these measures have been kept as is, redacted, or amended as necessary to reflect ongoing management. Where these measures are relevant to the proposed modification (MOD-7), they have been kept as is or amended as necessary.

The following acronyms have been used to describe each stage:

CD – Conversion Design; Conv – Conversion; Op – Operation; DD – Demolition Design; Dem – Demolition; and Con – Construction.

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
General												
A1	~~Caltex~~ **Ampol** would carry out the proposed works in accordance with the EIS, the SEEs, the Mod**ification** Reports, and the approval conditions.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A2	~~Caltex~~ **Ampol** would implement reasonable and practicable measures to avoid or minimise impacts to the environment that may arise as a result of the **approved p**~~P~~roject **and proposed modification**.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A3	~~Caltex~~ **Ampol** would ensure that the ~~Project~~ contractor **for the proposed modification** prepares and implements a Construction Environmental Management Plan (CEMP) ~~for the conversion works and a Demolition Environmental Management Plan (DEMP) for the demolition works (inclusive of the ACS Modification works, Tank 101 demolition works)~~ to manage ~~any Project~~ **potential construction phase** impacts. This would be reviewed and approved by a ~~Caltex~~ **Ampol** Environmental Management Representative (EMR). Elements of these plans may be shared as required.		✓			✓	✓			✓	✓	

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
A4	~~Caltex~~ **Ampol** would appoint an EMR to monitor the implementation of all required environmental mitigation and management measures. The EMR would ensure that all measures ~~were~~ **are** being effectively applied during the proposed works and that the work would be carried out in accordance with the CEMP~~, the DEMP~~ and all environmental approvals and legislative conditions.		✓			✓	✓			✓	✓	
A5	~~Caltex~~ **Ampol** and the various works' contractor personnel would undergo training in accordance with the CEMP~~, the DEMP~~ and currently implemented environmental and safety measures agreed as part of the ~~Project~~ **proposed modification** approval.		✓			✓	✓			✓	✓	
A6	~~Caltex~~ **Ampol** would provide Sutherland Shire Council the opportunity to review and comment on the CEMP prior to the commencement of ~~conversion~~ **proposed** works.		✓								✓	
~~A7~~	~~Prior to the demolition works commencing for a particular structure or group of structures, Caltex would develop a specific demolition management plan (DMP) for each structure or group of structures to be demolished. The DMPs would be made available to the appropriate regulators prior to being implemented if requested. The DMPs for the two concrete stacks (power plant and common stacks) and for the tall complex structures (two catalytic cracker units (plants 4 and 34)) would be provided to the EPA for comment ahead of the demolition works for these structures taking place.~~					✓				✓		
~~A8~~	~~Caltex would provide a draft of the DEMP and SWMP to NSW DPI for review and comment prior to finalising.~~				✓				✓			
~~A9~~	~~Caltex would provide NSW Health with a copy of the DEMP and Asbestos Management Plan (AMP) for review and comment prior to finalising.~~				✓				✓			

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
A10	~~Caltex~~ **Ampol** would provide ~~NSW OEH~~ **NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW)** with a copy of the Biodiversity and Weed Management Plan (BWMP) for review and comment prior to finalising.				✓						✓	
A11	Following the ~~ACS Modification works~~ **proposed modification**, ~~Caltex~~ **Ampol** will update the Asbestos Management Plan **(AMP)** for the Site and Asbestos Register.							✓				✓
A12	~~A~~ **The** Containment Cell Long Term Environmental Management Plan (CCLTEMP) would **continue to be implemented for the Asbestos Contaminated Soil containment cell**. ~~be prepared in consultation with the EPA prior to the closure of the containment cell. The CCLTEMP would detail the ongoing environmental management of containment cell, including maintenance of the capping and drainage, groundwater monitoring (including groundwater quality and levels), and land use restrictions that will apply to the containment cell. The CCLTEMP would be attached to the positive covenant for the land where the containment cell is located, if required.~~							✓				
~~A13~~	~~From development consent of SSD-5544-MOD-2 until the quarterly community meeting after the containment cell is closed, Caltex **Ampol** will provide an update on the progress of the ACS Modification works, including issues faced or complaints received, at each of the quarterly community meetings.~~						✓	✓				
~~A14~~	~~ACS from the pipeways classified as hazardous waste under the NSW EPA Waste Classification Guidelines would have a minimum cover of at least 500 mm plus the surface cap.~~						✓					
~~A15~~	~~Within one month after it has been validated that all ACS from the pipeways has been removed, the containment cell would be capped and permanently sealed as per the containment cell design.~~						✓					

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
~~A16~~	~~Caltex **Ampol** would prepare an ACS Modification Works Completion Report following the completion and closure of the containment cell. The report would include a summary of the waste classification and environmental monitoring data conducted in accordance with the Environmental Management Plans (and associated Sub Plans). Monitoring data should include but not necessarily be limited to:~~ ~~i. Waste Characterisation and Tracking~~ ~~ii. Air Quality monitoring (including dust and asbestos)~~ ~~iii. Groundwater Monitoring.~~						✓					
Hazards and Risk												
B1	A program of routine testing, inspection and maintenance would be developed for each new piece of equipment or instrumentation. This program would be added to the preventative maintenance program already established for existing plant and equipment.		✓	✓							✓	✓
B2	The recommendations of the Fire Safety Study and **SSD-5544 MOD-7 Fire Safety Study Addendum, as appended to the PHA (Appendix F) of the MOD-7 Modification Report),** would be implemented for the design and operation of the terminal.	✓	✓								✓	✓
B3	The Process Hazard Analysis Recommendations would be implemented for the design and operation of the terminal.	✓	✓									
B4	The relevant spill response plan for the Site would be updated for the ~~proposed~~ terminal.		✓									✓
B5	~~Caltex~~ **Ampol** would review hardware protection in place and proposed to ensure the risk of filling low flash point material into tanks designed for high flash point usage is minimised. Particular attention to human factors issues at manifolds.	✓	✓									
B6	~~Caltex~~ **Ampol** would determine need for additional means of communication, e.g. for lone worker on the proposed terminal.		✓									

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
B7	~~Caltex~~ **Ampol** would review the procedures used for potentially hazardous manual operation to ensure they are appropriate and sufficient for any increased frequency of use.		✓									
~~B8~~	~~The bullet pointed measures listed in Section 8.7 of the Demolition Works SEE would be implemented to ensure that the conclusions of Appendix C Hazards and Risks Assessment of the Demolition Works SEE remain valid.~~				✓	✓			✓	✓		
~~B9~~	~~Personnel required to work with hazardous/ flammable/ contaminated materials would be trained in safe use and handling and would be provided with all relevant safety equipment.~~						✓					
~~B10~~	~~Procedures are currently in place to manage incidents and injuries at the Site. This includes an established incident reporting and response process. These processes would be implemented for the ACS Modification.~~						✓	✓				
B11	**Ampol would continue to implement onsite safety processes and procedures and update the relevant existing Work Health and Safety Management Plan (WHSMP) to include the proposed modification as required.** Procedures would include training staff for the safe use and handling of hazardous/ flammable/ contaminated materials, use of relevant safety equipment, and incident reporting and response processes.										✓	✓
B12	**The SSD-5544 MOD-7 HAZID Workshop Recommendations, as appended to the PHA (Appendix F of the MOD-7 Modification Report), would be implemented for the design and operation of MOD-7 infrastructure.**										✓	✓
Soils, Groundwater, and Contamination												
C1	A Soils ~~and Erosion~~ **and Water** Management Plan **(SWMP)** would be developed as part of the Construction Environmental Management Plan (CEMP) to manage the excavation, testing, stockpiling, reuse,		✓								✓	

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
	and rehabilitation of soils **as well as water management requirements**. This plan would be developed in accordance with 'The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2 (Landcom, 2004) and would outline: • The areas where soil disturbance is likely • Soil testing procedures • Soil handling procedures • Locations where soil would be stockpiled on-site for either removal, treatment, or reuse • Locations of potentially contaminated areas • Procedures to reduce erosion and the spread of dust • Restricting traffic to defined roads or tracks where necessary • Measures to manage vehicles leaving the Site to reduce soil on public roads • ~~The rehabilitation of bare soil following completion of the construction works~~ • Inspection program for any erosion control structures and bunded areas • How excavations would be staged so that the length of time that excavations are left open and temporary stockpiles are required is minimised • **Remediated soils and validated crushed clean concrete slabs would be used as backfill where practicable. Imported material would be classified as virgin excavated natural material (VENM), excavated natural material (ENM) as defined by the ENM Order, 2014, or material covered under an NSW EPA specific Resource Recovery Order (RRO)** • Measures to protect excavations from increased stormwater runoff (e.g. by using bunds or similar structures where required) • That equipment is to be maintained and operated in a proper											

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
	and efficient condition to reduce the likelihood of spills or leaks • How the rehabilitation of bare soil would be managed across the Site once areas are returned to grade											
C2	All materials would be stockpiled in accordance with 'The Blue Book' *Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004). Principal controls would include the following: • Silt fences would be installed around stockpiles to reduce erosion and protect vegetation or Site infrastructure as necessary • Silt and sediment traps would be installed across stormwater drains in proximity to excavation areas • Stockpiles would be restricted to cleared areas and not impact any vegetation • **Contaminated s**~~S~~tockpiles would be placed on impermeable ~~sheeting~~ **surface** • Stockpiles would be covered and wetted down in order to reduce dust creation • Stockpiles would not be located in close proximity to any stormwater drainage systems **(where possible)** • ~~Caltex~~ **Ampol** would not stockpile in areas that are prone to flooding as identified in ~~Figure 4-10 of Appendix D of the Demolition Works SEE~~ in **the Surface water, wastewater, and flooding report (Appendix I of the MOD-7 Modification Report**) • Stockpile locations and erosion and sediment control requirements associated with the ~~Project~~ **proposed modification** would be reviewed by a suitably qualified person to ensure that the recommended measures achieve the environmental outcomes for the Site.		✓			✓	✓			✓	✓	

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~~C3~~	~~The Soils and Erosion Management Plan would also outline the inspection program for any erosion control structures and bunded areas.~~		✓								✓	
C4	Excavated soils would be **inspected and if necessary,** tested for both contaminants and odour using standard practices **Should elevated levels of contamination or odour (i.e. levels above those expected or planned for in the relevant location) be present in the soils or excavations, work related to the excavation would be suspended until a suitably qualified environmental consultant can instruct on how best to proceed to manage contamination, or vapour, or odour risks to deliver the works and achieve work health and safety and environmental compliance requirements.**		✓								✓	
C5	Clean materials would be separated from contaminated materials for reuse as backfill where required. **A Material Tracking Plan would be implemented to track materials to be reused or removed from the Site.**		✓								✓	
~~C6~~	~~A Contamination Management Plan would form part of the CEMP for the Project. This plan would outline measures for testing, classifying, handling, storing and managing contaminated soils and contaminated groundwater.~~		✓									
C7	Suspected contaminated materials would be assessed and classified in accordance with Environment Protection Licence (No. 837) (EPL) requirements and NSW (~~2009~~ **2014**) *Waste Classification Guidelines: Part 1: Classifying Waste*, batched, further tested (where required) and disposed by a licenced contractor.		✓								✓	

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C8	Disposal of any contaminated soils or groundwater would be in accordance with EPL requirements and NSW DECCW's *Waste Classification Guidelines* and the Contamination Management Plan (CMP) for the ~~Project~~ **proposed modification**. Contaminated materials **to be disposed offsite** would be sent to appropriately licensed facilities in accordance with the *Contaminated Land Management Act 1997*.		✓								✓	
C9	If Acid Sulfate Soils (ASS) are encountered during construction ~~or the ACS Modification works,~~ an ASS Management Plan **(ASSMP)** would be prepared in accordance with the ASS Manual (*ASS Management Advisory Committee 1998*).		✓			✓	✓			✓	✓	
C10	A Groundwater Management Plan (GWMP) would be developed and included within the CEMP. This plan would outline the measures that would be used to manage the testing, dewatering, storage, movement and treatment of any groundwater intercepted during the construction phase. Measures would include: • <u>Measures for the dewatering, storage, movement and treatment of groundwater encountered in excavations. Dewatered groundwater would be collected and sent to the on-site Wastewater Treatment Plant in accordance with the established Site wastewater management procedures, unless it is tested and is of suitable quality to be directed to stormwater</u> • The use of appropriate drip trays and interception techniques for any construction specific liquids stored on the Site • Bunding of any fuel or chemical storage area at the construction Site • Regular inspection of construction equipment to ensure any leaks are minimised and rectified		✓								✓	

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	• Management of vehicles leaving the Site to reduce soil on roads, production of dust and the introduction of contamination to the groundwater and/or stormwater system • Appropriate and timely disposal of any contaminated soil, water or waste generated during construction • ~~Regular inspection of erosion control structures and bunded areas~~ • Regular inspection and testing of containment areas~~, drainage lines and process pipe work~~ • A plan for corrective action should an unexpected **find** ~~increase in contaminants of potential concern (COPC)~~ be observed ~~in the groundwater monitoring~~ **during the proposed modification**. • **Management and monitoring of dewatering activities adjacent to Marton Park and the wetlands in Zone 4** • **Management and monitoring of groundwater quality should in-situ treatment of groundwater be warranted.**											
C11	Any runoff that may accumulate in excavations would be periodically tested for elevated levels of contamination. Water that is found to have elevated levels of contaminants would be collected and sent to the onsite Waste **W**~~w~~ater Treatment Plant in accordance with the established refinery wastewater management procedures.		✓								✓	
~~C12~~	~~Runoff entering any excavations would be limited by using bunds or similar structures as required.~~		✓			✓				✓		
~~C13~~	~~Construction /demolition workers would be instructed in appropriate health and safety and handling protocols for minimising human contact with contaminated soils and groundwater.~~		✓			✓	✓			✓		

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~~C14~~	~~During the cleaning of the crude and finished fuel tanks, measures would be implemented in line with Caltex existing Turnaround and Inspection process to contain and collect any potentially contaminating material for appropriate disposal to the on-site wastewater treatment plant, landfarm or appropriate off-site disposal facilities. This process would be detailed within the CEMP.~~		✓									
C15	Permits would be required to work in the areas where potential soil and groundwater contamination exists. The work permit includes requirements such as monitoring and **personal protective equipment (**PPE**)**. No unauthorised entry into these areas ~~is~~ **would be** permitted, without a permit.		✓			✓	✓			✓	✓	
C16	Appropriate inspection, assessment, maintenance and repair programmes that would be implemented as part of the operation of the ~~Project~~ **terminal (as modified)**. These safeguards would be incorporated into the updated management plans for the proposed terminal. The ~~Project~~ **terminal (as modified)** would be appropriately licenced under the *Protection of the Environment Operations Act 1997* and would be managed in accordance with EPL requirements.		✓	✓				✓				✓
C17	A Contamination Management Plan would be developed to outline measures for monitoring, handling, storing and managing contaminated soils and contaminated groundwater. It would include the following: • Excavated soils would be **inspected and if necessary,** tested for both contaminants and odour using standard practices • **Should elevated levels of contamination or odour (i.e. levels above those expected or planned for in the relevant location) be present in the soils or excavations, work related to the excavation would be suspended until a suitably qualified environmental consultant can instruct on how best to proceed to manage contamination, or vapour,**					✓	✓			✓	✓	

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	or odour risks to deliver the works and achieve work health and safety and environmental compliance requirements. • ~~During excavation visual and olfactory indicators of impact would be monitored. Where there is potential for volatile organic contaminants (based on known ground conditions) or where hydrocarbons are seen or smelt during excavations, soils would be inspected for hydrocarbon impacts using a PID and/or testing.~~ • ~~Excavated soils would not be used for backfill if they are impacted at levels exceeding commercial/ industrial as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.*~~ • **Where the risk of presence of asbestos has been identified,** ~~All~~ excavations would be sampled ~~for asbestos~~. Asbestos assessment would be undertaken in accordance with Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.* • ~~Asbestos impacted soil not found in the pipeways would be disposed of at the ACS containment cell or removed from the Site as soon as practicable if excavated. If these soils need to be temporarily stockpiled they would be stored at a defined location at the former CLOR site, covered and labelled as asbestos waste.~~ Asbestos impacted soil would be classified in accordance with NSW EPA guidelines for transport and disposal at ~~either the ACS Containment Cell or~~ a licensed landfill ~~(~~and in accordance with the Site waste management system and the ~~Demolition~~ Waste and Resource Management Plan (~~D~~WRMP) ~~for the demolition works~~ **or capped and contained onsite in accordance with the Detailed RAP(s)**. The excavation,											

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	transport and disposal of asbestos impacted soil would be undertaken by a licenced contractor and comply with NSW ~~WorkCover~~ **SafeWork** requirements. • Hydrocarbon impacted soil would not be temporarily stockpiled adjacent to the excavation. If these soils need to be temporarily stockpiled, they would be stored at a defined location ~~at the former CLOR site~~ **in accordance with the Detailed RAP(s).** • Excavated soils would be separated into stockpiles according to odours, staining and other environmental indicators. Soils that are potentially contaminated (following visual and olfactory inspection and or use of monitoring equipment) would be placed on impermeable ~~sheeting~~ surfaces into uniquely identified stockpiles and appropriately bunded and managed. The bunds would be impermeable and of sufficient capacity to ensure that runoff from these stockpiles is contained prior to being sent to the WWTP. • ~~Works in the vicinity of the contaminated water would be suspended until the environmental consultant can further assess the impacted groundwater and the associated risks.~~ • ~~Where no contamination issues are identified, excavated material would be used as backfill to bring the excavated area back to grade as soon as practicable. If required, certified VENM, ENM or appropriated remediated material would be used to provide additional backfill material.~~ • If excavated material cannot be re-used or managed onsite then it would be removed off-site as waste to an appropriately licensed facility. • Further, excavated material; would be classified in accordance with EPL condition O5.1 which requires “any liquid and/or non-liquid waste generated and/or stored [at the Site] is assessed and classified in accordance with the ~~NSW (2009) *Waste*~~											

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	~~*Classification Guidelines: Part 1: Classifying Waste*~~, ~~batched and further tested (where required, for example Toxicity Characteristics Leaching Procedure (TCLP) testing)~~ **NSW EPA Waste Classification Guidelines as in force from time to time**." • **Where contaminants exceed General and/or Restricted Solid Waste, and/or Hazardous Waste classification, the toxicity characteristics leaching procedure (TCLP) would be conducted to assess the leachable concentration and classification of waste can be reduced.** • The method of disposal or reuse would be in line with the materials' classification in accordance with specifications set out in a ~~D~~WRMP. • Where soils are reused on Site (i.e. are not considered to be impacted at levels exceeding commercial/ industrial as defined by *Schedule B1 Guidelines, Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013)* a record would be kept ~~(in the Waste Management Database)~~ of where these soils are reused, the volumes reused; the type and levels of contaminants present in the soils and the soil classification.											
~~C18~~	~~The Soil and Water Management Plan would outline management measures for any soils that are excavated or stored on-site during the demolition works and ACS Modification works and water management requirements. It would identify:~~ ~~• The areas where soil disturbance is likely~~ ~~• How excavations would be staged so that the length of time that excavations are left open and temporary stockpiles are required is minimised~~					✓	✓			✓	✓	

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	• ~~Locations where soil would be stockpiled on-site for either removal, treatment or reuse~~ • ~~That if additional backfill material is required, only certified VENM, ENM or appropriated remediated material would be used~~ • ~~Procedures to reduce erosion and the spread of dust~~ • ~~Restricting traffic to defined roads or tracks where necessary~~ • ~~Measures to protect excavations from increased stormwater runoff (e.g. by using bunds or similar structures where required)~~ • ~~Measures to manage the storage of demolition and ACS Modification works specific liquids at the Site and the appropriate bunding or containment of demolition related fuel or chemical storage areas~~ • ~~Demolition and ACS Modification works equipment is maintained and operated in a proper and efficient condition to reduce the likelihood of spills or leaks~~ • ~~Measures to manage vehicles leaving the Site to reduce soil on roads, production of dust and the introduction of contamination to the groundwater and/or stormwater system~~ • ~~Measures for the dewatering, storage, movement and treatment of groundwater encountered in excavations. Dewatered groundwater would be collected and sent to the on-site Wastewater Treatment Plant in accordance with the established Site wastewater management procedures, unless it is tested and is of suitable quality to be directed to stormwater~~ • ~~Procedures for dewatering, including the need to liaise with NOW to ensure the necessary water licences are obtained, if required~~ • ~~How the rehabilitation of bare soil would be managed across the Site once areas are returned to grade.~~											

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~~C19~~	~~The Soil and Water Management Plan would also:~~ • ~~Be developed in accordance with *'The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004)~~ • ~~Outline the inspection program for erosion control structures and bunded areas~~ • ~~Continue the existing groundwater monitoring program~~ • ~~Include a plan for corrective action should an unexpected increase in COPC be observed in the groundwater monitoring.~~					✓	✓			✓		
C20	An Asbestos Management Plan would be developed in accordance with the relevant guidelines. ~~Caltex~~ **Ampol** would utilise existing registers, procedures and plans in place for the Site for the preparation of an Asbestos Management Plan.					✓	✓				✓	
~~C21~~	~~Additional sampling would be undertaken to ensure that the area of soil disturbance is restricted as far as practicable to asbestos impacted areas only.~~						✓					
~~C22~~	~~ACS in the pipeways would be wetted down prior to excavation, loading and transport.~~						✓					
~~C23~~	~~ACS classified as general or restricted under the Waste Classification Guidelines would be transported directly to the containment cell. Excavation works would be staged to allow placement of ACS directly into the containment cell to minimise the need to stockpile ACS.~~						✓					
~~C24~~	~~Where hazardous ACS cannot be appropriately managed on-site, it would be taken off-site for treatment and disposal at an appropriately licensed facility.~~						✓					
~~C25~~	~~All vehicle tyres would be cleaned before exiting the containment cell works area a temporary truck wash system.~~						✓					

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~~C26~~	~~During the works, the containment cell area would remain bunded to prevent water flowing out of the respective areas except via the OWSS and WWTP.~~						✓	✓				
~~C27~~	~~During the works, stormwater within the containment cell works area would be directed to the OWSS and treated at the WWTP.~~						✓					
~~C28~~	~~Stormwater from within excavated areas of the pipeways would be sent to the WWTP unless it is tested and is of suitable quality to be directed to stormwater, as per normal operation of the pipeways.~~						✓					
~~C29~~	~~Two groundwater monitoring bores would be installed at the north and west of the containment cell. Quarterly monitoring of the two groundwater monitoring bores would be undertaken during construction, filling and closure of the cell.~~						✓	✓				
~~C30~~	~~A marker layer would be installed during the final capping of the containment cell to identify the presence of asbestos as a safeguard for potential future use.~~						✓					
~~C31~~	~~Following excavation of ACS, an independent licenced asbestos inspector would be employed to verify that the friable asbestos has been removed from the pipeways and that the Exemption Order under Section 419 of the Work, Health and Safety Regulation 2011 is no longer required.~~						✓					

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C32	The OEMP for the Site would ~~be updated to include~~ **continue to implement** the following measures: • **Appropriate groundwater monitoring, in accordance with the Site's EPL.** • ~~Quarterly groundwater monitoring for two years for the two installed monitoring wells. Following this time, annual groundwater monitoring would be undertaken to provide ongoing demonstration that the containment cell liner is operating effectively. Monitoring of these bores would occur in accordance with the existing groundwater monitoring program for the Site.~~ • Regular inspections of the Containment Cell to monitor the effectiveness of the erosion and sediment control measures incorporated into the design of the containment cell, in line with the Site's existing Inspection Checklist and following heavy rain events.							✓				✓
C33	**The Conceptual Remediation Action Plan (RAP) for MOD-7 works would be implemented, which would include:** **a. Data gap investigations within the Project Area** **b. Preparation of one or more Detailed RAP(s).** **The Detailed RAP(s) would be prepared in accordance with NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and be reviewed by the Site Auditor.**										✓	
C34	**Detailed investigations within the Project Area would include targeted sampling to identify the presence of Potential Acid Sulfate Soil (PASS) within remediation areas where excavations are anticipated to be greater than 2 metres below ground level (mbgl). The results would be used to inform preparation of the ASSMP for the proposed modification if required.**										✓	

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C35	**One or more Validation Report(s) would be prepared in accordance with the NSW EPA *Contaminated Land Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) and reviewed and approved by the Site Auditor, confirming that the area(s) are suitable for future commercial/ industrial land uses. Where Validation Report(s) are required for land within the audit boundary (see Figure 1, Appendix A of the Concept RAP), these would be subject to Site Audit Statements (SAS) and Site Audit Reports (SAR).**										✓	
C36	**Where relevant, one or more Environmental Management Plan(s) (EMP) would be prepared where residual contaminated soil and/ or groundwater impacts that do not meet commercial/ industrial standards and further monitoring or management is required. The EMP(s) may include Groundwater Monitoring Plan(s), which would detail groundwater monitoring requirements. The EMP(s) would be provided to the Site Auditor for endorsement.**											✓
C37	**The requirement for a licence and/or approval from the relevant agencies for the extraction of groundwater during excavation works would be determined during detailed design.**										✓	
C38	Construction personnel would be made aware of the potential presence of Non Aqueous Phase Liquids (NAPL) and would be shown how to identify its presence. The GWMP would include management measures to appropriately deal with any NAPL found onsite.										✓	

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~~Human Health and Ecological Risk~~												
~~D1~~	~~Construction/demolition personnel would be made aware of the potential presence of Non Aqueous Phase Liquids (NAPL) and would be shown how to identify its presence. The CEMP/ DEMP would include management measures to appropriately deal with any NAPL found onsite.~~		✓		✓		✓		✓	✓		
~~D2~~	~~Construction/demolition staff would be inducted and provided with training prior to working with potentially contaminated soil as part of the Project, to prevent unnecessary disturbance (e.g. dust generation, asbestos fibre liberation, contaminant mobility and volatilisation).~~		✓		✓		✓		✓	✓		
~~D3~~	~~The location of potentially contaminated areas would be noted in the CEMP/DEMP and provided to construction/demolition personnel involved in soil excavation and handling. The CEMP/ DEMP would also identify the type of contamination found in each area. Where necessary, safety training, and appropriate PPE would be provided.~~		✓	✓	✓	✓	✓		✓	✓		
~~D4~~	~~Caltex would continue to monitor groundwater quality in areas that are known to contain impacts to ensure that significant mobilisation of COPC from groundwater to surface water is not occurring.~~		✓	✓	✓	✓			✓	✓		
Waste Management												
E1	The ~~Project~~ **proposed modification** would be integrated into existing resource efficiency, waste management and handling, emergency response and preparedness plans for the existing Site.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
E2	Construction and Operation Waste and Resource Management Plans (WRMP) ~~and Demolition Waste and Resource Management Plans (DWRMP)~~ would be compiled prior to ~~the~~ each phase commencing. ~~The DWRMP would be updated to include reference to management of waste generated by the ACS Modification works prior to construction works commencing.~~	✓			✓		✓		✓		✓	✓

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E3	The WRMPs ~~and DWRMP~~ would: • Identify requirements consistent with the waste and resource hierarchy • Ensure resourcing efficiency is delivered through the design and responsible construction, demolition and operational practices • Ensure procurement of pre-fabricated materials to eliminate off-cuts on-site, and the re-use of materials where possible • Provide consistent clear direction on waste and resource handling, storage, stockpiling, use and reuse management measures (consistent with current management practices relating to ~~Caltex~~ **Ampol's** Kurnell Waste Management System) • Provide separate waste containers/ skips to ensure waste material segregation and maximise the opportunities for re-use and recycling • Set out procedures for management of recyclable wastes, including storage in suitable containers and designated waste management areas, to be transferred by a licensed waste contractor to an appropriate recycling facility where possible. • Identify disposal and management routes consistent with current management practices as adapted for the ~~Project~~ **proposed modification** • Set out clear requirements for meeting legislative and regulatory requirements • Ensure safe storage and disposal of waste ensuring least amount of harm to surrounding environment • Define requirements to support ~~Caltex~~ **Ampol's** sustainable procurement objectives through effective, design, construction, operation and procurement • Set out processes for disposal, including onsite transfer, management and the necessary associated approvals	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓

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	• Set out procedures for analysing new waste streams and determining the most suitable management measures to use when handling, storing, transporting and disposing of the waste • Set out procedures for management of unidentifiable waste streams. Unidentifiable waste streams would be analysed and sent for testing in an accredited laboratory to assess the risks associated with handling and disposal of the waste.											
E4	The WRMP ~~and DWRMP~~ would incorporate the requirements of the waste and resource hierarchy and cleaner production initiatives.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
E5	The WRMP ~~and DWRMP~~ would include a process for auditing, monitoring and reporting, which would include regular inspections offsite activities and the waste management area(s). The WRMP ~~and DWRMP~~ would be subject to regular auditing and a system would be used to record and report the types, volumes and management measures for all waste and resource arising from/used for the works.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
~~E6~~	~~Project-generated waste would be segregated at the source and stored in accordance with current Site practices. Site management practices would potentially need adapting to consider additional storage requirements. Regardless, all waste would be stored in suitable containers and designated waste management areas.~~		✓	✓		✓	✓			✓		
E7	~~Caltex~~ **Ampol's** existing procedures for the disposal of sewage, greywater, hazardous materials, general waste and recyclable materials would be adopted for the ~~Project~~ **terminal (as modified)** ~~(and modified if required)~~. This would include using licensed contractors to remove and transport waste from the Site.						✓	✓	✓		✓	✓

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E8	A Waste Register would be prepared, used and maintained by the ~~Demolition~~ Contractor to track all wastes generated from ~~Project~~ **the proposed modification**. The ~~Demolition~~ Contractor would retain waste receipts to indicate evidence of waste disposal. The database would also be used to track all materials reused at the premises including its reuse location, type of waste and classification. ~~A Waste Register would be prepared, used and maintained by the Contractor to track all wastes generated from the ACS Modification works and used to record and report the types, volumes and management measures for all waste and resources arising from/used for the works. This would be subject to regular auditing.~~				✓	✓	✓		✓	✓	✓	
E9	Stockpiled wastes would be: • Appropriately segregated to avoid mixing and contamination • Clearly labelled • Contained in bunded areas and if necessary on an appropriate lining • Less than 5 m in height • Located >40 m away from any sensitive receivers, heritage, ecological areas and watercourses.				✓	✓	✓		✓	✓	✓	
~~E10~~	~~Materials to be re-used would be analysed to ensure material is not contaminated and re-use is appropriate.~~				✓	✓	✓		✓	✓		
~~E11~~	~~An Asbestos Management Plan would be prepared and implemented in accordance with relevant legislative and other requirements. This plan would outline proposed methods of managing asbestos waste by the contractor.~~ ~~The Asbestos Management Plan would be updated to include the ACS Modification works.~~				✓	✓	✓				✓	

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E12	The Site's existing Asbestos Waste Register would be amended as appropriate, implemented and maintained to track asbestos wastes generated during the works.				✓	✓	✓	✓	✓	✓	✓	
E13	If stored onsite, asbestos wastes would be located away from operational areas and properly sealed and contained to minimise human exposure and clearly labelled. Signage and barriers/ fencing would be installed to ensure all employees, contractors and visitors would keep away from the area at all times.					✓	✓			✓	✓	
~~E14~~	~~The removal and disposal of asbestos wastes would be undertaken by a licenced asbestos contractor.~~					✓	✓			✓		
~~E15~~	~~A Decontamination Area would be provided onsite for all authorised personnel handling asbestos.~~				✓	✓	✓					
E16	Wastes (both liquid and non-liquid) generated from the works would be assessed, classified and managed. Where it is not feasible to remediate soils or where onsite management is not practicable, the soil would be classified and disposed off-Site in accordance with Waste Classification Guidelines (NSW EPA, 2014) to an appropriately licenced facility. ~~Wastes would be disposed of at an appropriately licenced facility.~~					✓	✓			✓	✓	
~~E17~~	~~Recyclable wastes would be stored in suitable containers and designated waste management areas, to be transferred by a licensed waste contractor to an appropriate recycling facility where possible.~~						✓					
~~E18~~	~~Treated soils from the CSRF would be used where possible for the containment cell construction works in accordance with the conditions of the Caltex treated soil exemption 2016.~~						✓					
~~E19~~	~~New waste streams would be addressed as they arise and assessed to determine the most suitable management measures to use when handling, storing, transporting and disposing of the waste.~~						✓					

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~~E20~~	~~Unidentifiable waste streams would be analysed and sent for testing in an accredited laboratory to assess the risks associated with handling and disposal of the waste.~~						✓					
~~E21~~	~~Additional sampling will be undertaken in the pipeways to further delineate the areas classified as asbestos contaminated in order to minimise the volume of soil classified as Special Waste and disposed of in the containment cell.~~						✓					
E22	~~Caltex~~ **Ampol** would complete inspections following periods of extended heavy rainfall to confirm that pumps within the containment cell sumps are directing leachate to the Site's WWTP.						✓	✓				
Surface Water, Wastewater and Flooding												
F1	The Construction Environmental Management Plan (CEMP) for the ~~Project~~ **proposed modification** would include a Soil ~~and Erosion~~ **and Water** Management Plan. This plan would include the following measures: • ~~All materials would be stockpiled in accordance with '*The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004)~~ • Silt fences would be installed around stockpiles to reduce erosion and the movement of suspended solids as necessary • Soil stockpiles and any polluted materials would be stored in designated areas which are not in close proximity to any stormwater drainage systems • Erosion control structures, bunded areas, containment areas, drainage lines and interception measures would be subject to regular inspection • Clean materials would be separated from contaminated materials		✓								✓	

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	• Soil erosion and sedimentation devices would remain in place until the disturbed ground surface is restored. These devices would also capture any gross pollutants.											
F2	A Soils and Water Management Plan would **include** ~~be developed as a sub plan to the DEMP~~ **CEMP. M measures** to be ~~included in the plan and~~ implemented during the ~~demolition~~ **construction** works to protect stormwater quality ~~would~~ includ**ing** ~~e~~: • Stormwater or groundwater ponded in excavations would be sent to the WWTP, unless it is tested and is of suitable quality to be directed to stormwater • Stormwater that is captured in the bunds around the contaminated soil stockpiles would be collected and sent to the WWTP • Silt fencing and/or alternate sediment control measures would be installed around soil stockpiles and disturbed areas or areas where dust suppression is being undertaken • Regular inspection would be undertaken of soil stockpiles~~/~~ **and** excavation areas, including following rainfall events • ~~Regular inspection of excavation areas and containment cell area, including following rainfall events~~ • Regular inspections would be undertaken of stormwater drains down hydraulic gradient of disturbed areas.~~;~~ • ~~Stormwater management measures incorporated into the design of the containment cell would be regularly inspected during operation in line with the Site's existing Inspection Checklist and following heavy rain events;~~ • ~~If stormwater quality is impacted during the demolition works and ACS Modification works in areas that have been disturbed, water would be diverted to the intermediate sewer system; and~~ • ~~During the demolition works and ACS Modification works, following notable but prolonged rainfall events (over three days)~~					✓	✓				✓	

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	~~or following heavy rainfall events over a shorter timescale, water sampling would be completed at the stormwater retention basin to ensure that the quality of the water is of an appropriate standard to be discharged from the Site. Water that is not of an appropriate quality would be either treated in situ or directed to the WWTP.~~											
~~F3~~	~~Caltex would continue to implement the measures within the Stormwater Management Plan (SMP) for the Site. This plan has been produced in response to Environment Protection Licence No. 837, PRP U24.1: Stormwater Catchment and Management Plan. The SMP has committed Caltex to implementing a Stormwater Management Strategy and completing a number of stormwater management measures in a staged manner. Measures include:~~ • ~~Ongoing maintenance of the existing stormwater system~~ • ~~Implementation of a number of projects to improve the infrastructure, reduce the potential for the refinery to flood, and prevent contaminated stormwater leaving the refinery premises~~ • ~~Working with the NSW Office of Environment and Heritage (OEH), NSW EPA and Sutherland Shire Council to divert to flow of stormwater from the National Park away from the Site's stormwater system to the Sutherland Shire Council's stormwater infrastructure~~ • ~~Carrying out stormwater flow monitoring~~ • ~~Updating the Site's stormwater system performance model to account for the changes to the stormwater system infrastructure that can then be used as a tool to assess future modifications, as necessary.~~ ~~This work would be completed in consultation with NSW EPA.~~	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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F4	Discharges from the Wastewater Treatment Plant would be within existing EPL limits during ~~demolition,~~ construction and operation. ~~Any required change to this Oily Water Management System would be discussed and agreed with NSW EPA.~~	✓	✓			✓	✓	✓		✓	✓	✓
F5	The measures and processes currently in place at the Site to prevent ~~any~~ loss of contaminant would be maintained throughout the ~~demolition, construction and~~ operation phases of the **terminal (as modified) and during the delivery of the ~~Project~~ proposed modification**. This includes appropriate measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (as relevant). All bunds on tanks which are retained in service would meet the capacity requirements of *Australian Standard AS1940* during the operation of the ~~Project~~ **terminal (as modified)**.	✓	✓			✓	✓	✓		✓	✓	✓
F6	~~Improvements to m~~ **M**onitoring would **continue to** be initiated to **confirm** ~~ensure~~ that if a loss of containment into a bund occurs**,** it is detected early and contingency actions can be taken promptly. The measures for tanks containing low flash materials include: • Explosive vapour detectors within the bunds • Triple infrared scanners on tank roofs • CCTV in conjunction with infrared cameras as a confirmation for alarms. All tanks onsite would **continue to** be subject to: • An automated high level shut off system • Continuance of a comprehensive inspection/ repair program.			✓								

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F7	**Earthworks required for MOD-7 works would not remove existing bunding in the Site and would not result in an increased offsite flood risk.** ~~Caltex undertakes a flood study, commencing in March 2018 that assesses potential flood risks from the Site to the Kurnell township, with a particular emphasis on the impacts from surface water entering the Site from land to the east and south of the Site and whether current diversion methods are appropriate. The flood study would consider the Sutherland Shire Council's *Draft Sea Level Rise Policy* (May 2016), or a latest revision.~~ ~~Caltex to remain in consultation with Sutherland Shire Council during throughout the flood risk ing investigation works to identify a mutually acceptable solution to potential flood risks along the north eastern boundary of the Site. The timing and form of consultation is to be mutually agreed by both parties (Caltex and Sutherland Shire Council) and outlined within a written document to be produced by Caltex prior to March 2018. It shall include regular reporting updates and milestone meetings, for example, at the Scope of Works, concept design, at the issuing of the draft report to discuss results and recommendations as a result of the study.~~			✓		✓		✓		✓	✓	

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F8	The following measures would be employed during and following the ~~demolition~~ **remediation and grading** of ~~the refinery process units and associated infrastructure~~ **land within Zones 2 and 3 (see Figure 1-1 of the MOD-7 Modification Report)**: • Appropriate bunding and controls would be put in place to prevent stormwater runoff from ~~the demolition works area~~ **contaminated soils** entering the stormwater system. • Following the completion of the ~~demolition~~ **remediation** works and removal of redundant infrastructure, the ~~former refinery process~~ area **defined in Figure 4-6 of the MOD-7 Modification Report** would be regraded. The regrading would aim to ~~ensure~~ **confirm** that water does not pool in this area. • As part of the regrading works, the surface material in this area would meet the commercial/industrial criteria as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013*. ~~A crushed aggregate made from clean concrete and asphalt from the demolition works would also be spread across the surface to help reduce soil erosion.~~ **Surface treatments, such as grassing or temporary pavement, would be provided to help mitigate soil erosion** • Stormwater runoff collected in the stormwater system would be subject to the controls within this system ~~(such as the oily water separators)~~ prior to being discharged.					✓				✓	✓	
F9	**All** excavation **and capping works** ~~of the pipeways~~ would be staged, effectively minimising the area of disturbance at one time. The ~~ACS Modification~~ **proposed modification** works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation.						✓				✓	

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F10	Local weather patterns would be monitored to **confirm** ~~ensure~~ that workers completing the ~~ACS Modification~~ **construction** works at the Site were aware of predicted heavy rainfalls so that work could be stopped in the pipeways **and other flood-prone areas** prior to them containing surface water flows.						✓				✓	
~~F11~~	~~The OEMP for the Site would be updated to include the following measures:~~ ~~• The new stormwater management infrastructure for the containment cell would be regularly maintained to ensure that stormwater flows are properly conveyed to the wider catchment; and~~ ~~• The leachate collection system including the tank would be regularly inspected to ensure that it is operating effectively and that no leaks have occurred.~~							✓				
F13	**Post-MOD-7 construction discharge rates from the Site would not exceed pre-construction discharge rates.**										✓	
F14	**Stormwater quality monitoring would be carried out pre-construction to establish a baseline, as well as short-term post-construction to confirm the efficacy of stormwater treatments.** **This water quality monitoring would be undertaken in accordance with the Blue Book (Landcom, 2004) and ANZECC & ARMCANZ (2000) guidelines.** **In the event of non-compliance, corrective and preventative actions would be identified.**										✓	
F15	**The existing OWS network would be protected during construction works, to avoid damaging or blocking this existing infrastructure and the WWTP.**										✓	

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Noise and Vibration												
G1	The CEMP~~/ DEMP~~ for the Project would include a Noise and Vibration Management Plan (NVMP). The NVMP would outline: • The locations of noise sensitive receivers • **Potential significant noise and vibration generating activities associated with the proposed modification** • Relevant feasible and reasonable noise mitigation measures as per the *NSW Interim Construction Noise Guideline* • **Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance and controlling the location and use of vibration generating equipment** • ~~Construction noise monitoring procedures; and~~ • Construction equipment maintenance to ensure good working order • **A monitoring program to assess performance against relevant noise and vibration criteria** • **Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.**		✓			✓					✓	
G2	Low-noise plant and equipment would be selected, where practicable, in order to minimise potential for noise and vibration. All equipment would be regularly checked to ensure that the mufflers and other noise reduction equipment are working correctly.		✓			✓	✓			✓	✓	

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G3	Community consultation with local residents would be undertaken to assist in the alleviation of community concerns. Prior to the proposed **modification** ~~demolition~~ works commencing within the Eastern ~~and Western~~ Right of Way~~s~~, ~~at Silver Beach, on the Wharf or~~ prior to particularly loud ~~demolition~~ works occurring on the main terminal site, potentially affected residents within Kurnell would be notified in advance. Should complaints be received, the complaints register would continue to be maintained and managed in line with the existing feedback process at the Site.		✓	✓		✓	✓			✓	✓	
G4	Any noise complaint(s) would be investigated immediately. Reasonable and feasible measures would to be implemented to reduce noise impacts.		✓	✓		✓	✓	✓		✓	✓	✓
G5	Construction~~/demolition~~ equipment would be located to reduce noise emission to sensitive receptors, where practicable.		✓			✓	✓			✓	✓	

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G6	**Condition C18 of SSD-5544 states that construction works should comply with following hours:** • **Monday to Sunday 7am until 10pm.** **High noise generating construction works, including works within the Eastern Right of Way (Zone 1A), would be confined to less sensitive times of the day and not undertaken on Sundays, public holidays, or outside of the hours 7am and 6pm Monday to Saturday (in line with Condition C19).** **Construction works outside of the work hours identified above would only be undertaken in the following circumstances (in line with Condition C20 of SSD 5544):** • **Works that are inaudible at nearest sensitive land receivers** • **Works that are consistent with Ampol's existing maintenance procedures and are in accordance with the existing Environment Protection Licence (No. 837) (EPL)** • **Works agreed to in writing by the Environment Protection Authority or the Department of Planning, Housing and Infrastructure** • **For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons.** ~~**The** majority of the conversion works for the Project would typically be completed between 7.00am to 10.00pm seven days a week. Some works consistent with Caltex~~ **Ampol's** existing day-to-day operational and maintenance procedures would occur over a 24 hour period as regulated by the ~~Environment Protection Licence (No. 837) (~~EPL~~)~~ for the Site.		✓			✓	✓				✓	

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G7	Construction~~/Demolition~~ staff and contractors would undergo training in environmental noise issues including: • Minimising the use of horn signals and maintaining a low volume. Alternative methods of communication should be considered • Avoiding any unnecessary noise when carrying out manual operations and when operating plant • Switching off any equipment not in use for extended periods during construction work • Ensuring works occur within approved hours.		✓			✓	✓			✓	✓	
G8	Should any unexpected construction activities occur which could potentially generate significant noise not described in this report, monitoring would be undertaken to ensure construction noise emission levels do not exceed EPL limits.		✓				✓				✓	
~~G9~~	~~Pipeline removal works would be confined to 7.00 am to 6.00 pm Monday to Saturday as per Condition C19 (for SSD 5544).~~					✓	✓					
~~G10~~	~~Demolition works near 30D Cook Street (i.e. within 500m) would be confined to 7.00am to 6.00 pm Monday to Saturday as per Condition C19.~~					✓				✓		
~~G11~~	~~Demolition noise monitoring would be undertaken when necessary to ensure compliance with demolition noise criteria.~~					✓	✓			✓		
G12	~~Caltex~~ **Ampol** would ensure that the noise generated by the **proposed modification** ~~demolition~~ works does not exceed the criteria defined in Table 2 (from Condition of Consent C16 of SSD-5544) unless the reasonable and feasible noise mitigation strategies outlined within the ~~D~~NVMP have been implemented. Reasonable and feasible noise mitigation strategies would include appropriate respite periods during particularly noisy or prolonged activities.					✓				✓	✓	

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~~G13~~	~~The DNVMP would describe where demolition noise limits from Table 2 (from Condition of Consent C16 of SSD-5544) are likely to be exceeded and what reasonable and feasible noise mitigation would be employed to minimise noise.~~					✓				✓		
~~G14~~	~~To help ensure that the structures on Site that are to be retained with high or medium heritage significance are protected from potential vibration impacts, the DNVMP would also~~ ~~• Utilise Appendix H Heritage Impact Assessment to identify the medium to high heritage significance buildings to be retained;~~ ~~• Identify where works to demolish redundant structures are occurring within 20 m of a medium to high significance heritage building and the requirement to undertake vibration monitoring and management for these buildings to protect their integrity; and~~ ~~• Outline general monitoring and management measures to monitor vibration and manage buildings.~~				✓				✓			
~~G15~~	~~The Tank 101 demolition works would be coordinated with other nearby demolition works to reduce the potential for cumulative impacts.~~									✓		
G16	**Vibration intensive equipment would be selected and minimum working distances, as presented in Table 4-5 of the Noise and Vibration Impact Assessment, would be adhered to. The use of less vibration intensive methods of construction or equipment would be considered where feasible and reasonable.**										✓	

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G17	**Equipment associated with the relocated firewater system would be treated so that operational noise levels do not exceed the criteria defined in Condition of Consent C17 of SSD-5544. Maintenance and testing activities associated with the firewater system would be conducted during standard daytime hours only:** • **Monday to Saturday – 7am to 6pm** • **Sunday – 8am to 6pm.**											✓
Air Quality and Odour												
H1	An Air Quality Management Plan (AQMP) would be prepared as part of the CEMP to minimise the impact of dust upon sensitive receivers. This would include: • Measures to monitor dust emissions from the construction phase, such as visual inspections • Appropriate measures to be undertaken during adverse weather conditions • Appropriate, reasonable, and feasible measures to mitigate adverse air quality impacts, such as: - Vehicles would only travel on designated roads within the Site where possible and would be limited to a maximum speed of 10 km/hr in offroad areas and 25 km/hr elsewhere - Loads would be covered, and all tailgates would be securely fastened. Vehicles would not be loaded higher than the sides and tailboard. - Concrete cutting and coring would be undertaken using “wet tools” - Water sprays would be used to dampen down soils prior to excavation, handling and/or loading/ unloading materials - All plant would be maintained and operated in line with the manufacturer’s specifications in order to minimise the emission of air pollutants and offensive odours.		✓			✓	✓			✓	✓	

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	- Plant and construction vehicles would be turned off when not in use. • ~~Dust emissions from the construction phase of the Project and during the demolition works would be monitored by construction/demolition staff.~~ • ~~Visual inspections would be completed by demolition staff during the works.~~ • ~~Demolition staff would also complete dust deposition monitoring during the demolition works (as per AS/NZS 3580) in appropriate locations on the Site boundary and in Kurnell. Staff would also monitor dust (PM_{10}) levels using the onsite real time ambient air quality monitoring station.~~ • ~~When required, during activities likely to cause high dust levels or adverse weather conditions etc., a designated worker would continuously monitor downwind emissions to the community or local residents, using the methods described above, and call a halt to activities if sensitive receptors are likely to be affected by airborne particulate matter.~~ • ~~Should significant impacts be likely, appropriate measures would be taken to mitigate adverse air quality impacts.~~											
~~H2~~	~~Within the refinery, vehicles would only travel on designated roads where possible and would be limited to a maximum speed of 10 km/hr in offroad areas and 25 km/hr elsewhere.~~		✓			✓	✓			✓		
~~H3~~	~~Where there is the potential for dust or odour generation from trucks carrying spoil, loads would be covered and all tailgates would be securely fastened. Vehicles would not be loaded higher than the sides and tailboard.~~		✓			✓	✓			✓		
~~H4~~	~~Construction and potentially dust generating demolition activities would be limited during high wind events if sensitive receivers are likely to be significantly impacted.~~		✓			✓	✓			✓		

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~~H5~~	~~All plant would be maintained and operated in line with the manufacturer's specifications in order to minimise the emission of air pollutants and offensive odours. Plant and construction vehicles would be turned off when not in use.~~		✓			✓	✓			✓		
~~H6~~	~~Stockpiled material would be assessed for the potential for causing odorous or particulate emissions. If air pollutants and offensive odours are likely, controls would be put into place to manage adverse impacts.~~		✓			✓				✓		
~~H7~~	~~All concrete cutting and coring would to be undertaken using "wet tools."~~		✓			✓				✓		
H8	An odour reduction program would **continue to** be implemented in accordance with the existing EPL **during construction and operation.**		✓	✓							✓	✓
H9	The guidepoles on the External Floating Roof Tanks (EFRTs) in gasoline service would be fitted with sleeves.		✓	✓								
H10	~~Caltex~~ **Ampol's** Leak Detection and Repair (LDAR) Program would continue in accordance with the Environment Protection Licence.		✓	✓								
~~H11~~	~~All reasonable and feasible measures would be implemented to minimise dust and odour emissions during the demolition works~~					✓	✓			✓		
~~H12~~	~~VOC and Odour Monitoring would be undertaken by demolition workers or ACS Modification workers (i.e. visual and olfactory monitoring) and monitoring equipment during excavation activities where potential hydrocarbon contamination is present. Contractors would notify the Caltex Environment Specialist of any significant odours identified during demolition.~~					✓	✓			✓		

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H13	~~Soils or concrete with significant hydrocarbon staining or obvious hydrocarbon odours would be transported to the former CLOR area and stored appropriately.~~ **To minimise impacts related to odour, the AQMP would include the following measures:** • Stockpiles of contaminated soil stored onsite would be managed to prevent odorous VOC emissions and windblown particulate emissions • Excavation would be staged to manage potential VOC and odour emissions. Where practical, excavations would not commence prior to 8am nor after 4pm as weather conditions at these times are generally conducive to adverse odour air quality situations from fugitive emissions • In the event of an odour complaint, an evaluation would be undertaken to confirm if the **proposed modification** ~~demolition~~ works are the source of the odours. If the construction works are confirmed as a potential ongoing odour source, additional mitigation measures would be implemented which could include the use of water sprays to suppress odours and, if necessary, the use of odour suppressants. Offsite olfactory observations and VOC monitoring using equipment would also be undertaken if necessary. In the event of ongoing odour issues, excavation activities would be stopped and if necessary, the excavation covered or backfilled.					✓				✓	✓	
~~H14~~	~~Excavation would be staged to manage potential VOC and odour emissions. Where practical, excavations would not commence prior to 8am nor after 4pm as weather conditions at these times are generally conducive to adverse odour air quality situations from fugitive emissions.~~					✓	✓			✓		

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~~H15~~	~~In unfavourable weather conditions (e.g. dry and windy conditions) or where dust sources are present near sensitive receivers, water sprays would be used to dampen down soils prior to excavation, handling and/or loading/ unloading materials. All exposed surfaces (from recent excavations) and stockpiles (of excavated material) would also be watered, sprayed or covered where required, to minimise nuisance dust and odours.~~					✓	✓			✓		
~~H16~~	~~During adverse meteorological conditions and extraordinary events, such as events where elevated background dust is present, additional mitigation measures would be considered to prevent and minimise air quality impacts from demolition works. These measures would include, but not be limited to implementing the following during high wind events (e.g. > 8 m/s hourly average):~~ • ~~Reducing working surface area~~ • ~~Commencing excavation during favourable wind conditions~~ • ~~Increase wetting agents for exposed surfaces~~ • ~~Increase covering of exposed surface areas.~~					✓	✓			✓		
H17	Surface disturbance would be minimised. Exposed ground would be rehabilitated as soon as practicable.					✓	✓			✓	✓	
H18	<u>During concrete crushing:</u> • <u>The crusher would be located as far as practicable from the Site boundary, allowing adequate buffer distance from receptors.</u> • Real-time dust monitoring would be undertaking during the operation of the concrete crusher. Details of this monitoring (and associated response actions) would be incorporated into the AQMP for the **construction** ~~demolition~~ works. • <u>A number of dust suppression measures would be implemented. These could include regular watering of stockpiles, dust curtains and other measures as appropriate.</u>					✓				✓	✓	

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~~H19~~	~~During crushing, a number of dust suppression measures would be implemented. These could include regular watering of stockpiles, dust curtains and other measures as appropriate.~~					✓				✓		
~~H20~~	~~Where biological matter is present within cooling water inlet pipework, the pipework would be removed be as soon as possible. This would help to minimise the potential for odour issues associated with the degradation and then exposure of the biological matter.~~					✓				✓		
~~H21~~	~~Where visible dust emissions are observed appropriate management actions would be implemented to prevent impact.~~					✓				✓		
~~H22~~	~~In the event of an odour complaint, an evaluation would be undertaken to confirm if the demolition works are the source of the odours. If the demolition works are confirmed as a potential ongoing odour source, additional mitigation measures would be implemented which could include the use of water sprays to suppress odours and, if necessary, the use of odour suppressants. Offsite olfactory observations and VOC monitoring using equipment would also be undertaken if necessary. In the event of ongoing odour issues, excavation activities would be stopped and if necessary, the excavation covered or backfilled.~~					✓	✓			✓		
H23	In line with ~~Caltex~~ **Ampol's** existing procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the complaint would be provided to the affected community members.					✓	✓			✓	✓	
~~H24~~	~~Dust deposition monitoring would be undertaken during the demolition works (as per AS/NZS 3580). This would include monitoring points in appropriate locations on the Site boundary and in Kurnell.~~					✓				✓		

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (MOD 1, 4 and 5)		ACS Works (MOD-2, 5 and 6)		Tank 101 demolition works (MOD 3)		MOD-7	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
H25	The onsite real time ~~ambient air quality~~ **meteorological** monitoring station would ~~continue to~~ operate throughout the **construction/**demolition works. This station **would** continuously monitor~~s, for PM_{10}~~, wind direction and speed, temperature**, air pressure,** ~~and~~ humidity and rainfall.					✓	✓			✓	✓	
~~H26~~	~~A summary of the air quality monitoring data for the demolition works would be provided to the community during Caltex quarterly community meeting.~~					✓	✓			✓		
~~H27~~	~~The DEMP would include a subplan: the Containment Cell Management Plan. With regards to air quality, this subplan would include:~~ ~~• A brief overview of the containment cell operations relevant to potential air emission sources.~~ ~~• Identification of mitigation measures for each respective emission source including those measures outlined in the DEMP for the Site (where relevant to operations within the containment cell area).~~ ~~• Details of proposed monitoring and recordkeeping procedures.~~ ~~During the production of this plan the NSW EPA *Guidelines for Environmental Management On-Site Remediation*, would be reviewed and if necessary relevant measures incorporated.~~						✓					
~~H28~~	~~The Containment Cell Management Plan would be prepared and include the following mitigation measures:~~ ~~• A Soil Acceptance Criteria which identifies:~~ ~~– Only soil contaminated with airborne asbestos* (referred to in the ACS Modification works as ACS) from the Site (as defined by Figure 1-2 in the SEE) would be accepted into the containment cell.~~ ~~– Soils entering the containment cell from the Site but outside of the pipeways must be classified in accordance with the~~						✓					

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	~~NSW EPA Waste Classification Guidelines 2014, as either special general solid waste or special restricted solid waste.~~ ~~All soils, regardless of their classification under the NSW EPA Waste Classification Guidelines 2014 from the pipeways on the Site (as shown on Figure 1.2 of the SEE) would be disposed of in the containment cell.~~ ~~The total volume of ACS would be limited by the design specifications final landform.~~ • ~~Prior to the commencement of filling activities dust and aerosol monitoring stations would be placed at a minimum of six locations around the working area with the objective of monitoring prevalent upwind and downwind locations.~~ • ~~Soil moisture content will be managed to ensure that it is greater than 15% in order to minimise potential particulate matter and asbestos [fibre] emissions to the maximum extent practicable by wetting of soils during filling of cell to minimise the generation of dust.~~ • ~~Directed water sprays will be used when required throughout ACS handling operations.~~ • ~~A biodegradable cover would be sprayed over ACS in the containment cell to minimise the generation of dust. The cover would be applied following the placement of ACS within the containment cell, and at the end of each day.~~ • ~~Limiting potentially dust generating activities during high wind events (i.e. >8m/s hourly average or in severe wind gust conditions)~~ • ~~Stockpiles will be maintained in a moist condition when not covered, and be covered if not in use or left overnight.~~ • ~~Completed areas of the works area will be revegetated with native grasses as soon as is practicable.~~											

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		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
	~~*Note – Airborne asbestos means any fibres of asbestos small enough to be made airborne (Safe Work Australia, April 2016, Code of Practice: How to Safely Remove Asbestos)~~											
~~H29~~	~~The DEMP and relevant sub plans (e.g. Asbestos Management Plan and Containment Cell Management Plan) would be revised to include the following measures:~~ ~~• A defined exclusion zone around the work area within which only staff who have been appropriately inducted in relation to the site procedures are permitted entry~~ ~~• Wetting of soils during excavation and disturbance works to minimise the generation of dust~~ ~~• An Asbestos Removal Control Plan which identifies appropriate procedures for personal protective equipment; staff induction and decontamination of equipment~~ ~~• Preparation of an asbestos monitoring and management plan to account for the activities that may liberate asbestos into the atmosphere. Dust and aerosol monitoring would occur in areas of the Site where asbestos in soil has been identified or is suspected to occur (including the pipeways) together with monitoring and analysis methods, exposure and control criteria and contingencies that will be implemented in the event specific exposure control criteria are exceeded.~~						✓					
H30	**Caterpillar 3406B diesel engines in the relocated firewater system would be retrofitted to improve emission performance to meet Tier 1 US EPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022).**										✓	

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		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
Transport and Access												
I1	**Sutherland Shire Council and Kurnell residents would be informed of works that would significantly affect the road network at least two weeks prior to these activities occurring (or in line with regulatory requirements). Significant activities would include the MOD-7 works commencing, works to construct the new storage shed in Zone 1A commencing, and Oversize and Overmass (OSOM) movements along Captain Cook Drive.** ~~Local Authorities and Kurnell residents would be informed of any Project related work which would affect the road network.~~		✓			✓	✓			✓	✓	
I2	A **Construction** Traffic Management Plan **(CTMP)** would be developed for the construction~~/ demolition~~ phase. The Traffic Management Plan would comply with all relevant Regulations and By-Laws and in particular address safe access and egress to the public road network. The ~~Transport Management Plan~~ **CTMP** would include: • Hours of permitted vehicle activity • Designated routes for construction ~~and demolition~~ traffic and defined access points to the Site ~~and demolition works area~~ • Duration of works • Permitted ~~demolition~~ vehicle types • Designated areas within the Site and **MOD-7 Project Area** ~~demolition works area~~ for truck turning movements, parking, loading and unloading to allow heavy vehicles to enter and leave the Site and **MOD-7 Project Area** in a forward direction • Sequence for implementing traffic management measures should these be required • Procedures and/or principles for construction and demolition vehicle speed limits and the safe operation of construction and demolition vehicles		✓			✓	✓				✓	

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	• Coordination of off-site heavy vehicle movements from the ~~demolition works and ACS Modification works~~ **Site** to help ensure that heavy vehicle movements do not exceed ~~60~~ **136** movements per day~~.~~ • **Outline plan for the movement of OSOM vehicles accessing the Site, including routes, appropriate construction hours for deliveries, road closures, and permit requirements.**											
~~I3~~	~~Works to remove pipelines from under the road reserves in Kurnell would not take place before a road opening application has been approved by Sutherland Shire Council and on the days the following events are taking place:~~ ~~• Australia Day (January);~~ ~~• The Festival of Kites (May);~~ ~~• The Boree Regatta (October). and~~ ~~• Water events for the Australian Scout Jamboree (first two weeks of January 2016).~~				✓	✓						
~~I4~~	~~Traffic related to the ACS Modification works would be managed under the Traffic Management Plan that forms a sub-plan to the DEMP~~						✓					
I5	**Consultation with Transport for NSW, Sutherland Shire Council, and other proponents of the Breen Resource Recovery Facility and Kurnell Planning Proposal projects would take place, as relevant, through the delivery of the MOD-7 works to help manage potential cumulative traffic impacts along Captain Cook Drive.**										✓	

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Heritage												
~~J1~~	~~A Heritage Management Strategy would be prepared for the Australian Oil Refinery prior to shut-down of the refinery plant, to provide Caltex with a basic framework for the ongoing management of the Site's heritage during present and future works. The Strategy would include a review of the heritage significance of the overall Site. The review would clarify the extent and relative heritage value of the place by identifying key elements of industrial and built heritage as well as social values of the refinery, and the relative contribution of these elements to the overall significance of the Site. Recommendations would also address the future assessment and management of memorabilia and other significant items of moveable heritage maintained on-site.~~	✓										
J2	If any further heritage items were discovered throughout the **delivery of the** ~~Project~~ **proposed modification**, work would cease until an assessment is carried out by a qualified heritage professional.	✓	✓			✓	✓			✓	✓	
~~J3~~	~~An archival photographic record of the existing fabric and operations of the Kurnell Refinery would be prepared while the plant is still operational, and during the decommissioning process. The recording would be undertaken in accordance with the Heritage Council guidelines on *Photographic Recording of Heritage Items Using Film and Digital Capture* (2006). The archival recording would be maintained for the appreciation of present and future generations. To this end, the recording would be lodged with the Sutherland Shire Library and NSW State Library.~~	✓	✓									
J4	The Heritage Management Strategy (HMS) and the **relevant** management strategies within it would continue to be implemented.				✓	✓			✓	✓	✓	✓

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~~J5~~	~~Opportunities to adaptively reuse redundant buildings identified in the HMS as having high or moderate heritage significance would continue to be reviewed prior to final demolition works.~~				✓	✓						
J6	The sculptural panels by Bert Flugelman would be retained and preserved.				✓	✓					✓	✓
~~J7~~	~~Sandstone blocks from the informal sandstone wall along Silver Beach would be set aside in a secure location prior to works, and reinstated in the same location following removal of the cooling water outlet pipeline.~~				✓	✓						
~~J8~~	~~Appropriate mitigation measures would be implemented to reduce the likely damage to the interpretive footpath in front of the driveway entrance to the Kurnell Wharf. Measures would include:~~ ~~• Making a record of the current state of the pavement.~~ ~~• Removing the affected pavement in sections and storing these sections in a secure location.~~ ~~• Reinstating the pavement in the same location following the removal of pipelines;~~ ~~• If this is not practicable, a similar pavement treatment and a matching or compatible interpretative design would be reinstated.~~				✓	✓						
J9	If historical archaeological relics are unexpectedly found during the ~~demolition~~ **proposed modification** works, works in the area of the relics would cease and the Heritage Council of NSW would be notified.					✓	✓			✓	✓	
J10	A Stop Works procedure would be implemented should any **unexpected finds of** Aboriginal Heritage **or non-Aboriginal heritage importance** ~~items~~ be found. Works would cease at the vicinity of the item and ~~OEH~~ **Heritage NSW** would be notified as soon as possible					✓	✓			✓	✓	

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J11	If any human remains are disturbed, all work in the vicinity of the remains would stop immediately and the remains would not be further disturbed or moved. Works would cease at the vicinity of the item and ~~OEH~~ **Heritage NSW** and NSW Police would be notified as soon as possible.					✓	✓			✓	✓	
J12	Prior to works commencing, all personnel and contractors involved in ground disturbance works would be briefed on the procedures to follow if human remains or unexpected heritage items are found.				✓	✓	✓		✓	✓	✓	
J13	As part of the **CEMP** ~~DEMP~~, a Heritage Management Section ~~will~~ **would** be developed. This ~~will~~ **would** incorporate previous management and mitigation measures that are not already included in the HMS.				✓	✓	✓				✓	
J14	**An Aboriginal Cultural Heritage Management Plan (ACHMP) would be prepared and implemented for the proposed modification. Measures would include:** • **A map outlining where 'intact sands' (as described in the MOD-7 Aboriginal Cultural Heritage Assessment Report) could be disturbed. This map would be shared with MOD-7 contractors** • **Where impacts to Aboriginal archaeological deposits are identified, a Registered Aboriginal Party representative would be engaged to monitor works in this area** • **If Aboriginal archaeological deposits are identified during intrusive subsurface works, Aboriginal archaeological works would be prepared to a standard comparable to that required by the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. Printed and/or digital copies of associated reports would be made available to Registered Aboriginal Parties upon request.**										✓	

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	• **Ampol would ensure that the proposed modification's standard environmental site induction includes an Aboriginal heritage component.** **The ACHMP for the proposed modification would be subject to periodic review to verify that all mitigation measures are being adhered to and are working effectively.**											
J15	**An Aboriginal community representative must be present where it is reasonably suspected burials or human remains may be encountered. If human remains are unexpectedly encountered and they are thought to be Aboriginal, the Aboriginal community would be notified immediately.** **Recording of Aboriginal ancestral remains would be undertaken by, or be conducted under the direct supervision of, a specialist physical anthropologist or other suitably qualified person.** **Archaeological reporting of Aboriginal ancestral remains would be undertaken by, or reviewed by, a specialist physical anthropologist or other suitably qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains as the remains of Aboriginal people rather than as scientific specimens.**										✓	
J16	**Provisions regarding appropriate consultation protocols with Registered Aboriginal Parties would be included in the ACHMP. Contact details and preferred contact methods for each Registered Aboriginal Party, as well other relevant stakeholders, would be specified.**										✓	
Ecology												
K1	A Biodiversity and Weed Management Plan (BWMP) would be prepared in order to limit and control the spread of noxious weeds within the Site~~/demolition works area~~. It would include the following:	✓	✓	✓	✓	✓					✓	

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	• Wash down procedures to reduce the spread of weeds via vehicles and machinery • Measures to target potential new weed outbreaks including soil stockpiles and any other disturbed areas • Outline monitoring programs for noxious and problematic weeds on site and in the surrounding areas • Measures for strict stockpiling control to help eradicate all noxious weeds as per NSW DPI specifications for Sutherland Shire LGA • Include a list of 'frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO for the control of noxious weeds; and ensure that only amphibian friendly herbicides are used • Wash down protocols for construction/demolition vehicles and machinery to prevent the spread of root-rot fungus (*Phytophthora cinnamomi*) and noxious weeds • All personnel undertaking routine management activities of any noxious weeds should be appropriated trained and all contractors should hold the necessary permits and licences. Noxious weed information sheets would be provided to demolition contractors to help identification of relevant noxious weeds.											

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K2	~~A BWMP would be prepared in order to limit potential impacts to existing vegetation outside of the area of proposed works, but within the Site. It would include the following:~~ • ~~Existing vegetation on Site would be clearly marked on all Site plans and construction diagrams, with clear indications of no-go zones within all vegetated areas~~ • ~~Existing vegetation would be clearly signposted and fenced off prior to the commencement of construction activities, and should remain fenced off until the completion of works (as per the Vegetation Exclusion Zones shown on Figure 17-1)~~ Absolutely all works would be limited to the ~~defined construction/ demolition footprint~~ **Project Area, as defined in Figure 4-1 of the MOD-7 Modification Report**.	✓	✓	✓	✓	✓					✓	
K3	To minimise the potential for impacts to native fauna species, the BWMP would be developed and include following measures: • Identification sheets would be provided to all construction workers on Site for the ~~two~~ threatened ~~frog~~ species predicted to occur within the Site. • Stop work procedures would be implemented during the works on the chance encounter of any dispersing threatened frogs or birds to avoid death or injury to frogs dispersing across the Site, or disturbance to nesting threatened birds. • ~~If any frogs are found within the Project Area, works would cease until frogs have been relocated to areas outside the area of impact~~ • If any threatened frogs, e.g. Green and Golden Bell Frog or Wallum Froglet, are identified within the Site, works would cease and active searching should be undertaken by a qualified zoologist experienced in the identification and management of the Green and Golden Bell Frog and Wallum Froglet	✓	✓	✓							✓	

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		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem	Con	Op
	• All trenches would be inspected prior to works each morning. **Exclusion fencing shall be maintained during all seasons of the year.** Any frogs that become trapped within trenches would be assessed by a suitably qualified ecologist or veterinarian and then released into the nearest suitable habitat if uninjured • Wash down protocols to prevent the spread of Amphibian Chytrid Disease (chytridiomycosis) would be implemented at relevant work areas. Protocols would be consistent with **NSW DCCEEW** ~~OEH~~ guidelines (DECC, 2008b) • 'Frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO would be used for the control of noxious weeds • If fauna are found to be utilising the Site, or a nest, den or roost is found, work in the immediate area is to stop and the animals are to be allowed to move off freely, or relocated by an authorised person to an area outside the construction footprint • **Measures to limit light spill during construction, such as strategic placement and directional lighting, and implementing motion sensor activation.**											
~~K4~~	~~To minimise the potential impacts to native fauna during the demolition works the following measures would be included in the BWMP:~~ ~~• Demolition workers would be provided with identification sheets relating to the threatened fauna species predicted to occur within the Site.~~ ~~• Stop work procedures would be implemented during the works on the chance encounter of any dispersing threatened frogs or the identification of nesting Pied Oystercatcher, Little Tern, Osprey or White-bellied Sea-eagle to avoid death or injury to frogs dispersing across the study area, or disturbance to nesting threatened birds.~~				✓	✓						

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	• ~~Trenches/ holes would be back-filled daily or covered overnight. Where this is not possible, other measures would be considered to prevent and/or mitigate fauna entrapment. Trenches/ holes would be inspected prior to works each morning. Injured frogs that become trapped within trenches would be assessed by a veterinarian or ecologist. Uninjured frogs would be captured and released into the nearest suitable habitat to the south of the study area.~~ • ~~If threatened frogs, Green and Golden Bell Frog or Wallum Froglet are identified during demolition works, active searching would be undertaken by a qualified zoologist experienced in the identification and management of the Green and Golden Bell Frog and Wallum Froglet.~~ • ~~When open trenching/ digging/ excavating, Caltex **Ampol** would ensure that exclusion fencing is erected prior to works commencing each morning. Exclusion fencing shall be maintained during all seasons of the year, given the active season for the Green and Golden Bell Frog extends from September to April and the Wallum Froglet peak activity period occurs during the colder months.~~ • ~~If practicable, works at Silver Beach to remove the cooling water outlet should be completed outside of the known nesting periods for Pied Oystercatcher (August to January) and Little Tern (Spring/Summer). If nesting shorebirds are encountered in the Silver Beach foreshore area in the vicinity of works (within 20 m), works at Silver Beach would cease, a qualified zoologist would be consulted and appropriate actions would be implemented, prior to works recommencing.~~ • ~~If practical, works to remove tall structures on site should be completed outside of the known nesting periods the threatened bird species (July to September for Osprey and June to January~~											

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	~~for White-bellied Sea-eagle). If not practical then tall structures would be inspected for active nests prior to commencing the demolition works.~~											
~~K5~~	~~The following recommendations, would be contained in the Cooling Water Outlet Management Plan for managing the potential marine ecology impact and implemented during demolition works:~~ • ~~Silt curtains would be installed seaward of the demolition works area but not directly above existing seagrass communities;~~ • ~~All plant and equipment used in the water column would be appropriately prepared, checked and cleaned to avoid potential release of contaminants;~~ • ~~Plant and equipment used in the water column would be inspected to ensure fragments of the invasive algae Caulerpa taxifolia are not present;~~ • ~~Spill kits would be used to contain and clean up any spills from demolition plant and equipment. Spill kits would be located within 20 m of demolition plant and equipment; and~~ • ~~Demolition works at Silver Beach (particularly those located in the water column) would be timed such that they do not coincide with high-tide conditions or during significant wave action.~~				✓	✓						

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~~K6~~	~~Following the removal of the continental carbon pipeline and other infrastructure Caltex would develop a strategy to manage the redundant right of way (CCROW). The strategy would include measures to:~~ ~~• Remove fencing, reprofile and allow natural regeneration the southern part of the CCROW (beyond the southern boundary of the Site) to promote consistent and connected vegetative communities across the southern part of Caltex ownership;~~ ~~• Remove and keep out noxious and invasive weeds, especially during the regeneration phase; and~~ ~~• Reprofiling of the CCROW could include creating gaps in the raised easement to allow for hydrological exchange and habitat regeneration.~~					✓						
~~K7~~	~~Caltex would undertake the following prior to excavation along the Continental Carbon Right of Way:~~ ~~• pre-clearing inspections; and~~ ~~• implementing frog exclusion measures to ensure dispersing frogs are not captured and trapped in trenches during pipeline removal (e.g. exclusion fencing).~~					✓						
K8	**The following measures would be considered in the detailed design of new buildings to manage light spill:** • **Lighting is directed away from nearby retained habitat** • **Installation of light shields** • **Timer switchers (when possible)** • **Appropriate wavelength controls.**											✓

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Coastal Processes												
~~L1~~	~~A Cooling Water Outlet Management Plan would be developed as part of the Demolition Environment Management Plan (DEMP). Rehabilitation works at Silver Beach would be in accordance with this Cooling Water Outlet Management Plan. The following measures would be included:~~				✓	✓						
~~L2~~	~~A detailed survey of the likely extent of the disturbed area at Silver Beach would be undertaken prior to commencing demolition works to ensure that the pre-existing topography is re-established following the works.~~					✓						
~~L3~~	~~The affected sand dunes (including the back-beach and sub-aerial beach) would be re-instated using the stockpiled overburden sand and if necessary, additional sand. Additional sand used for reinstating sand dunes would be of similar particle size and composition as the overburden sand.~~					✓						
~~L4~~	~~The affected sand dunes would be restored to match the previously surveyed topography. A smooth profile from the back-beach area to the dune would be re-established to ensure the aerodynamics are as consistent as possible with the undisturbed areas adjacent to the disturbed area. If necessary, liquid sprays or geotextiles would be used to help stabilise the beach and protect against erosion.~~					✓						

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~~L5~~	~~The affected sand dunes would be re-vegetated using indigenous, native flora. The existing vegetation is limited to grasses, with no woody vegetation. The area would be re-planted with similar grass species in a manner that ensures minimal loss of wind-blown sand from the dune while the area is re-vegetating. All re-vegetated areas would:~~ ~~• contain signage to highlight these areas as rehabilitation zones that prohibit public and vehicular access;~~ ~~• be temporarily fenced, and~~ ~~• be maintained and monitored until vegetation is established using approved dune rehabilitation methods.~~					✓						
~~L6~~	~~Material of a similar sediment size and colour characteristics would be used as back fill material for the trench below the low tide mark. To account for later settling and consolidations, some overfilling would be undertaken to account for later consolidation (approximately 10 % would be recommended).~~					✓						
Social impact												
M1	**Construction workers for the proposed modification would be employed from the local area where possible to reduce the need for workers to relocate to the area during construction, and to contribute to local employment opportunities.**										✓	
M2	**Stakeholder engagement activities carried out during construction would be accessible to a range of groups (such as residents and businesses) in the community. This would include, at a minimum, a range of engagement methods (including options for physical copies of engagement materials). Material in relevant languages used in the local area would be made available if requested.**										✓	

Appendix E

Conditions of consent to be modified

Appendix E Conditions of consent to be modified

The conditions of consent provided in SSD-5544 (7 January 2014), SSD-5544 MOD-1 (10 August 2015), SSD-5544 MOD-2 (27 October 2017), SSD-5544 MOD-3 (17 November 2017), SSD-5544 MOD-4 (9 August 2018) SSD-5544 MOD-5 (10 July 2019), and SSD-5544 MOD-6 (were reviewed based on the outcomes of the assessments within this Modification Report to determine their relevance to the modification works.

Table E-9-6 identified certain conditions of consent to be modified. The precise wording of the revised conditions will be discussed with DPHI and relevant stakeholders following exhibition of the Modification Report and review of submissions that may be received.

General comments:

- Where conditions of consent are considered applicable to the proposed modification, these have not been included in Table E-6
- Where conditions of consent reference the following works that have been completed, consider removing.
  - "Demolition works"
  - "ACS Management Works"
  - "Tank 101 demolition"
  - "Continental Carbon Pipeline"
  - "CWO Pipeline."

Table E-6 Conditions of consent to be modified

Condition ref.	Description	Comment
Schedule B Administrative conditions		
B2	The Applicant must carry out the Development generally in accordance with the: (a) EIS; (b) RTS; (c) site layout plans and drawings in the EIS (see Appendix A); (d) MOD 1; (e) MOD 2; (f) MOD 3; (g) MOD 4; (h) MOD 5; (i) MOD 6.	This condition may need to be updated to include reference to this modification.
B13	Prior to the commencement of construction, the Applicant must apply to the EPA to vary the Environment Protection Licence (EPL) for the Kurnell Refinery (Licence No. 837) to permit the Development.	This condition may need to be updated to include reference to the proposed modification.

Condition ref.	Description	Comment
Schedule C Environmental performance and management		
C1	The Applicant must: (a) carry out the Development in accordance with the PHA; (b) implement all control measures proposed in the PHA; (c) implement all actions proposed by Caltex in response to the recommendations from the Buncefield incident investigation report (Kurnell Buncefield Review - Final, submitted to the Department May 2013). (d) implement all proposed actions listed in Caltex's response to the Department's requests for additional information and clarifications (Caltex Response to D&I Queries of Caltex Submitted QRA – August 2013).	This condition may need to be updated to include reference to this modification report.
C3	At least one month prior to the commencement of construction of the Development (except for construction of those preliminary works that are outside the scope of the hazard studies), or within such further period as the Planning Secretary may agree, the Applicant must prepare, in consultation with WorkCover NSW, and submit for the approval of the Planning Secretary, the studies set out under subsections (a) to (d) (the pre-construction studies) of this Condition. Construction, other than for preliminary works, must not commence until approval has been given by the Planning Secretary and, with respect to the Fire Safety Study, approval has also been given by Fire and Rescue NSW.	This condition may need to be updated to include reference to this modification report.
C4	The Applicant must develop, in consultation with WorkCover NSW, and implement the plans and systems set out under subsections (a) to (b) of this Condition. No later than two months prior to the refinery process units shutting down, or within such further period as the Planning Secretary may agree, the Applicant must submit, for the approval of the Planning Secretary, documentation describing those plans and systems.	This condition may need to be updated to include reference to this modification report.
C5	Prior to the commencement of commissioning the first asset within each system (see Condition C2), the Applicant must submit a Pre-Commissioning Plan and Pre-Startup Safety Review Checklists to the Planning Secretary.	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
C6	Pre-Startup Compliance Report One month prior to the commencement of operation of the first asset in each of the four systems (see Condition C2), the Applicant must submit to the Planning Secretary, a report detailing compliance with Conditions C3, C4 and C5 of this consent. The report must be prepared in consultation with WorkCover NSW, and must include: (a) dates of study/ plan/ system submission, approval, commencement of construction and commissioning; (b) actions taken or proposed, to implement the recommendations and safety-related control measures in the studies/ plans/ systems; and (c) responses to each requirement imposed by the Planning Secretary under Condition C7 of this consent.	This condition may need to be updated to include reference to this modification report.
C7	Post-Startup Compliance Report Three months after the refinery process units shut down, the Applicant must submit to the Director- General, a report that has been prepared in consultation with WorkCover NSW verifying that: (a) the Emergency Plan required under Condition C4(a) is effectively in place and that at least one emergency exercise has been conducted; and (b) the Safety Management System required under Condition C4(b) has been fully implemented and that records required by the system are being kept. The report must be prepared in consultation with WorkCover NSW.	This condition may need to be updated to include reference to this modification report.
C8	Hazard Audit Twelve months after all four systems being fully operational and every three years thereafter, or at such intervals as the Planning Secretary may agree, the Applicant must carry out a comprehensive Hazard Audit of the Development and within one month of each audit submit a report to the Planning Secretary. The audits must be carried out at the Applicant's expense by a qualified person or team, independent of the Development, approved by the Planning Secretary prior to commencement of each audit. Hazard Audits must be consistent with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit Guidelines' (HIPAP No. 5). The audit reports must, in addition to the requirements provided in HIPAP No 5: (a) verify implementation of all actions proposed by Caltex in response to the recommendations from the Buncefield incident investigation report (Kurnell Buncefield Review - Final, submitted to the Department May 2013). (b) verify implementation of all actions listed in Caltex's response to the Department's requests for additional information and clarifications (Caltex	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
	Response to DP&I Queries of Caltex Submitted QRA – August 2013). (c) confirm that the throughput and storage quantities of potentially hazardous materials are consistent with the PHA. (d) verify that an inspection, testing and preventative maintenance program has been developed, implemented and maintained to ensure the reliability and availability of the key safety critical equipment. (e) verify implementation of any measures arising from the reports submitted in respect of Conditions C2 to C5 of this consent. The audit report must be accompanied by a program for the implementation of all recommendations made in the audit report. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented.	
C11A	The Applicant must: (a) ensure that only VENM or any other material approved in writing by the EPA is used as fill in the Eastern ROW and Western ROW; (b) ensure that the material used as backfill for Silver Beach is of similar grain size and colour characteristics; (c) be permitted to use only VENM or any other material that meets all of the conditions of a Resource Recovery Order issued by the EPA under the Protection of the Environment Operations (Waste) Regulation 2014 for use in the Caltex Terminal. (d) ensure that any VENM or other materials used by the Applicant are fit for purpose and are only used as specified by the relevant Resource Recovery Exemption issued by the EPA. (e) keep accurate records of the volume and type of fill to be used; and (f) make these records available to the Department upon request.	This condition may need to be updated to include reference to this modification report.
C13	In the event that groundwater is intersected during construction and demolition works the Applicant must: (a) obtain the necessary water licences or approvals from NOW; (b) develop a Groundwater Management Plan for the testing, dewatering, storage, movement and treatment of any groundwater in consultation with the NOW, to the satisfaction of the Planning Secretary.	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
C14	If Acid Sulfate Soils (ASS) are encountered during construction demolition works, the Applicant must take steps to prevent further oxidation of exposed ASS, and will cease all excavation work until an ASS Management Plan is prepared for the Development to the satisfaction of the Planning Secretary. This Plan must: (a) be prepared in consultation with the EPA and Council by a suitably qualified and experienced expert; (b) be approved by the Planning Secretary prior to the continuation of any excavation works; (c) outline the investigations that have be undertaken to test for the presence of ASS in accordance the NSW State Government's Acid Sulphate Soils Manual (ASSMAC 1998); (d) detail the protocols to be put in place and followed; (e) detail how the ASS will be tested, handled and stockpiled; (f) detail measures to prevent erosion and sedimentation of ASS; and, if necessary (g) outline how the ASS will be disposed of off-site (e.g. at a licensed facility).	This condition may need to be updated to include reference to this modification report.
C15A	The Applicant must update and implement the Contamination Management Plan for the demolition works to the satisfaction of the Planning Secretary. This plan is to update the plan approved under condition C15 and must also: (a) be submitted to the Planning Secretary for approval (See condition D1A for timing); (b) detail measures for the identification and monitoring of potentially contaminated soils and groundwater including the use of excavation visual and olfactory indicators; and (c) include measures for managing potentially contaminated soils and groundwater during ground disturbance and excavation works;	This condition may need to be updated to include reference to this modification report.
C15B	The Applicant must ensure that any asbestos encountered during the demolition works is monitored, handled, transported and disposed of by appropriately qualified and licensed contractors in accordance with the requirements of WorkCover and relevant guidelines, including: (a) Work Health and Safety Regulation 2011; (b) Model Code of Practice – How to Manage and Control Asbestos in the Workplace, 2011 Safe Work Australia; (c) Model Code of Practice – How to Safely Remove Asbestos, 2011 Safe Work Australia; and (d) Protection of the Environment Operations (Waste) Regulation 2005.	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
C19	High noise generating construction and demolition works, including the pipeline removal works within the Eastern and Western Right of Ways, and the Tank 101 demolition works described in MOD 3, must be confined to less sensitive times of the day, and must not be undertaken on Sundays or public holidays or outside of the hours 7:00am and 6:00pm Monday to Saturday.	This condition may need to be updated to include reference to this modification report. Refer to Section 4.3.2 for the revised wording used in this Modification Report.
C22	The Applicant must prepare and implement a Noise Management Plan for construction works and site operations.	This condition may need to be updated to include reference to this modification report.
C24	The Applicant must carry out all reasonable and feasible measures to minimise dust generated during construction and demolition works.	This condition may need to be updated to include reference to this modification report.
C25	During Construction and demolition works, the Applicant must ensure that: (a) all trucks entering or leaving the site have their loads covered; (b) trucks associated with the Development do not track dirt onto the public road network; and (c) any dirt on public roads as a result of the development is promptly removed.	This condition may need to be updated to include reference to this modification report.
C30	The Applicant must commission an appropriately qualified heritage expert to undertake an archival photographic recording of the existing fabric and operation of the Kurnell Refinery while the plant is still operational and during the decommissioning process. The recording should include a range of media and must be undertaken in accordance with the current Heritage Council Guidelines on Photographic Recording of Heritage Items Using Film or Digital Capture (2006). The archival recording must be submitted to the Heritage Council of NSW, Sutherland Shire Library and the NSW State Library within 12 months of the closure of the refinery and prior to the removal or demolition of any existing elements.	This condition has been satisfied, as outlined in the Heritage Impact Assessment (Appendix K) of this Modification Report. Consider removing.
C31	The Applicant must prepare and implement a Heritage Management Strategy for the Australian Oil Refinery site prior to shut-down of the refinery plant. The Strategy must: (a) be prepared by a suitably qualified person in consultation with Council and the Heritage Council of NSW; (b) be submitted to the Planning Secretary for approval at least 2 months prior to the shut-down of the refinery plant; (c) review the heritage significance of the Australian Oil Refinery site; and (d) set out a framework to minimise or mitigate the loss of heritage value during the decommissioning process, and for the ongoing management of the Site's heritage during present and future works.	This condition has been satisfied, as outlined in the Heritage Impact Assessment (Appendix K) of this Modification Report. Consider removing.

Condition ref.	Description	Comment
C33	If during the course of construction and demolition the Applicant becomes aware of any previously unidentified heritage object(s), all work likely to affect the object(s) must cease immediately and the Heritage Council of New South Wales must be notified immediately in accordance with section 146 of the Heritage Act 1977. Relevant works must not recommence until written authorisation from the Heritage Council of NSW is received by the Applicant.	This condition may need to be updated to include reference to this modification report.
C34	If during the course of construction and demolition the Applicant becomes aware of any previously unidentified Aboriginal object(s), all work likely to affect the object(s) must cease immediately and the OEH informed in accordance with section 89A of the National Parks and Wildlife Act 1974. Relevant works must not recommence until written authorisation from OEH is received by the Applicant.	This condition may need to be updated to include reference to this modification report.
C39	The Applicant must ensure that any waste generated on the site during construction and demolition is classified in accordance with the EPA's Waste Classification Guidelines and disposed of to a facility that may lawfully accept the waste.	This condition may need to be updated to include reference to this modification report.
C42	The Applicant must prepare and implement a Biodiversity Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared in consultation with the Council; (b) be approved by the Planning Secretary (Refer to Conditions D1 and D2 for timing); (c) include measures to be taken to minimise impacts on flora and fauna; (d) include a program with timeframes for implementation of the relevant recommendations contained in the Ecology Impact Assessment in Appendix I of the EIS, and the Management and Mitigation Measures contained in Chapter 19 of the EIS to minimise impacts on flora and fauna and maintain the biodiversity value of the site and surrounding environment.	This condition may need to be updated to include reference to this modification report.
Schedule D Environmental management, reporting, and auditing		
D1	The Applicant must prepare and implement a Construction Environmental Management Plan for the Development to the satisfaction of the Planning Secretary. (a) be prepared in consultation with Sutherland Shire Council and the EPA; (b) be submitted to the Planning Secretary for approval no later than four (4) weeks prior to the commencement of construction, or within such period otherwise agreed by the Planning Secretary; (c) identify the statutory Consents that apply to the Development;	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
	(d) consolidate all relevant management plans and monitoring programs required in the conditions of this Consent; (e) outline all environmental management practices and procedures to be followed during construction and demolition works associated with the Development; (f) describe all activities to be undertaken on the site during construction of the Development, including a clear indication of construction stages; (g) incorporate all relevant management and mitigation measures contained in the EIS and RTS; (h) detail how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues must be addressed in the Plan: (i) Human Health and Ecological Risk management - which must be mitigated and managed in accordance with Section 6.2 of the "Human Health and Ecological Qualitative Risk Assessment" report prepared by URS, dated 28 February 2013 and the relevant Management and Mitigation Measures contained in Appendix C of this consent; (ii) Biodiversity management (See Condition 42); (iii) Pest, Vermin & Noxious Weed management (See Condition C43); (iv) Soils and Erosion management (See Condition C11); (v) Contamination management (See Condition C15); (vi) Noise and Vibration management (See Condition C22); (vii) Air Quality management (See Condition C28); (viii) Stormwater and Wastewater management (See Condition C12); (ix) Traffic management (See Condition C36); (x) Heritage management (Aboriginal and non-Aboriginal) (See Condition 33 & 34); (xi) Waste and Resource management (See Condition C40); (xii) Groundwater management, including measures which are consistent with the relevant Management and Mitigation Measures contained in Appendix C of this consent;; (xiii) Acid Sulfate Soils management – if required (See Condition C14); (xiv) Emergency (including spill) management; (xv) means for assessing (and where identified) for managing interactions and cumulative impacts from the concurrent construction of other development works in the area should these coincide with the Development (e.g. the Caltex Ports and Berthing upgrade, remediation projects);	

Condition ref.	Description	Comment
	(i) describe the roles and responsibilities for all relevant employees involved in construction and demolition works associated with the Development; (j) include arrangements for community consultation, including consultation with the NSW Department of Education and local schools at key stages of the development that may affect school operations, to identify issues and mitigate impacts throughout the course of the Development. (k) Include a complaints handling procedure during construction and demolition and operation; and, (l) include appropriate procedures to allow the regular review of the requirements of each plan to ensure that they are effective and allow for adaptive management to address contingencies that may arise over the life of the development. The approval of a Construction Environmental Management Plan does not relieve the Applicant of any requirement associated with this development consent. If there is an inconsistency with an approved Construction Environmental Management Plan and the conditions of this development consent, the requirements of this development consent prevail. Construction of the Development must not commence until written Consent of this plan has been received from the Planning Secretary.	
D2	The Applicant must prepare and implement an Operational Environmental Management Plan for the project to the satisfaction of the Planning Secretary. This Plan must: (a) be approved by the Planning Secretary prior to the commencement of operations; (b) provide the strategic framework for environmental management of the Development; (c) identify the statutory approvals that apply to the Development; (d) include a copy of all relevant management plans and monitoring programs relevant under this consent, including: (i) Water Management Plan (See Condition C12); (ii) Noise Management Plan (See Condition C22; (iii) Traffic Management Plan (See Condition C36); (iv) Waste Management Plan (See Condition C40); (v) Biodiversity Management Plan (See Condition 42); and, (vi) Pest, Vermin & Noxious Weed Management (See Condition C43). (e) outline all environmental management practices and procedures to be followed during operation; (f) describe all activities to be undertaken on the site during operation; (g) detail how the environmental performance of the operation of the project will be monitored, and what actions will be taken to address identified adverse environmental impacts;	This condition may need to be updated to include reference to this modification report.

Condition ref.	Description	Comment
	(h) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project; (i) describe the procedures that will be implemented to: • keep the local community and relevant agencies informed about the operation and environmental performance of the project; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the project; • respond to any non-compliance; and • respond to emergencies; and (j) include: • copies of any strategies, plans and programs approved under the conditions of this consent; and • a clear plan depicting all the monitoring required to be carried out under the conditions of this consent. (k) a copy of the Long Term Environmental Management Plan (see Condition 53) for the ACS management works.	
D9	The Applicant must, to the satisfaction of the Planning Secretary: (a) make the following information publicly available on its website: • the EIS; • MOD 1 and its accompanying documents; • MOD 2 and its accompanying documents; • MOD 3 and its accompanying documents; • MOD 4 and its accompanying documents; • MOD 5 and its accompanying documents; • MOD 6 and its accompanying documents; • current statutory approvals for the Development; • approved strategies, plans or programs; • a summary of the monitoring results of the Development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; • a complaints register, updated on a quarterly basis; • copies of any annual reviews (over the last 5 years); • any independent environmental audit, and the Applicant's response to the recommendations in any audit; and • any other matter required by the Planning Secretary; and (b) keep this information up-to-date,	This condition may need to be updated to include reference to this modification report.

Appendix F

Preliminary hazard analysis

Appendix G

Soils and groundwater report

Appendix H

Conceptual Remedial Action Plan

Revision 1 – 12-May-2025
Prepared for – Ampol Australia Petroleum Pty Ltd – ABN: 17 000 032 128

Appendix I

Surface water, wastewater, and flooding report

Appendix J

Aboriginal cultural heritage assessment report

Appendix K

Heritage impact assessment report

Appendix L

Traffic and transport assessment report

Appendix M

Noise and vibration impact assessment report

Appendix N

Air quality assessment report

Appendix O

Social impact assessment report

Appendix P

Biodiversity development assessment report

Appendix Q

Matters of National Environmental Significance

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 31-Mar-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	106
Listed Migratory Species:	79

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	49
Commonwealth Heritage Places:	1
Listed Marine Species:	106
Whales and Other Cetaceans:	15
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	5
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	32
Key Ecological Features (Marine):	None
Biologically Important Areas:	4
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Historic			
Kamay Botany Bay: botanical collection sites	NSW	Listed place	In feature area
Kurnell Peninsula Headland	NSW	Listed place	In feature area

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Towra point nature reserve	Within Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area	In feature area
Eastern Suburbs Banksia Scrub of the Sydney Region	Critically Endangered	Community likely to occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Community likely to occur within area	In feature area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area	In feature area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area	In buffer area only

Community Name	Threatened Category	Presence Text	Buffer Status
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Pachyptila turtur subantarctica](#) Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pluvialis squatarola](#) Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
[Pterodroma leucoptera leucoptera](#) Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
[Pterodroma neglecta neglecta](#) Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
[Pycnoptilus floccosus](#) Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Sternula albifrons](#) Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area
FISH			
[Epinephelus daemelii](#) Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In feature area
[Macquaria australasica](#) Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Rexea solandri (eastern Australian population)](#) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
[Seriolella brama](#) Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
FROG			
[Heleioporus australiacus australiacus](#) Giant Burrowing Frog, Eastern Owl Frog [92013]	Endangered	Species or species habitat may occur within area	In buffer area only
[Litoria aurea](#) Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
MAMMAL			
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Isoodon obesulus obesulus			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Notamacropus parma			
Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
OTHER			
[Dendronephthya australis](#) Cauliflower Soft Coral [90325]	Endangered	Species or species habitat known to occur within area	In buffer area only
PLANT			
[Acacia terminalis subsp. Eastern Sydney (G.P.Phillips 126) listed as Acacia terminalis subsp. terminalis MS](#) Sunshine Wattle (Sydney region) [91564]	Endangered	Species or species habitat known to occur within area	In feature area
[Caladenia tessellata](#) Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Calochilus pulchellus](#) Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area	In feature area
[Cryptostylis hunteriana](#) Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Eucalyptus camfieldii](#) Camfield's Stringybark [15460]	Vulnerable	Species or species habitat may occur within area	In feature area
[Genoplesium baueri](#) Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Melaleuca biconvexa](#) Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In feature area
[Melaleuca deanei](#) Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterostylis sp. Botany Bay (A.Bishop J221/1-13) Botany Bay Bearded Greenhood, Botany Bay Bearded Orchid [64965]	Endangered	Species or species habitat likely to occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Hoplocephalus bungaroides			
Broad-headed Snake [1182]	Endangered	Species or species habitat may occur within area	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population)			
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Meridolum maryae			
Maroubra Woodland Snail, Maroubra Land Snail [89884]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Anous stolidus](#) Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
[Ardenna carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
[Ardenna grisea](#) Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Calonectris leucomelas](#) Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
[Diomedea antipodensis](#) Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
[Fregata ariel](#) Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
[Carcharias taurus](#) Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
[Cuculus optatus](#) Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In feature area
[Calidris subminuta](#) Long-toed Stint [861]		Roosting known to occur within area	In feature area
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Gallinago megala](#) Swinhoe's Snipe [864]		Roosting likely to occur within area	In feature area
[Gallinago stenura](#) Pin-tailed Snipe [841]		Roosting likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian & Overseas Telecommunications Corporation [14359]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12058]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [12059]	NSW	In feature area
Defence		
Commonwealth Land - Defence Service Homes Corporation [14360]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14357]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14363]	NSW	In buffer area only
Defence - BANKSMEADOW DEPOT (Sydney Workshop Company) [11117]	NSW	In buffer area only
Defence - BANKSMEADOW DEPOT (Sydney Workshop Company) [11116]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [16462]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15756]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15757]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15754]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16460]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16463]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15881]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15753]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15750]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15886]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15751]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [15885]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15884]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15749]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14362]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15755]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15752]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16470]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16454]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16455]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16456]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16457]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16465]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16467]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16464]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16468]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16469]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16466]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16461]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16453]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16459]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16458]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14361]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14358]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		
Commonwealth Land - Airservices Australia [12057]	NSW	In buffer area only
Unknown		
Commonwealth Land - [15503]	NSW	In buffer area only
Commonwealth Land - [15406]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [14378]	NSW	In buffer area only
Commonwealth Land - [15883]	NSW	In buffer area only
Commonwealth Land - [15882]	NSW	In buffer area only
Commonwealth Land - [16452]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Cape Baily Lighthouse	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
[Calidris subminuta](#) Long-toed Stint [861]		Roosting known to occur within area overfly marine area	In feature area
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
[Calonectris leucomelas](#) Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pachyptila turtur](#) Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In feature area
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
[Pluvialis squatarola](#) Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
[Pterodroma cervicalis](#) White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
[Recurvirostra novaehollandiae](#) Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Stercorarius antarcticus as Catharacta skua](#) Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Tringa brevipes as Heteroscelus brevipes](#) Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
[Tringa incana as Heteroscelus incanus](#) Wandering Tattler [831]		Roosting known to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
[Festucalex cinctus](#) Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
[Filicampus tigris](#) Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
[Hippichthys penicillus](#) Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In feature area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Stigmatopora nigra](#) Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
[Syngnathoides biaculeatus](#) Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
[Trachyrhamphus bicoarctatus](#) Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Mammal			
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
[Arctocephalus pusillus](#) Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In feature area
[Dugong dugon](#) Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Boat Harbour	Aquatic Reserve	NSW	In buffer area only
Cape Banks	Aquatic Reserve	NSW	In buffer area only
Kamay Botany Bay	National Park	NSW	In feature area

Protected Area Name	Reserve Type	State	Buffer Status
Towra Point	Nature Reserve	NSW	In feature area
Towra Point	Aquatic Reserve	NSW	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Towra Point Estuarine Wetlands	NSW	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Kamay Ferry Wharves Project	2020/8825		Post-Approval	In buffer area only
Residential development, 11 Jennifer Street, Little Bay, NSW	2018/8170		Completed	In buffer area only
Controlled action				
Expansion of Port Botany facilities	2002/543	Controlled Action	Post-Approval	In buffer area only
Kurnell Sand Extraction and Backfilling Proposal	2002/631	Controlled Action	Completed	In feature area
Sand Reclamation to Towra Beach	2003/1085	Controlled Action	Post-Approval	In feature area
Not controlled action				
Botany Bay Cable Project	2007/3552	Not Controlled Action	Completed	In feature area
BP/Mobil Pipeline to Kingsford Smith Airport	2000/104	Not Controlled Action	Completed	In buffer area only
Carbon Black Plant Upgrade	2006/2785	Not Controlled Action	Completed	In feature area
Construction Of Two New Fuel Processing Plants On Existing Site	2003/1243	Not Controlled Action	Completed	In feature area
Georges River Program 2	2003/999	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Industrial Subdivision	2004/1859	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Industrial Subdivision, 262-276 Captain Cook Drive	2004/1899	Not Controlled Action	Completed	In feature area
Installation of viewing platform	2005/2138	Not Controlled Action	Completed	In feature area
Little Bay Residential Subdivision	2002/873	Not Controlled Action	Completed	In buffer area only
Noxious weed removal, Anzac Rifle Range	2002/761	Not Controlled Action	Completed	In buffer area only
Noxious weed removal and controlled burn	2003/1272	Not Controlled Action	Completed	In feature area
Noxious Weed Removal at Anzac Rifle Range	2004/1336	Not Controlled Action	Completed	In buffer area only
Rabbit Control Anzac Rifle Range	2005/1940	Not Controlled Action	Completed	In feature area
Rehabilitation works of the Coogee Sewer Diversion Submain - Maxwell Avenue, Mar	2004/1683	Not Controlled Action	Completed	In buffer area only
Rubbish removal, Anzac Rifle Range	2002/760	Not Controlled Action	Completed	In buffer area only
Shipment of Spent Nuclear Fuel to USA	2007/3672	Not Controlled Action	Completed	In feature area
Sydney Desalination Plant	2005/2331	Not Controlled Action	Completed	In feature area
Taleb Property Pty Ltd, Tempe Tyres Warehouse project, Captain Cook Drive, Kurnell	2017/8068	Not Controlled Action	Completed	In feature area
Undertake a controlled burn of the Eastern Suburbs Banksia Scrub at Byrne Cresce	2004/1728	Not Controlled Action	Completed	In feature area
Upgrade of Captain Cook Drive	2012/6286	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Transport of intermediate level radioactive waste to Lucas Heights, NSW	2015/7437	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Transport of OPAL Spent Fuel to France in 2018 and 2025	2016/7841	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In feature area
Relocation of Grey-Headed Flying-Fox Colony	2008/4568	Referral Decision	Completed	In buffer area only

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus			
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In feature area
Sharks			
Carcharias taurus			
Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
Carcharias taurus			
Grey Nurse Shark [64469]	Migration	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north and south)	Known to occur	In feature area

Bioregional Assessments [Resource Information]

SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix R

Cumulative Projects Long List

Kurnell Terminal SSD-5544 Modification Report (MOD-7)
Cumulative Impact Screening/ Scoping Summary - Long-list
Taken from DPHI Cumulative Impacts Guidelines

Justification
1. Spatial relevance
2. Scale
3. Timing
4. Available information/ Status

Fu ure pro ec	n orma on source	Approx ma e D s ance o Proposa s	Pro ec S a us nd ca ve T m ng Over ap	Po en a over ap be ween mpac o proposed mod ca on on assessmen ma er and mpac o o her pro ec on he same assessmen ma er												n Ou	Jus ca on	Re evance o proposa
				Hazards and r sk	So s groundwa er and con am na on	Sur ace wa er was ewa er and ood ng	Abor g na cu ura her age	H s or c her age	Tra c and ranspor	No se and v bra on	Soc a	A r qua y	B od vers y	Was o managemen	Landscape and v sua			
Kamay Ferry Wharves	DPHI Major Projects website	350 m north	Approved and currently under construction. Under construction until late 2024	Unlikely - Small scale of potential hazards and risks on this project and manageable hazards and risks on proposed modification	Unlikely - Soil erosion and subsequent increased sedimentation into Botany Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Soil erosion and subsequent increased sedimentation into Botany Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Limited potential for Aboriginal heritage items at the Site.	Unlikely - Both projects would impact heritage items but are unlikely to intersect.	Unlikely - No impacts are expected.	Unlikey - No overlap in construction schedule, therefore null cumulative construction noise impact.	Unlikely - No overlap in construction schedule	Unlikely - Sensitive receivers close to and in between both projects and substantial earthworks required for both projects, but appropriate controls would be implemented.	Unlikely - Due to distance and appropriate controls applied to manage indirect impacts.	Unlikely - Waste material may need to be disposed at facilities further away from the Site if capacity is reached, if construction overlaps. Appropriate controls would be applied.	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site	In	1. Yes 2. Yes 3. Yes - Operation only. Construction ends 2024, Mod 7 starts start of 2025 4. Yes - EIS and website, and approved	Standard assessment
Kurnell Refinery - Crude Oil Tank	DPHI Major Projects website	Onsite	Approved 2006, construction completed	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Unlikely - Project last modified 19 years ago	Out	1. Yes 2. Yes 3. No 4. Yes approved	N/A
Kurnell Desalination Plant + Water Delivery	DPHI Major Projects website	13 m west	Original project approved in 2006. Currently operational Last mod approved 2010	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Out	1. Yes 2. Yes 3. No 4. Yes approved	N/A
Caltex Kurnell - Diesel Hydro-treater	DPHI Major Projects website	Onsite	Last modified 2010	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Unlikely - Project last modified 15 years ago	Out	1. Yes 2. Yes 3. No 4. Yes approved	N/A
Kurnell Ports and Berthing Facility	DPHI Major Projects website	1.3 km northwest	Approved 2013. Currently operational	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Unlikely - Project approved 12 years ago and construction is complete	Out	1. Yes 2. Yes 3. No 4. Yes approved	N/A
Kurnell Battery Enery Storage System	DPHI Major Projects website	Onsite	Planning approvals commence mid 2024 Construction would commence once grading to facilitate future land uses within Zone 2 has completed	Likely - Both projects with potential hazards and risk impacts, and location within the Kurnell Terminal	Unlikely - Construction would commence following remediation of Zone 2. Negligible impacts expected.	Unlikely - Appropriate surface water management controls would be applied during construction. During operation, both projects would have separate surface water systems.	Unlikely - Any existing Aboriginal heritage values would be removed during proposed modification	Unlikely - Earthworks for BESS would be undertaken as part of the proposed modification, therefore the BESS would be unlikely to affect archaeological heritage items.	Likely - Both projects would require access to and from the Kurnell Terminal and along Captain Cook Drive. Cumulative assessment to be included in Kurnell BESS EIS.	Likely - Cumulative noise may occur. Cumulative assessment to be included in Kurnell BESS EIS.	Likely - Potential for construction fatigue. Cumulative assessment to be included in Kurnell BESS EIS.	Likely - Sensitive receivers close to and in between both projects and substantial earthworks required for both project. Cumulative assessment to be included in Kurnell BESS EIS.	Unlikley - Projects located within the existing development site would not result in any increase to the existing disturbance footprint for the Kurnell Terminal. Measures would be applied to manage indirect impacts	Likely - Waste material may need to be disposed at facilities further away from the Site if capacity is reached. Cumulative assessment to be included in Kurnell BESS EIS.	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site.	Out	1. Yes 2. Yes 3. Yes 4. EIS not available yet (Scoping report only)	Scoped out - Cumulative assessment to be completed in Kurnell BESS EIS
Botany Bay Transmission Line	DPHI Major Projects website	350 m north	Original project approved in 2007. Currently operational Last mod approved 2016 No documentation is publicly available for this project	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Unlikely - Works were limited to within Botany Bay	Out	1. Yes 2. Yes 3. No 4. No approval documents available	N/A
Terminals Bulk Liquids Storage Expansion Mod 4	DPHI Major Projects website	3.6 km north	Original project approved in 1997. Currently operational Last modification approved 2022 for additional thermal oxidiser	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Out	1. No 2. Yes 3. No 4. Yes approved	N/A
Port Botany Expansion	DPHI Major Projects website	5.7 km northwest	Original project approved 2005. Last modification approved 2019	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Unlikely - Due to distance from the Site	Out	1. No 2. Yes 3. No 4. Yes approved	N/A
Elgas LPG Facility	DPHI Major Projects website	3.6 km north	Original project approved 1994. Last modification approved 2014	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Unlikely - Construction completed 10 years ago	Out	1. No 2. No 3. No 4. Yes approved	N/A
Dicker Data Warehouse and Distribution Centre	DPHI Major Projects website	400 m west	Original project approved in 2019. Currently operational Last modification approved 2020	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Unlikely - Construction completed and operational	Out	1. Yes 2. Yes 3. No 4. Yes approved	N/A
Breen Resource Recovery Facility	DPHI Major Projects website	2 km west	Currently under assessment. Construction expected to continue until 2028	Unlikely - Both projects have associated hazards and risks but are unlikely to affect each other	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Limited potential for Aboriginal heritage items at the Site.	Unlikely - Both projects would impact heritage items but are unlikely to intersect.	**Likely - Both projects' traffic routes are likely to use Captain Cook Drive**	Unlikely - Due to distance from the Site	Unlikely - Potential for construction fatigue.	Unlikely - Sensitive receivers close to and in between both projects and substantial earthworks required for both projects, but appropriate controls would be implemented.	Unlikely - Due to distance and appropriate controls applied to manage indirect impacts.	Unlikely - Waste generated from this project would be stockpiled for processing at the new resource recovery facilty	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site	In	1. Yes 2. Yes 3. Yes 4. Yes EIS currently under assessment	Standard assessment
Cronulla Sewage Scheme	DPHI Major Projects website	4 km west	Original project approved 2000. Last modified 2017 (transfer from OEMPs to EMS)	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Unlikely - Change was administrative and no impacts are expected	Out	1. Yes 2. No 3. No 4. Yes approved	N/A
Kurnell Stormwater Separation Improvement Project (DA24/0008)	DAs for each LGA on council websites	Onsite	Approved May 2024. Construction to complete late 2024. Operational overlap with proposed modification construction	Unlikely - No impacts expected from this project	Unlikely - Construction of the two projects would not overlap. Included as baseline. Operation of the project would be beneficial to the Site.	Unlikely - Construction of the two projects would not overlap. Included as baseline. Operation of the project would be beneficial to the Site.	Unlikely - Limited potential for Aboriginal heritage items at the Site. Construction areas would not overlap.	Unlikely - Non-Aboriginal heritage items are common to both areas. However, impacts not expected from either project.	Unlikely - Construction of the two projects would not overlap.	**Likely - Operation of the SSIP would be in close proximity to the relocated FWS and may create cumulative noise.**	Unlikely - Construction would not overlap. Potential for noise affecting local residents would be managed.	Unlikely - Construction of the two projects would not overlap.	Unlikely - Appropriate controls applied to manage indirect impacts.	Unlikely - Construction of the two projects would not overlap	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site	In	1. Yes 2. No 3. Yes 4. Yes approved	Standard assessment
Kurnell Asbestos Remediation Project DA20/0779	DAs for each LGA on council websites	Onsite	Approved in 2020. Works expected to continue for three months once approved	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Unlikely - Works are completed	Out	1. Yes 2. No 3. No 4. Yes approved	N/A
Kurnell Asbestos Remediation Project Modification (MA24/0070)	DAs for each LGA on council websites	Onsite	Pending approval. Works expected to continue for three months once approved	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Out	1. Yes 2. No 3. Yes 4. Yes, pending approval	N/A
Kurnell Scrapyard Site Remediation Project (DA23/0798)	DAs for each LGA on council websites	Onsite	Pending approval. Works expected to continue for three months once approved	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Unlikely - Works have been incorporated into the proposed modification	Out	1. Yes 2. No 3. Yes 4. Yes, pending approval	N/A
Woolooware to Kurnell Tower Replacement Project	Ausgrid project pages	120 m south west	Review of Environmental Factors (REF) public (June 2024) Expected to commence in late 2024-2028	Unlikely - No impacts expected from this project	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Limited potential for Aboriginal heritage items at the Site.	Unlikely - Both projects would impact heritage items but are unlikely to intersect.	Unlikely - Limited construction impacts for the project.	**Likely - Overlap in construction may increase noise for industrial recivers surrounding south of the Project Area.**	Unlikely - Potential for construction fatigue.	Likely - Sensitive receivers close to and in between both projects and substantial earthworks required for both projects	Unlikely - Appropriate controls applied to manage indirect impacts.	Unlikely - Waste material may need to be disposed at facilities further away from the Site if capacity is reached, if construction overlaps. Appropriate controls would be applied.	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site	In	1. Yes 2. Yes 3. Yes 4. Yes, pending approval	Standard assessment
Kurnell Planning Proposal	Sutherland Shire Council Planning Proposal	860 m south-west	Planning proposal submitted Once approved, construction would be completed in a phased manner in 10-20 years. Unclear when construction would commence	Unlikely - No impacts expected from this project	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Soil erosion and subsequent increased sedimentation into Quibray Bay could be a potential negative cumulative impact, but appropriate controls would be implemented.	Unlikely - Limited potential for Aboriginal heritage items at the Site.	Unlikely - Both projects would impact heritage items but are unlikely to intersect.	**Likely - Both projects' traffic routes are likely to use Captain Cook Drive. Impacts would be expected if construction programs align - no clear construction program.**	Unlikely - Due to distance from the Site.	Unlikely - Potential for construction fatigue.	Likely - Sensitive receivers close to and in between both projects and substantial earthworks required for both projects. Impacts would be expected if construction programs align - no clear construction program.	Unlikely - The addition of the proposed modification is considered unlikely to significantly contribute to direct impacts to biodiversity. Appropriate controls applied to manage indirect impacts.	Unlikely - Waste material may need to be disposed at facilities further away from the Site if capacity is reached, if construction overlaps. Appropriate controls would be applied.	Unlikely - Landscape and visual impacts of proposed modification are consistent with current character of the Site	In	1. Yes 2. Yes 3. Unclear - Precautionary principal applied; assessment assumes that construction programs would align 4. Planning proposal submitted.	Standard assessment