

Kurnell Terminal Demolition Project

Soil & Water Management Plan

(incorporating Contamination Management Plan, Acid Sulfate Soils Management Plan and Groundwater Management Plan)

CALTEX AUSTRALIA PETROLEUM PTY LTD

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Attachment E: Coffey (2007) Groundwater Flow Direction and Groundwater Monitoring Wells

Attachment F: CLOR Stockpile Area – Location Map

Attachment G: Containment Cell Surface Water Controls

Revision History

Revision No.	Date of Revision	Description of Revision	Section / Page No.
A	July 2015	Draft for consultation	-
B	September 2015	Final for approval	-
C	September 2015	Approved	-
D	January 2018	Updated to include SSD 5544 MOD2 and SSD 5544 MOD3. Submitted to Department of Planning and Environment for approval	Whole document

1 INTRODUCTION

Caltex are in the process of converting the petroleum refinery in Kurnell (the 'Site') to a finished fuel terminal facility (the 'Project').

The Project is divided into three phases:

- Converting infrastructure to allow the Site to operate as a terminal and shut down the refinery (the conversion works).
- Demolition and removal of redundant infrastructure, including Tank 101 (the demolition works).
- Construction, filling and closure of the asbestos containment cell (the ACS Management works).

The Soil and Water Management Plan (SWMP) has been prepared in relation to the demolition works.

The objective of the Project is to ensure that Caltex's operations within Australia remain viable and can provide a safe, reliable and sustainable supply of petroleum fuels to NSW and the ACT. As such the Project will allow the Site to continue to be utilised as a terminal where finished products can be received by ship, stored in tanks before leaving the Site by pipeline to other terminals.

The demolition works and ACS Management works are being undertaken in accordance with Development Consent from the Department of Environment and Planning, Approval Number: SSD 5544 MOD1, SSD 5544 MOD2, SSD 5544 MOD3, and the consolidated Management and Mitigation Measures (MMM) (refer to Approval: SSD 5544 MOD3).

This SWMP has been prepared in accordance with conditions **C12A**, **C14** and **C15A** of SSD 5544 and SSD 5544 MOD 1 as outlined in **Table 1** below.

Table 1 – Development Consent conditions addressed in this Management Plan

Condition Requirements for SSD 5544 and SSD 5544 MOD 1		Reference Section
C12	<i>The Applicant shall prepare and implement a Water Management Plan for construction works and site operations to the satisfaction of the Secretary. The plan(s) must:</i> <i>(a) be prepared in consultation with the EPA;</i> <i>(b) be approved by the Secretary (refer to Conditions D1 and D2 for timing) ;</i> <i>(c) in addition to the standard requirements for management plans (see Condition D3), this plan must include a Surface Water Management Plan, that:</i> • <i>includes a description of the water management system on site, including the:</i> • <i>stormwater system; and,</i> • <i>oily water wastewater system.</i> • <i>includes plans for the above two components of the systems; and</i> • <i>demonstrates compliance with any requirements of the EPL and/or the EPA.</i>	Section 4.1 Section 4.2 Attachment B & C Section 1.2.1 and Section 4.6

Condition Requirements for SSD 5544 and SSD 5544 MOD 1		Reference Section
C12A	The Applicant shall update and implement the Soil and Water Management Plan for the demolition works to the satisfaction of the Secretary. This plan is to update the plan approved under condition C12 and shall also: (a) be submitted to the Secretary for approval (See condition D1A for timing); (b) include a description of soil and water issues associated with the demolition works; (c) include measures for managing soils that are excavated and stockpiled on site including erosion and sediment control measures for stockpiles and disturbed areas; (d) include details of water management and monitoring requirements during demolition works; and (e) include procedures for corrective action in the event that potential contaminants of concern are identified in the groundwater from the quarterly groundwater monitoring program.	Section 1 Section 4.3 and Section 5.1 Section 5.2, Section 5.4, Section 5.5 Section 4.4, Section 5.3, Section 7
C14	If Acid Sulfate Soils (ASS) are encountered during construction and demolition works, the Applicant shall 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 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 Secretary prior to the continuation of any excavation works; (c) outline the investigations that have been undertaken to test for the presence of ASS in accordance with the NSW State Government's Acid Sulfate 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; detail measures to prevent erosion and sedimentation of ASS; and, if necessary outline how the ASS will be disposed of off-site (e.g. at a licensed facility).	Section 6
C15	The Applicant shall prepare and implement a Contamination Management Plan for the construction works. The Plan shall: (a) be prepared in consultation with the EPA and NSW Health; (b) be to the satisfaction of the Secretary (refer to Condition D1 for timing); (c) outline measures for managing potentially contaminated soil and groundwater, including soil testing, classification, handling, storing and disposal; (d) detail the measures that will be employed to prevent erosion and sedimentation of contaminated soil; (e) detail measures for periodically testing surface water run-off that may accumulate during excavation works for elevated levels of contamination, with any water that is found to have elevated levels of contaminants being disposed of via the on-site Wastewater Treatment Plant. (f) detail measures for managing asbestos encountered during works, including disturbances of soil and release of asbestos into the air; (g) outline how all contaminated soil and associated waste material would be managed in accordance with the Protection of the Environment Operations Act 1997 and associated regulations and characterised in accordance with the EPA's Waste Classification Guidelines; (h) detail how the storage, disposal and transport of asbestos waste would be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulations; and (i) assess any likely impact on existing remediation projects and, if any impacts are identified, provide details as to the measures that shall be taken to reduce or avoid that impact.	Section 5 Section 5.2 Section 4.4 Section 5.4 Section 5 and refer to the DWRMP Section 5.4 and refer to the DWRMP
C15A	The Applicant shall update and implement the Contamination Management Plan for the demolition works to the satisfaction of the Secretary. This plan is to update the plan approved under condition C15 and shall also: (a) be submitted to the 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.	Section 5 & Section 7.7 Section 5.2

This SWMP has also been prepared in accordance with the following:

- SSD 5544 conditions – B1, B2, B16, B21, C11, C11A, C11B, C13, C14, C15A, C15B, and D3; and
- MMM – C2, C9, C12, C13, C15, C17, C18, C19, C20, C21-C31, D1, D2, D3, D4, F2, F3, F4, F5, and F8.

1.1 References

The SWMP has been developed in accordance with the:

- 'The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2 (Landcom, 2004).
- Managing Urban Stormwater: Soils and Construction - Volume 2A: Installation of services (DECC 2008)
- ASS in accordance the NSW State Government's Acid Sulfate Soils Manual (ASSMAC 1998)

1.2 Legislation and Other Requirements

1.2.1 Environment Protection Licence

The Terminal currently operates in accordance with an Environment Protection Licence (EPL 837) issued by the NSW Environment Protection Authority (EPA). EPL 837 contains numerous operational conditions and Pollution Reduction Programs (PRPs), including the requirement for a stormwater management plan discussed in **Section 4.6**.

2 OBJECTIVES

The objectives of the SWMP are to:

- Describe the water management system on the site including both; storm water and oily water systems;
- Describe the soil and water issues associated with the demolition works;
- Include measures for management soils that are excavated and stockpiled on Site;
- Identify water management and monitoring requirements during demolition works;
- Present plans of the water management systems; and
- Demonstrate compliance with EPL 837 and prevent pollution of waters and soil at all times.

Measures for managing sediment and potential residual hydrocarbons, in Botany Bay that may result from the removal of the Cooling Water Outlet Pipeline are addressed in the Cooling Water Outlet Management Plan.

Additional measures for managing soil and water during the construction, filling and closure of the ACS containment cell are detailed in the Containment Cell Management Plan.

The demolition works and ACS Management works are unlikely to have an impact on existing remediation projects detailed below. The demolition works and ACS Management works will be monitored in accordance with the SWMP for impacts on existing projects:

- SSD 5353 - Port and Berthing Works;
- DA 13/0335 - Construction and operation of a Bio-Pile Pilot Trial to treat Hydrocarbon impacted soils;
- DA 09/840 - Jet Fuel Remediation;
- DA 11/1090 - Remediation of Limestone Pits; and
- MP 11/0004 - Caltex Jet Fuel Pipeline Upgrade Project.

3 PROJECT OVERVIEW

The Site has an ISO 14001 accredited Environmental Management System (EMS). This system includes comprehensive management plans and is used site wide. The EMS should be used in conjunction with the DEMP and this sub-management plan.

The demolition works will broadly involve the following activities within the demolition works area (refer to **Attachment A**):

- Demolition, dismantling or removal of:
 - refinery process units and associated infrastructure;
 - redundant tanks and associated infrastructure;
 - redundant pipeways and above and underground pipelines; and
 - redundant buildings and services.
- Associated civil works’;
- Waste management activities including concrete crushing; and
- Returning the works areas to ground level.

The ACS Management works will broadly involve the following activities within the ACS Management works area (refer to **Attachment A**):

- Additional soil sampling within the pipeways to confirm the waste classification of the soil prior to placement in the containment cell;
- 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 directly to the containment cell location for emplacement;
- Filling and compaction of the ACSs into the containment cell;
- Verifying the removal of ACS from the pipeways; and
- Closure of the containment cell.

Refer to the Demolition Environmental Management Plan (DEMP) for **Site Location** figures.

3.1 Works Program

Caltex commenced the demolition works during the second half of 2015. The ACS Management works will commence in early 2018.

A schedule for demolition works and the ACS Management works is shown in **Table 2** below.

Table 2 – Proposed Works Schedule

Task	Indicative Date
Demolition works	
Demolition of Refinery Process Units	Mid 2015 – Mid 2017
Demolition of Tanks	Mid 2016 – Mid 2018
Pipeline Removal	Start 2016 – Mid 2018
Demolition of Buildings	Mid 2016 – End 2017
Concrete Crushing	Q3 2017
ACS Management works	
Containment Cell Construction	Late 2017 – Q1 2018
Excavation of ACS from Pipeways and Filling of Containment Cell	Q2 2018 – Q4 2018
Closure of Containment Cell	Q1 2019

It is noted that the schedule of demolition works associated with the Project may vary from the anticipated schedule, but will not extend beyond three years from the date of consent of SSD 5544 MOD1 (i.e. 10 August 2018). The ACS Management Works will not extend beyond 30 April 2019 in accordance with Condition B7B.

4 SURFACE WATER MANAGEMENT

4.1 Existing Stormwater Management

The Kurnell Terminal can be divided into seven different stormwater catchment areas as shown in **Figure 1** and listed on **Table 3**, which was based on the GHD Water Technology Report: “Caltex Refining Company Pty Ltd – CRL/ALOR Stormwater Management Study – Draft Report” (March 1992). Within each catchment, stormwater can flow either into an aboveground or underground stormwater drain or pipe or an open stormwater drain. A schematic plan of the Kurnell Stormwater Drainage System is also provided in **Attachment B**. The majority of demolition works take place in Catchments A and B. The ACS Management works take place predominately in Catchment B (pipeways shown in **Figure 2** and **Figure 3**) and Catchment F (containment cell).

Table 3 - Stormwater Drainage System Catchments

Catchment	Location Description
A	Eastern and northern area of the Site which includes the large eastern tank area.
B	Central area of the Site which contains majority of the refinery process areas as well as offices, cafe, workshops and store houses; and western part of the Site which contains wastewater treatment plant, western tank area, LPG loading area and storage plant, the Quibray Bay Stormwater Retention Basin and parking area.
C	Northern corner of the Site which includes main offices, former staff houses, gardens, employee car park and wetland.
D	An area between the CLOR and the refinery which contains a flare stack and concrete channel.
E	South western corner of the Site occupied by the now decommissioned CLOR, and which contains yard office, workshop, laboratory, maintenance, process units and tank compounds.
F	South eastern corner of the Site, which predominately comprises relatively undeveloped land and a small area of tank compound, the landfarm area (which is a bioremediation site), a recycling area, and a sludge lagoon.
G	North eastern undeveloped area mostly outside of the Site boundary, which is part of the Kamay Botany Bay National Park.

Stormwater generated on the Site is collected in the Site’s stormwater system, treated where necessary and discharged off-site to three receiving water bodies, Marton Park Wetland, Quibray Bay and Botany Bay. The key water quality management strategy adopted by the Site has been to prevent, to the extent practicable, interaction between petroleum hydrocarbons and stormwater. Consequently the stormwater system only collects runoff from areas of the Site that have been designated low risk with respect to interaction with petroleum products, such as roadways and building roofs.

Topography within the Site is generally flat, although steeper areas exist on the eastern boundary. Soils within the Site are sandy and overly sandstone bedrock. Stormwater runoff generally flows from the eastern boundary through pipes and open channels towards the northwest into the Quibray Bay, Botany Bay, and some Caltex owned land adjacent to the

Site and Marton Park. Some stormwater flows onto the Site across the eastern Site boundary from the Kamay Botany Bay National Park.

There are various retention, retarding and treatment systems incorporated into the Site's stormwater system. The main Site catchments with the potential for interaction between petroleum products and stormwater are Catchments A and B, primarily along the pipeways. The systems incorporated into the stormwater system to regulate flow and discharge rates and prevent discharge of impacted stormwater from the Site are as follows:

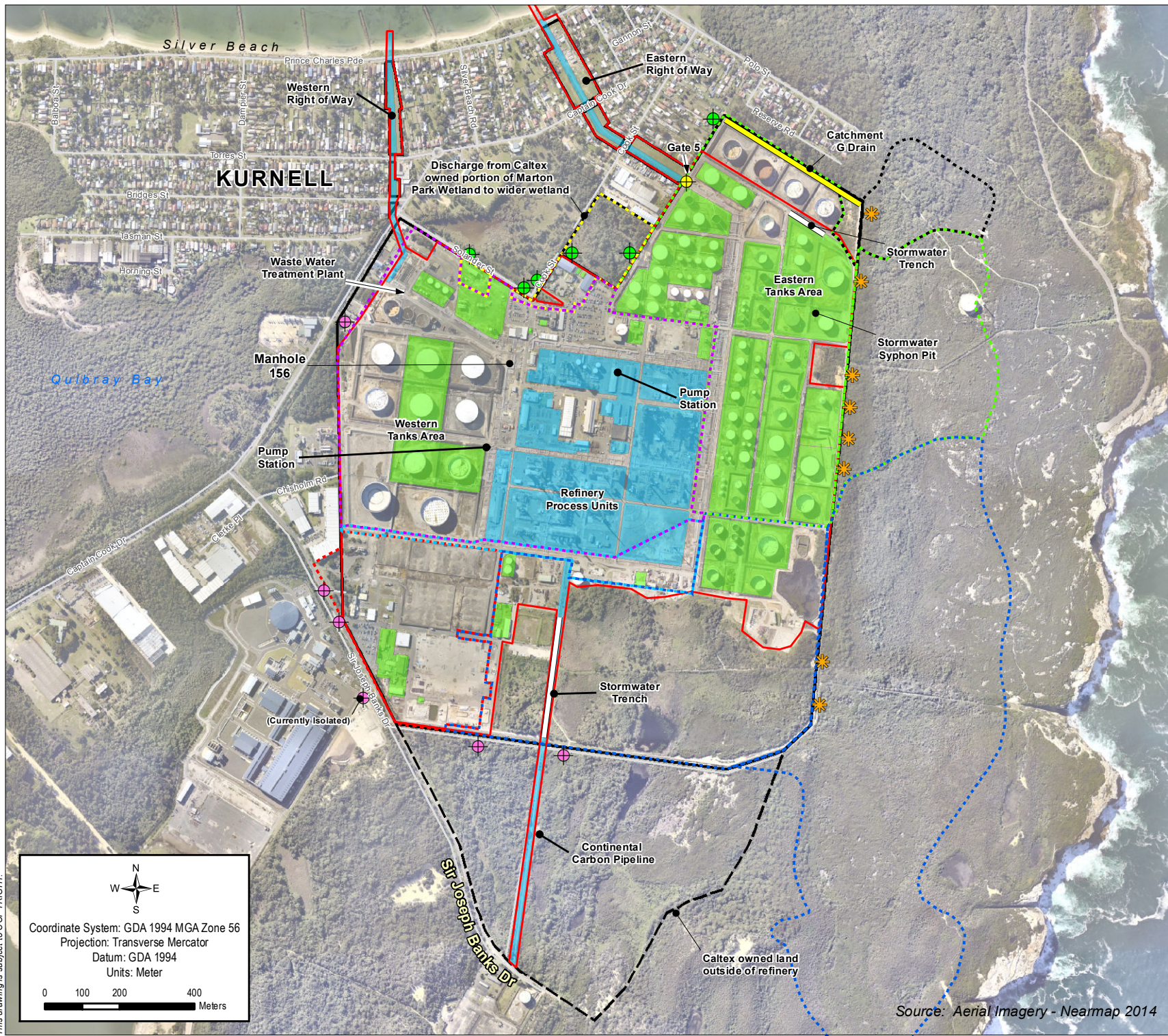
- Provision for isolation of drainage in pipeways;
- Installation of manually operated skimmer pumps at pump transfer points (pumping to the oily water sewer system);
- Ability to redirect stormwater to the intermediate sewer (Catchment B only);
- Retention in an on-site retention basin (Catchment B only);
- Discharge via siphon systems; and
- Treatment in oil/water/solids separators.

Stormwater from the Site is discharged, ultimately, to three receiving environments. These include:

- Discharge by open drainage lines to Quibray Bay through a narrow strip of the Towra Point Nature Reserve and the mangrove wetland;
- Discharge into Botany Bay at Silver Beach near the wharf; and
- Discharge to Marton Park Wetland primarily by infiltration.

Until recently when the CLOR was operating, runoff from parts of this area (Catchment E) was treated in a manner similar to that described above for Catchments A and B. The CLOR has ceased operation and has been demolished. Runoff from this area is no longer treated prior to offsite discharge, except any water that collects in the former CLOR oily water sewer system, which is now pumped to the Terminal's oily water sewer system for treatment in the wastewater treatment plant (WWTP).

Catchments B, D, E & F, comprise in the order of 70% of the total Site catchment area. These catchments all discharge ultimately to Quibray Bay via aboveground drainage lines passing through a narrow strip of the Towra Point Nature Reserve and the mangrove wetland on the northern side of Quibray Bay. Quibray Bay (and surrounds) is therefore the main receiving environment and is also the most environmentally sensitive of the current stormwater receiving environments.



Legend

- The Site
- Caltex Land Ownership
- Demolition Works Area
- Roads

Inflow Points

- From Kamay Botany Bay National Park

Discharge Points

Discharge:

- To Botany Bay
- To Marton Park Wetland
- To Quibray Bay

- Stormwater Trench
- Catchment G Drain

Catchments

- Catchment A
- Catchment B
- Catchment C
- Catchment D
- Catchment E
- Catchment F
- Catchment G

Areas where excavation may occur to:

- 1.0 m
- 2.0 m

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CALTEX (REFINERIES)
NSW PTY LTD

KURNELL REFINERY
CONVERSION MODIFICATON

**STORMWATER CATCHMENT
AREAS & POTENTIAL GROUND
DISTURBANCE ACTIVITIES**

URS

Figure: 1
Rev. A A4



Coordinate System: GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

0 100 200 400
Meters

Figure 2 – ACS Management works – Pipeways Excavation to 0.2 m

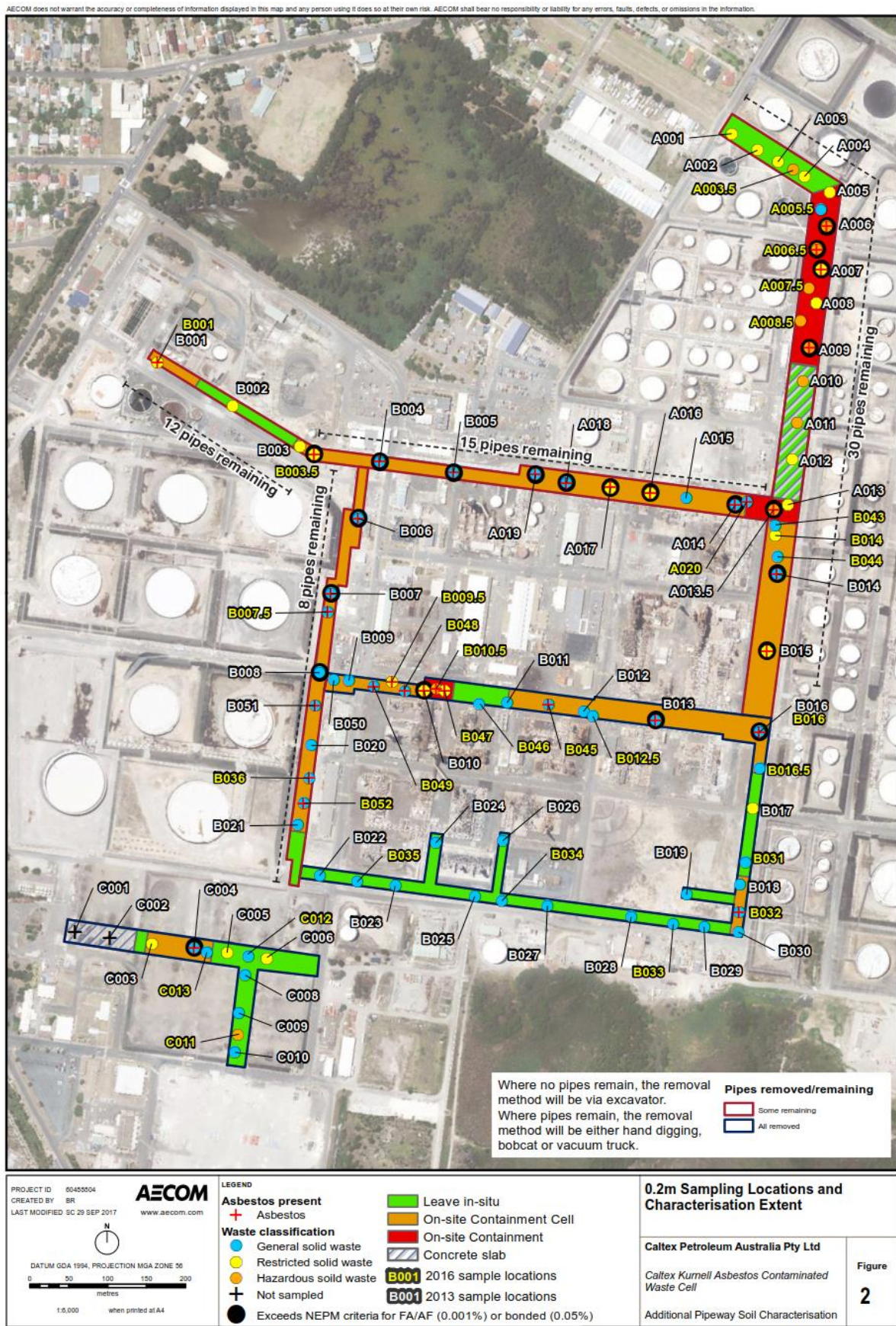
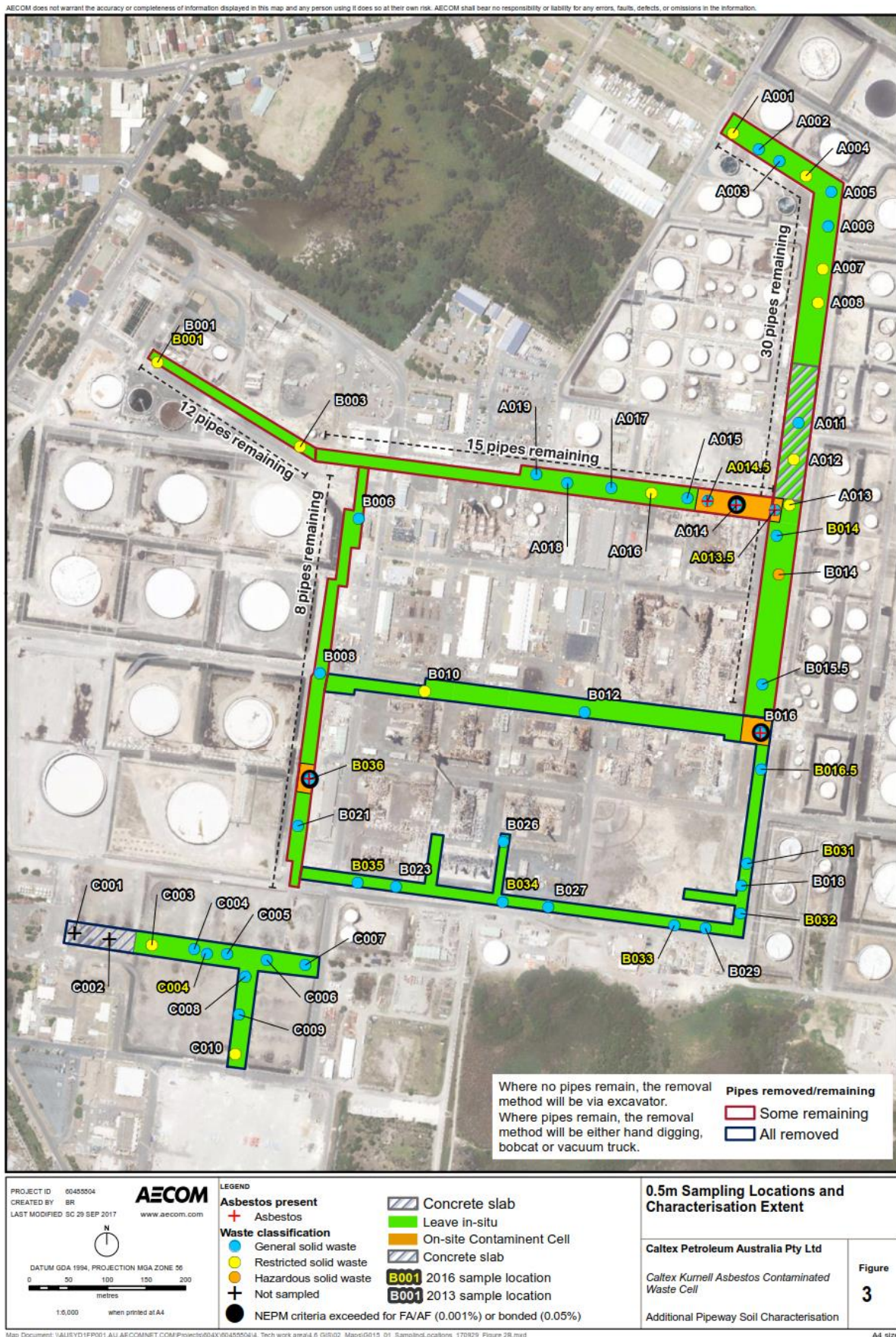


Figure 3 – ACS Management works – Pipeways Excavation to 0.5 m



4.2 Existing Oily Water Management

The Site has a separate Oily Water System to handle water that is or may be impacted by petroleum products, including a proportion of stormwater runoff collected from areas where there may be interaction with petroleum products such as tanks bunds and former refinery process areas.

Oily water is drained to the on-site WWTP where it is subjected to secondary treatment prior to being discharged to the submerged ocean outfall at Yena Gap (EPL Point 2).

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 WWTP.

Oily water is treated in the WWTP. The treatment process utilises physical, chemical and biological treatment. Treated effluent is discharged to the Tasman Sea via the Yena Gap outfall under conditions of the EPL. A schematic plan of the Kurnell Oily Water Sewer System is also provided in **Attachment C**.

4.3 Potential Surface Water Impacts

Demolition works

Potential impacts related to stormwater associated with the demolition works include those arising from demolition and ground disturbance works (i.e. impacts from stormwater runoff quality), as well as potential changes to the operation and functioning of the stormwater catchment in the short and longer term (i.e. catchment hydraulics).

During demolition works, stormwater quality impacts could arise from a range of factors, including:

- Erosion and entrainment of dust, soil and other material in stormwater from areas where ground disturbance works and excavation are required;
- Leaks from fuel and hydraulic fluid from various plant items required for the demolition works potentially impacting on stormwater quality;
- Leaks of residual matter from within redundant plant and equipment prior to removal, which could impact rainwater runoff quality; and
- Impact on stormwater quality arising from the interaction with contaminated soils potentially exposed by demolition and/or excavation works.

It should be noted that there is no potential for residual hydrocarbons from the Site being released into the cooling water outlet, as this pipeline as various sections of the pipeline have been removed. As discussed in **Section 2**, the management of the removal of sections of this pipeline was outlined in a staged Cooling Water Outlet Management Plan.

ACS Management works

During the ACS Management works, stormwater quality impacts could arise from:

- erosion and entrainment of dust, soil and other material in stormwater from areas where excavation or grading works are required;
- leaks of fuel and hydraulic fuel from various plant items required for the ACS Management works potentially impacting stormwater quality; and
- impact on stormwater quality arising from interaction with contaminated soils potentially exposed by the ACS Management works.

Catchments A and B both have controls in place that remove suspended solids from stormwater by sedimentation and remove oil by gravity separation. These would remain in place for the duration of the construction works (i.e. the works to excavate the ACS soils and to construct, fill and close the containment cell).

The containment cell works area is located within existing bunds (refer to **Attachment G**). Surface water from within this area would continue to be directed to the Site's oily water sewer system. Equally, surface water that interacts with the excavation of ACS from within the pipeways would also be captured by the skimmer and syphon system and be directed to the oily water sewer system.

4.4 Surface Water Management

In order to prevent contamination of stormwater during the demolition works and ACS Management works the following mitigation measures will be implemented:

1. Where practicable, stormwater or groundwater ponded in excavations will be sent to the WWTP, unless it is tested and is of suitable quality to be directed to stormwater, in accordance with EPL 837;
2. Impacted stormwater not able to be diverted to the oily water sewer system must be bunded and treated in-situ, passed through oil absorbent socks and sediment fences or treated by any other suitable means to a level suitable for discharge prior to discharge from the Site.
3. Where practicable, stormwater that is captured in the bunds around contaminated soil stockpiles will be collected and sent to the WWTP;
4. Regular inspections will be undertaken of soil stockpiles/excavation areas, including following rainfall events to ensure pooled stormwater does not overflow;
5. Regular inspection of the pipeways excavation areas and containment cell, including following rainfall events
6. Regular inspections will be undertaken of stormwater drains down hydraulic gradient of disturbed areas;
7. If stormwater quality is impacted during the demolition works and ACS Management works in areas that have been disturbed, water will be diverted to the oily water sewer system where practicable;

8. During the demolition works and ACS Management works, following notable but prolonged rainfall events (over three days) or following heavy rainfall events over a shorter timescale, water sampling will 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 will be either treated in situ or directed to the WWTP.
9. The containment cell area would remain bunded to prevent water flowing out of the respective areas except via the oily water sewer system and WWTP.
10. Stormwater within the containment cell works area will be directed to the oily water sewer system and treated at the WWTP.
11. All vehicle tyres would be cleaned before exiting the containment cell works area via a temporary truck wash system.

During the regular inspections of the surface water management system any issues identified with the control measures, such as silt fencing or ponding of water, corrective actions will be implemented in accordance with this Plan.

A number of additional controls would be implemented for the ACS Management works including installation of a leachate collection tank and design specifications of the containment cell. These have been included in the Containment Cell Management Plan.

4.5 Storage of Hazardous Liquid

To manage the storage of demolition specific liquids at the Site the following measures will be put in place:

1. All hazardous chemicals will be accompanied by the relevant Material Safety Data Sheets (MSDS) required by work health and safety regulations.
2. Fuels and chemicals will be stored in self-containing bunding.
3. Spill kits will be located next to fuel and chemical storage areas.
4. Where possible, a minimum volume of each chemical will be kept on Site.
5. All Caltex staff and contractors will be inducted to Site including training on storage of liquids and response to spills (in accordance with the Site's Pollution Incident Response Management Plan (PIRMP)).

4.6 Stormwater Management Plan

In addition to the measures to address potential impacts from the demolition works, to fulfil the EPA requirement for additional stormwater improvement investigations within *PRP U24.1: Stormwater Catchment and Management Plan*, Caltex has prepared a Stormwater Management Plan (SMP) to prevent the discharge of contaminated waters from the Site. This plan includes implementing a stormwater management strategy and completing a number of stormwater management measures in a staged manner.

In summary, the strategy and related actions nominated in the plan are as follows:

1. Maintenance of the existing stormwater system (ongoing).
2. Implementing a number of projects to improve the infrastructure, reduce the potential for the Site to flood, and prevent contaminated stormwater leaving the Site (commenced in 2012 and completed in 2014).
3. Work 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 (commenced in 2012 and completed in 2014).
4. Stormwater flow monitoring from 2013 and ongoing.
5. 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 (will commence once Strategy Item 2 has been finished).
6. Carry out further stormwater system hydraulic performance monitoring and review the model, as necessary, following the implementation of the proposed projects to reassess the adequacy of the stormwater system for meeting the objective to "prevent the discharge of contaminated waters from the premises at all times". Depending on the outcome of the review, further projects may be developed to improve the stormwater system.

There will be a significant reduction in the volume and contaminant load in the oily water sewer system from the shutdown of the refinery. The significant reduction of wastewater volume and contaminant load will result in the existing WWTP being reassessed to determine the potential for related changes in efficiency and performance.

Caltex has proposed the following measures to manage changes to the oily water sewer:

- The existing WWTP will be retained for treatment of oily water for the demolition works and the beginning of the operation of the Project. It would be operated under the EPL conditions;
- In consultation with the EPA, a PRP condition, will be developed and included in the Terminal EPL, and it will:
 - apply when the Terminal is operational;
 - characterise the Terminal wastewater streams;
 - identify and assess Terminal wastewater management options;
 - recommend preferred options; and
 - confirm applicable EPL conditions, including those related to discharge points, quality and monitoring; and
 - continue consultation with the EPA.

The treated wastewater effluent will continue to discharge to Yena Gap in accordance with the current EPL conditions.

5 GROUNDWATER & SOIL MANAGEMENT

Ground disturbing activities are predicted to occur during the following works:

- Refinery process units removal
- Tank demolition
- Underground pipeline removal;
- Infrastructure, services and building demolition
- Excavation of asbestos contaminated soils (ASC) from the pipeways
- Construction of the containment cell.

An estimated 150,000 tonnes of soil is likely to be excavated during the demolition works. An estimated 14,000 m³ of ACS is expected to be excavated from the pipeways.

Ground disturbance associated with the removal of different infrastructure will be to a maximum depth of 2 metres below ground level (mbgl). The ground disturbing works will be staged with the aim of minimising the area of ground disturbed at any one time.

The primary Contaminants of Potential Concern (COPC) at the Site are:

- Total petroleum hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene and xylene (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- Phenols;
- Lead (Pb); and
- Asbestos.

Permits are required to work in areas where potential soil and groundwater contamination exists. The work permit includes requirements such as monitoring and PPE. No authorised entry into these areas is permitted without a permit.

5.1 Potential Impacts to Soil and Groundwater

Demolition works

Potential soil and groundwater impacts from the demolition works include:

- Demolition workers encountering contaminated soil, asbestos and potential acid sulfate soils (ASS) during excavation activities;
- Excavation works and stockpiling of soils generating dust and/or odours that affect on-site and off-site receptors (discussed in the Air Quality Management Plan);

- Stockpiles, excavated areas and newly disturbed areas subject to erosion and sediment control issues;
- Increased infiltration locally affecting groundwater flows as areas that were previously covered by concrete such as the refinery process areas become permeable;
- Disturbance of soils through excavation and backfilling increasing contaminant migration to underlying groundwater;
- Contaminants from stockpiles generated during intrusive works potentially contaminating to cause ground and surface water contamination;
- Spills and leaks from demolition equipment potentially contaminating soil and groundwater; and
- Vehicles wheels tracking and dispersing contaminated materials around the Site.

ACS Management works

Potential soil and groundwater impacts from the ACS Management works include:

- Excavation works within the pipeways generating dust and liberating contamination that could spread across the Site and offsite;
- Disturbance of soils through during the ACS Management works potentially mobilising contaminants and resulting in contaminant migration to underlying soils and groundwater;
- Spills and leaks from construction equipment potentially contaminating soil and groundwater; and
- Vehicles dispersing contaminated materials across the Site and off-site.

5.2 Stockpile Management

5.2.1 Excavation

Excavated material from demolition excavation works will be staggered in accordance with the Project Schedule identified in **Table 2**. Excavations will be staggered so that the length of time that excavations are left open and temporary stockpiles required are minimised.

During excavation visual and olfactory indicators of impact will 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 will be inspected for hydrocarbon impacts using a PID and/or testing.

Excavated soils will be stockpiled in two areas:

1. Next to the excavation, when required for backfilling. If the stockpiles show visual or olfactory signs of hydrocarbon contamination they must not be stored next to the excavation. Stockpiles may only be kept next to an excavation in the ROW for up to two weeks. Stockpiles may only be kept next to an excavation in all other areas of the demolition works area for up to six weeks.

2. At dedicated areas on the former CLOR site (indicative location provided in **Attachment F**) or other dedicated areas for subsequent re-use, recycling, waste classification and disposal (disposal requirements are discussed in the Demolition Waste and Recovery Management Plan).

Excavated material will be classified in accordance with EPL condition O5.1. If excavated material cannot be re-used or managed on-site then it will be removed off-site as waste to an appropriately licensed facility, as discussed in the Demolition Waste and Resource Management Plan.

5.2.2 Stockpiling

Silt fencing and/or alternate sediment control measures will be installed around soil stockpiles, across stormwater drains in proximity to excavation areas, and other disturbed areas or areas where dust suppression is being undertaken to reduce suspended solids in stormwater runoff.

Vehicles which travel on unsealed surfaces will be, if required, washed down at the truck wash pad, which is bunded and directed to the WWTP, to minimise the spread of contaminated soils off-site. Materials which are tracked onto sealed surfaces or offsite by vehicles will be cleaned up to prevent pollution of waters.

Stockpiles will be managed in accordance with the Blue Book (Landcom, 2004), in addition to the following Site controls:

1. Excavated soils will be separated into stockpiles according to odours, staining and other environmental indicators.
2. Stockpiles will be restricted to cleared areas and not impact any vegetation (refer to the Biodiversity and Weed Management Plan for exclusion areas);
3. Stockpiles will be placed on impermeable sheeting/surfaces and/or in bunded areas if they are considered likely to be contaminated. The bunds will be impermeable and of sufficient capacity to ensure that runoff from these stockpiles is contained prior to being sent to the WWTP;
4. Stockpiles will be covered and wetted down in order to reduce dust creation;
5. Stockpiles must be stored at least 2 m from potential areas of impact, including waterways, roads, steep slopes, or any stormwater drainage systems;
6. Stockpiles will not exceed 3 m in height;
7. Caltex will not stockpile in areas that are prone to flooding (north west of the Site, as identified in Figure 4-10 of Appendix D of the MOD1 SEE);
8. Stockpiles are stabilised or covered if they are to be in place for more than 20 days (The Blue Book, 2004);
9. Construct earth banks on the upslope to divert water around stockpiles, and place sediment fences 1 to 2 meters downslope;
10. Stockpile locations and erosion and sediment control requirements associated with the demolition works will be reviewed by a suitably qualified person to ensure that the recommended measures achieve the environmental outcomes for the Site.

5.2.3 Backfilling and Rehabilitation

Following testing of excavated soils, where soils are considered suitable for re-use on-site, excavated material will be used as backfill to bring the excavated area back to grade as soon as practicable, in accordance with the Demolition and Waste Resource Management Plan. If backfilling is required using soil from off-site the following criteria for selection of material will apply on Site:

- **Western Right of Way (ROW) and Eastern ROW** - only VENM, or a material approved in writing by the EPA.
- **Caltex Terminal** – 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. Also ensure that any VENM or other materials used are fit for purpose and are only used as specified by the relevant Resource Recovery Exemption issued by the EPA.

Records of the volume and type of fill used will be kept on Site (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, and made available to the Department of Planning and Environment (DPE) on request.

Following backfilling, to minimise dust emissions and potential for sediment runoff, consideration will be given to covering of the bare soil in these areas, including measures such as watering in dry and windy conditions or sowing a grass cover.

Following the completion of demolition works and removal of redundant infrastructure, the former refinery process area will be regraded. The regrading shall ensure that water does not pool in this area. The surface material in this area will meet the commercial and industrial criteria as defined by Schedule B1 Guidelines, Investigation Levels for Soil and Groundwater, National Environmental Protection Measure ((Assessment of Site Contamination) Amendment Measure 2013). A crushed aggregate made from clean concrete and asphalt from the demolition works will also be spread across the surface to help reduce soil erosion. Stormwater runoff from this area will be collected in the stormwater system and would be subject to the existing stormwater controls within this system (such as the oily water separators) prior to being discharged. Further details of the management and treatment of the crushed concrete is discussed in the DWRMP.

Mitigation of dust impacts during demolition, excavation and backfilling are discussed in the Air Quality Management Plan.

5.3 Groundwater

In the event that groundwater is intersected during demolition works, and the groundwater requires extraction/disposal, the following procedure will be followed:

1. Testing for contamination in accordance with B1 Guidelines, Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.

2. If the tested groundwater is found to be of a suitable quality it will be discharged to stormwater, in accordance with EPL 837. If it is not suitable for discharge to stormwater it will be treated at the WWTP.
3. If the volume of groundwater extracted during excavations exceeds 3 ML/year, Caltex will consult with the NSW Office of Water (NOW) to obtain necessary licences or approvals.
4. Ensure the extraction of groundwater does not cause a draw down effect that would impact on acid sulfate soils in acid sulfate soil areas.

Attachment E shows the location of groundwater monitoring wells and groundwater flow direction at the Terminal.

As detailed in the Containment Cell Management Plan the following additional controls will be implemented during the ASC Management works:

- Two groundwater monitoring bores will be installed at the north and west of the containment cell, as shown in the Containment Cell Management Plan. Quarterly monitoring for the two new monitoring wells in addition to the existing wells located to the south and east of the cell will be undertaken during construction, filling and closure of the cell covering a period of two years. Following this time, annual groundwater monitoring will be undertaken to provide ongoing demonstration that the containment cell liner is operating effectively. Monitoring of these bores will occur in accordance with the existing groundwater monitoring program for the Site.
- Leachate from the closed containment cell will be treated at the Site's WWTP in accordance with EPL 837.
- The liner system will be in place to protect the groundwater from residual hydrocarbons that may be present within the ACSs.
- All vehicle tyres will be cleaned before exiting the containment cell works area via a temporary truck wash system.

5.4 Asbestos in the Soil

Demolition works

Residual asbestos contamination is of relevance to areas of historical spoil stockpiling and for the pipeway easements.

The Site manages asbestos in accordance with the '*Management of Asbestos, Asbestos Containing Materials and Synthetic Mineral Fibres*' (April 2015). This plan identifies the steps which will be undertaken in the event that asbestos is identified in structures or equipment during the demolition works.

Prior to demolition works taking place the Caltex person commissioning the work shall ensure that the workplace **Asbestos Register** is reviewed, and if the register is inadequate having regard to the proposed demolition an invasive asbestos and ACM survey must be conducted by a competent person to determine if any asbestos or ACM is fixed or installed (assuming presence) to those areas that are likely to be accessible during demolition.

In the event that asbestos is discovered in soil the following steps will be taken:

- The Caltex responsible person shall ensure that the Caltex Hazmat Administrator is supplied with the following information:
 - Specific Caltex location ID;
 - Specific locations and any details relating to the asbestos or ACM present in the soil;
 - A copy of all confirmatory laboratory reports.
- The soil will be managed as asbestos or ACM contaminated soil.

Asbestos impacted soil will be managed on-site or where this is not possible, will be removed from the Site as soon as practicable. If these soils need to be temporarily stockpiled they will be stored at a defined location at the former CLOR site (or other designated area), covered and labelled as asbestos waste (refer to **Attachment F** for an indicative location in the CLOR). Asbestos impacted soil being removed from the Site, will be classified in accordance with NSW EPA guidelines for transport and disposal at a licensed landfill (and in accordance with the Site waste management system and the Demolition Waste and Resource Management Plan. The excavation, transport and disposal of asbestos impacted soil will be undertaken by a licenced contractor and comply with NSW SafeWork requirements.

ACS Management works

The ACS management works propose to remove the ACSs from the pipeways and place them in a containment cell, in order to remove the hygiene risk and the WHS Regulation Exemption. Refer to the Remedial Action Plan and Containment Cell Management Plan for further information.

5.5 Excavation Works - Contaminants of Potential Concern

The SEE divided the Site into 22 separate Contamination Management Zones (CMZ) to assist with classifying and managing the types of contaminants that may be found within different areas (refer to **Attachment D**). **Table 4** presents a summary of the COPC within the CMA that have a potential to be affected by the demolition works. In addition **Table 4** specifies the maximum depth of excavation in each area and the groundwater monitoring that will be undertaken (as per the existing monitoring plan) in each of the CMZs to assess potential impacts of demolition works.

5.5.1 Elevated COPC – Response Measures

Impacts on the COPC are considered unlikely, as identified in the MOD 1 SEE (URS 2015), however in the event that groundwater monitoring identifies unexpected increase in a COPC Caltex will prepare and implement a corrective action plan. The measures to respond to a COPC will depend on which COPC are observed and the concentrations detected. The initial response to an increased level of COPC will include the investigation of the source, pathway and receptor relationship, i.e. for the contaminant in question, what is it, where is the source, what concentration is involved, how is it moving, what direction is it moving, where is the nearest sensitive receptor and would the receptor be affected given the contaminant concentrations.

To understand this relationship it is possible that additional groundwater investigations would be required. Once this relationship is understood, a plan of action can be developed if required. This plan may involve additional monitoring or may require treating the contamination in situ, removing it, containing it or a combination of these measures. Depending on the location of the contaminant, increased monitoring of the groundwater from the source to the Site boundary may also be required. These plans or measures would be discussed and agreed with the EPA and potentially a consent authority depending on the measures. Again depending on the contaminant specific actions required, other stakeholders or the community may also be consulted.

If a corrective action plan was required, it would form part of the DEMP, but would be its own sub-plan and would not form part of the SWMP. This is because in the unlikely event that an issue was identified, this sub-plan may need to be transferred over to the Operational Environmental Management Plan once the demolition works are complete if works are still being undertaken.

Table 4 – Contamination Zones – Excavation and Groundwater Monitoring Requirements

CMZ*	Zone	Excavation May Occur to:	Monitoring	Contaminants of Potential Concern ^{Note 1}
Western Tank Area	Zone B	1 m	Quarterly groundwater monitoring at PMW14, PMW07, PMW09 and PMW12.	Total Petroleum Hydrocarbons (TPH); benzene, toluene, ethylbenzene and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs).
	Zone C		Quarterly groundwater monitoring is conducted at PMW03, PMW11, PMW05, PMW06 and PMW17.	TPH, BTEX, PAHs.
Eastern Tank Area	Zone D	1 m	Quarterly groundwater monitoring of monitoring wells hydraulically down gradient from Zone D (PMW08, PMW31, PMW32 and PMW33).	TPH, BTEX, PAHs. Potentially mercaptans and Pb. LNAPL was identified in the western portion of Zone D in the early 1990s. Although the LNAPL were recovered in 1994, it is possible that affected groundwater may be present.
	Zone E		Quarterly groundwater monitoring at PMW37 and PMW16.	TPH, BTEX, PAHs, lead (inorganic) and Tetraethyllead (TEL)). Potentially contaminants from off-site transported by the stormwater network.
	Zone F		Quarterly groundwater monitoring at PMW04, PMW27, PMW23, PMW26, PMW25, PMW36, PWW34.	TPH, PAHs, BTEX, Pb (inorganic and TEL).
	Zone I		Quarterly groundwater monitoring of PMW20.	TPH, PAHs, BTEX, metals and asbestos. LNAPL has been encountered at in-bound well PMW20, associated with a historic leak of jet fuel from a line leak in the Zone.
Refinery Process Units	Zone G	2 m	No regular groundwater monitoring has been undertaken in Zone G. Monitoring wells considered to be hydraulically down gradient from Zone G include wells present in Zones B, C, S and T.	TPH, PAHs, BTEX, Monoethanolamine (MEA) , Perchloroethylene (PCE), Dimethyl disulfide (DMS), Phenol, Ammonia and Metals (Hg, Cr, Pb). Potential asbestos associated with the insulation of some pipes and equipment.
	Zone H		No environmental monitoring or soil and groundwater assessment is undertaken.	TPH, BTEX, PAHs. Aluminium (Al), fluoride and asbestos from the FCCU. Potentially MEA from leaks and spills.
	Zone J		No environmental monitoring or soil and groundwater assessment is undertaken	TPH, BTEX, PAHs. Polychlorinated biphenyls (PCBs) associated with transformer oil, are considered a potential contaminant of concern in Zone J. Potentially metals (e.g. Cr) associated with cooling water, PCBs associated with transformer oil and chlorinated compounds.
	Zone L		No groundwater monitoring is not currently conducted.	TPH, BTEX, PAHs, Phenols, Metals (Pb and Cr) and asbestos. Potentially contaminants from off-site transported by the oily water sewer system (OWSS) and stormwater network.

CMZ*	Zone	Excavation May Occur to:	Monitoring	Contaminants of Potential Concern ^{Note 1}
	Zone S		Quarterly groundwater monitoring includes one in-bound monitoring well (PMW13) within Zone S.	TPH, BTEX, PAHs, Potentially Ammonia Phosphate Tetrachloroethylene Pesticides associated with chemical storage. Possibly contaminants from products derived from other zones connected via the OWSS and stormwater network.
Continental Carbon Pipeline	Zone K	2 m	No regular environmental monitoring is conducted.	TPH, BTEX, PAHs, Phenols, lead and asbestos.
Fuel Pipelines and Cooling Waste Intake – Eastern ROW	Zone M	2 m	Quarterly groundwater monitoring includes five monitoring wells within Zone M (PMW18, PMW19, PMW02, PMW24, PMW01).	TPH, BTEX, PAHs, and Lead Potentially contaminants from products in other Zones connected via the stormwater network.
Cooling Water Outlet Right of Way – Western ROW	Zone V	2 m	-	Salinity
Buildings	Zone A	1 m	Quarterly groundwater monitoring is conducted from three boundary and one in-bound monitoring well in Zone A (PMW30, PMW38, PMW10 and PMW09).	TPH, toluene, PAHs, Butanone or methyl ethyl ketone (MEK) and Furfural. Potential asbestos associated with the insulation of some pipes.
	Zone P		No environmental monitoring or soil and groundwater assessment is undertaken.	TPH, BTEX, PAHs and Asbestos.
	Zone T		No environmental monitoring or soil and groundwater assessment is undertaken.	TPH, BTEX, PAHs

Note 1 Not all of the contaminants listed in Table 4 are tested in the groundwater monitoring program

**Only CMZs that are in the area affected by the demolition works have been summarised in this table.*

Elevated concentrations of ammonia, phosphorus, aluminium, iron and zinc in groundwater have been detected across the majority of zones, with isolated exceedances of arsenic, cadmium, copper, iron and zinc. These exceedance levels of ammonia, phosphorus, aluminium, arsenic, cadmium, copper, iron and zinc are considered representative of wide-spread groundwater quality in Kurnell, rather than being indicative of contamination sourced from any particular CMZ

Quarterly groundwater monitoring will be undertaken in accordance with the existing groundwater monitoring plan for the site. This includes quarterly monitoring of groundwater wells and testing for pH, conductivity, temperature, dissolved oxygen, TPH and BTEX. Where excavation works identify impacts, or significant changes in groundwater conditions occur as a result of excavation works, then additional testing for Contaminants Of Potential Concern listed in Table 4 may be considered.

6 ACID SULFATE SOILS

A review of the NSW Acid Sulfate Soil Map (Department of Infrastructure, Planning and Natural Resources (DIPNR)) and previous reports, indicate that the proposed works are on ground classified as 'Low Probability' of containing Potential Acid Sulfate Soils (PASS) (URS, 2011). Environmental problems associated with PASS occur as a result of development works which expose soil with the potential to undergo oxidation reactions on contact with oxygen and water. The result of the oxidation reactions typically produces low pH runoff which in turn acidifies soil, groundwater and surface waters.

Acid sulfate soils have also been recorded and classified by Sutherland Shire Council¹ across the demolition works area (refer to **Figure 2**). These maps show the demolition works area extends across land classified as Class 4 (the main Site) and Class 3 (Eastern and Western Right of Way (ROWs)) with respect to PASS. Works to the north of the Western ROW and the Eastern ROW will extend into a Class 5 area. Sutherland Shire Council has provided the following definitions of Class 3, Class 4, and Class 5 areas:

- *In a Class 3 area, acid sulfate soils are likely to be found beyond 1 metre below the natural ground surface. Any works that extend beyond 1 metre below the natural ground surface, or works which are likely to lower the water table beyond 1 metre below the natural ground surface, will trigger the requirement for assessment and may require management (Sutherland Shire Council, 2010).*
- *In a Class 4 area, acid sulfate soils area are likely to be found beyond 2 metres below the natural ground surface. Any works that extend beyond 2 metres below the natural ground surface, or works which are likely to lower the water table beyond 2 metres below the natural ground surface, will trigger the requirement for assessment and may require management (Sutherland Shire Council, 2010).*
- *In a Class 5 area, acid sulfate soils are not typically found. Areas classified as Class 5 are located within 500 metres of adjacent Class 1, 2, 3 or 4 land. Works in a Class 5 area that are likely to lower the water table below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land will trigger the requirement for assessment and may require management.*

The demolition works will be staged so that the area disturbed at any one time is restricted, so that any potential impact can be limited and easily managed.

The probability of encountering acid sulfate soils in the ACS Management works area is considered very low as excavations would only be to about 0.5 mgbf.

¹ http://www.sutherlandshire.nsw.gov.au/General/Shire_maps

6.1 Monitoring

For soils excavated from below 1 m in Class 3 areas and below 2 m in Class 4 areas, the following testing will be undertaken to assess for the potential presence of acid sulfate soils.

1. For stockpiled soils, any collected water within the bunded areas will be field tested for pH. Treatment will be required if less than pH 6.5.
2. Field screening of either in-situ soils or stockpiles as soon as practicable following excavation will be undertaken. The field screening procedure will be undertaken in general accordance with ASSMAC (1998) guidance. Where field screening identifies potential presence of PASS or actual ASS, this soil will be managed as ASS and laboratory testing will be undertaken to provide treatment requirements. Treatment of the soil with lime will be undertaken at a rate based on the results of the laboratory testing.
3. Following treatment, verification testing will be undertaken in general accordance with ASSMAC (1998) to confirm a suitable amount of lime has been applied.

6.2 Reporting

The appointed ASS consultant supervising the treatment of the PASS will report to the Environment Representative on a weekly basis (or sooner if appropriate) on the performance of the ASS monitoring. These regular reports will detail the following:

- Performance of sediment retention features;
- Results of the treatment verification and site monitoring, and the associated success of the treatment methods proposed;
- The amount of PASS disposed offsite (if undertaken);
- Recommendations for corrective actions to improve the effectiveness and/or efficiencies for the treatment approaches; and
- The implementation and success of previously recommended corrective actions.

On completion of all works associated with the treatment and monitoring of PASS, a final report will be issued to the Environment Representative (ER) and the ASS consultant. This report will detail:

- The various approaches used to treat the excavated and in-situ PASS and any associated acid drainage;
- The results of the treatment verification and site monitoring;
- The final placement of the excavated treated PASS; and
- Back filling of the trenches where in-situ PASS was exposed.

6.3 Procedures

PASS which are excavated during demolition works will require treatment prior to beneficial reuse on Site. Treatment of the soils will need to be conducted in a dedicated area on the Site. The treatment area will be constructed to provide adequate protection of the surrounding area from potential acid discharge from the PASS prior to treatment.

The treatment area will be constructed in the following manner:

- The area will be flat and surrounded by earth bunds to prevent surface run off during rain periods or during drying process. The earth bunds will be constructed of soil mixed with lime;
- A small collection point will be constructed at the low point within the bunded treatment area to collect potential acid leachate and/or run off. Lime will be turned into the banks and base of the pond to mitigate downward migration of acid waters into the underlying water table. Any acid water (pH<6.5) collected will undergo treatment which will comprise the addition of a fine lime slurry to raise the pH levels to between 6.5 and 8.5 and remove (by precipitation) dissolved aluminium, iron, and manganese which may be present at elevated levels in solution. If it accumulates, the precipitate shall be removed from the pond for offsite disposal which will be conducted in accordance with the requirements of the environmental guidelines: assessment, classification and management of liquid and non-liquid wastes (DEC,1999); and
- Prior to placement of PASS for treatment, a layer of fine agricultural lime will be placed across the base of the treatment area (at a rate yet to be determined) to buffer downward percolating acid waters.

Depending on the volume of PASS excavated and the rate of the excavation works, stockpiling of PASS may be required prior to treatment being conducted. Dedicated areas for stockpiling will be constructed in a manner similar to that for the proposed treatment area.

The selected method of treatment for the excavated PASS will be in general accordance with ASSMAC, 1998.

The amount of lime required to adequately treat the sulfidic acidity will be determined by:

- The amount of PASS being treated;
- The inorganic sulphur content in the PASS (this will be determined by laboratory testing of soil samples); and
- The type of lime selected for treatment.

Guidance provided in Tables 6.1 (p.22) and 6.2 (p.23) of the "Management Section" of the *Acid Sulfate Soil Manual* (ASSMAC, 1998) will be followed to determine the amount of lime required to treat the PASS, in conjunction with the effective neutralising value of the selected lime. If the buffering capacity of the soil being treated is found to be acceptable this may be taken into account when determining the liming rates. An alternative to treatment of the PASS will be immediate disposal to a landfill licensed to receive untreated PASS. This normally requires the excavated material to be transported to the landfill within 24 hours of excavation.

Disposal of ASS off-site will be to a suitably licensed facility. Refer to the DWRMP for further details on disposal of ASS.

7 IMPLEMENTATION

7.1 Roles and Responsibilities

Overall responsibility for the implementation of this Management Plan rests with Caltex. All employees and the Contractor will meet the requirements of this Management Plan and associated procedures. Management actions set out in this Management Plan may be delegated in writing by Caltex to the specific Contractor.

Key works personnel including the Demolition Project Lead (and their delegates), Caltex ER, Contractor Project Manager and each Contractor's Environment / HSE Representative will ensure that all management actions are undertaken to a satisfactory standard and that all personnel are aware of their responsibilities with respect to environmental matters. There will be dedicated staff to manage environmental issues (or integrated HSE matters) during the implementation and operational phase of the works. A general outline of responsibilities in relation to environmental management is provided below:

Demolition Project Lead / Demolition Execution Superintendent / Demolition Support Services Superintendent

- Overall accountability for the environmental management of the demolition works and ACS Management works.
- Implementation of the Caltex Environmental Policy with respect to the demolition works and ACS Management works.
- Overall responsibility for development, implementation, maintenance and compliance with the SWMP.

Caltex Environmental Representative (ER)

- Accountable for environmental matters on the demolition works and ACS Management works.
- Provide support to Caltex personnel and the Contractor as required to ensure the SWMP is implemented and complied with.
- Review effectiveness and implementation of this Management Plan following a regulatory non-compliance or incident, or at a minimum of every 12 months during the demolition works.
- Monitor the implementation of all required environmental management actions and compliance with legislation.
- Undertake environmental auditing as required.
- Implement *Protection of the Environment Operations Act 1997* (POEO Act) notification requirements in the event of a pollution incident (these requirements can be delegated to appropriate personnel by the ER).

All Personnel (Caltex and the Contractor)

- Comply with the requirements of the SWMP.
- Report all environmental incidents as they occur.
- Attend environmental inductions or any other training as required.

7.2 Induction

Caltex has a Site induction program that all contractors and employees are required to complete prior to undertaking any work.

All Caltex employees and the Contractor are required to undertake the Caltex Project Induction before they can commence work on the demolition works.

7.3 Training

All personnel will have the experience and necessary training to carry out their required tasks, including in the use of equipment and the implementation of this Management Plan.

Caltex and the Contractor will each maintain a Training Register that records all environmental training completed by its personnel, including records of attendance at awareness training and toolbox talks, as well as competency assessments.

Staff involved in the demolition and excavation works will be trained in how to identify petroleum hydrocarbon products (including Light Non Aqueous Petroleum Liquid (LNAPL)).

7.4 Incident Management

Caltex will continue to implement its existing incident management procedures, including for response to, investigation and reporting of incidents.

A comprehensive Emergency Management System is currently implemented at the Kurnell Terminal, with associated response and safety equipment held on site. Key personnel are trained to support the implementation of the system. Regular training exercises are carried out by Caltex.

In the event of an incident causing environmental harm occurs as a result of demolition works, the Kurnell Pollution Incident Response Management Plan (PIRMP) will be implemented. The PIRMP is designed to manage environmental incidents which may occur on site.

7.5 Complaints Management

Caltex has a complaint management procedure for the investigation, response and reporting of complaints.

Caltex manages all community complaints in accordance with the requirements of EPL 837, including:

- Reporting complaints in the Annual Return for EPL 837
- Keeping a legible record of all complaints made to Caltex and its Contractors, including:
 - The date and time of the complaint
 - The method by which the complaint was made
 - Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
 - The nature of the complaint
 - The action taken by Caltex in relation to the complaint, including any follow-up contact with the complainant
 - If no action was taken by Caltex, the reasons why no action was taken

Caltex will continue to operate its 24-hour hotline number (1800 802 385 toll free) to receive feedback and complaints associated with the demolition works. Feedback and complaints will be relayed to the ER and relayed to the Demolition Project Lead (or their delegates), Terminal Manager and the Senior Environmental Specialist (Licensing), as relevant depending on their nature.

Feedback and complaint records will be logged in the Complaints Register, tracked and where relevant, responded to. Responses to complaints will be made, where reasonably possible, within 48 hours of receiving the complaint.

7.6 Performance Indicators

The following performance indicators will be implemented during the demolition works and ACS Management works:

- All stockpiles managed in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction Guideline.
- No silt runoff from stockpiles beyond the silt fencing.
- No significant increase in COPC levels in groundwater.
- No impacts to the environment from ASS or PASS.
- No environmental pollution incidents.

7.7 Monitoring

The key monitoring requirements during demolition works include:

- All excavated soil stockpiles will be sampled for asbestos. Asbestos assessment will 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. Where asbestos is identified as being present, the area will be managed in accordance with the site's 'Safe Work Standard for Asbestos Containing Materials Management Program' and 'Safe Work Procedure for Excavation Certificates'.
- During excavation visual and olfactory indicators of impact will 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 will be inspected for hydrocarbon impacts using a PID and/or testing.
- Quarterly groundwater monitoring.
- Inspection of all stockpiles for erosion.
- Inspection of stormwater drains down gradient of work areas if erosion of stockpiles is observed.
- Any collected water within the bunded areas will be field tested for pH (to monitor for ASS). Treatment will be required if less than pH 6.5.

Monitoring requirements specific to the ACS Management works are detailed in the Containment Cell Management Plan.

7.8 Reporting

The reporting requirements include:

- Notification to the Environmental Representative of any sediment erosion impacts observed.
- The notification to the Environmental Representative of all asbestos and hydrocarbon impacts encountered.

7.9 Corrective Action

Corrective actions will be implemented in the event that monitoring undertaken in accordance with this plan and summarised in **Section 7.7**, have identified that demolition works have potentially caused environmental impacts. Dependent on the cause of the impact (e.g. asbestos, heavy rainfall, insufficient sediment control measures) corrective actions will be implemented to mitigate and remove the impact. The corrective action for each type of environmental incident is detailed in **Section 4 Surface Water Management**, **Section 5 Groundwater and Soil Management**, and **Section 6 Acid Sulfate Soils**.

7.10 Works following Demolition Works

Caltex will undertake a flood study 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 will consult with Sutherland Shire Council throughout the flooding 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.



KEY

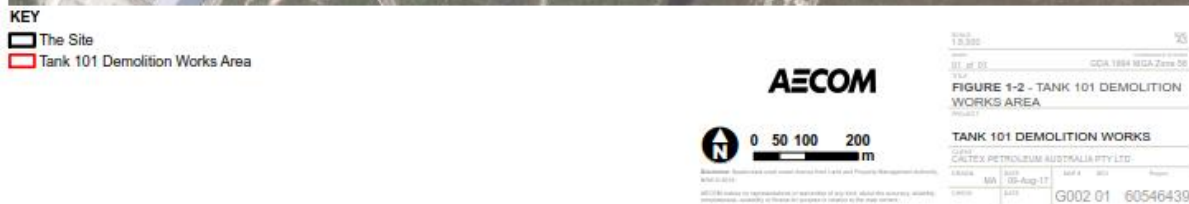
- The Site
- Caltex Land Ownership
- ACS Modification Works Area
- Pipeways to be excavated
- Special General & Special Restricted Soil in Pipeways
- Special Hazardous Soil in Pipeways
- Containment Cell Works Area

AECOM

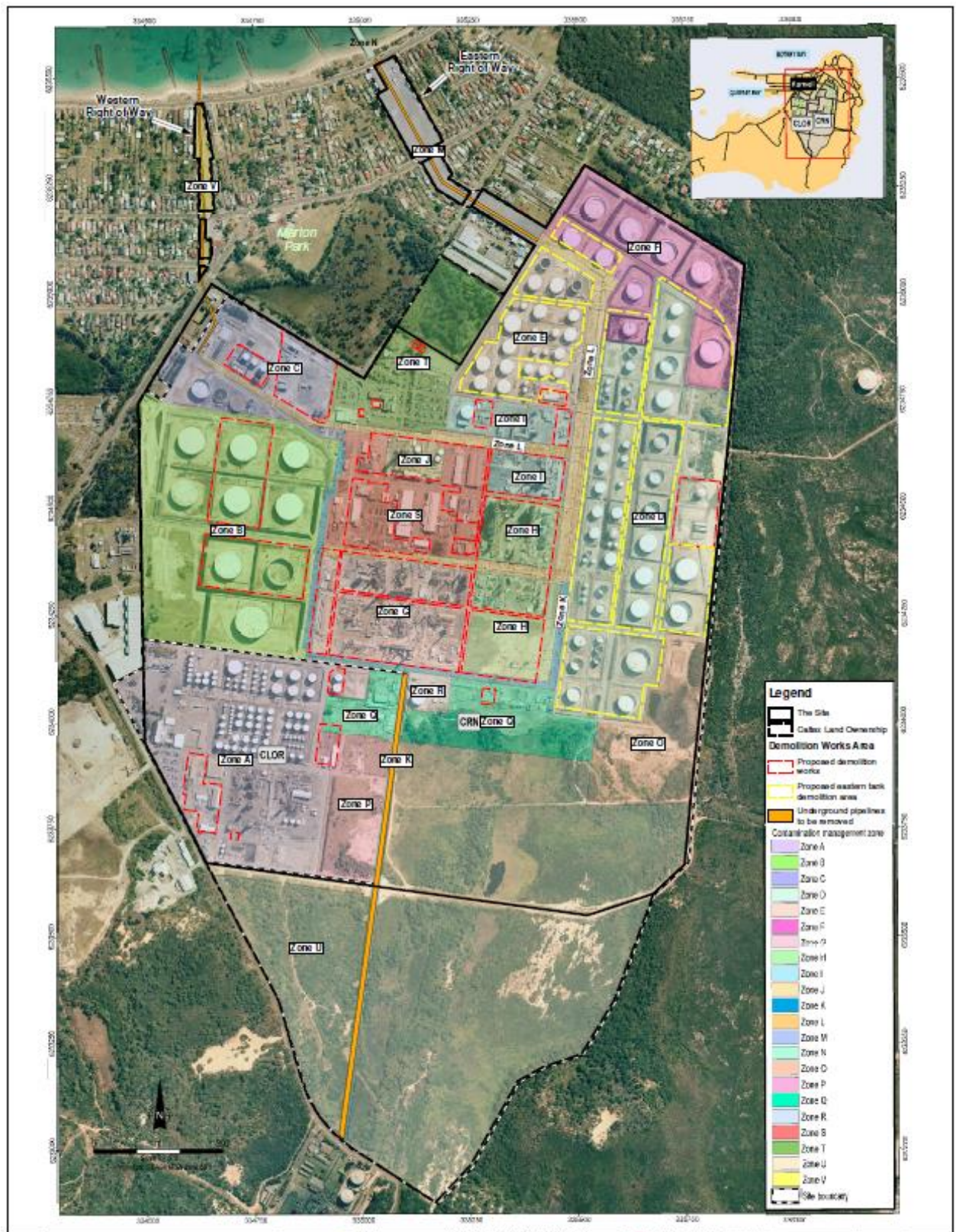


Disclaimer: Spatial data used under license from Land and Property Management Authority, 2019. AECOM makes no representations or warranties of any kind, about the accuracy, reliability, completeness, suitability or fitness for purposes of the map content.

SCALE	1:5,000	SHEET	A3
DATE	01 of 01	COORDINATE SYSTEM	GDA 1994 MGA Zone 55
FIGURE 1.2 - PROPOSED ACS MODIFICATION FINAL			
PROJECT			
KURNELL ACS MODIFICATION			
CLIENT			
CALTEX PETROLEUM AUSTRALIA PTY LTD			
DRAWN	DATE	MAP #	REV
MJB	24-May-17		
CHECK	DATE	G002 04	60488804
WM	30/09/2016		



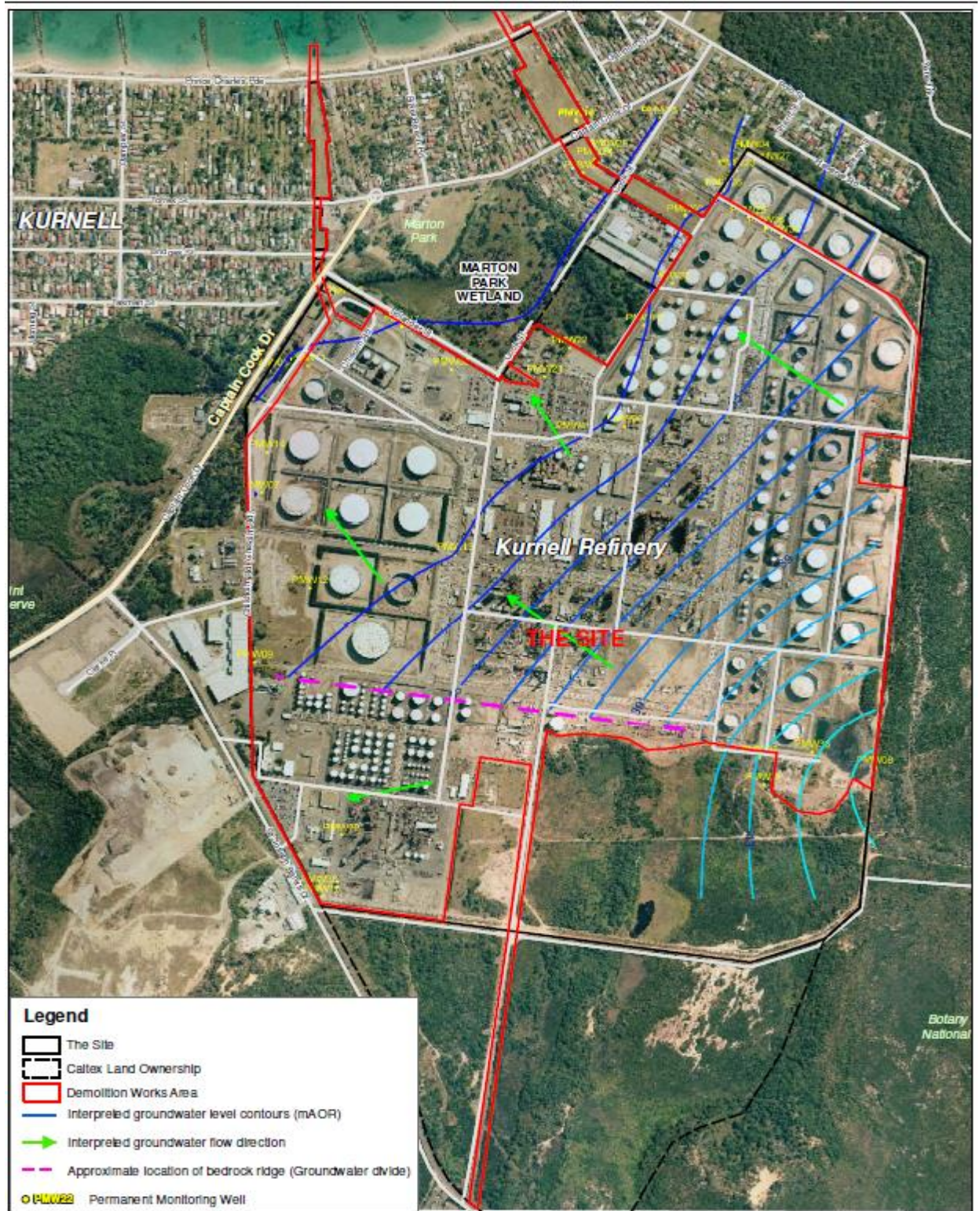
Attachment D - Coffey (2007) Contamination Management Zones



Source: Coffey Environment, Feb 2007 (Figure 7, project number ENVILCOV00290AQ)

Whilst every care is taken by URS to ensure the accuracy of the digital data, URS makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of URS.

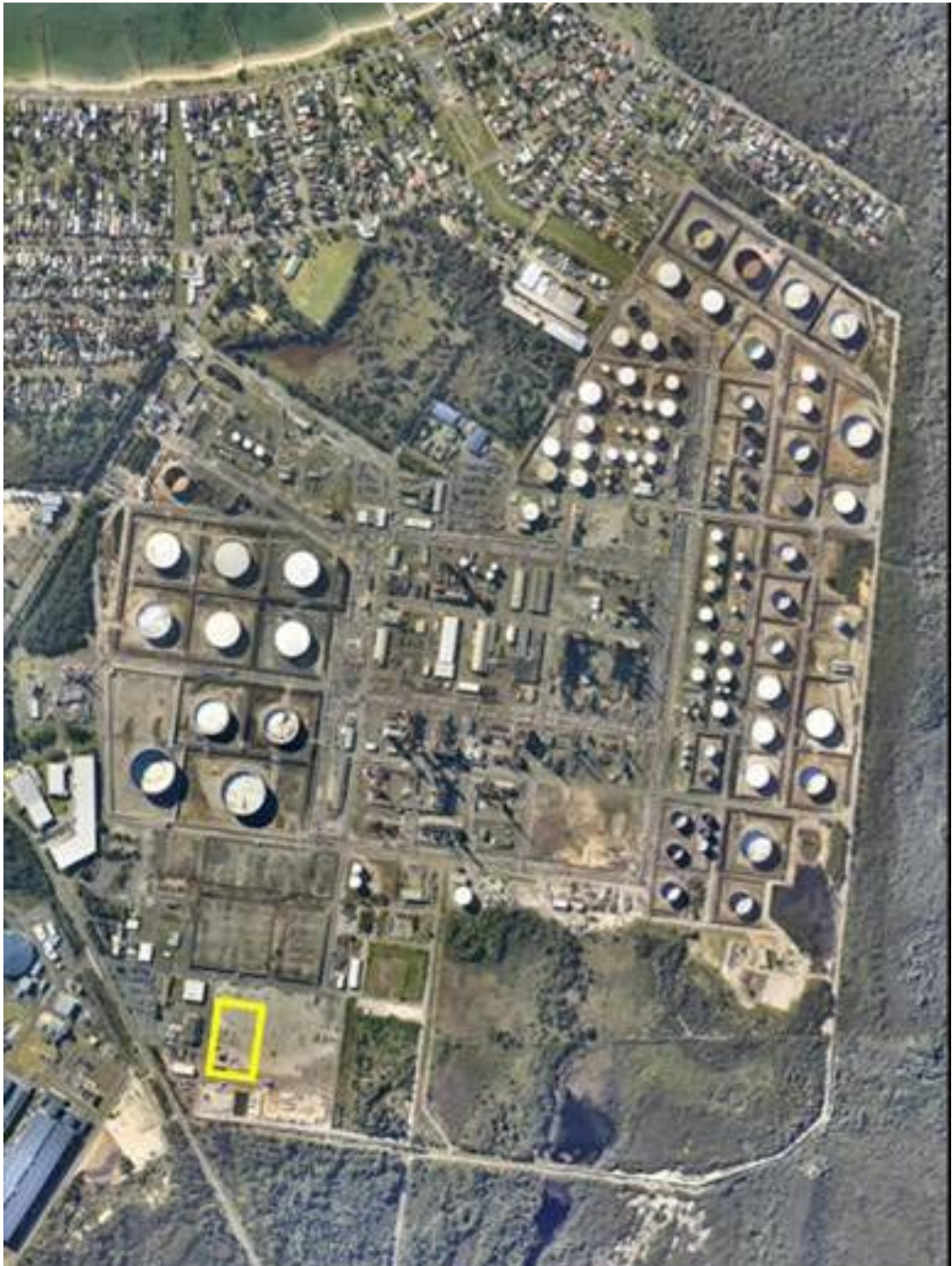
Attachment E - Coffey (2007) Groundwater Flow Direction and Groundwater Monitoring Wells



Source: Coffey Environments, Feb 2007 (Figure 3, project number: ENWILCON/00250AQ)

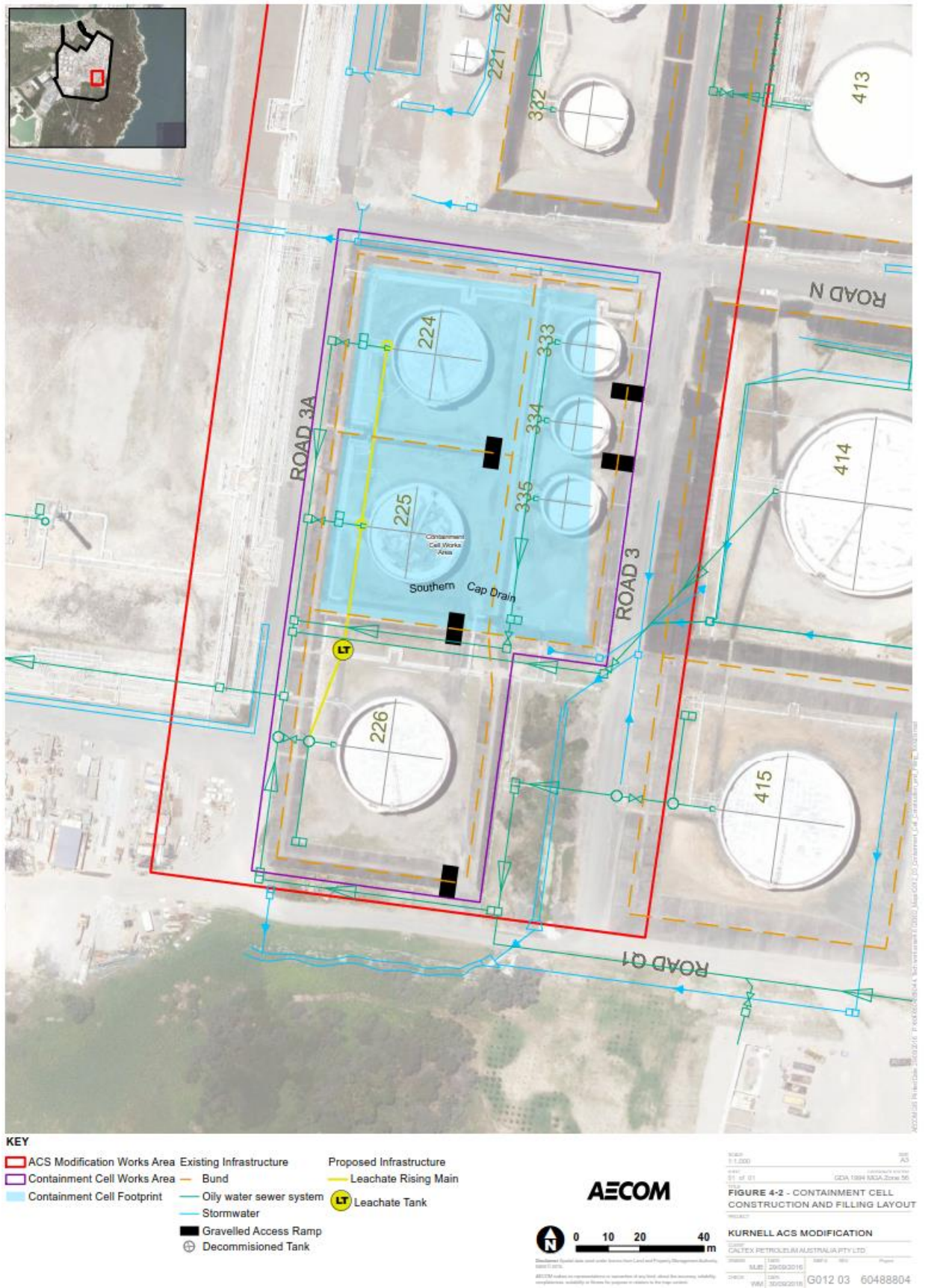
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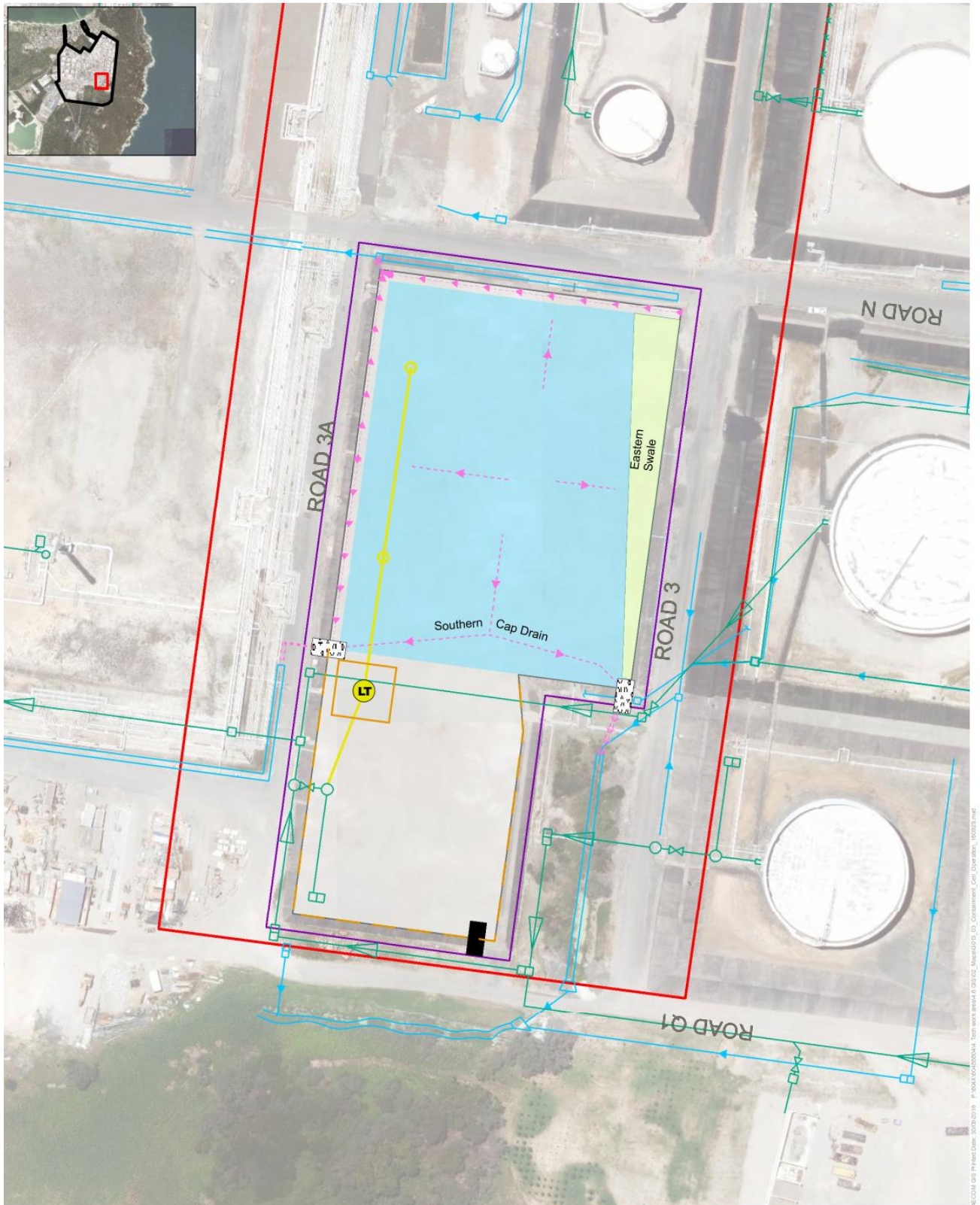
Attachment F – CLOR Stockpile Area – Location Map



Please note: the location of the stock-pile may change but that the same management measures will be employed to ensure appropriate management of any stockpiles.

Attachment G – Containment Cell Surface Water Controls

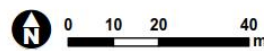




KEY

- | | | | | | |
|---|---|---|--|--|--|
| ACS Modification Works Area | Containment Cell Works Area | Containment Cell Footprint | Bund | Stormwater | Gravelled Access Ramp |
| — Leachate Rising Main | LT Leachate Tank | Bund | Graded Existing Bunded Area | — Stormwater Controls | |
| | | | | — Cap Drain | |
| | | | | --- Formed Channel | |
| | | | | --- Under Road Pipe | |
| | | | | — SW Drain | |
| | | | | --- Unformed Channel | |
| | | | | RA Rock Armour (Erosion Control) | |

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SCALE: 1:1,000
SHEET: 01 of 01
COORDINATE SYSTEM: GDA 1994 MGA Zone 56

FIGURE 4-6 - CONTAINMENT CELL OPERATIONAL LAYOUT

KURNELL ACS MODIFICATION

CLIENT: CALTEX PETROLEUM AUSTRALIA PTY LTD

PROJECT: G013 03 60488804

DATE: 30/09/2018