

# **Kurnell Refinery Conversion Project**

## **Water Management Plan**

CALTEX REFINERIES (NSW) PTY LTD

January 2014

## 1 INTRODUCTION

Caltex propose to convert the petroleum refinery in Kurnell (the 'Site') to a finished fuel terminal facility (the Project). The Project is being undertaken in accordance with Development Consent from the Department of Planning and Infrastructure (Application Number: SSD 5544).

This Water Management Plan (WMP) has been prepared in response to Development Consent condition C11 and C12 which states:

*C11 During the construction of the Development, the applicant shall implement suitable erosion and sediment control measures on site, in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction Guideline and the relevant Management and Mitigation measures contained within Appendix C of this consent.*

*C12 The Applicant shall prepare and implement a Water Management Plan for construction works and site operations to the satisfaction of the Director-General. The plan(s) must:*

- (a) be prepared in consultation with the EPA;*
- (b) be approved by the Director-General (refer to Conditions D1 and D2 for timing);*
- (c) In addition to the standard requirements for management plans (see Condition D3), this plan must include a Surface Water Management Plan, that:*
  - includes a description of the water management system on site, including the:*
    - stormwater system; and,*
    - oily water / wastewater system.*
  - includes plans for the above two components of the systems;*
  - demonstrates compliance with any requirements of the EPL and/or the EPA.*

### 1.1 Background

Kurnell Refinery is located on the Kurnell Peninsula within the Sutherland Shire Local Government Area (SS LGA), approximately 15 kilometres (km) south of Sydney's Central Business District (CBD). The refinery was commissioned in 1956 and is currently used to receive and store crude oil and some refined products as well as for refining crude oil into refined products. The crude oil is delivered to the refinery via ships that dock at Kurnell Wharf in Botany Bay. These materials are transferred via pipeline to storage tanks on the Site. The crude oil is then piped from the storage tanks to the crude distillation units for processing into fuels to supply the NSW and ACT markets. **Figure 1** shows the location of the Site.

The Project comprises:

- Continued use of parts of the Site in a manner similar to that currently in place for the storage and distribution of petroleum product;
- Cleaning and modification of some of the existing tanks on Site to store refined product (i.e. finished product tanks); and
- A range of ancillary works to improve efficiency and capability for use as a terminal.

It is expected that the proposed works would be carried out over a 54 month period.

The ultimate aim of the Project is to allow the Site to be utilised as a terminal where finished products can be received by ship, stored in tanks before leaving the Site by pipeline to the

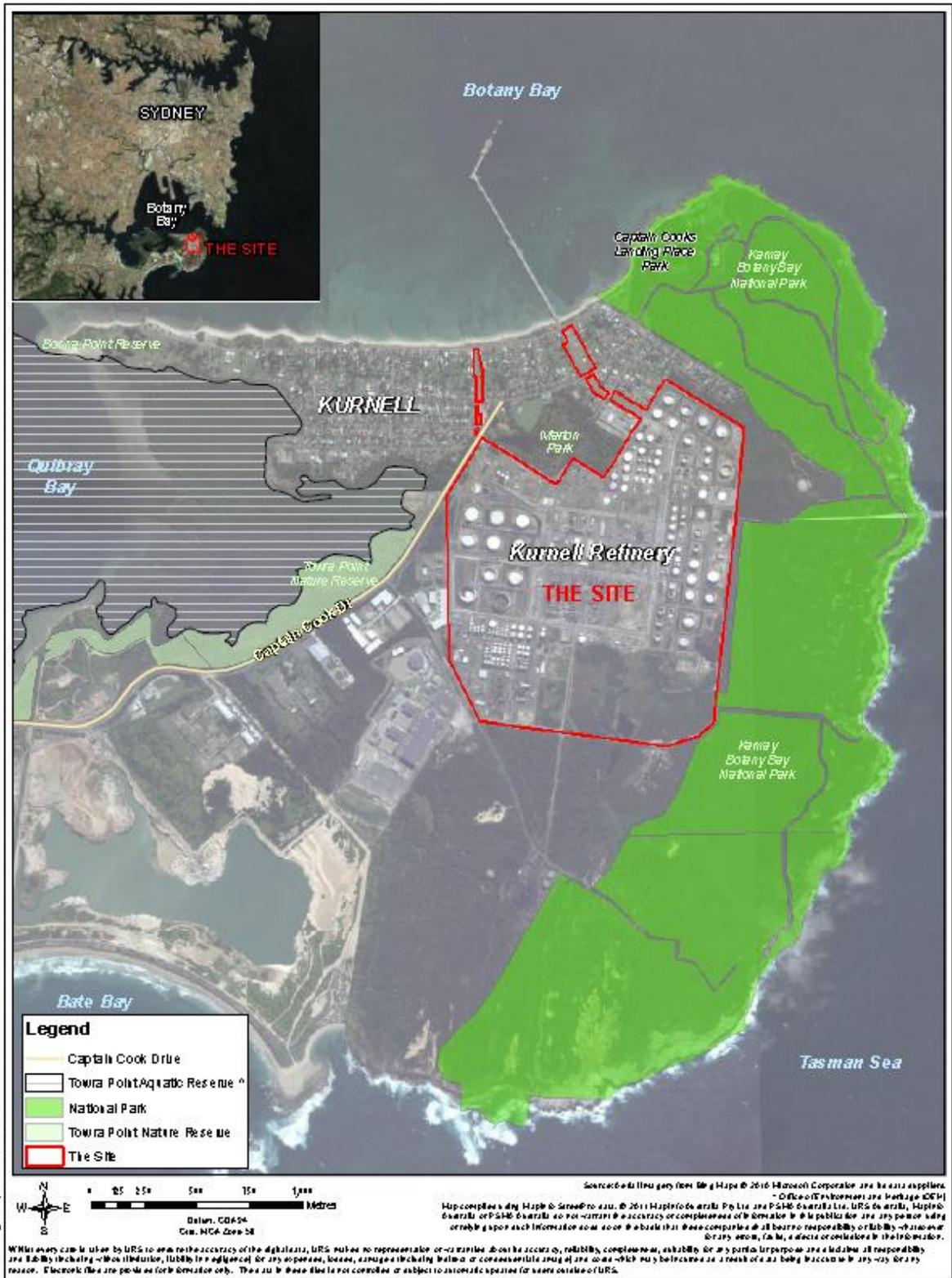


Figure 1: Site Location Caltex Kurnell Refinery.

Caltex Banksmeadow Terminal, Silverwater Terminal, Joint User Hydrant Installations (JUHI) facility at Sydney Airport, or to the Caltex Newcastle Terminal via the Newcastle Pipeline.

## **1.2 Environmental Protection License**

The refinery currently operates in accordance with an Environmental Protection License (EPL number: 837) issued by the NSW Environment Protection Authority. This EPL contains numerous operational conditions and Pollution Reduction Programs (PRPs) which include a requirement for a stormwater management plan. The EPL includes the following PRP with respect to stormwater management:

### **U10 PRP U24: Stormwater Catchment & Management Program**

#### **Objective**

*The objective of this program is to prevent the discharge of contaminated waters from the premises at all times.*

#### **U10.1 PRP U24.1: Stormwater Management Plan**

*The licensee must prepare and submit to the EPA a Stormwater Management Plan. The Plan must assess the adequacy of the existing stormwater and waste water collection systems to meet the above objective. The plan must also identify appropriate management strategies where necessary to:*

- 1. minimise flooding at the site by diverting clean stormwater generated off-site away from the premises;*
- 2. prevent contaminated waters collected within the premises from entering the clean water systems (for example, stormwater or cooling water systems); and*
- 3. segregate and reduce the inflow of clean stormwater collected within the premises from entering the Waste Water Treatment System.*

*The Plan must be developed by the licensee in consultation with the EPA and a suitably qualified consultant. The Plan must include a proposed timeframe for the implementation of the identified management strategies.*

*Note: In developing the Stormwater Management Plan for the site, the licensee should consult the previous study completed for the site in March 1992 titled: "Caltex Refining Company Pty Ltd – CRL/ALOR Stormwater Management Study – Draft Report" prepared by Gutteridge Haskins & Davey Pty Ltd.*

## **2 OBJECTIVES**

The objective of the Water Management Plan is to:

- Describe the water management system on the site including both; storm water and oily water systems;
- Present plans of the water management systems; and

- Demonstrate compliance with the Environmental Protection License for the Site.

### 3 PROJECT OVERVIEW

The work associated with the Project is consistent with routine maintenance and replacement of plant and equipment undertaken as part of normal refinery operations. The Project will install the following items of equipment at the Site:

- Eight transfer pumps;
- New product lines between the Oil Movement Centre (OMC) and the jet, diesel and gasoline finished product tanks;
- New slops line between the OMC and slops tanks;
- Pipe supports and associated civil works for the pipeline runs; and
- Associated valves and pipework on plot.

Table 1 provides a description of the various works proposed for the Project.

**Table 1 - Proposed Project Works**

<b>Discipline</b>	<b>Description</b>	<b>Plant Locator</b>
Mechanical	Installation of eight off transfer pumps.	Various Pump Plots around the Site
Piping	Fabrication and installation of process piping through the various pipeways between the OMC and the various finished product storage tanks.	Various Pipeways and Tank Bunds around the Site
Civil	Supply and installation of new equipment footings and concrete paved areas.	Various Tank Bunds and Pump Plots
Structural	Fabrication and installation of new concrete and structural steel pipe supports, new access platforms to product tanks and access stairs and jump-overs on plot.	Various Pipeways and Tank Bunds around the Site
Electrical	Installation of LV power cables, LV boards and termination at LV board and electrical equipment.	Various Pump Plots and Tank Bunds around the Site
Instrumentation	Installation of instrumentation, cable trays and associated cabling.	Various Pump Plots, Pipeways and Tank Bunds around the Site

The potential source of impact to water quality during the Project is limited to:

- Excavation and stockpiling of soil, including potentially contaminated soil, resulting in silt erosion due to stormwater runoff.

### 3.1 Project Program

The approximate Project program is shown in Table 2.

**Table 2 - Approximate Project program**

<b>Task</b>	<b>Date</b>
Detailed Engineering and Design Start	Mid 2012
Engineering and Design Completed	Q2 2013
Tank Conversions Start	Q3-Q4 2013
Installation of Piping, Pumps and Associated Infrastructure	Q3-Q4 2013
Construction on Piping Completed	Q2 2014
Kurnell Refinery Shutdown	Q3 – Q4 2014
Continued Tank Conversions	Q4 2014 – Q4 2016
Conversion to Terminal Completed	Q4 2016

#### 4 EXISTING STORMWATER MANAGEMENT

The Kurnell Caltex Refinery can be divided into seven different stormwater catchment areas as shown in **Figure 2** and listed on Table 1, 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 A.

**Table 1 - 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 National Park.

Stormwater generated on the Site is collected in the Site’s stormwater system, treated where necessary and discharged off-site to two receiving water bodies, 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 refinery 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.

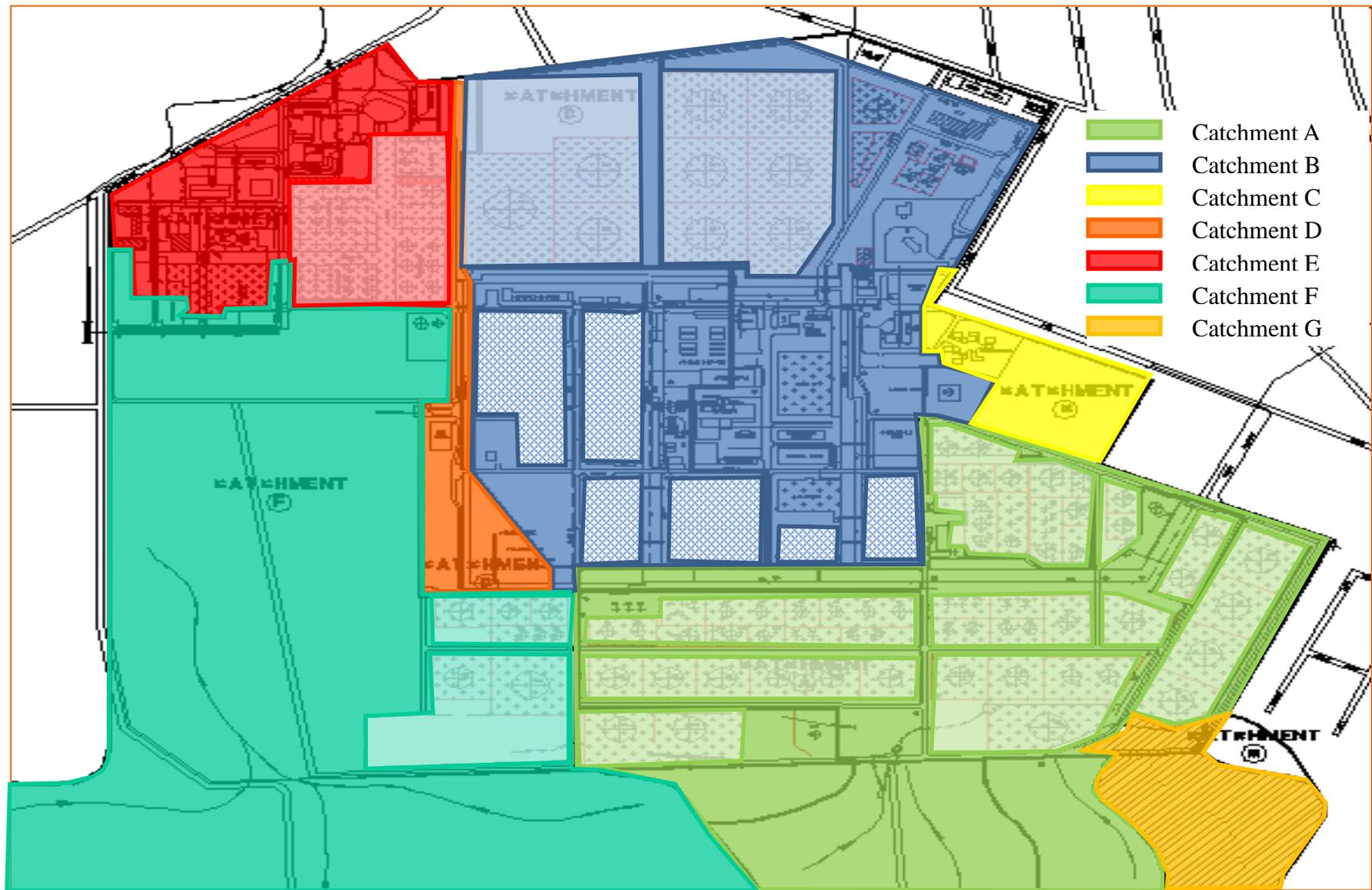


Figure 2 – Catchment Plan

## 5 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 refinery process areas.

Oily water is drained to the on-site Wastewater Treatment Plant where it is subjected to secondary treatment prior to being discharged to the submerged ocean outfall at Yena Gap (EPL Licence 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 wastewater treatment plant (WWTP).

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

## 6 EPL COMPLIANCE MANAGEMENT

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 which 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 were as follows:

1. Ongoing maintenance of the existing stormwater system (ongoing).
2. Implement 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).
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).
4. Carry out stormwater flow monitoring from 2013 through to 2014.
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).

Catchments A and B, the main Site catchments in which the review and improvement measures are focussed, are within the Project Area. The Project is not expected to have any impact to stormwater management or drainage at the site

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 would be retained for treatment of oily water for the construction of the Project and the beginning phases of the operation of the Project. It would be operated under the current EPL conditions;
- in consultation with the EPA, a PRP condition, would be developed and included in the terminal EPL, and it would:
  - 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.

## **7 IMPLEMENTATION**

### **7.1 Responsibilities**

Overall responsibility for the implementation of this Water 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 Project personnel including the Caltex Project Manager, Caltex EMR, 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 project. A general outline of responsibilities in relation to environmental management is provided below:

#### **Caltex Project Manager**

- Overall accountability for the environmental management of the Project.
- Implementation of the Caltex Environmental Policy with respect to the Project.

- Overall responsibility for development, implementation, maintenance and compliance with this Management Plan.

#### **Caltex Environmental Management Representative (EMR)**

- Accountable for environmental matters on the Project.
- Provide support to Caltex personnel and the Contractor as required to ensure this Management Plan is implemented and complied with.
- Review effectiveness and implementation of this Management Plan.
- 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 EMR).

#### **All Personnel (Caltex and the Contractor)**

- Comply with the requirements of this Management Plan.
- 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 Project.

### **7.3 Training**

All Project 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.

### **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 Refinery, 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

## **7.5 Compliance Management**

Caltex has a complaint management procedures 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 Project. All feedback and complaints will be relayed to the EMR and relayed to the Refinery Manager, Community Relations Manager and the Environmental Protection Superintendent, as relevant depending on their nature.

Any 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.

## **8 ENVIRONMENTAL PROCEDURES**

Specific control measures required to undertake the Project including the Performance Objectives, Management Actions, Performance Indicators, Monitoring, Reporting and Corrective Actions set out in the following sections.

Suitable equipment, facilities, training, work practices and other necessary precautions will be taken to minimise impacts to the environment and the risk of pollution.

All Caltex and Contractors personnel will implement reasonable and practicable measures to avoid or minimise impacts to the environment that may arise from the Project.

### **8.1 Management Actions**

The management actions include;

- Sampling of all excavations for asbestos and inspection for hydrocarbon impacts;

- Removal from site any soil impacted with asbestos. Asbestos impacted soil will be classified in accordance with NSW EPA guidelines for transport and disposal at a licensed landfill;
- Relocation of any soils visually impacted with hydrocarbons (but free from asbestos) to the landfarm within the Site;
- Stockpiling of soils free from asbestos or hydrocarbon impact and the installation of appropriate silt fencing where material is needed for backfilling. Stockpiling activities must be set back from site boundaries and stormwater drains (minimum setback being 10m);
- Silt fencing must be installed in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction Guideline;

## **8.2 Performance Indicators**

The following performance indicators will be implemented during the project:

- No asbestos or hydrocarbon impacted soils stockpiled on site;
- All stockpiles managed in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction Guideline; and
- No silt runoff from stockpiles beyond the silt fencing.

## **8.3 Monitoring**

The key monitoring requirements for this Project:

- Sampling of all excavations for asbestos and visual screening for hydrocarbons.
- Inspection of all stockpiles for erosion.
- Inspection of stormwater drains down gradient of work areas if erosion of stockpiles is observed.

## **8.4 Reporting**

The reporting requirements include:

- Notification of EMR of any sediment erosion observed
- The notification of the EMR of all asbestos and hydrocarbon impact encountered.

## **8.5 Corrective Action**

The corrective actions to be implemented during the Project include:

- Installation of additional silt control measures or the relocation of stockpiles.
- Clean-up of sediment beyond silt fencing.



