Report

Kurnell Refinery Conversion Environmental Scoping Assessment

14 AUGUST 2012

Prepared for

Caltex (Refineries) Pty Ltd

43177836

URS

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Abbreviations

Abbreviation	Description
AHIMS	Aboriginal Heritage Information Management System
AHD	Australian Height Datum
CLOR	Caltex Lubricating Oil Refinery
DGRs	Director-General's environmental assessment requirements
DIPNR	Department of Infrastructure, Planning and Natural Resources
DP&I	Department of Planning and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act (1979)
EP&A Regulation	Environmental Planning and Assessment Regulation (2000)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
EPIs	Environmental Planning Instruments
ESA	Environmental Scoping Assessment
HIPAP	Hazardous Industry Advisory Paper
LGA	Local Government Area
MHF	Major Hazardous facility
NHL	National Heritage List
OEH	Office of Environment and Heritage (previously DECC and DECCW)
PoEO Act	Protection of the Environment Operations Act 1997
PULP	Premium Unleaded Petrol
PHA	Preliminary Hazard Analysis
SEPPSRD	State Environmental Planning Policy State and Regional Development 2011
SSD	State Significant Development
SSLEP	Sutherland Shire Local Environment Plan
SPULP	Super Premium Unleaded Petrol
UNP	Unleaded Petrol
ULSD	Ultra Low Sulphur Diesel
WWTP	Waste Water Treatment Plant

Executive Summary

Caltex Refineries (NSW) Pty Ltd (hereafter referred to as Caltex) announced in July 2012 that it would progress with converting Kurnell Refinery (the Site) to a finished fuel terminal facility (the Project). This Project is being proposed in response to increased competition from refineries in Asia, and the balance of supply and demand in Australia.

Caltex is seeking approval for State Significant Development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the works associated with the conversion of the Kurnell Refinery to a finished product terminal.

The purpose of this document is to provide information for the preparation of the Director General's Requirements to inform the content of an Environmental Impact Statement for the Project.

The local community, including indigenous stakeholders, as well as a number of government and non-government organisations will also be consulted as part of the EIS process.

Upon receipt of the DGRs, Caltex would prepare an EIS and submit the assessment to DP&I as part of the development application process.

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Introduction

1.1 Introduction

Caltex Refineries (NSW) Pty Ltd (hereafter referred to as Caltex) announced in July 2012 that it would progress with converting Kurnell Refinery (the Site) to a finished fuel terminal facility (the Project). This Project is being proposed in response to increased competition from refineries in Asia, and the balance of supply and demand in Australia.

The Kurnell Refinery is located on the Kurnell Peninsula within the Sutherland Shire Local Government Area (LGA), approximately 15 km south of Sydney's CBD. The refinery was commissioned in 1956 and is currently used for the receipt of crude oil and some refined products and the refining of crude oil delivered to the refinery via ships into Botany Bay. These materials are transferred via pipeline to storage tanks on the Site. The crude oil is then piped on demand from the storage tanks to the crude distillation units for processing into fuels to supply the NSW market. **Figure 1-1** shows the location of the Site.

Caltex is proposing to use approximately 60% of the tanks currently on site for the storage of finished fuel product, product mixes and site effluent water. Many of the nominated tanks would remain in their current service. Some tanks would change service to store materials other than their current service. This work would also require associated pipeline, pump and other infrastructure upgrade work. The ultimate aim of the proposed works is to allow the Site to be utilised as a terminal where finished products would be received by ship, stored in tankage and leave the site predominantly by pipeline to Banksmeadow terminal or the Newcastle Pipeline. Provision is made to retain the current capability for out loading via the wharf, however, this would be of low frequency. No truck loading of products would be done on site.

This Environmental Scoping Assessment (ESA) has been prepared to support a request for Director-General's environmental assessment requirements (commonly referred to as DGRs) from NSW Department of Planning and Infrastructure (DP&I). This request is made in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation* (2000) (EP&A Regulation). The Project meets the criteria to be assessed as State Significant Development (SSD) and would be subject to the requirements of Part 4 of the *Environmental Planning and Assessment Act* (1979) (EP&A Act) which requires an Environmental Impact Assessment to be undertaken and be presented within an Environmental Impact Statement (EIS).

This ESA includes information on the '*location, nature and scale of the works*' as required under Schedule 2 of the EP&A Regulation. It also provides:

- ESA background and site location (Section 1);
- details regarding the Project need and Project description (Section 2);
- statutory planning provisions that apply to the Project (Section 3); and
- a preliminary assessment of the likely key environmental impacts of the Project (Section 4).

This will provide sufficient information to NSW DP&I for the preparation of the DGRs to inform the content of the EIS for the Project.

1.2 .Proponent and Team

The proponent for the works is Caltex Refineries (NSW) Pty Ltd, 2 Solander Street, Kurnell, NSW 2231. The proponent contact is, Lauren Engel, Caltex Projects Manager.

This report has been prepared by URS Australia Pty Ltd (URS), c/o 407 Pacific Highway, Artarmon, NSW 2064, Tel: (02) 8925 5500. The environmental planning and assessment coordinator is William Miles, Senior Associate Environmental Planner.

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W E
S

0 100 200 400 600 800 Metres

Datum: GDA94
Grid: MGA Zone 56

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CALTEX (REFINERIES) PTY LTD

PROJECT CHEMISTRY - LAND BASED WORKS

SITE LOCATION AND LAYOUT

URS

File No: 43177815.019.mxd Drawn: SB Approved: RO Date: 25/07/2012

Figure: **1-1**

Rev. **A** A4

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Project Need and Description

The purpose of this document is to provide information for the preparation of the Director General's Requirements to inform the content of an Environmental Impact Statement for the Project.

2.1 Introduction

Caltex announced in July 2012 that it would progress with converting the Kurnell Refinery (the Site) to a finished fuel terminal facility (the Project).

This Project is being proposed in response to increased competition from refineries in Asia, and the balance of supply and demand in Australia.

The Project would comprise:

- 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);
- a range of ancillary works to improve efficiency and capability across the site for its conversion and use as a terminal.

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

2.2 Site Location

The Site is located on the Kurnell Peninsula within the Sutherland Shire, approximately 15 km south of Sydney's CBD. The Site is bordered by Kamay Botany Bay National Park to the east, Captain Cook's Landing Place Park to the south, Bonna Point Reserve in the west and the community of Kurnell to the north. The Site location is provided in **Figure 1-1**.

2.3 Existing Operations

Kurnell Refinery was commissioned in 1956 and is a facility used to process crude oil and produce refined petrochemical products. It is the largest oil refinery in NSW and the second largest of the seven fuel refineries in Australia, based on crude oil processing capacity. The refinery mainly produces petrol (49%), diesel (22%) and jet fuel (15%). The volumes of the different products vary from year to year depending on the type of crude processed in the refinery and changes in product demand.

The crude oil feed stock as well as some refined product is currently offloaded from marine tankers at a berth in Botany Bay and is transferred, by pipelines, to storage tanks on the Site. The products from the refinery are also piped below Botany Bay to distribution depots in Banksmeadow as well as piped to ships at the Kurnell Wharf. Caltex owns and operates a 200 km pipeline between the Kurnell Refinery and the Wickham terminal in Newcastle. This pipeline is used to transfer fuel products such as petrol, diesel and jet fuel. A relatively small number of road tankers transport selected products directly to users from the refinery. The existing infrastructure on the Site includes a number of refinery process plants, steam and limited electricity generation, waste water treatment, crude and petroleum products storage facilities, catalyst and chemicals storage, warehousing, workshops and a wharf. The Site footprint is provided in **Figure 1-1**.

The existing Site can be split broadly into a number of operational areas. The tanks on the western part of the Site are mainly used to store crude oil. The main processing and refining plant is located to the immediate east of the crude oil storage tank area, and the majority of the finished product tanks are located to the east of the refining area. The northern part of the Site consists mainly of offices, control rooms, warehouses, various gantries and other supporting infrastructure. Two pipeline easements also run from the refinery to Botany Bay through the town of Kurnell. Various pipes, pipe racks, pumps, filters and other associated infrastructure are located throughout the Site.

The Kurnell Refinery employs approximately 430 people plus some 300 contractors, giving the facility a total of 730 employees. Maintenance shutdowns occur two to three times each year for up to six weeks at a time. During these periods there may be up to an additional 600 contractors working at the refinery.

2.4 Project Need

Caltex initiated a review of their refining operations in May 2011, as the refineries were competitively disadvantaged and were consequently losing money. The Kurnell and Lytton refineries in their current configuration are relatively small and are disadvantaged compared to the modern, larger scale and more efficient refineries in the Asian region. This disadvantage has been exacerbated by the impact of the on-going strength of the Australian dollar, lower Caltex refining margins and increasing costs on the 'as is' refining business.

As a result of the refining review, Caltex is proposing to close the Kurnell Refinery and convert the Site to an import terminal. Conversion to a terminal is required to support the safe, reliable supply of fuel to Caltex's marketing operations, and more broadly to ensure supply reliability of petroleum fuels to the NSW economy.

2.5 Project Objective

Given the need outlined above, the objective of the Project is to ensure that Caltex's operations within Australia remain viable whilst ensuring that the company can provide a safe, reliable and sustainable supply of petroleum fuels to NSW.

2.6 Project Alternatives

In arriving at this proposal, a wide number of options were considered, including the performance of the Kurnell and Lytton refineries and various levels of investment in refining plant. The decision to close the refinery and convert the Kurnell Refinery to a terminal was made following consideration of a wide range of criteria, including financial metrics, the level of risks involved in the alternatives, the impact on the marketing operations, the company's competitive position, Caltex's funding capacity and the feasibility to execute (including Caltex's internal capabilities and resourcing constraints). After considering the various options Caltex has decided that the feasible approach for the future would be to convert Kurnell Refinery to a terminal.

2.7 Project Description

2.7.1 Construction Overview

The Project would include modifications to the existing operation on Site to convert it to a working finished product terminal. The proposed terminal would manage the following products:

- Gasoline – Unleaded Petrol (UNP), Premium Unleaded Petrol (PULP) and Super Premium Unleaded Petrol (SPULP);
- Ultra Low Sulphur Diesel (ULSD);
- Jet Fuel;
- Fuel Oil;
- Slop[1]; and
- Effluent water.

The Project would include conversion of tanks and line systems in parts of the Site to expand terminal operations. These works would all occur within the Site footprint outlined on **Figure 1-1**.

During the initial conversion activities the Site would still be operating in its current mode as both a refinery and a terminal. Cessation of refinery operations would occur in mid-2014 and this would be followed by continuing conversion of some tanks on Site to hold finished products. Eventually the Site would operate wholly as a terminal. Construction staging is described in greater detail in Section **2.7.3**.

The modifications required for the Project are summarised below.

Tanks

The Site has over 100 tanks used for storing crude oil, refined or finished product, other petroleum intermediate products and effluent water. Some of these tanks would be used to contain finished product when the refinery is converted to a terminal. These include tanks that are currently used for storage of Crude oil, Gasoline, Diesel, Jet Fuel, Fuel Oil, Slop and effluent water. Of the above tanks, some will be changed to other services. The conversion process would involve the following activities:

- shutdown of the tanks and associated infrastructure);
- removal of the contents from the equipment;
- draining the product run down lines from the battery limits to the storage location; and
- isolating and making safe any infrastructure and instrumentation that is not required.
- upgrading product movement automation and operational control systems to improve site efficiency;
- modifications to tank internals, roofs, manifolds and product distribution pipe work as required;
- installation of additional product quality controls;
- modifying the Site drainage systems and water treatment measures to reflect the smaller footprint;
- upgrading safeguard systems; and

These works would commence in advance of recommissioning the tanks to receive imported finished product and would be conducted throughout the Project. Over the long term, there would be a reduction in the total number of tanks required for the storage of finished product imports and terminal operations when compared to the number currently required for refinery operations.

[1] Slop or slop oil is a petrochemical industry term for the odds and ends of oil produced in a refinery. This by-product is usually subject to further processing to make it suitable for sale and use.

Pipe and Pump Works

Pump and pipe works would be required as part of the tank conversions in order to pump finished product from the wharf to the product tanks, and from the east to west of the Site. Approximately 20 new pumps would be installed around the Site to service product internal movements. New concrete foundations would be built to accommodate the pumps.

All piping modifications required as part of the tank conversions would be located above ground or in pipe culverts at road crossings. The piping would be constructed predominantly beside or above existing pipe ways and would be supported where required.

Electrical/Instrumentation facilities

The instrumentation on Site would also be upgraded for the Project. This work would include upgrades to the:

- wharf and tank instrumentation and control systems to enable remote and automated control;
- oil movements manifold systems and remote valves with segregated product distribution piping to respective tanks;
- power supplies to new pumps;
- the existing four large steam boilers at Kurnell would be decommissioned when the refinery is converted to a terminal and two new unmanned packaged boilers would be installed to keep fuel oil at a temperature suitable for pumping; and
- revised site electrical systems.

Utilities

Existing air, potable water, firewater, natural gas and nitrogen utilities would remain at the Site, however, usage would significantly decrease. The existing Waste Water Treatment Plant would require modification to manage the reduction in feed rate and contaminant content that would occur in terminal operation.

2.7.2 Construction Staging and Program

Construction hours would typically be confined to the period 7.00am to 6.00pm Monday to Saturday and comply with the Sites Environmental Protection Licence (No. 837) conditions. No work that is audible at the nearest residential receptor would be completed outside these hours. Any work to be carried out outside the hours stated and audible at residential receptors would be subject to discussion with and approval by the relevant parties.

A high level schedule for conversion activities is as follows:

Task	Date
Detailed Engineering & Design Start	Mid 2012
Tank Conversions and Pipe Installation Start	End 2012
Engineering & Design Completed	Mid 2013
Construction on Piping Completed	Mid 2014
Steam Boilers commissioned for service	Mid 2014
Kurnell Refinery Shutdown	Mid 2014
Continued Tank Conversions	End 2014 – end 2016
CONVERSION TO TERMINAL COMPLETED	**December 2016**

2.7.3 Operation

Operation as a Terminal

The Site would import finished products (gasoline, jet fuel, diesel and fuel oil) through the two fixed berths at the existing wharf and the sub berth located in Botany Bay. Product would be stored in existing tanks

The major product distribution systems would continue to operate in line with current practice, i.e., product would be pumped under the bay to the Banksmeadow terminal, the Sydney/Newcastle pipeline or the Joint User Facility at Sydney Airport for further distribution. Road transport of products would cease.

It is currently envisaged that refinery operation would cease in mid-2014 and existing terminal operations would be expanded as limited by the available facilities at that date. Additional conversion works would continue until December 2016 when completion of scheduled transition activities is achieved. At present there are no plans to cease terminal operations at the Site.

2.8 Ancillary Facilities and Infrastructure

The following section outlines the implications of the Project on existing resourcing and infrastructure provision.

2.8.1 Electricity

Existing electricity infrastructure would be used for the Site following conversion. Existing electricity usage would reduce significantly following the shutdown of the refinery operations. Electricity would still be required for operation of the terminal assets and general amenities.

2.8.2 Water and Storm water/Wastewater Management

The current Site operations consume approximately 6 ML of potable water per day. Approximately 97% of this consumption would be removed following the shutdown of the refinery operations at the Site. A further 1 ML of potable water per day is consumed for amenities. This volume would reduce over time as the Site is converted and the work force shrinks. The long term demand at the Site following the completion of the Project is expected to reduce the overall potable water consumption by approximately 90%.

It is currently envisaged that drainage arrangements for the existing process plants would be kept in service during the decommissioning and cleaning processes. Storm water runoff from paved areas would continue to be routed to the Waste Water Treatment Plant (WWTP) on Site. Following this period, process plant sewers would be capped and the Site regraded to divert rain water runoff to the existing storm water system. No changes are proposed to this system. Tank bunded areas and tank water draws would remain unchanged and flow would continue to be processed through the WWTP. Issues regarding water are discussed further in **Section 4.2.4.**

2.8.3 Sewer

Existing sewerage infrastructure would continue to be used. It is expected that the amount of sewerage generated would decrease significantly.

2.8.4 Natural gas

Natural gas would continue to be used on Site to fuel packaged boilers. Boilers are required to maintain fuel oil temperatures to a level where the fuel oil can be pumped through pipes. The current natural gas usage averages 7,150 GJ per day. It is anticipated that this would decrease by approximately 80% following the Site's conversion to a terminal.

2.8.5 Road Access and Surface Vehicle Movements

Road access to the Site would remain unchanged. Vehicle (car and truck) usage may increase marginally during initial conversion activities (2013-2014), but would decrease following the termination of refining. Vehicle movements to and from the Site would continue to decrease until full terminal operation is established due to reduced employees, service groups, deliveries and tanker loading activities on Site. This is discussed in **Section 4.2.8**.

2.8.6 Shipping Movements

It is envisaged that ship movements would decrease over time, however, the average size of individual ships would be likely to increase.

2.8.7 Workforce

With the removal of the refining operation at the Site and high automation of the terminal, the number of employees would decrease. The final operational workforce is currently being determined; however it is anticipated to be between 80-100 employees would provide direct operational or supporting services to the terminal which would operate in a shift arrangement over 24 hours per day 7 days per week.

3

Planning Considerations

This Chapter provides a preliminary assessment of the Project in accordance with the applicable Commonwealth, State and Local statutory and non-statutory planning framework.

3.1 Commonwealth Legislation

3.1.1 Environmental Protection and Biodiversity Conservation Act 1999

Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) states that an action which has, will have or is likely to have a significant impact on a matter of national environmental significance may not be undertaken without prior approval of the Commonwealth Minister for Environment and Heritage, as provided for under the provisions of Part 9 of the EPBC Act. The Act identifies the following as matters of national environmental significance for which Ministerial approval is required:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance (including Ramsar Wetlands);
- Listed threatened species and ecological communities;
- Listed migratory species protected under international agreements (e.g. CAMBA and JAMBA);
- Protection of the environment from nuclear actions; and
- Commonwealth marine areas.

The Act also protects the environment within which any action is proposed to be undertaken, or where an action will affect Commonwealth land.

The Project would not involve a nuclear action, is not expected to have a significant effect upon the health and viability of any migratory species listed under provisions of the Act, would not affect any World Heritage property, and would not affect any Commonwealth land or its environment.

Kurnell Refinery is located within five kilometres of the Towra Point Nature Reserve, a listed Ramsar wetland of international significance, and the Kurnell Peninsula Headland which is included in the National Heritage List established under the EPBC Act.

The National Heritage List (NHL) was established to protect places that have outstanding value to the nation. Approval from the Minister is required under the EPBC Act for controlled actions which are deemed will have a significant impact on items and places listed under the NHL. The Kurnell Peninsula Headland is listed on the NHL (Listing No. 105812).A desktop assessment of the potential for threatened biota to occur within the Site would be undertaken as part of the preparation of the EIS for the Project (**Section 4.2.11**). If it is considered that potential habitat for threatened biota exists within the Site boundary, further ecological assessment, including an on-ground ecological survey may be required.

Any assessment would also determine if the Project is likely to result in a significant impact to any Matter of National Environmental Significance as listed under the EPBC Act. The Site comprises land which has been extensively disturbed, and which lies within an operational oil refinery. Given this fact, and the outcomes of the above considerations, at this stage, it is not anticipated that the Project would have a significant impact on any matter of national environmental significance. Consequently, it is unlikely that the Project would be declared a controlled action under the EPBC Act. As a result, the Project would not require the approval of the Commonwealth Minister for Environment and Heritage.

3.1.2 Australian Heritage Council Act 2003

The Australian Heritage Council Act 2003 (AHC Act) establishes the Australian Heritage Council as an independent advisory body regarding National/Commonwealth heritage places and mandates the Council to maintain the Register of the National Estate (RNE) to promote the assessment and conservation of heritage items. Although there are no items listed under the RNE within the study area, items in the surrounding area could be present. Any potential impact of the Project on these items would be discussed in the EIS.

3.2 NSW State Legislation

3.2.1 Environmental Planning and Assessment Act 1979

A project can be declared State Significant Development (SSD) under Section 89C, Part 4 of the EP&A Act, if it meets relevant criteria within the Schedules of the *State Environmental Planning Policy* (SEPP) on *State and Regional Development* (2011) or is declared SSD by order of the Minister for Planning in the Government Gazette. This Project meets the requirements for a SSD under Clause 10 (3), Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP S&RD) and therefore is classified as SSD.

The provisions of the EP&A Act and the EP&A Regulation set out the requirements of assessment placed on an applicant wishing to submit a DA under Part 4 of the Act as SSD.

Section 78(A) (8A) of the EP&A Act states that a '*development application for State significant development is to be accompanied by an environmental impact statement prepared by or on behalf of the applicant in the form prescribed by the regulations.*' Schedule 2 of the EP&A Regulation sets out the requirements of an EIS and requires that the content of an EIS is '*subject to the environmental assessment requirements that relate to the EIS*'.

This document has been prepared to allow the Director-General of DP&I to issue Director General's Environmental Assessment Requirements (DGRs) for the Project.

Sections 89J and 89K of the EP&A Act outline authorisations that are not required for SSD authorised by a development consent, and authorisations that cannot be refused if necessary for carrying out SSD that is authorised by a development consent.

The requirements of other Acts that are applicable to the Project are discussed in more detail below.

3.2.2 State Environmental Planning Policies

The following State Environmental Planning Policies (SEPPs) operate under the jurisdiction of the EP&A Act.

3 Planning Considerations

State Environmental Planning Policy (State and Regional Development) 2011

Clause 8, Part 2 *State Environmental Planning Policy State and Regional Development* 2011 (SEPPSRD) states that a project is to be determined as State Significant Development (SSD) if it is listed in Schedule 1 or 2. Clause 10 (3) of Schedule 1 relates to chemical, manufacturing and related industries and includes development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility.

This Project meets the requires of Clause 10, Schedule 1 of the SEPPSRD as it relates to a Site that would store or use of dangerous goods in such quantities that constitute the development as a major hazard facility. The Kurnell Refinery is currently registered as a Major Hazardous Facility, which will remain unchanged following conversion of the Site to a terminal

The provisions of the SEPPSRD support the Project being assessed as SSD.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

SEPP 33 outlines the approach used in NSW for planning and assessing the risks and hazards associated with industrial development proposals. Through the policy, the permissibility of an industrial proposal is linked to its safety and pollution control performance. SEPP 33 applies to any proposals that fall under the policy's definition of '*potentially hazardous industry*' or '*potentially offensive industry*'. The policy states:

"*potentially hazardous industry means a development for the purposes of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality to (a) human health, life or property, or (b) the biophysical environment; and includes a hazardous industry and a hazardous storage establishment.*

potentially offensive industry means a development for the purposes of an industry which, if the development were to operate without employing any measures to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment."

For development proposals classified as 'potentially hazardous industry' the policy establishes a comprehensive test by way of a preliminary hazard analysis (PHA) to determine the risk to people, property and the environment at the proposed location and in the presence of controls.

State Environmental Planning Policy 14 - Coastal Wetlands

State Environmental Planning Policy No 14 – Coastal Wetlands (SEPP 14) aims to ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State. The provisions of SEPP 14 will be further investigated during preparation of the EIS.

State Environmental Planning Policy 55 - Remediation of Land

State Environmental Planning Policy 55 - Remediation of Land (SEPP 55) provides a State wide planning approach to the remediation of contaminated land. The EIS would assess the Project against the requirements of this SEPP.

3 Planning Considerations

State Environmental Planning Policy 71 - Coastal Protection

State Environmental Planning Policy 71 - Coastal Protection (SEPP 71) commenced on 1 November 2002. The policy has been made under the Environmental Planning and Assessment Act 1979 to ensure:

- development in the NSW coastal zone is appropriate and suitably located;
- there is a consistent and strategic approach to coastal planning and management; and
- there is a clear development assessment framework for the Coastal Zone.

Part 4 of the SEPP specifies provisions relating to development control for development within the Coastal Zone including public access, effluent disposal and storm water. This Project is not expected to affect the coastal zone.

State Environmental Planning Policy – Kurnell Peninsula

State Environmental Planning Policy (Kurnell Peninsula) 1989 (SEPP (Kurnell Peninsula)) aims to conserve the natural environment of the Kurnell Peninsula and ensure that development is managed having regard to the environmental, cultural and economic significance of the area to the nation, State, region and locality. SEPP (Kurnell Peninsula) applies to the land within the Shire of Sutherland, known as Kurnell Peninsula, and adjacent waterways.

Kurnell Refinery falls within zone 4(c1) (Special Industrial (Oil Refining) Zone pursuant to the SEPP (Kurnell Peninsula). The objectives of the 4 (c1) are to recognise land used for oil refinery, liquid fuel depot and liquefied petroleum gas extraction purposes, and to ensure that development has regard to environmental safety planning principles. The Project would continue the use of the land as a liquid fuel depot and therefore would be acceptable under this SEPP.

SEPP (Kurnell Peninsula) also seeks to mitigate land use conflicts within and adjacent to the zone and to ensure that adequate provision is made for the supply of water and the disposal, in an environmentally sensitive manner, of all wastes and stormwater from the land. Issues regarding water usage, stormwater management and waste treatment and disposal will be examined within the EIS.

Clauses 23A to 23D, SEPP (Kurnell Peninsula) also prescribe the protection of items and places of Aboriginal and historic heritage. Schedule 2 ‘Archaeological Items’ and Schedule 3 ‘Heritage items’ include a number of items that are in close proximity to the Project. This includes the listing of the ‘Australian Oil Refinery’.

Schedule 2 Clause 23B (2) states:

(2) The Council may consent to the carrying out of development on an archaeological site or potential archaeological site that has non-Aboriginal heritage significance only if:

> *(a) it has considered a conservation assessment of the impact of the proposed development on the site, and*
>
> *(b) it has notified the Heritage Council of its intention to do so and taken into consideration any comments received from the Heritage Council within 28 days after the notice was sent, and*
>
> *(c) it is satisfied that any necessary excavation permit required by the Heritage Act 1977 has been granted.*

A heritage assessment would be undertaken as part of the EIS. This assessment would include consultation with the Heritage Council if required.

3.2.3 Other NSW State Legislation

While the EP&A Act provides the framework for the planning and development approvals system in NSW, there are a number of other Acts, Regulations and Environmental Planning Instruments (EPIs) of relevance to the Project. The relevant Acts and Regulations are discussed below.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (PoEO Act) provides for the issue of an Environment Protection Licence (EPL) for scheduled activities pursuant to Section 48 of the PoEO Act, in relation to pollution and waste disposal caused by development or operation of developments. Activities requiring an EPL are listed in Schedule 1 of the Act.

Activities relating to chemical storage are listed in clause 9 of Schedule 1. These include Petroleum Products Storage with a capacity to store more than 200 tonnes (liquefied gases) or 2,000 tonnes (chemicals in any other form). The proponent has an existing EPL (No. 837) that licenses a number of activities for Kurnell, including Petroleum Products Storage. A number of amendments would be required to the EPL, prior to the refinery shutting down to account for the changes in the operation of the Site. When the Site ceases operating as both a refinery and a terminal, the EPL would be amended. The parameters around these changes would be discussed with the Environmental Protection Agency (EPA) during the EIS process.

Further, under Section 89K of the EP&A Act, any necessary EPL modifications under the PoEO Act would be applied consistently with any approval as SSD.

The PoEO Act also provides for the management of water, air and noise pollution and the control of wastes. The EIS would identify measures by which impacts on air, water and noise pollution as a result of the Project could be avoided, reduced or mitigated.

Contaminated Land Management Act 1997

The primary objective of the Contaminated Land Management Act 1997 (CLM Act) is to establish a process for investigating and remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment. Where land is identified as potentially contaminated, consultation with the NSW Office of Environment and Heritage (OEH) should be undertaken.

The Site is listed as a NSW Contaminated Site under the CLM Act. In June 2003 the EPA issued an Agreement to the Voluntary Investigation Proposal for the Kurnell Refinery and right of way. This agreement is detailed on the Section 149 Planning Certificates.

The EPA stated that three areas were to be investigated, namely the area of Tank 101, the right of way and the Caltex Lubricating Oil Refinery (CLOR) area. The EPA stated that soil and groundwater within the Site are contaminated and that they present a significant risk of harm to human health and environmental receptors. Contaminants of concern in groundwater in the Tank 101 and the right of way were identified by the EPA as TPH, BTEX and Naphthalene. Investigation works were carried out following receipt of the agreement. On 1 July 2005 the EPA gave notice that the terms of voluntary investigation proposal had been satisfactorily completed.

Management of any contamination that may be encountered as part of the Project would be assessed as part of the EIS.

3 Planning Considerations

Environmentally Hazardous Chemicals Act 1985

The Environmentally Hazardous Chemicals Act 1985 regulates chemical wastes in NSW. Under the Act, Chemical Control Orders (CCO) can be declared for specific wastes types. CCOs can set controls on activities throughout the chemical's lifecycle through general requirements and by requiring that certain activities be subject to particular licence conditions. OEH currently has five CCOs in place in NSW, which includes Polychlorinated Biphenyl (PCB) wastes.

Condition L8.1 of the Site's EPL 837 notes that the licensee must comply with the "Chemical Control Order in Relation to Materials and Wastes Containing Polychlorinated Biphenyl, 1997" This CCO outlines controls on the generation, processing, string, conveying and disposal of PCB materials or wastes (depending on the concentration of PCB).

Any wastes generated as part of the Project would need to be managed in accordance with the Environmentally Hazardous Chemicals Act 1985 and EPL 837

Roads Act 1993

The *Roads Act 1993* (Roads Act) regulates a range of activities undertaken on public roads. Section 138 of the Roads Act requires that a person obtain the consent of the appropriate roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a public road.

The Project would not require any of the works listed above. Accordingly an approval under section 138 of the Roads Act would not be required for the Project.

Water Management Act 2000

The *Water Management Act 2000* (WM Act) establishes a framework for managing water in NSW. The Act creates:

- mechanisms for protecting and restoring water sources and their dependent ecosystems;
- improved access rights to water; and
- partnership arrangements between the community and the Government for water management.

No impacts to aquifers or other water sources are anticipated as a result of the Project therefore no approvals would be needed under the WM Act.

Water Act 1912

The Water Management Act 2000 is gradually replacing the planning and management frameworks within the Water Act 1912. Surface water allocation for the Project is administered under Part 2 of the Water Act 1912 and groundwater is administered under Part 5 of the Water Act 1912.

Where the Project is likely to intercept groundwater, a licence under Part 5 of the Water Act 1912 would be required. Groundwater is likely to be encountered in excavations deeper than 1.4m. Previous civil works at Kurnell showed that groundwater was almost always encountered in excavations greater than 1m depth. Only minor excavations works are expected as part of the Project. This would be assessed as part of the EIS.

3 Planning Considerations

Threatened Species Conservation Act 1995

The Threatened Species Conservation Act 1995 (TSC Act) provides legal status for biota of conservation significance in NSW. The Act aims to '*conserve biological diversity and promote ecologically sustainable development*'. The environmental assessment has identified the presence of threatened species and the strategies for management and mitigation of any impacts.

Schedules to the TSC Act provide the listings of threatened species, populations and ecological communities that would be considered within the EIS. Where appropriate, desktop studies would be supplemented with field studies to ensure that any ecological impact was fully anticipated.

Fisheries Management Act 1994

Part 7a, section 220A of the Fisheries Management Act (FM Act) provides for the conservation of all biological diversity of aquatic and marine vegetation. It also ensures that the impact of any 'action' affecting threatened species, populations or ecological communities is appropriately assessed.

Under Section 89K of the EP&A Act any necessary approvals under the FM Act would be applied consistently with any approval as SSD.

Noxious Weeds Act 2003

The Noxious Weeds Act provides for the identification and control of noxious weeds and specifies the duties of public and private landholders to control noxious weeds. The Act stipulates that an occupier of land must take steps to control noxious weeds on their land. The Act also provides for the monitoring of and reporting on the effectiveness of the management of weeds in NSW. Appropriate methods for controlling noxious weed species are defined under the control category or categories for particular species of weeds.

As part of the ecological assessment within the EIS, noxious weeds would be identified and a plan for their management could be compiled.

Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides for the conservation of environmental heritage defined as places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance which are at least 50 years old. The Act provides for the listing of heritage structures on the State Heritage Register and Orders can be made under the Act to protect relics from removal or alteration. This Act applies to non-Aboriginal relics only. Aboriginal relics are protected under the *National Parks and Wildlife Act 1974* (see below). A heritage study would be completed as part of the EIS.

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides for the preservation of land and the protection of that land, as well as the protection of flora and fauna and aboriginal heritage. An aboriginal heritage study and ecological assessment would be included as part of the EIS.

Pipelines Act 1967

The *Pipelines Act 1967* (Pipelines Act) specifies provisions relating to the construction, operation and maintenance of pipelines and purposes connected therewith. Pursuant to clause 5(1)(a) of the Pipelines Act, subject to section 5A, a licence is not required to be held in respect of a pipeline constructed or to be constructed under, or under an approval or other authority granted under, any Act, other than this Act or the EP&A Act. Accordingly, the Project does not require a licence pursuant to the Pipelines Act for the minor pipeline works to be undertaken.

3.3 Local Planning Policies and Instruments

The proposed works are likely to be assessed in accordance with Section 79C(i) of the EP&A Act. This states that Environmental Planning Instruments (EPIs) need to be considered during the EIS process.

The Site is within the Sutherland Shire Council Local Government Area (LGA) and therefore the Sutherland Shire Local Environment Plan (SSLEP) (2006) would need to be considered. This LEP aims to promote an appropriate balance of development and management of the environment that will be ecologically sustainable, socially equitable and economically viable. The Site is zoned pursuant to SEPP Kurnell Peninsula, therefore, the local zoning provisions of the SSLEP are not applicable to the Proposal.

3.4 Strategic Planning Framework

The EIS would assess the Project against all relevant strategic planning documents, including:

Land Use Safety Study (Kurnell Peninsula) 2007

The Land Use Safety Study assesses the current risks from Caltex Refinery operations to existing and future residential land uses and provides recommendations for risk reduction and development control. The Land Use Safety Study identifies three main sources of risk from the Refinery:

1) Fires from large crude oil and refined petroleum product storage tanks and associated transfer pipelines;

2) Fires, explosions or toxic gas releases from processing areas; and

3) Fires and explosions from large liquefied petroleum gas (LPG) storage.

The PHA for the Project contained within the EIS will consider this study.

NSW Coastal Policy 1997

The NSW Coastal Policy 1997 provides the strategic direction for coastal management in NSW. By using the principles of ecologically sustainable development, the NSW Coastal Policy aims to facilitate the development of the coastal zone in a way that protects and conserves its values. One of the policy's objectives is to recognise and consider the potential effects of climate change in the planning and management of coastal development.

A greenhouse gas assessment will be undertaken as part of the EIS. This assessment will include a consideration of climate change (refer to **Section 4.2.4** and **4.2.6**).

NSW Coastal Planning Guideline: Adapting to Sea Level Rise

The *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* (DoP 2010) aims to ensure that the risks of sea level rise and enhanced coastal risks and hazards are recognised. It applies to all coastal areas of NSW, including the NSW Coastal Zone, as well as Sydney Harbour and Botany Bay. 'Coastal areas' is defined broadly in the guideline to include the coastline, beaches, coastal lakes and estuaries, as well as the tidal reaches of coastal rivers. It also includes other low-lying land surrounding these areas that may be subject to coastal processes in the future as a consequence of sea level rise.

A consideration of sea level rise will be provided as part of the EIS (refer **Section 4.2.4**).

The Metropolitan Plan for Sydney 2036

The Metropolitan Plan for Sydney 2036 (Metropolitan Plan) integrates land use, urban and funded–transport planning together for the first time, providing a framework for sustainable growth and development across the city to 2036.

A socio-economic assessment will be undertaken as part of the EIS (refer to **Section 4.2.7**).

3.5 Stakeholder Consultation

An important element of the EIS process is consultation with the community and regulatory stakeholders. The objective of consultation is:

- to provide clear communication about the scope of the Project;
- provide an understanding of the regulatory approvals and permitting process to facilitate undertaking the Project;
- seek information, feedback and local knowledge as input to the EIS process; and
- proactively work with the community and regulators to maximise opportunities and minimise impacts and risks.

Following the announcement of the Project, Caltex and the wider project team will consult with relevant stakeholders, including government agencies and Sutherland Shire and Botany Bay Council, as part of the EIS process for the Project.

Community consultation would be planned early in the EIS process. The consultation program developed would involve engagement with the local community, community representatives, industrial neighbours as well as the local media.

The long-standing connection between the refinery and the local community has meant that Caltex is already engaged in a monthly consultation event and a quarterly meeting with the people of Kurnell. This consultation is regularly advertised and well attended by a core group from the local community. It is proposed that this forum would be used to discuss the Project with the local community. These meetings have been an effective method for community consultation with regards to other recent development associated with the refinery such as the upgrade of the Kurnell (Jet Fuel) B-Line.

If required, at appropriate stages in the process, consultation would be undertaken with the local Aboriginal community. Consultation would be in line with the *Aboriginal Cultural Heritage Guidelines for Proponents* (OEH, 2010).

3 Planning Considerations

Consultation with the relevant stakeholders will continue throughout the approvals process, including prior to preparing the EIS, consultation on the findings of the EIS prior to exhibition, opportunity for widespread community consultation at public exhibition and close-out consultation once submissions had been received.

4

Environmental Considerations

4.1 Environmental Setting and Context

The Caltex Refinery is located on the Kurnell Peninsula on the southern coastal border of the Sydney metropolitan area, approximately 15 km from Sydney's CBD (refer to **Figure 1-1**). The Project would be undertaken on land owned and occupied by Caltex Australia Ltd, described as Lot 25 of Deposited Plan (DP) 776328, Lot 570 DP752064, Lot 283 DP752064, Lot 1 DP132055 in the Sutherland Shire Local Government Area (SSLGA).

Kurnell Peninsula covers some 2,000 hectares (ha) of land and is bounded by Botany Bay to the north, the Tasman Sea to the east, the Princes Highway to the west and Cronulla to the south.

The Peninsula has national historical significance (Captain Cook's landing place), and environmental significance (Towra Point Nature Reserve and part of Kamay Botany Bay National Park). It also contains Kurnell village with approximately 2,100 residents, and various industrial developments, including the Kurnell Refinery. Sydney Airport lies about 4 km north of the Kurnell Refinery site across Botany Bay (**Figure 1-1**).

4.2 Environmental Aspects

This chapter provides a preliminary assessment of the potential areas of environmental impact that the Project may have on the environment. These have been highlighted as environmental aspects for consideration based on previous similar projects undertaken, previous environmental studies undertaken at the Site and site-specific influences. These include:

- Hazards & Risk;
- Soil, Contamination and Health;
- Groundwater;
- Surface water, Wastewater & Flooding;
- Noise & Vibration;
- Air Quality & Odour;
- Greenhouse Gas;
- Socio-Economic;
- Transport and Access;
- Waste Management;
- Heritage;
- Ecology; and
- Visual.

These aspects are discussed further in **Sections 4.2.1** to **4.2.12**.

Following the preliminary assessment of the environmental aspects, a prioritisation of environmental issues will be undertaken (**Section 5**) to highlight risk areas for primary consideration in the EIS.

Where required, the environmental aspects may be discussed in terms of the Site operating initially as both a terminal and a refinery, and following this there being a shutdown of the refinery after which the Site would be function only as a finished product terminal.

4 Environmental Considerations

4.2.1 Hazards and Risks

Background

The Project meets the criteria of a potentially hazardous development (as defined by Part 1, Clause 3 of the State Environmental Planning Policy No 33—Hazardous and Offensive Development). For 'potentially hazardous industry' SEPP 33 establishes a comprehensive test by way of a preliminary hazard analysis (PHA) to determine the risk to people, property and the environment at the proposed location and in the presence of controls.

The Site is currently provisionally registered as a Major Hazardous facility (MHF) under the Work Health and Safety Regulation 2011 and has submitted a Formal Safety Case as part of this requirement. It is expected that this would continue.

Preliminary Assessment and EIS Scope

The key consequences that can result in harm or damage to the adjacent properties in close proximity to the Site during refining operations may include damage and/or injury from:

- the ignition of substances within an adjacent area resulting from a release from the future terminal operation;
- radiant heat from a fire within the future terminal;
- blast overpressure resulting from an explosion on the future terminal; and
- Toxic release of H_2S or chlorine.

The removal of the refining operations would result in the removal of some of the current risks associated with the Site including air and noise emissions.

A Hazard and Risk assessment would be required for the Project. This assessment will be carried out in accordance with the State Environmental Planning Policy No. 33 — Hazardous and Offensive Development (SEPP 33), as described in the guideline document entitled Applying SEPP 33. SEPP 33 specifies that a preliminary hazard analysis (PHA) must be prepared for development applications for 'potentially hazardous industry'.

To determine whether a PHA would be required, a Preliminary Hazard Screening Assessment (PHS) would be completed. The aim of the hazard and risk screening is to:

- Determine whether the on-site hazards and risks from the use and processing of potentially hazardous material may have the potential to cause off-site risks; and
- Determine whether a Preliminary Hazard Analysis (PHA) is required for the Project.

Both the PHS and PHA would be undertaken in line with DP&I's SEPP 33 Guidelines, and it's Hazardous Industry Advisory Paper (HIPAP) No 4, Risk Criteria for Land Use Planning and their HIPAP No 6, Guidelines for Hazard Analysis.

Should it be required, the PHA would determine the risk of the Project to the land uses around the Site, both before and after the Project and during the transitional period when refining ceases. Risks that would be assessed include risk of fatality and injury from fires, explosions or toxic materials from the acute effects of incidents, and risk to the biophysical environment from dangerous goods used and processed at the Site, as per the requirements of HIPAP 4 and 6. It would

- Identify potential hazards involved in the Project and to ensure that proposed safeguards are adequate; and
- Demonstrate that the Project will not impose an unacceptable level of risk.

The PHA would demonstrate that the level of risk conforms to the criteria established in Hazardous Industry and Planning Paper No. 4 and will provide the consent authority with sufficient information to form a judgement about the level of risk involved in the Project.

4.2.2 Soils, Contamination and Health

Background

The Kurnell Peninsula, including the area beneath the Site, is an elevated plateau of Hawkesbury Sandstone, approximately 18km in length. The sandstone is medium- to coarse-grained, composed predominantly of quartz with minor lithic fragments, feldspar, mica and clay pellets. The sandstone is overlain by Quaternary (Pleistocene) wind-blown medium- to fine-grained well-sorted marine quartz sand[2].

The Site lies on the aeolian Kurnell landscape unit, composed of gently undulating to rolling coastal dunefield and relict dunes (NSW Soil Conservation Service Soil Landscape Series, Wollongong-Port Hacking). The Site is essentially flat and low lying, at an elevation of approximately 5-10m Australian Height Datum (AHD).

The depth to bedrock beneath the Site varies between 2m to 20m. Bedrock surface elevation rises toward the east and south of the Site, with sandstone outcrops mapped at the northeast and southeast boundaries.

A review of the NSW Acid Sulphate map (Department of Infrastructure, Planning and Natural Resources (DIPNR)) online and review of previous reports for Kurnell indicate that the Site is ground classified as 'Low Probability' of containing Potential Acid Sulphate Soils (PASS) or 'Disturbed Terrain'.

The contaminants of concern for soils at the Site are those associated with the fuels refining process. The primary contaminants of concern are likely to be:

- Petroleum hydrocarbons: compounds associated with all petroleum products;
- Benzene, toluene, ethylbenzene and xylene (BTEX): compounds found in petroleum products;
- Polycyclic aromatic hydrocarbons (PAH): a group of over 100 compounds found in crude oil petroleum products;
- Phenols: compounds also found in petroleum products; and
- Lead (Pb): an additive formerly used in the manufacture of leaded petrol. The manufacture of leaded petrol has ceased at the refinery. The refinery's lead manufacturing facilities have been demolished and the area was remediated in 2001.

Any works involving the disturbance of soil on the Site (including pipe or footing works associated with pump installation and tank conversion) will need to be properly considered within the EIS and during construction.

[2] Environmental Assessment for Crude Oil Storage Tank (Tank 632), (2006), URS, Caltex

Preliminary Assessment and EIS Scope

The desktop review for the Site has indicated that the presence of contamination on or close to the Project cannot be discounted, particularly given the historic and current use of the Site.

The Site is located on ground considered to have a Low Probability of containing Acid Sulphate Soils. Therefore for the PASS, detailed assessment regarding the management of acid sulphate plans are not considered necessary as part of the EIS.

The EIS would review all readily available information on any issues relating to contamination on the Site and assess the likelihood of any impacts occurring as a result of the Project. The nature of the existing soils would be determined prior to construction including their suitability for the proposed works. These qualities would be assessed to assist in developing of any control measures required during construction to mitigate potential adverse environmental impacts. The EIS will include procedures to be followed in the event that contaminated soil is encountered during the construction phase during the installation of pipes or footings for pumps.

A study of the potential ecological and human health risks posed by contaminants on Site would be assessed in the EIS in relation to the potential for contaminated soil to be uncovered during construction works to be undertaken.

4.2.3 Groundwater

Background

The Site is underlain by Quaternary sands, silts and clays overlying Hawkesbury Sandstone. The original sand dunes (Botany Bay Sands) of the Kurnell Peninsula are well sorted and form a highly permeable, high yielding aquifer system referred to as the Botany Aquifer. It is a system of generally unconfined aquifers of variable yield, with local partial confining due to clay beds.

Groundwater under the Site is contained within an unconfined aquifer in Quaternary sands. The depth to groundwater is approximately 2m. An investigation undertaken by Coffey Environments in 2007 suggested that groundwater flow is generally in a north westerly direction and is largely influenced by the strike and dip of the underlying sandstone bedrock.

Groundwater at the boundary of the Site is regularly monitored to identify the potential for migration of hydrocarbon contaminated groundwater before it leaves the Site. There are various monitoring wells installed along the northern and western boundaries of the Site corresponding to the down gradient direction of groundwater flow. These wells are regularly monitored for the presence of hydrocarbons. Bore logs also indicate that groundwater is found at depths ranging from 1.2 to 11mbgl. Where available, records indicate that the water is of low to very low salinity.

Preliminary Assessment and EIS Scope

The potential for contaminated groundwater to be present in proximity to the where the works would be undertaken will be determined through a desk-based assessment and a review of existing groundwater data. The EIS would identify procedures to be followed should contaminated groundwater be encountered during the construction phase. Considering the minor nature of the constructions works, and the shallow footings required for pumps and other infrastructure, it is deemed unlikely that groundwater would be intercepted. However, management strategies and procedures for dewatering and for the disposal of waste water would be considered within the EIS.

Consultation would be carried out with Sutherland Shire Council, Botany Bay City Council and the NSW Office of Water to ensure that the Project is compliant with relevant guidelines and legislation. Mitigation measures will be recommended to address any potential impacts identified.

4.2.4 Surface Water, Wastewater and Flooding

Background

The Kurnell Peninsula contains few formal drainage lines. Surface drainage at the Site generally flows from the steeper areas on the eastern boundary via a series of constructed drainage lines within the Site, towards the northwest into Quibray Bay and Botany Bay.

Potentially contaminated stormwater may be generated by rainfall within tank bunds, process units and pump slabs. These areas drain, via the oily water system, to the Site's wastewater treatment plant, which discharges via a submerged diffuser to the ocean at Yena Gap.

Clean stormwater, which is runoff from areas outside the process units and tank compounds, is collected in gutters and minor drainage lines and directed into major drainage paths, termed pipeways. The pipeways contain various pipelines and also provide temporary storage for stormwater flows during storm events. Runoff collected in pipeways discharges via one of two outlets, one adjacent to the wharf on Silver Beach and the other via creek into Quibray Bay.

Surface runoff entering the Site from the Kamay Botany Bay National Park to the east and south is considered clean. Some of it is collected from two major runoff points and diverted through a series of pipes before being discharged to the north of the Site.

There are also minor open infiltration areas on the Site, where stormwater soaks into the sandy soil.

The current Site operations consume approximately 6 ML of potable water per day. Approximately 97% of this demand would be removed following the shutdown of the refinery operations at the Site. A further 1 ML of potable water per day is consumed for amenities. This would reduce over time as the Site is converted into a terminal. The long term demand at the Site following the construction of the Project is expected to reduce the overall potable water consumption by approximately 90%.

Preliminary Assessment and EIS Scope

During the construction and operation of the Project, surface water runoff from the Site would have the potential to impact surrounding water bodies. This would be managed through the existing bunding and drainage arrangements and, during the construction phase, through the Construction Phase Environmental Management Plan.

Consultation would be carried out with Sutherland Shire Council, Botany Bay City Council and the NSW Office of Water to ensure that the Project is compliant with relevant guidelines and legislation. Mitigation measures will be recommended to address any potential impacts.

As part of the EIS an assessment would be undertaken of how wastewater would be managed. It is currently envisaged that drainage on the existing process plants would be kept in service during the Project. Wastewater and potentially contaminated runoff would continue to be routed to the Waste Water Treatment Plant (WWTP) on Site. Following the shutdown of the refinery process plant sewers would be capped off and the Site re-graded to divert rain water run off to the existing storm water

system which would remain unchanged. Tank related sewers would remain unchanged and flow would continue to be processed through the WWTP

The assessment would also include consideration of any potential flooding impacts, including a consideration of climate change and sea level rise.

4.2.5 Noise and Vibration

Background

The Site is close to a number of sensitive noise receptors including the residential receptors of Kurnell. The residential suburb of Kurnell lies to the north and northwest of the Site. This area also contains several commercial/industrial properties and a primary school (**Figure 1-1** shows the location of Kurnell). On Site offices at Kurnell and any other commercial operations in close proximity would also need to be considered as part of any assessment.

The existing background noise from the refinery is typical of a heavy industrial site. Existing Environmental Protection Licence (EPL) 837 noise limits are:

"L6.1 Noise from the premises must not exceed:

a) An LA10(15 minute) noise emission criterion of 70 dB(A) (0700 to 2200) seven days a week; and

b) An LA10(15 minute) noise emission criterion of 65 dB(A) at all other times, except as expressly provided by this licence."

Preliminary Assessment and EIS Scope

Construction noise associated with the Project would be characterised by site preparation activities, decommissioning of tanks and associated pipe flushing, installation of the new pipes and pumps and other ancillary works as described in **Section 2**. Noise would also be generated from the transportation of materials and equipment associated with these activities.

During construction, the Project would predominantly generate noise from associated plant and equipment such as excavators, trucks and material processing devices. Much of the construction impact would be mitigated by carrying out works in line with standard working hours (7.00am to 5.00pm Monday to Saturday) and, for Kurnell, by adhering to the various noise restrictions in EPL 837.

The plant and equipment used for construction of the Project would be similar to that already present. Given the industrial nature of the Site and distance between the proposed location of the works and sensitive receiver locations, it is considered unlikely that there would be any perceptible increase in the noise levels in the local environment during construction.

Noise from the Site is likely to reduce significantly with conversion to terminal operations and the cessation of refining.

An assessment of noise and vibration for the proposed Project would be undertaken in accordance with government policy and guidance, including:

- *NSW Industrial Noise Policy* (INP, EPA 1999) for the assessment of the operational noise;
- *NSW Road Noise Policy* (RNP, DECCW 2011) for the assessment of the off-site traffic noise on public roads;

- *NSW Interim Construction Noise Guidelines* (ICNG, DECC 2009) for the assessment of the noise from construction of the Project; and
- *Assessing Vibration: A Technical Guideline* (DEC, 2006) for the assessment of the vibration from construction of the proposed development.

Management controls would be recommended to minimise potential noise impacts. Where required, noise attenuation would be incorporated into the design of major noise sources within the Site.

4.2.6 Air Quality, Odour & Greenhouse Gas

Background

As described in **Section 4.2.5** a number of residential and commercial receptors are located close to the Site. On-site offices at Kurnell and any other commercial operations in close proximity would also need to be considered as part of any air quality assessment. The air quality in the area surrounding the Site is impacted by emissions from industry and by traffic emissions from heavy vehicles and cars using the local and regional road network.

Prevailing wind data from the Bureau of Meteorology between 1939 and 2004[3] shows that the majority of winds originate from the north west, west or south. This would indicate that in the majority of cases, any odour or dust currently generated is blown either on to the Site itself or Botany Bay. Specific mitigation measures would need to be implemented to reduce or avoid any impacts of the Project and to account for the direction of prevailing winds.

Existing atmospheric emissions from the Refinery's operation include (as described in EPL 837):

- Arsenic;
- Benzene;
- Benzo(a)Pyrene;
- Fine particulates;
- Hydrogen Sulfide;
- Lead;
- Mercury;
- Nitrogen Oxides;
- Sulfur Oxides; and
- Volatile organic compounds.

The proposed conversion to a finished product terminal including the cessation of refining would significantly reduce and potentially eliminate air emissions from the Site which currently require regular monitoring in accordance with EPL 837.

Preliminary Assessment and EIS Scope

There would be potential for air quality impacts during the construction of the Project. These impacts would be localised to the vicinity of works and may include emissions from construction machinery and vehicles, and fugitive dust generation and odours, particularly where earthworks are involved. Impacts can be mitigated through use of dust suppression techniques (e.g. water sprays to exposed areas, covers on truck loads, use of wheel washes) and through use of well maintained machinery.

[3] Found on the World Wide Web: http://www.bom.gov.au/cgi-bin/climate/cgi_bin_scripts/windrose_selector.cgi

4 Environmental Considerations

An air quality assessment would be prepared as part of the EIS, prepared in accordance with relevant guideline documents including the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DECCW 2005).

The assessment of construction activities would provide a discussion on the construction activities required, their potential to adversely affect air quality, and a compilation of mitigation measures associated with the construction phase.

The assessment would also address potential air quality impacts as a result of the operation of the Project. The assessment would recommend both design and management measures to mitigate any potential impacts that are identified, however it is likely that the Project would demonstrate a significant improvement in air emissions following the cessation of refining at the Site.

Potential scope 1 and 2 greenhouse gas emissions from the Project would be calculated and an assessment would be made of the potential emissions on the environment (National Greenhouse Accounts Factors DECC 2008). Reasonable and feasible measures would be recommended to reduce these emissions where possible.

4.2.7 Socio-Economic

Background

The Kurnell refinery employs 430 permanent staff and 300 contractors, giving the facility a total of 730 employees. The construction phase of the Project would involve expenditure over five to seven years and generate associated employment. The numbers of staff employed on Site will fluctuate during the construction phase.

The final operational workforce is currently being determined; however it is anticipated to be between 80-100 employees would provide direct operational or supporting services to the terminal which would operate in a shift arrangement over 24 hours per day 7 days per week.

Employment at the refinery is concentrated mostly around activities associated with the refining and processing units on Site, and these activities would be discontinued following cessation of refining operations. There would also be a reduction in contract labour as most of this effort is expended in the processing areas.

Preliminary Assessment and EIS Scope

An assessment will be undertaken as part of the EIS to determine the socio-economic impacts of the Project on a local and domestic level.

4.2.8 Transport and Access

Background

Captain Cook Drive is the major access road to Kurnell Peninsula and to the Site. It is a State arterial road of six lanes divided by a central median strip along its length from Taren Point Road in the west and Gannons Road in the east. West of Gannons Road, it is a four lane divided road continuing to west of Woolooware Road where it becomes a two lane undivided road into Kurnell village and the refinery. The Princes Highway, Taren Point Road, and Kingsway all link Captain Cook Drive to the wider road network.

The main entrance to the Site is via Solander Street, which is a two lane undivided road. Vehicle access to the Site is also available from Sir Joseph Banks Drive.

Preliminary Assessment and EIS Scope

During construction, there would be a small temporary increase in traffic movements. These movements are likely to be insignificant in terms of typical traffic movements to the Site, as any affected roads are already subject to high levels of traffic as well as heavy vehicle movements. As such, it is not proposed to undertake detailed modelling of traffic volumes during construction.

Following the completion of construction activities, the workforce size at the site would reduce with the resultant traffic flows to and from the site also reduced. Traffic would also decrease due to reduced service groups, deliveries and tanker loading activities on Site.

4.2.9 Waste Management

Background

It is expected that following the cessation of refining there would be changes to the regular operational waste streams at the Site. These include, but may not be limited to, a reduction in air emissions, waste water generation, spent catalysts and a range of processing chemicals and hazardous substances from the Site. The EPL would be amended following the cessation of refining to reflect these changes.

Preliminary Assessment and EIS Scope

The overall change of waste materials generation would be identified during the EIS. The EIS would provide accurate estimates of the quantity and classification of the potential liquid and non-liquid waste streams produced by the construction and operation of the Project. It will include a description of how these will be appropriately handled and managed. This would include consideration of the Waste Classification Guidelines (DECC, 2008), Contaminated Land Management Act 1997 and the Environmentally Hazardous Chemicals Act 1985 as described in **Section 3.2.3**.

4.2.10 Heritage

Background - Aboriginal

The refinery has been on the Site since 1955, and, consequently, the Site is considered to be a highly modified environment.

There are many sites of indigenous heritage significance registered on the Kurnell Peninsula, including shell middens, open camp sites, burials and Potential Archaeological Deposits (PADs). This indicates the significance of the peninsula for past Aboriginal people, who would have lived there for thousands of years.

A search was undertaken of the NSW Atlas of Aboriginal Places. There are no registered Aboriginal Places within 3km of the Site.

A search of the Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) on 25 June 2012 was undertaken for the Site. No Aboriginal Sites are registered within the Site boundary.

Background – Non Aboriginal

The Kurnell Headland (to the north and east of the Site) is listed on the National Heritage List. Kurnell Peninsula Headland is the site where Lieutenant (later Captain) James Cook first set foot on Australian soil in 1770. Kurnell Peninsula was listed on 20 September 2004.

A search was undertaken of the State Heritage Register, and there are no items or places listed on the State Heritage Register in close proximity to the Site.

A number of heritage sites in relation to the Kurnell Peninsular are provided in Schedule 2 of the Kurnell SEPP (refer to **Section 3.2.2**). This includes the listing of the 'Australian Oil Refinery'.

Preliminary Assessment and EIS Scope

Given the existing levels of disturbance at the Site, it is unlikely that the Project would have a significant impact on any indigenous heritage values. Nevertheless, as part of the EIS, a thorough desktop review would be undertaken of registered Aboriginal and non-aboriginal heritage sites.

If required, at appropriate stages in the process, consultation would be undertaken with the local Aboriginal community. Consultation would be in line with the Aboriginal Cultural Heritage Guidelines for Proponents (OEH, 2010).

As the Site is listed as an 'Archaeological Site' under Schedule 2 of the Kurnell SEPP, a detailed heritage assessment would be undertaken as part of the EIS, which would include consultation with the Heritage Council.

4.2.11 Ecology

Background

The Site is a disturbed and highly modified area. The Site is bounded by Kamay Botany Bay National Park to the south, east and north, with a number of other parks and reserves located near the Kurnell Refinery, including:

- Towra Point Nature Reserve;
- Boat Harbour Aquatic Reserve;
- Cape Banks Aquatic Reserve;
- Bonna Point Reserve; and
- Marton Park.

The Kamay Botany Bay National Park incorporates the northern and southern headlands of the entrance to Botany Bay. Vegetation in the Kurnell portion of the park has been prone to extensive clearing historically, however several areas of remnant vegetation occur, including threatened ecological communities listed under the NSW TSC Act. The National Park provides potential habitat for a range of common species, as well as a number of species listed under the TSC Act and EPBC Act. Additionally, numerous species listed under the Japan-Australia Migratory Birds Agreement (JAMBA) have been recorded within the park (NSW NPWS 2002).

Towra Point Nature Reserve is located on the northern side of the Kurnell Peninsula, to the west of the Kurnell Refinery, and forms the south and east shores of Botany Bay. As discussed in **Section 3.1**, Towra Point Nature Reserve is a listed Ramsar site and includes of a variety of habitats such as seagrass meadows, mangroves, saltmarshes, dune woodlands, *Casuarina* forest, small occurrences of littoral rainforest and sand dune grasslands. The vegetation within Towra Point Nature Reserve is considered to be regionally significant. The Ramsar site contains a diverse array of native flora, and supports habitat and potential habitat for a number of threatened species (DSEWPaC 2012).

A number of previous studies have been undertaken for works relating to the Kurnell Refinery, including:

- Flora and Fauna Assessment for a Proposed Development at the Caltex Oil Refinery, Kurnell, Urban Bushland Management Consultants Pty Ltd 2006; and
- Kurnell B Line Upgrade Environmental Assessment, URS 2011.

These reports have identified the potential for threatened biota to occur within terrestrial areas of the Kurnell peninsula and there are previous records of threatened species within the Site boundary. However, the studies show that minimal habitat exists within the Site for threatened biota, and no threatened ecological communities occur within the Site boundary.

Despite the lack of obvious habitat within the Site, as the records show, given the close proximity of the Site to the nearby National Park, Nature Reserve and coastal areas, there is a possibility of a number of threatened and/or migratory species flying over or entering the Site.

Preliminary Assessment and EIS Scope

Given the existing levels of disturbance and the modified nature of the Site, it is considered unlikely that the Project would have the potential to significantly change ecological values on the Site.

Nevertheless, a detailed desktop review will be undertaken as part of the EIS to ensure appropriate assessment of ecological values within the Site, and to adequately assess potential impacts to surrounding sensitive environmental receptors.

The following documentation and databases would be accessed as part of the EIS desktop review:

- The NSW Office of Environment and Heritage Bionet Atlas of NSW Wildlife online database, for previous records of species within the minimum 10 x 10 km^2 centred on the Site;
- A spatial request would be sent to the NSW Office of Environment and Heritage Spatial Data Programs unit, for all previous threatened species records within a 10km radius of the Site;
- The Department of Sustainability, Environment, Water, Population and Communities EPBC Act Protected Matters Search Tool, for all Matters of National Environmental Significance within a 10 km radius of the Site; and
- Previous environmental reports relating to the Site:
  - Flora and Fauna Assessment for a Proposed Development at the Caltex Oil Refinery, Kurnell, Urban Bushland Management Consultants Pty Ltd 2006; and
  - Kurnell B Line Upgrade Environmental Assessment, URS 2011.

Based on the results of the desktop review, an assessment of the potential for threatened biota to occur within the Site would be undertaken. This would involve completing a habitat assessment to determine the presence or absence of potential suitable habitat for threatened species predicted to occur (based on the desktop review results) or previously recorded within the Site. If it is considered that potential habitat for threatened biota exists within the Site boundary, further ecological assessment, including an ecological survey may be required.

An assessment would also be undertaken as part of the EIS to determine if the Project is likely to result in a significant impact to any threatened biota as listed under the NSW TSC Act or any Matter of National Environmental Significance as listed under the EPBC Act.

4.2.12 Visual

Background

The Project and associated plant and equipment would be of a similar industrial nature, and located adjacent to, existing structures at the Site. No demolition of the major structures on Site is included as part of this Project.

Preliminary Assessment and EIS Scope

All works associated with the Project are considered to be minor in terms of visual and amenity impacts and as such a detailed visual impact assessment is not considered required as part of the EIS.

2.2 Cumulative Impacts

Preliminary Assessment and EIS Scope

Other planned or strategic projects in the vicinity of the Project would be confirmed through a review of any relevant development applications currently being lodged or determined with the NSW DP&I, the relevant local planning authorities, and any works that are permissible under self-determination by relevant statutory agencies.

The Cumulative Effects Assessment (CEA) would examine other projects in the Kurnell area that are either being considered or implemented within the planning approval framework in NSW (i.e. those in the public domain, but not yet operational). An appropriate geographic parameter for consideration of other projects (e.g. 1km of the Site) will be established for the CEA. Projects that have shared receptors with the Project will be identified and any cumulative impacts assessed and if possible appropriately mitigated.

5

Prioritisation of Environmental Aspects

5.1 Aspect Identification

As identified in **Section 4**, the environmental aspects for consideration associated with the Project have been identified as:

- Hazards & Risk;
- Soil, Contamination and Health;
- Groundwater;
- Surface water, Wastewater & Flooding;
- Noise & Vibration;
- Air Quality & Odour;
- Greenhouse Gas;
- Socio-Economic;
- Transport and Access;
- Waste Management;
- Heritage;
- Ecology; and
- Visual.

5.2 Prioritisation of Aspects

5.2.1 Approach

The prioritisation of environmental aspects for the Project was based on the need to recognise that a higher degree of investigation and assessment is required for the aspects with the highest level of potential environmental or social risk.

To understand the potential level of risk associated with each aspect, a qualitative risk assessment was conducted. It was generally based upon the methodologies outlined in Standards Australia's document *HB 203:2006 Environmental Risk Management – Principles and Process*, *Australian Standard AS/NZ 4360:2004 Risk Management*, and *AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines*. The analysis categorised levels of risk for a given event based on the significance of effects (consequences) and the manageability of those effects (likelihood).

The consequence and likelihood judgments were based on the following criteria outlined in **Tables 5-1** and **5-2** below.

Table 5-1 Measures of Likelihood Categories for the ESA

Rank	Likelihood	Description
3	Likely	Could easily happen and would probably occur
2	Possible	Could happen and has occurred elsewhere
1	Unlikely	Unlikely to happen

5 Prioritisation of Environmental Aspects

Table 5-2 Measures of Consequence Categories for the ESA

Rank	Consequence	Description
3	Major	Long term detrimental impacts on the environment or population; large impact area; reportable incident to external agency; may result in large fines and prosecution; operational constraints; high level of community concern.
2	Moderate	Substantial temporary or minor long term detrimental impacts on the environment or population; moderate impact area; reportable incident to external agency; action required by reportable agency; community interested.
1	Minor	Minor impacts on the environment or population; small impact area; no operational constraints; some local community interest.

Table 5-3 shows the issues prioritisation matrix used to identify whether the potential environmental or social risks associated with the Project would be considered to be High, Medium or Low prior to further detailed assessment. This matrix uses a traffic light system to highlight high, medium and low risks.

Table 5-3 Aspects Prioritisation Matrix

Likelihood	Consequence		
	3 Major	2 Moderate	1 Minor
1 Unlikely	Medium	Medium	Low
2 Possible	High	Medium	Low
3 Likely	High	High	Medium

5.2.2 Assessment

Issues relevant for each environmental aspect were considered in **Section 4** of this Report and a qualitative assessment in line with the criteria outlined in **Section 5.1.2** was completed.

This assessment aims to prioritise issues for assessment and does not consider the application of mitigation measures to manage environmental effects. In all cases, appropriate and proven mitigation measures, chosen based upon consultation with regulatory authorities and other similar projects would be used to minimise potential impacts. These measures would be described in detail in the EIS.

The prioritisation of environmental aspects related to the Project is provided in **Table 5-4**. This assessment is based on the findings in **Section 4** of this Report.

5 Prioritisation of Environmental Aspects

Table 5-4 Prioritisation of Unmitigated Environmental Aspects

Aspect	Potential Impacts based on unmitigated / inherent risk	Likelihood	Consequence	Priority
Hazard and Risk	Exposure of surrounding population to a hazard or risk via storage of large amounts of hazardous material.	1	2	3 (Medium)
Soils, Contamination and Health	Exposure of surrounding population to a hazard or risk via exposure of historical contaminated material during construction. Erosion impacts during construction. Emission of controlled or uncontrolled hazardous substances during operation.	1	2	3 (Medium)
Groundwater	Spread of existing contamination from the Site into Botany Bay via groundwater.	1	2	3 (Medium)
Surface Water, Wastewater and Flooding	Impact of contaminated stormwater on the quality and ecology of the Botany Bay or surrounding Nature Reserves/National Parks during construction. Impact of contaminated stormwater and effluent on the quality and ecology of Botany Bay or surrounding Nature Reserves/National Parks during operation	1	2	3 (Medium)
Noise and Vibration	Construction noise would be within existing EPL limits. Operational noise would likely decrease following the completion of the Project.	1	1	2 (Low)
Air Quality, Odour and Greenhouse Gas	Emissions during construction and operation of the Project. Greenhouse gas emissions would likely decrease as a result of the Project.	1	2	3 (Medium)
Socio-Economic	The Project would likely result in a decrease in demand for labour at the Site in the long term.	3	1	4 (Medium)
Transport and Access	Traffic related to the construction stage may result in increased vehicles movements to the Site	1	1	2 (Low)
Waste Management	Project waste could be inadequately managed.	1	1	2 (Low)
Heritage	Discovery of culturally significant items on the Site. Inadequate management of the Refinery as a listed Historic Site under Schedule 2 of the Kurnell SEPP.	1	1	2 (Low)
Ecology	The Project could directly or indirectly impact on threatened species in surrounding Nature Reserves/National Parks.	1	2	3 (Medium)
Visual	The visual impact of the Project would be negligible.	1	1	2 (Low)

5.2.3 Findings

The EIS for the Project would focus on the environmental aspects highlighted as 'Medium' Risks in **Table 5-4**. These aspects include:

- Hazard and Risk;
- Soils, Contamination and Health;
- Groundwater;
- Surface Water, Wastewater and Flooding;
- Air Quality, Odour and Greenhouse Gas;
- Socio-Economic; and
- Ecology

These would be subject to a detailed assessment within the EIS. Where necessary mitigation measures would be identified to ensure that the risks associated with these aspects are avoided or mitigated to an acceptable level for regulators and the public.

A number of aspects have been considered as being 'Low Risk' in **Table 5-4**. It has been determined that it is unlikely that the Project would result in any significant environmental impacts in relation to these aspects, either alone or cumulatively in relation to other issues. It is proposed that these issues are discussed at a desktop level within the EIS.

5.3 Conclusion

Caltex is seeking approval for State Significant Development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the works associated with the conversion of the Kurnell Refinery to a finished product terminal.

The purpose of this document is to provide information for the preparation of the Director General's Requirements to inform the content of an Environmental Impact Statement for the Project.

As part of this ESA, issues were prioritised based on the absence of mitigation measures. The objective of the prioritisation process was to identify the issues that require more detailed assessment in the EIS. The outcome of the prioritisation process is summarised in **Table 5-5.**

Table 5-5 Environmental Aspects Prioritisation

Medium Priority Issues	Low Priority Issues
Hazard and Risk	Waste Management
Soils, Contamination and Health	Noise & Vibration
Groundwater	Transport & Access
Surface Water, Wastewater and Flooding	Heritage
Air Quality, Odour and Greenhouse Gas	Visual
Socio-Economic	
Ecology	

5 Prioritisation of Environmental Aspects

These issues will be fully identified and assessed as part of the EIS process. Where necessary mitigation measures will be identified and impacts will be either avoided or mitigated. Where residual impacts remain, these will be taken forward into a cumulative impact assessment.

The local community, including indigenous stakeholders, as well as a number of government and non-government organisations will also be consulted as part of the EIS process.

Upon receipt of the DGRs, Caltex would prepare an EIS and submit the assessment to DP&I as part of the development application process.

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Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Caltex (Refineries) Pty Ltd and only those third parties who have been authorised in writing by URS to rely on this Report.

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It is prepared in accordance with the scope of work and for the purpose outlined in the contract dated 17 July 2012.

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