

Kamay Wharf Project

Preliminary Site Investigation – Kurnell Site

6 December 2022

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Kamay Wharf Project

Preliminary Site Investigation – Kurnell Site



Ian Batterley
Principal



Peter Lavelle
Partner & CEnvP SC (EIANZ)



Ashton Hincksman
Partner

Environmental Resources Management Australia Pty Ltd
Level 14, 207 Kent Street
Sydney NSW 2000

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Acronyms and Abbreviations

Name	Description
ACM	Asbestos Containing Material
AHD	Australian Height Datum
AMG	Australian Map Grid
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CLM	Contaminated Land Management Act 1997
CoPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DP	Deposited Plan
DPI	Department of Primary Industries
DSI	Detailed Site Investigation
EPL	Environment Protection License
ESA	Environmental Site Assessment
m	Metre
m AHD	Metres Above Australian Height Datum
m bgl	Metres Below Ground Level
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	New South Wales Environment Protection Authority
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PFAS	Per and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
POEO Act	Protection of the Environment Operations Act 1997
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
SAQP	Sampling and Analysis Quality Plan
TBT	Tributyltin
TRH	Total Recoverable Hydrocarbons

1. INTRODUCTION AND OBJECTIVES

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by Arup Australia Pty Ltd (Arup) to undertake a Preliminary Site Investigation (PSI) of the Project Area identified as the Kamay Ferry Wharf Project, located in Kurnell, NSW (the Project Area).

ERM understands Transport for New South Wales (Transport for NSW) is seeking approval to reinstate the ferry wharves at La Perouse and Kurnell in Botany Bay (the project) under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) as State significant infrastructure.

The project would allow for an alternative connection between La Perouse and Kurnell rather than by road. The primary purpose of this infrastructure would be to operate a public ferry service to service visitors to the area and by the local community for cultural and recreational purposes. It would also provide supplementary temporary mooring for tourism-related commercial vessels and recreational boating.

The project provides opportunities for significant cultural and economic benefits to the local Aboriginal community by providing improved access to culturally significant sites.

It is also expected to deliver benefits and opportunities to wider communities on either side of Botany Bay such as investment opportunities in a ferry service and other new visitor/tourist experiences

A concept design has been developed for the proposed redevelopment which includes the following key features:

- Two new wharves, one at La Perouse and one at Kurnell that would include:
 - Berth for ferries (to accommodate vessels up to 40m long);
 - Berth for recreational and commercial vessels (to accommodate vessels up to 20m long);
 - Sheltered waiting areas and associated furniture;
 - Additional space within waiting areas to accommodate other users such as fishing and those using recreational vessels; and
 - Signage and lighting.
- Landside paving, access ramps, seating and landscaping at the entrance to the wharves;
- Reconfiguration of existing car parking areas at La Perouse and Kurnell to increase the number of spaces (including provision of accessible parking and kiss-and-ride bays);
- Reconfiguration of footpaths around the new car parking areas; and
- Provision for bike racks at La Perouse.
- Installation of utilities to service the wharves

Information provided to ERM indicates the total construction period is anticipated to take up to 13 months, starting in early 2022. The construction of the two wharves will occur at the same time with landside and waterside works occurring simultaneously.

A concept design has been developed for the project, which forms the basis of this assessment. This PSI has been prepared to support the Environmental Impact Statement (EIS) prepared for the project

The Project Area location is illustrated on **Figure 1** and the current layout is presented on **Figure 2**.

1.1 Objective

The objective of these works was to undertake a Preliminary Site Investigation (PSI) that refines the current understanding of the Project Area and aids Arup in assessing potential constraints associated with site contamination that may require consideration prior to or during development of the proposed Kamay Ferry Wharf (the Project).

1.2 Scope of Works

To meet the project objective, ERM completed the following scope of works:

- Review of background information relating to the Project Area, including:
 - Information relating to surface water discharge conditions and sample results;
 - The NSW Environment Protection Authority (EPA) Contaminated Land Register;
 - Historical aerial photographs;
 - Land titles information;
 - Registered groundwater bore information;
 - Relevant government databases; and
 - Published soil, geology and topographic maps.
- Preparation of this PSI report.

Investigative work was conducted with reference to relevant parts of the following guidelines:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM (1999)) (as amended May 2013) - herein referred to as the ASC NEPM (2013);
- NSW EPA (2017). *Guidelines for the NSW Site Auditor Scheme* (3rd edition); and
- NSW EPA (2020). *Consultants reporting on contaminated land – Contaminated land guidelines*.

2. PROJECT AREA IDENTIFICATION

The Project Area identification information is presented within the table below:

Table 2.1 – Site Identification Details

Item	Description
Site Address	<ul style="list-style-type: none"> ■ Proposed Kamay Ferry Wharf. Captain Cook Drive, Kurnell, NSW
Site Owner	<ul style="list-style-type: none"> ■ Waterways Authority ■ The State of NSW ■ Sutherland Shire Council
Legal Description	<ul style="list-style-type: none"> ■ Part Lot 71 DP 908; and ■ Part Lot 3 DP 1165618
Local Government Area	<ul style="list-style-type: none"> ■ Sutherland Shire Council
Current Zoning	<ul style="list-style-type: none"> ■ E1 – National Parks and Nature Reserves ■ E2 – Environmental Conservation ■ W1 – Natural Waterways ■ B1 – neighbourhood Centres
Geographical Co-Ordinates	<ul style="list-style-type: none"> ■ 34°00'22"S 151°33'00" E (approximate centre of Site)
Site Location and Site Layout	<ul style="list-style-type: none"> ■ Figure 1 and Figure 2

3. SITE BACKGROUND REVIEW

3.1 Site Setting

The following sections summarise the information obtained during the Project Area background and history review.

Copies of all database search results are provided in **Appendix B**.

Table 3.1 – Site Setting

Item	Description
Project Area	Approximately 28.5 ha (including land and water portions of the Project Area)
Current land-use	The Project Area is currently comprised of undeveloped recreational land (beach, open grass parkland and vegetated bushland), open water (Botany Bay) and public roadways,
Proposed Future Use	Re-instatement of public ferry wharves and associated infrastructure at La Perouse and Kurnell in Botany Bay
Surrounding Land use	The land uses surrounding the Project Area include: <ul style="list-style-type: none"> ■ North: Botany Bay; ■ South: Low density residential dwellings then the former Kurnell refinery (Caltex Kurnell Terminal); ■ East: Undeveloped recreational bushland then Botany Bay / Pacific Ocean; and ■ West: Low density residential dwellings (suburb of Kurnell) followed by undeveloped bushland / wetlands and then Quibray Bay.
Site Elevation	Between 0 – 4 m Australian Height Datum (AHD)
Topography	<ul style="list-style-type: none"> ■ Regional topography is generally flat with a slight slope to the north / north east. The portion of the Project Area located on land slopes to the north in the direction of Botany Bay.
Hydrology	<ul style="list-style-type: none"> ■ The portion of the Project Area located on land was observed to be comprised of a public road way in the south western portion, of the Project Area, a public beach within the northern portion of the Project Area and undeveloped recreational land in the eastern portion. ■ During periods of rainfall, it is anticipated that surface waters would either flow into stormwater infrastructure located within Captain Cook Drive, infiltrate the Project Area surface in unsealed portions of the Project Area or flow offsite to the adjacent Botany Bay.
Geology, Soils and Acid Sulfate Soils	<p>Geology mapping provided by NSW Planning and Environment – resources and energy indicates the Project Area is underlain by an unnamed Quaternary formation comprising coarse quartz sands, varying amounts of shell fragments and clean to muddy, shelly, mostly marine sand overlying the Triassic Hawksbury Sandstone Formation comprising medium to coarse-grained quartz sandstone with minor shale and laminite lenses.</p> <p>Soils within the Project Area are described as:</p> <ul style="list-style-type: none"> ■ Deep podzols of dunes within swales and organic peats within swamp areas. <p>Mapping indicated that the western portion of the Project Area was comprised of class 1, class 3 and class 5 Acid Sulfate Soils (ASS). Mapping indicated that there was a high probability of ASS occurring within subtidal marine sediments.</p>
Hydrogeology	<p>Information from NSW Department of Primary Industries' and the Bureau of Meteorology indicated the following:</p> <ul style="list-style-type: none"> ■ A search of registered groundwater bores identified 11 bores within the 2 km search radius. Standing water levels were measured between 0 m below ground level (bgl) to 3.0 m bgl. Registered bores were utilised for arrange of purposes including water supply, domestic, household, monitoring and water supply bores. ■ Drillers logs indicated that groundwater was identified within unconsolidated sand and clayey sand.

3.1.1 Aerial Photographs

Historical aerial photographs (**Appendix B**) were reviewed to assess potential historical land use practices undertaken within and surrounding the Project Area. A summary of information obtained from the review is presented within the table below. ⁴

Table 3.2 – Aerial Photography

Year	Description
1956 – Black and White	<ul style="list-style-type: none"> ■ Project Area: The Project Area appears to be comprised of undeveloped land with scattered vegetation. Several access tracks are visible across the Project Area area. Captain Cook Drive is present in its current alignment but appears to be unsealed. ■ Surrounding Area: The area surrounding the Project Area is comprised of Botany Bay to the north of the Project Area, undeveloped bushland (Kamay Botany Bay National Park) located to the south and east of the Project Area, low density residential dwellings to the west and the Kurnell Refinery / Caltex Terminal located to the south of the Project Area. The oil refinery wharf extending from the Kurnell refinery into Botany Bay is located approximately 500 m to the west of the Project Area.
1961 – Black and White	<ul style="list-style-type: none"> ■ Project Area: A small jetty appears to be present within the central portion of the Project Area extending from the beach area into Botany Bay. . ■ Surrounding Area: No significant changes since previous aerial photography.
1970 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: Captain Cook Drive appears to have been sealed. Residential development has increased to the west of the Project Area with additional low density dwellings present along Captain Cook Drive.
1972 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
1975 – Black and White	<ul style="list-style-type: none"> ■ Project Area: Significant sedimentation appears to have occurred within the Project Area boundary. Approximately 50% of the water side portion of the Project Area now appears to be sediments above the water line. The Jetty that was present within the 1961 imagery has been demolished. ■ Surrounding Area: No significant changes since previous aerial photography within the landside portion of the Project Area. Significant sedimentation has occurred among the coastline with damage visible to the adjacent terminal wharf / jetty present.
1978 – Black and White	<ul style="list-style-type: none"> ■ Project Area: The abovementioned sedimentation appears to have been removed from the Project Area. The Project Area area is consistent with aerial photography from 1972. ■ Surrounding Area: The surrounding area is consistent with aerial photography from 1972.
1979 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography
1980 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography
1983 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
1988 – Black and White	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photograph. ■ Surrounding Area: No significant changes since previous aerial photography.
1990 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography
1994– Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography
1998 – Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography
2002 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography

Year	Description
2004 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2005 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2007 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2009 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2011 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2014 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2017 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.
2020 - Colour	<ul style="list-style-type: none"> ■ Project Area: No significant changes since previous aerial photography. ■ Surrounding Area: No significant changes since previous aerial photography.

3.1.2 Land Titles

A land titles search was conducted as part of the site background review and is included in **Appendix C**.

A review of the land titles search did not reveal any additional information in regards to contamination.

3.1.3 Historical Business Records

A search of historical business records for the Project Area and surrounding area was undertaken of records held between the 1930s to the 1990s. The results of the search area summarised below, and a copy of historical business records is provided within **Appendix B**.

Table 3.3 – Historical Business Records

Year	Registered Business Types	Potential Contaminants
1930	<ul style="list-style-type: none"> ■ No records 	<ul style="list-style-type: none"> ■ N / A
1940	<ul style="list-style-type: none"> ■ Chemical Manufacturing; ■ Electrical Accessories Manufacturing; and ■ Lacquer, Paint & Varnish Manufacturing. 	<ul style="list-style-type: none"> ■ TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics
1965	<ul style="list-style-type: none"> ■ Retail Grocers; and ■ Light Carriers. 	<ul style="list-style-type: none"> ■ TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics
1970	<ul style="list-style-type: none"> ■ Mixed business; and ■ Dog and Cat Breeders. 	<ul style="list-style-type: none"> ■ TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics
1980	<ul style="list-style-type: none"> ■ Glass merchants; ■ Carpenters and Joiners; ■ Patternmakers / engineering; ■ Concrete Contractors; and ■ Glass Merchants. 	<ul style="list-style-type: none"> ■ TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics
1990	<ul style="list-style-type: none"> ■ Patternmakers / engineering. 	<ul style="list-style-type: none"> ■ TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics

Year	Registered Business Types	Potential Contaminants
2005	<ul style="list-style-type: none"> ■ Air conditioning (commercial / industrial); ■ Demolition Contractors; ■ Nurseries; and ■ Paving / Concrete. 	<ul style="list-style-type: none"> ■ PFAS, Asbestos, TRH, BTEX, SVOCs, VOCs, Heavy Metals, Nutrients and Inorganics
2010	<ul style="list-style-type: none"> ■ House construction ; ■ Garage doors; and ■ Building and industrial cleaning. 	<ul style="list-style-type: none"> ■ Asbestos, TRH, BTEX, SVOCs, VOCs, Heavy Metals and Inorganics

3.1.4 NSW EPA PFAS Investigation Program

A search of the NSW EPA Per and Polyfluoroalkyl Substances (PFAS) investigation program database indicated that the following PFAS investigations had been or were being undertaken at the Project Area nor within the 2 km report buffer area:

Table 3.4 – NSW EPA PFAS Program

Site Name	Description	Source	Distance from Site
Botany Bay area	<ul style="list-style-type: none"> ■ The number of potential sources of PFAS in the area makes it difficult to attribute detections in Botany Bay to individual sources. PFAS was detected in sediment, surface and groundwater. ■ Fishing restrictions were introduced at the end of 2017 for Botany Bay area. None of the reported PFAS concentration data from Botany Bay have been released. 	<ul style="list-style-type: none"> ■ State-wide PFAS investigation program 	<ul style="list-style-type: none"> ■ Onsite
Kurnell: Caltex	<ul style="list-style-type: none"> ■ Caltex is investigating potential PFAS contamination stemming from the historical use of firefighting foams at its Kurnell refinery. Sampling has shown PFAS detections both on and offsite. ■ Further investigations are ongoing to help determine the extent of the contamination and if there are any ways local residents might come into contact with these chemicals. 	<ul style="list-style-type: none"> ■ State-wide PFAS investigation program 	<ul style="list-style-type: none"> ■ 225 m South East

3.1.5 NSW EPA Contaminated Lands Records of Notice

A search of the NSW EPA contaminated land database under the Contaminated Land Management Act 1997 (CLM Act 1997) undertaken for the Project Area and a 1 km buffer area indicated the following sites are recorded on the NSW EPA contaminated land record of notices:

Table 3.5 – NSW EPA Contaminated Land records of Notice

Site Name	Site ID	Address	Notices	Distance (m)	Direction
Caltex Kurnell Terminal	3200	2 Solander Street Kurnell	1 current and 5 former	225	South east

3.1.6 NSW EPA Contaminated Land Search

A search of the NSW EPA contaminated land database under the CLM Act 1997 undertaken for the Project Area and a 1 km buffer area indicated the following have been notified to NSW EPA:

Table 3.6 – NSW EPA Contaminated Land Search

Site Name	Address	Activity that caused Contamination	EPA Site Management Class	Distance (m)	Direction
Caltex Kurnell Terminal	2 Solander Street Kurnell	Other Petroleum	Contamination Currently regulated under the Protection of the Environment Operations Act 1997 (POEO Act)	225	South east
Former Caltex Kurnell Service Station	Corner Captain Cook Drive and Solander Street Kurnell	Service Station	Regulation under CLM Act not required	848	South west

3.1.7 National Pollutant Inventory Industrial Facilities

A search of the National Pollutant Inventory (NPI) register indicated the following sites to be located within the 500 m search buffer area:

Table 3.7 – National Pollutant Inventory Industrial Facilities

Facility Name	Address	Primary ANZSIC Class	Latest Report	Distance from Site (m)	Direction
Caltex Kurnell Terminal	2 Solander Street Kurnell	Petroleum Refining and Manufacturing	2018/2019	225	South east

3.1.8 Licensing under the POEO Act 1997

A search of the NSW EPA record of licensed activities under the *Protection of the Environment Operations Act 1997* undertaken for the Project Area and 500 m buffer area identified the following sites:

Table 3.8 – Licensing under the POEO Act

Licence Holder	EPL Number	Location Name	Premise Address	Fee Based Activity	Distance to Site	Direction
Caltex refineries (NSW) Pty Ltd	837	Caltex refineries (NSW) Pty Ltd	2 Solander Street Kurnell	Chemical storage waste generation, petroleum products storage, shipping in bulk	225	South east

3.1.9 Delicensed Premises still Regulated by EPA, Licenses Surrendered, Clean Up and Penalty Notices

A search of the NSW EPA record of licensed activities under the *POEO 1997* undertaken for the Project Area and 1 km buffer area identified the following sites:

Table 3.9 – Surrendered Licences

License holder	No.	Name	Premise Address ¹	Fee Based Activity	Status	Distance (m)	Direction
Ausgrid	13112	Botany Bay Cable Project	Botany Bay	Licensed discharge to water	Surrendered	0	onsite
Caltex Refineries (NSW) Pty Ltd	6605	Caltex Refineries (NSW) Pty Ltd	2 Solander Street Kurnell	Licensed discharge to water	Surrendered	363	north

3.1.10 Clean up Penalty Notices

A search of the NSW EPA cleanup notices issued *Protection of the Environment Operations Act 1997* undertaken for the Project Area and 1 km buffer area identified the following sites:

Table 3.10 – Clean Up and Penalty Notices

Location ID	Notice no.	Notice Type	Licence Holder	Location Name	Address	Distance (m)	Direction
768	1505450	Penalty Notice	Caltex Refineries (NSW) Pty Ltd	Caltex Refineries (NSW) Pty Ltd	2 Solander Street Kurnell	225	South
768	1515756	Penalty Notice					
768	1526923	Penalty Notice					
768	1535959	Penalty Notice					
768	1041406	s.91 Clean-up Notice	Caltex Australia Petroleum Pty Ltd				
768	1041460	s.91 Clean-up Notice					
768	1041670	s.91 Clean-up Notice					
768	1115113	s.91 Clean-up Notice	Caltex Refineries (NSW) Pty Ltd				
768	1115881	s.91 Clean-up Notice					
768	1521201	s.91 Clean-up Notice					
768	1521564	s.91 Clean-up Notice					

3.1.11 Potentially Contaminating Activities

A search of potentially contaminating land uses within the Project Area and surrounding buffer area identified the following sites:

- Kurnell fuel terminal located 225 m to the south east of the Project Area (**Figure 3**).

Search results did not identify any of the following land uses within the search buffer area:

- Cattle Dip Sites;
- Dry Cleaners;
- Fire Rescue Sites;
- Gas Terminals;
- Mines and / or Quarries;
- Petrol Stations;
- Power Stations;
- Substations;
- Telephone Exchanges;
- Waste Management Facilities; and
- Water Treatment Facilities.

4. SITE INSPECTION

A site inspection to confirm that nature of current land uses was undertaken on 30 July 2020 by Ian Batterley, a suitably qualified and experienced ERM environmental scientist. Observed site features are presented on **Figure 2**.

The Project Area is accessed via Captain Cook Drive located within the western portion of the Project Area. At the time of the Project Area inspection, the majority of the Project Area was comprised of unsealed land including a beach area within the north western portion of the Project Area, undeveloped bushland (Botany Bay National Park) located within the central and eastern portions of the Project Area and Botany Bay located within the Northern portion of the Project Area.

- During inspection works, the Project Area was generally flat with a slight slope to the north in the direction of Botany Bay. While no surface waters (on the landside portion of the Project Area) were present during the Project Area inspection, during periods of rainfall it is considered likely that surface waters present within sealed portions of the Project Area would likely be directed to stormwater infrastructure located along Captain Cook Drive. Surface waters within unsealed portions of the Project Area would likely infiltrate the Project Area surface or flow towards Botany Bay located immediately north of the land portion of the Project Area.
- During the Project Area inspection, no evidence (vents, risers, filler points etc.) of fuel / chemical storage or illegal waste disposal / buried drums etc. was noted.
- There was no evidence of sheen / odours within surface waters (Botany Bay) that indicated the presence of anthropogenic contamination.
- Vegetation surrounding the Project Area appeared to be generally healthy and free from obvious signs of stress.

5. CONCEPTUAL SITE MODEL

5.1 Potential Sources of Contamination

Based on the Project Area history and background data reviewed and ERM's professional experience, the Contaminants of Potential Concern (CoPC) associated with current and historical land uses undertaken in the general area are considered to include the following:

Potential Source	CoPC	Potentially Affected Media	Comment
Uncontrolled fill	<ul style="list-style-type: none"> ■ Asbestos, total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene and xylenes (BTEX); semi-volatile organic compounds (SVOCs), Volatile Organic Compounds (VOCs), heavy metals, polycyclic aromatic hydrocarbons (PAHs), phenols, OCP / OPP 	<ul style="list-style-type: none"> ■ Soil ■ Groundwater ■ Sediments ■ Surface Water 	<ul style="list-style-type: none"> ■ Potential for uncontrolled fill materials to have been imported to the Project Area from adjacent industrial sites / unknown sources during construction of roadways and other minor construction works within the Project Area.
Historical onsite and surrounding land uses	<ul style="list-style-type: none"> ■ Per- and Polyfluoroalkyl Substances (PFAS), Tributyltin (TBT), ASS, TRH, BTEX, SVOCs, VOCs, Heavy Metals, Nutrients and Inorganics 	<ul style="list-style-type: none"> ■ Soil ■ Groundwater ■ Sediment ■ Surface Water 	<ul style="list-style-type: none"> ■ The Kurnell refinery is located approximately 235 m to the south of the Project Area (inferred hydraulically downgradient). ■ The northern portion of the Project Area was identified to contain a former pier / jetty area. ■ The fuel terminal jetty is located approximately 200 m to the west of the Project Area and is utilised for loading of large transport ships which was damaged during a storm in the 1970s. ERM notes that this may have resulted in the loss / spill of fuels / oils into surrounding environment. ■ PFAS contamination may be present from surrounding industrial properties and other sites discharging to Botany Bay potentially impacting surface water and sediment. ■ Nutrient / inorganic compounds may be present within sediments located within the intertidal zone. ■ ASS mapping indicates the likely presence of ASS within intertidal sediments
Hazardous building materials	<ul style="list-style-type: none"> ■ Asbestos, PCBs, lead. 	<ul style="list-style-type: none"> ■ Soil ■ Groundwater 	<ul style="list-style-type: none"> ■ While no evidence of illegal dumping was noted during the Project Area inspection, the potential for historically dumped waste materials within portions of the Project Area (particularly bushland areas) should be considered.

5.2 Potential Pathways

The primary potential exposure pathways of concern at the Project Area are:

- Inhalation of vapour (from soil and/or groundwater) and contaminated dust (from soils);
- Dermal contact and / or incidental ingestion with contaminated surface water and soils / sediments;
- Transport of contamination through surface water flows;
- Transport of contamination to underlying groundwater aquifers; and
- Transport / mobilisation of contaminants through mechanical transport during construction works.

5.3 Potential Receptors

Key receptors have been identified as:

- Current site users (recreational);
- Future site users (recreational and commercial / industrial);
- Potential future users of groundwater;
- Workers carrying out installation or maintenance works within the Project Area;
- Groundwater beneath the Project Area;
- Adjacent sensitive residential receptors; and
- Adjacent sensitive ecological receptors such as the national park and surface water bodies including Botany Bay.

5.4 Conceptual Site Model

Based on the results of the desktop assessment, site inspection and the potential sources, pathways and receptors identified above ERM developed the below Conceptual Site Model (CSM).

Table 5-1 – Conceptual Site Model

Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment
Uncontrolled fill	Dermal contact and / or incidental ingestion with contaminated surface waters / soils.	<ul style="list-style-type: none"> ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Low - Moderate	<ul style="list-style-type: none"> ■ Potential for uncontrolled fill materials to have been imported to the Project Area from adjacent industrial sites / unknown sources during construction of roadways and other minor construction works within the Project Area.
	Transport of contamination through surface water flows.	<ul style="list-style-type: none"> ■ Adjacent sensitive receptors; ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Low	
	Transport of contamination to underlying groundwater aquifers	<ul style="list-style-type: none"> ■ Adjacent sensitive receptors; and ■ Future potential on-site users of groundwater. 	Low	
	Transport of contaminants through mechanical transport	<ul style="list-style-type: none"> ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Low - Moderate	
Historical onsite and surrounding land uses	Dermal contact and / or incidental ingestion with contaminated surface waters / soils.	<ul style="list-style-type: none"> ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Low	<ul style="list-style-type: none"> ■ The Kurnell refinery is located approximately 200 m to the south of the Project Area. ■ The northern portion of the Project Area was identified to contain a former pier / jetty area. ■ The fuel terminal jetty is located approximately 200m to the west of the Project Area and is utilised for loading of large transport ships.
	Transport of contamination through surface water flows.	<ul style="list-style-type: none"> ■ Adjacent sensitive receptors; ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Moderate	

Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment
	Transport of contamination to underlying groundwater aquifers	<ul style="list-style-type: none"> ■ Adjacent sensitive receptors; and ■ Future potential on-site users of groundwater. 	Moderate - High	<ul style="list-style-type: none"> ■ PFAS contamination may be present from surrounding industrial properties and other sites discharging to Botany Bay resulting in potential impact to surface water and sediments. ■ Nutrient / inorganic compound may be present within sediments located within the intertidal zone ■ ASS mapping indicates the likely presence of ASS within intertidal sediments ■ ERM notes that based on the likely saline nature of groundwater within the Project Area, the onsite use of groundwater for beneficial purposes is unlikely.
	Transport of contaminants through mechanical transport (during excavation of sediments etc)	<ul style="list-style-type: none"> ■ Workers carrying out development, installation or maintenance works within the Project Area. 	High	
Hazardous building materials	Inhalation of contaminated dust / fibres.	<ul style="list-style-type: none"> ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area 	Low - Moderate	<ul style="list-style-type: none"> ■ While no evidence of illegal dumping was noted during the Project Area inspection, the potential for duped waste materials within portions of the Project Area (particularly bushland areas) should be considered.
	Transport of contaminants through mechanical transport	<ul style="list-style-type: none"> ■ Current and future site users; and ■ Workers carrying out development, installation or maintenance works within the Project Area. 	Low - Moderate	

6. QUALITATIVE EVALUATION OF ENVIRONMENTAL RISK

As outlined within the CSM presented above, ERM considers there may be a potential risk to human health / ecological receptors due to the following potentially complete pollutant linkages identified at the Project Area:

- Potential uncontrolled fill materials associated with construction of the existing roadways or levelling / site filling purposes;
- Historical onsite and surrounding land uses including (but not limited to) the adjacent Caltex Kurnell Refinery which is currently regulated by the NSW EPA; and
- Potential impacted surface materials resulting from illegal dumping of waste materials.

Based on information reviewed as part of this PSI, it is the opinion of ERM that the risk to current onsite human health is generally considered to be low. ERM notes that where the Project Area is to be redeveloped and / or Arup require a greater understanding of liabilities or to inform site management controls a Detailed Site Investigation (DSI) of soil and groundwater conditions should be undertaken to assess the contamination status of the Project Area.

Prior to undertaking investigation works, a Sampling and Analysis Quality Plan (SAQP) detailing the requirements for further investigation should be developed. While the specific requirements of the investigation would be detailed within the SAQP, ERM considers that the DSI should be undertaken on a targeted basis in consideration of the identified contaminants of potential concern (CoPCs) and include an assessment of soil and groundwater as follows:

- a targeted sampling approach to assess potential point sources of contamination such as potential uncontrolled fill and contaminated soils, sediment, surface and groundwater associated with historical onsite and offsite land uses; and
- the collection of background samples to ensure collected results are assessed in consideration of naturally occurring conditions.

7. CONCLUSIONS AND RECOMENDATIONS

ERM was engaged by Arup to undertake a PSI at the Project Area identified the Kamay Ferry Wharf Project located in Kurnell, NSW (the Project Area).

The objective of these works was to undertake a PSI that refines the current understanding of the Project Area and aids Arup in assessing potential constraints associated with site contamination that may require consideration prior to or during development of the proposed Kamay Ferry Wharf.

To meet the above objectives, ERM undertook a PSI including a review of the NSW EPA contaminated land register, historical aerial photographs, groundwater-bore information; relevant government databases, published soil, geology and topographic maps and a site inspection.

The results of the PSI indicated the following:

- The Project Area is located in predominantly public open space comprising beach area, parkland and undeveloped bushland associated with Botany Bay National Park with the northern portion of the Project Area extending into Botany Bay;
- The Project Area is underlain by a quaternary formation comprising coarse quartz sands, varying amounts of shell fragments and clean to muddy, shelly, mostly marine sand overlying the Triassic Hawksbury Sandstone Formation comprising medium to coarse-grained quartz sandstone with minor shale and laminate lenses.
- Groundwater within the surrounding area was identified at depths between 0 m bgl to 3.0 m bgl with registered bores utilised for a range of purposes including domestic, household, monitoring and water supply bores.
- Historical records indicate the Project Area has largely been vacant since the 1950s with minor construction works of a small jetty / pier in the 1970s. The surrounding area has comprised low density residential to the west, open space / bushland to the east and the Kurnell refinery to the south since the 1950's to present time.

Based on information reviewed as part of this PSI, ERM considers there to be a potential risk to human health / ecological receptors due to the following potentially complete pollutant linkages identified at the Project Area:

- Potential uncontrolled fill materials associated with construction of the existing roadways or levelling / site filling purposes;
- Historical onsite and surrounding land uses including (but not limited to) the adjacent Caltex Kurnell Refinery which is currently regulated by the NSW EPA; and
- Potential impacted surface materials resulting from illegal dumping of waste materials;

ERM further notes that based on the proposed construction method, the potential release of contamination within subsurface soils, sediments requires consideration during the design of construction environmental controls.

It is the opinion of ERM that based on the results of this PSI, to provide greater certainty on the potential constraints associated with contamination an intrusive investigation of soil, sediment, surface water and groundwater should be undertaken to more accurately assess the contamination status of the Project Area.

APPENDIX A FIGURES



Data Source:
 Site Boundary : Client Provided
 NSW DFSI, DCDB/DTDB, 2020
 Nearmap Imagery September 2020
 Locality : Esri OpenStreetMap, 2020

Legend

- Project Area
- Local Government Area
- Cadastre (Lot)
- National Park
- Nature Reserve
- Road Network

Site Location - Kurnell Wharf Site

F1a

Drawing No: 0564417s_PSI_G001_R0.mxd	Preliminary Site Investigation - Kamay Wharf Project
Date: 02/12/2020	Kurnell, NSW
Drawn By: GC	Client: Arup Australia Pty Ltd
Reviewed By: IB	
Coordinate System: GDA 1994 MGA Zone 56	
0 250 500 750m	
	<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>





Legend

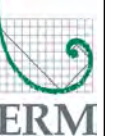
- ▭ Project Area
- ▭ Construction Boundary
- ▭ Car Park (Disturbance Areas)
- ▭ Landscaping (Disturbance Areas)
- ▭ Utilities Trench (Disturbance Areas)
- ▭ Cadastre (Lot)
- ▭ National Park
- Ferry Design (Concept)
- Car Park Design
- Proposed Utilities:**
- - - Comms
- · - · Electrical
- Fire Main
- - - Water
- Stormwater

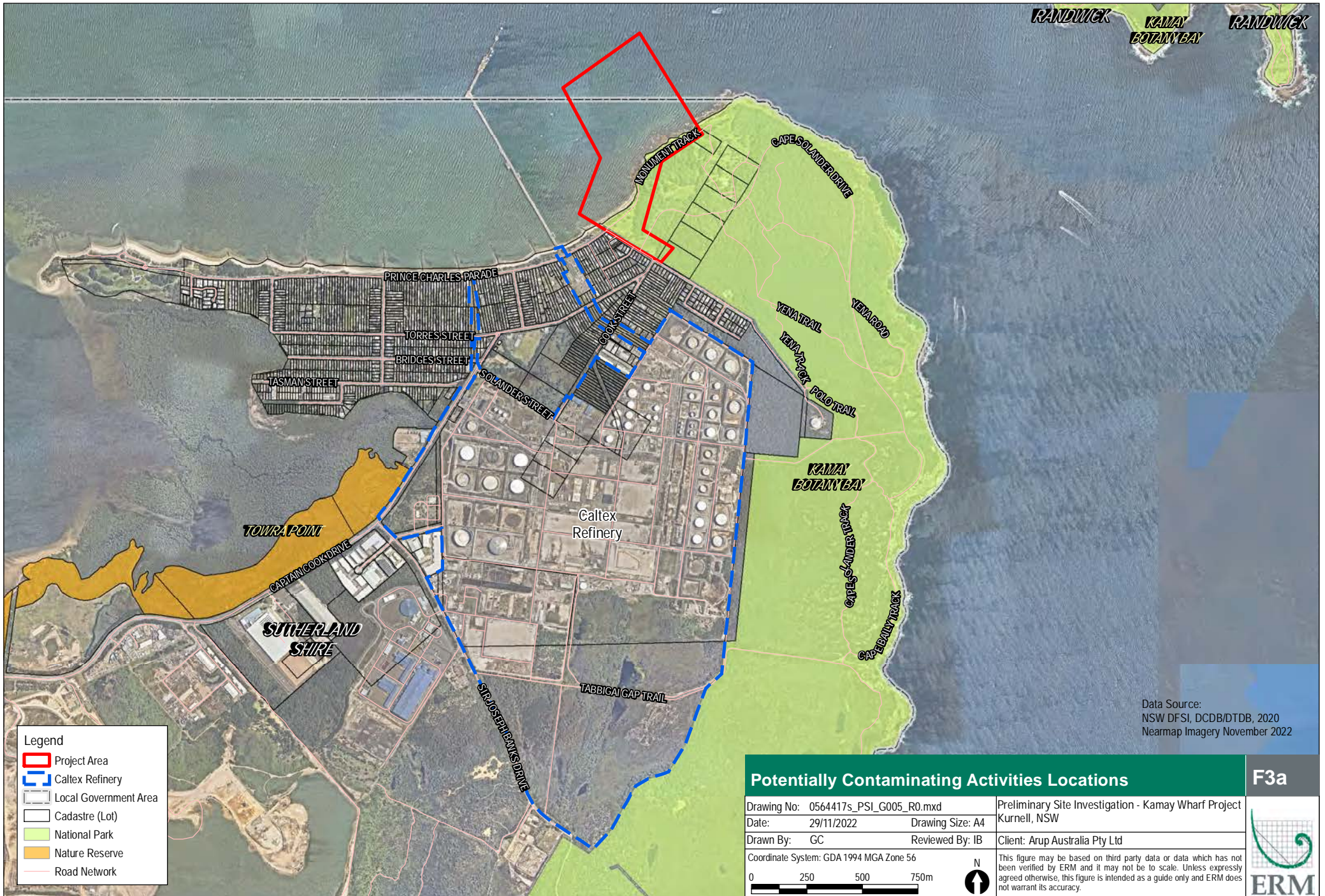
Data Source:
 Site Layout : Client Provided
 NSW-DFSI-BCDB/DTDB, 2020
 Nearmap Imagery September 2020

Site Layout - Kurnell Wharf Site

F2a

Drawing No: 0564417s_PSI_G003_R1.mxd Date: 02/12/2020 Drawn By: GC Coordinate System: GDA 1994 MGA Zone 56 0 25 50 75m	Drawing Size: A3 Reviewed By: IB Client: Arup Australia Pty Ltd This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
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Legend

- Project Area
- Caltex Refinery
- Local Government Area
- Cadastre (Lot)
- National Park
- Nature Reserve
- Road Network

Data Source:
NSW DFSI, DCDB/DTDB, 2020
Nearmap Imagery November 2022

Potentially Contaminating Activities Locations

F3a

Drawing No: 0564417s_PSI_G005_R0.mxd	Preliminary Site Investigation - Kamay Wharf Project	
Date: 29/11/2022	Drawing Size: A4	Kurnell, NSW
Drawn By: GC	Reviewed By: IB	Client: Arup Australia Pty Ltd
Coordinate System: GDA 1994 MGA Zone 56		
<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>		



APPENDIX B DESKTOP SEARCH RESULTS



DUE DILIGENCE *INSIGHT* REPORT

Property Details

Proposed Wharf Site, Kurnell NSW

Search Date: 28 July 2020

Executive Summary

Dataset	Identified	Not identified
Sensitive Receptors	▲	
Planning Controls	▲	
Soil Landscape	▲	
Salinity		▲
Radon	▲	
Acid Sulfate Soil	!	
Geology	▲	
Naturally Occurring Asbestos Potential (NOA)		▲
Topography	▲	
Hydrogeology	▲	
Groundwater Bores	▲	
Groundwater Dependent Ecosystems	▲	
Other Bores	!	
Environmental Registers, Licences and Incidents		
Contaminated Land Record of Notices	▲	
Sites Notified as Contaminated to the NSW EPA	▲	
Potentially Contaminated Areas		
<i>Defence Sites (current, former and RCIP)</i>		▲
<i>Former Gasworks Sites</i>		▲
<i>PFAS Sites</i>	!	
Licensing under the POEO Act		
<i>Licences</i>	!	
<i>Surrendered Licences still Regulated by EPA</i>	!	
<i>Clean Up and Penalty Notices</i>	!	
NPI Industrial Facilities	!	
Public Register of Properties Affected by Loose-Fill Asbestos Insulation		▲
Other Potentially Contaminating Activities		
<i>Contamination Legacy Areas</i>		▲
<i>Derelict Mines and Quarries</i>		▲
<i>Historical Landfills</i>		▲
<i>Unexploded Ordnance (UXO) Sites - Department of Defence (DoD)</i>		▲
<i>Aviation Fuel Depots/Terminals</i>		▲
<i>Cattle Dip Sites</i>		▲
<i>Dry Cleaners</i>		▲
<i>Liquid Fuel Depots/Terminals</i>	!	
<i>Fire and Rescue Sites</i>		▲
<i>Gas Terminals</i>		▲
<i>Mines and Quarries</i>		▲
<i>Power Stations</i>		▲
<i>Service Stations</i>		▲
<i>Substation/Switching Station</i>		▲
<i>Telephone Exchanges</i>		▲
<i>Waste Management Facilities</i>		▲
<i>Wastewater Treatment Facilities</i>		▲
Current Commercial & Trade Directory Data		▲
Historic Commercial & Trade Directory Data	!	
Other Environmental Constraints		
Federal, State and Local Heritage	!	
Natural Hazards	!	
State Environmental Planning Policy (Coastal Management)	!	

Understanding your Report

Your Report has been produced by Land Insight and Resources (LI Resources).

Your Report is based on information available from public databases and sources at the date of reporting. The information gathered relates to land that is within a **200 to 2000 m radius** (buffer zone) from the boundaries of the Property. A smaller or larger radius may be applied for certain records (as listed under records and as shown in report maps).

While every effort is made to ensure the details in your Report are correct, LI Resources cannot guarantee the accuracy or completeness of the information or data provided.

The report provided by LI Resources includes data listed on page 3 (table of contents). All sources of data and definitions are provided on the report maps and as listed in the Product Guide (Attached). For a full list of references, metadata, publications or additional information not provided in this report, please contact LI Resources at info@liresources.com.au.

The report does not include title searches; dangerous good searches or; property certificates (unless requested); or information derived from a physical inspection, such as hazardous building materials, areas of infilling or dumping/spilling of potentially contaminated materials. It is important to note that these documents and an inspection can contain information relevant to contamination that may not be identified by this Report.

This Report, and your use of it, is regulated by LI Resources Terms and Conditions (See LIR Product Guide).

Land Insight and Resources

ABN 70 167 080 837

phone: + 61 2 9979 1720

e-mail: info@liresources.com.au

<https://liresources.com.au/>

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Section 1 - Property Setting

1.1 SITE LOCATION MAP AND SENSITIVE RECEPTORS

Map 1 (200m Buffer)

Sensitive receptor	Category	Distance (m)*	Direction
Kamay Botany Bay National Park	Parks and Reserves	0	Onsite

*Distance from the sensitive receptor point feature to the site boundary centroid.

1.2 PLANNING CONTROLS

Map 2 (onsite)

Zoning

Zoning		
	E1 E2 W1 B1	National Parks and Nature Reserves Environmental Conservation Natural Waterways Neighbourhood Centre

Environmental Planning Instruments

Type	Local Environmental Plan	Classification
Local Provisions	Sutherland Shire Local Environmental Plan 2015	Activity Hazard Risk (Refinery Risk Area)

1.3 SOIL AND LAND USE INFORMATION

Map 3a/3b (onsite)

Soil Landscape

Soil Landscape	AEkn	KURNELL	Soil Group	AEOLIAN
Description	<p>Landscape - gently undulating to rolling coastal dunefields and relict dunes. Local relief to 15m, slope gradients 1-10%. North-south oriented dunes with convex narrow crests, broad (1000m-2000m) gently include concave swales and isolated swamps. Extensive heathland.</p> <p>Soils - deep (>200cm) Podzols (uc2.31, Uc2.32, Uc2.34) on dunes and in swales. Organic Acid Peats (O) in swamps.</p> <p>Limitations - extreme wind erosion hazard, highly permeable soils, very low fertility and permanently high water tables (localised).</p>			

Salinity

Salinity Hazard	-	Not identified

Radon

Radon Level	On the Property?	Within Buffer?
Bq/m3	6	6

Typical radon levels in Australia are low and the values shown are the average values for each census district. For specific location, factors such as the local geology and house type could lead to different values. (ARPANSA).

Acid Sulfate Soil

ASS Risk Maps (Table 1.3.1)	On the Property?		Within Buffer?	
Class	Class 1 / Class 3 / Class 5		Class 1 / Class 2 / Class 3 / Class 4 / Class 5	
Atlas of Australian Acid Sulfate Soil (Table 1.3.2)	Aa(p-)	ASS in subtidal marine environments	Probability of Occurrence	High Probability of occurrence
	Bi(p-)	ASS in sandplains and dunes		Low Probability of occurrence
	Cu(--)	unclassified		Extremely low probability of occurrence
	Cq(p4)	ASS in inland lakes, waterways, wetlands and riparian zones		Extremely low probability of occurrence

Table 1.3.1. Classification scheme in the ASS Planning Maps

Class of Land as shown on ASS Planning Maps	
1	Acid sulfate soils in a class 1 area are likely to be found on and below the natural ground surface.
2	Acid sulfate soils in a class 2 area are likely to be found below the natural ground surface.
3	Acid sulfate soils in a class 3 area are likely to be found beyond 1 metre below the natural ground surface.
4	Acid sulfate soils in a class 4 area are likely to be found beyond 2 metres below the natural ground surface.
5	Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent class 1,2,3 or 4 land.

For each class of land, the maps identify the type of works likely to present an environmental risk if undertaken in the particular class of land. If these types of works are proposed, further investigation is required to determine if ASS are actually present and whether they are present in such concentrations as to pose a risk to the environment.

Table 1.3.2. Atlas of Australian Acid Sulfate Soils¹ (ASRIS) (CSIRO/NatCASS)

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
Probability of Occurrence of ASS¹	
A	High Probability of occurrence – (>70% chance of occurrence in mapping unit)
B	Low Probability of occurrence – (6-70% chance of occurrence in mapping unit)
C	Extremely low probability of occurrence – (1-5% chance of occurrence in mapping unit)
D	No probability of occurrence – (<1% chance of occurrence in mapping unit)
x	Disturbed ASS¹ terrain – (ASS ¹ material present below urban development).
U	Unclassified – (Insufficient information to classify map unit)
Zones	
a	Potential acid sulfate soil material and/or Monosulfidic Black Ooze (MBO).
B, c	Potential acid sulfate soil generally within upper 1 m.
c, d, e	ASS ¹ generally within upper 1 m.
f	ASS ¹ generally below 1 m from the surface
g	ASS ¹ , generally below 3 m from the surface.
H	ASS ¹ generally within 1 m of the surface.
I, j	ASS ¹ generally below 1 m of the surface.
K	ASS ¹ material and/or Monosulfidic Black Ooze (MBO).
L, m, n, o, p, q	ASS ¹ generally within upper 1 m in wet / riparian areas.
Subscripts to codes	
(a)	Actual acid sulfate soil (AASS) = sulfuric material.
(p)	Potential acid sulfate soil (PASS) = sulfidic material.
(q)	Monosulfidic Black Ooze (MBO) is organic ooze enriched by iron monosulfides.

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
Probability of Occurrence of ASS¹	
Confidence levels	
(1)	All necessary analytical and morphological data are available
(2)	Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence
(3)	No necessary analytical data are available, but confidence is fair, based on a knowledge of similar soils in similar environments
(4)	No necessary analytical data are available, and classifier has little knowledge or experience with ASS, hence classification is provisional

¹Acid Sulfate Soils (ASS) are all those soils in which sulfuric acid may be produced, is being produced, or has been produced in amounts that have a lasting effect on main soil characteristics (Pons 1973). Acid sulfate soil (ASS) may include PASS or AASS + PASS. Potential acid sulfate soil (PASS) = sulfidic material. Actual acid sulfate soil (AASS) = sulfuric material.

1.4 GEOLOGY AND TOPOGRAPHY

Map 4 (onsite)

Geology

Map Sheet	Symbol	Formation	Group	Era	Period	Description
Wollongong Port Hacking 1:100 000 Geological Map	Qhb	Unnamed	-	Cainozoic	Quaternary	coarse quartz sand, varying amounts of shell fragments
	Qtd	Unnamed	-	Cainozoic	Quaternary	clean to muddy, shelly, mostly 'marine' sand, sometimes with low dunes
	Rh	Hawkesbury Sandstone	-	Mesozoic	Triassic	medium to coarse-grained quartz sandstone with minor shale and laminite lenses

Naturally Occurring Asbestos Potential (NOA)

Category	On the Property?	Within Buffer?
Not identified	-	-

Topography

Topography	2-14mAHD
------------	----------

Section 2 – Hydrogeology

2.1 HYDROGEOLOGY AND GROUNDWATER BORES

Map 5a (500m – 2000m Buffer)

	On the Property?	Within Buffer? ¹
Aquifer Type	Porous, extensive aquifers of low to moderate productivity	Porous, extensive aquifers of low to moderate productivity
Drinking Water Catchments	Not identified	Not identified
Protected Riparian Corridor	Not identified	Not identified
UPSS Environmentally sensitive zone	Yes	Yes
Wetlands	Botany Bay Estuarine Wetland	Botany Bay Estuarine Wetland
Groundwater Bores	Not identified	Yes, see 2.1.1 and 2.1.2

¹ - Groundwater bore buffer size will change depending on the number of GW bores found within buffer; if there are less than 7 bores within buffer, buffer will increase to max 2km until bores are found.

Table 2.1.1. Groundwater Bore Details

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL (m)	Salinity	Yield (L/s)	Distance (m)	Direction
GW023990	Water supply	01-Mar-66	4.6	4.5	2.7	Good	0.35	89.50	south-west
GW115043	DOMESTIC	01-Jan-96	6	6	0		0	145.02	south-west
GW101435	Household	17-Jan-98	4.58	4.58	0		1	206.52	south-west
GW102678	Monitoring	16-Jun-93	4.1	4.1	2.55		0	254.56	south
GW102676	Monitoring	17-Jun-93	3.9	3.9	2.45		0	342.98	south
GW102675	Monitoring	17-Jun-93	3.9	3.9	1.98	470.00 mg/L	0	374.77	south-west
GW114776	DOMESTIC	01-Mar-14	7	0	2.5		1.5	397.11	south-west
GW106215	Unknown	13-Jul-05	0	0	0		0	423.76	south-west
GW023151	Water supply	01-Dec-65	3.8	3.8	1.8	Good	0.32	425.92	south-west
GW106506	Household	01-Jan-95	0	6	3		0.5	430.36	south-west
GW105711	Unknown	13-Apr-05	0	0	0		0	445.62	south-west

Table 2.1.2. Groundwater Bore Driller Lithology Details

Groundwater Bore ID	From Depth (m)	To Depth (m)	Lithology	Description	Distance (m)	Direction
GW023990	0.00	4.57	SAND	Sand water supply	89.50	south-west
GW101435	0.00	4.58	<Null>	Sand, unconsolidated	206.52	south-west
GW102678	0.00	1.50	SAND	Sand, lt.grey, fine,med	254.56	south
GW102678	1.50	4.10	SAND	Sand clayey, very soft dk grey	254.56	south
GW102676	0.00	3.90	SAND	Sand/lt grey fn.med. grain	342.98	south
GW102675	0.00	3.90	SAND	Sand/fine/med.grain,grey,shell frags.	374.77	south-west
GW114776	0	3	Sand	SAND	397.11	south-west
GW114776	3	7	Sand	SAND WATER ZONE.	397.11	south-west
GW023151	0.00	3.81	SAND	Sand water supply	425.92	south-west

2.2 HYDROGEOLOGY AND OTHER BOREHOLES

Map 5b (500m Buffer)

	On the Property?	Within Buffer?
Groundwater Vulnerability	Sutherland Groundwater Vulnerability	Sutherland Groundwater Vulnerability
Groundwater Exclusion Zones^{1,2}	Not identified	Not identified
Hydrogeologic Unit	Surficial Sediment Aquifer (porous media - unconsolidated) Late Permian/Triassic sediments (porous media - consolidated)	Surficial Sediment Aquifer (porous media - unconsolidated) Late Permian/Triassic sediments (porous media - consolidated)
Other known borehole investigations	Not identified	Yes, see 2.2.1

¹ - Botany Groundwater Management Zones (BGMZ): Zone 1 – the use of groundwater remains banned; Zones 2 to 4 – domestic groundwater use is banned, especially for drinking water, watering gardens, washing windows and cars, bathing, or to fill swimming pools.

² - Williamstown Groundwater Management Zones (WGMZ): Primary Management Zone – this area has significantly higher levels of PFAS detected and therefore, the strongest advice applies. Secondary Management Zone – this area has some detected levels of PFAS; Broader Management Zone – the topography and hydrology of the area means PFAS detections could occur now and into the future.

Groundwater Dependent Ecosystems

Site	On the Property?	Within Buffer?
Ecosystems that rely on the Surface expression of Groundwater	Not identified	Not identified
Ecosystems that rely on Subsurface presence of Groundwater	High / Moderate potential for GW interaction	High / Moderate potential for GW interaction

Table 2.2.1. Other known borehole investigations (Coal Seam Gas (CSG), Petroleum Wells and Other Boreholes) (500m buffer)

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
EROW_CPT2	Borehole	Eastern Right of way: Cooling water Inlet Pipe Removal	Caltex Australia	19-04-17	6	210.1	south-west
EROW_CPT3	Borehole			19-04-17	6	257	south-west
EROW_BH4	Borehole			11-04-17	4.2	280.4	south-west
EROW_CPT4	Borehole			19-04-17	6	281.4	south-west
EROW_BH11	Borehole			11-04-17	4.2	292.8	south-west
EROW_CPT7	Borehole			19-04-17	6	311.2	south-west

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
EROW_CPT6	Borehole			19-04-17	6	340	south-west
EROW_CPT5	Borehole			19-04-17	13.41	344.1	south-west
EROW_BH10	Borehole			11-04-17	4.2	345.5	south-west
EROW_CPT8	Borehole			19-04-17	18.47	354.6	south-west

Section 3 – Environmental Registers, Licences and Incidents

3.1 CONTAMINATED LAND PUBLIC REGISTER

Map 6 (1000m Buffer)

Contaminated Land Record of Notices

Site Name ²	Area n ⁰	Address ¹	Notices	Distance (m)	Direction
Caltex Kurnell Terminal (refer also to ID23868)	3367	2 Solander STREET, KURNELL	1 current and 5 former	223	South-east

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.

2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.

Sites Notified as Contaminated to the EPA

Site Name ²	Address ¹	Activity that caused Contamination	EPA Site Management Class ³	Distance (m)	Direction
Caltex Kurnell Terminal (refer also to ID23868)	2 Solander STREET, KURNELL	Other Petroleum	Contamination currently regulated under POEO Act	223	South-east
Former Caltex Kurnell Service Station	Corner Captain Cook Drive and Solander STREET KURNELL	Service Station	Regulation under CLM Act not required	848	South-west

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.

2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.

3. The EPA maintains a record of sites that have been notified to the EPA by owners or occupiers as contaminated land. The sites notified to the EPA and recorded on the register are at various stages of the assessment and/or remediation process. Table 5 outlines the possible management status that can be attributed to a registered contaminated site.

Table 3.3.1. EPA Site Management Class Explanation

EPA Site Management Class	
Under Assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Contamination currently regulated under the CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under the POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.

EPA Site Management Class	
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

3.2 POTENTIALLY CONTAMINATED AREAS

Map 6 (1000m Buffer)

Defence Sites

Site name	RCIP*	Description	Source	Distance (m)	Direction
Not identified	-		-	-	-

*RCIP (Regional Contamination Investigation Program)

Former Gasworks Sites

Site name	Description	Source	Distance (m) *	Direction
Not identified	-	-	-	-

PFAS Sites

Site name	Description	Source	Distance (m) *	Direction
Botany Bay area	The number of potential sources of PFAS in the area makes it difficult to attribute detections in Botany Bay to individual sources. PFAS was detected in sediment, surface and groundwater. Fishing restrictions were introduced at the end of 2017 for Botany Bay Area. None of the contamination readings from Botany Bay have been released.	State-wide PFAS investigation program	0	onsite
Kurnell: Caltex	Caltex is investigating potential PFAS (per- and poly-fluoroalkyl substances) contamination stemming from the historical use of fire-fighting foams at its Kurnell refinery. Sampling has shown PFAS detections on and offsite. Further investigations are ongoing to help determine the extent of the contamination and if there are any ways local residents might come into contact with these chemicals.	State-wide PFAS investigation program	223	South-east

*2km search. If the site is not within 1km buffer, it will not be shown on the map.

3.3 LICENSING UNDER THE POEO ACT

Map 7 (500m Buffer)

Licences

EPL Number	Licence holder	Location Name	Premise Address ¹	Fee Based Activity	Distance (m)	Direction
837	CALTEX REFINERIES (NSW) PTY LTD	CALTEX REFINERIES (NSW) PTY LTD	2 SOLANDER STREET, TAREN POINT	Chemical storage waste generation, Petroleum products storage, Shipping in bulk	165	south

Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

Surrendered Licences still Regulated by EPA

Licence N°	Licence holder	Location Name	Premise Address ¹	Fee Based Activity	Status	Distance (m)	Direction
13112	AUSGRID	Botany Bay Cable Project HDD	Botany Bay, La Perouse Headland, BOTANY, NSW, 2019	Other activities Miscellaneous licensed discharge to waters (at any time)	Surrendered	0	onsite
20349	CALTEX REFINERIES (NSW) PTY LTD	Caltex Kurnell Ports and Berthing Upgrade Project - Dredging	BOTANY BAY, KURNELL, NSW 2231	Miscellaneous licensed discharge to waters (at any time)	Surrendered	363	north

Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

Clean Up and Penalty Notices

Location ID	Notice N°	Notice Type	Licence holder	Location Name	Premise Address ¹	Distance (m)	Direction
768	1505450	Penalty Notice	CALTEX REFINERIES (NSW) PTY LTD	CALTEX REFINERIES (NSW) PTY LTD	2 SOLANDER STREET, KURNELL, NSW 2231	165	south
768	1515756	Penalty Notice				165	south
768	1526923	Penalty Notice				165	south
768	1535959	Penalty Notice				165	south
768	1041406	s.91 Clean Up Notice	CALTEX AUSTRALIA PETROLEUM PTY LTD	CALTEX REFINERIES (NSW) PTY LTD	2 SOLANDER STREET, KURNELL, NSW 2231	165	south
768	1041460	s.91 Clean Up Notice				165	south
768	1041670	s.91 Clean Up Notice				165	south
768	1115113	s.91 Clean Up Notice	CALTEX REFINERIES (NSW) PTY LTD	CALTEX REFINERIES (NSW) PTY LTD	2 SOLANDER STREET, KURNELL, NSW 2231	165	south
768	1115881	s.91 Clean Up Notice				165	south
768	1521201	s.91 Clean Up Notice				165	south
768	1521564	s.91 Clean Up Notice				165	south

Location ID	Notice N ^o	Notice Type	Licence holder	Location Name	Premise Address ¹	Distance (m)	Direction
768	1526815	s.91 Clean Up Notice				165	south

¹. Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

3.4 NATIONAL POLLUTANT INVENTORY (NPI)

Map 7 (500m Buffer)

Facility name	Address	Primary ANZSIC Class	Latest report	Distance (m)	Direction
Caltex Kurnell Terminal	2 SOLANDER STREET , KURNELL, NSW 2231	Petroleum Refining and Petroleum Fuel Manufacturing	2018/2019	165	south

3.5 PUBLIC REGISTER OF PROPERTIES AFFECTED BY LOOSE-FILL ASBESTOS INSULATION

Map 7 (onsite)

Address	Match Found
Not identified	-

Section 4 – Other Potentially Contaminating Activities

4.1 POTENTIALLY CONTAMINATING ACTIVITIES

Map 8a (500m Buffer)

Cattle Dip Sites

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Dry Cleaners

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Fire Rescue Sites

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Gas Terminals

Site name	Operator	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Liquid Fuel Depots/Terminals

Site name	Owner	Location	Status*	Distance (m)	Direction
Kurnell - Fuel Terminal	Caltex	Solander Street Kurnell	Current	223	South-east
Kurnell - Fuel Refinery	Caltex	Solander Street Kurnell	Former	223	South-east

Mines and Quarries

Deposit Name	Method	Description	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Petrol Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Power Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Substation / Switching Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Telephone Exchanges

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Waste Management Facilities

Site name	Owner	Class	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Wastewater Treatment Facilities

Site name	Operator	Class	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

***Status:**

Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

Current: business that are operational on the day this report was issued.

Former: business that have been closed or discontinued 1 to 2 years from the day this report was issued. All former sites older than 2 years will be reported in the 'Historical commercial and trade data' section in this report.

4.2 CURRENT COMMERCIAL AND TRADE DATA

Map 8b (200m Buffer)

Current Commercial and Trade Data

Site name ¹	Category	Location	Status ²	Distance (m)	Direction
Not identified	-		-	-	-

¹ Data includes categories associated with potentially contaminating activities. All negligible risk data is not reported.

² Status: Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

Current: business that are operational on the day this report was issued.

Former: business that have been closed or discontinued 1 to 2 years from the day this report was issued. All former sites older than 2 years will be reported in the historical business section in this report.

Tanks (AST/UST)

ID	Tank type	Description	Status	Distance (m)	Direction
Not identified	-		-	-	-

Note: This is not an exhaustive list of all existing tanks.

4.3 FORMER POTENTIALLY CONTAMINATED LAND

Map 8c (500m Buffer)

Contaminated Legacy Areas

Site Name	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-

Note: This section includes known contaminated areas such as James Hardies Asbestos waste legacy areas, Pasmenco Smelter and Uranium processing site.

Derelict Mines and Quarries

Site name	Method	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-	-

Historical Landfills

Site name	Description	Source	Distance (m)	Direction
Not identified	-		-	-

Unexploded Ordnance (UXO) Areas

Site name	Category	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-	-

4.4 HISTORICAL COMMERCIAL AND TRADE DATA

(not mapped)

1930 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1940 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1950 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1965 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Grocers' Retail	Palumbo P	2 Prince Charles Pde Kurnell NSW Australia	address	10.8	south-west
Carriers' Light	Percival F C	65 Captain Cook Dr Kurnell NSW Australia	address	131.3	south-west

1970 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
MIXED BUSINESSES	Pillinger & Scott,	Princes Pde AND Polo St, Kurnell NSW Australia	address	3	south-west
MIXED BUSINESSES	Kurnell General Stores,	2 Prince Charles Pde, Kurnell NSW Australia	address	10.7	south-west
DOG & CAT BREEDERS	Tagalong Kennels,	59 Captain Cook Dr, Kurnell NSW Australia	address	101	south-west

1980 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Glass Merchants &/or Glaziers	Lewis P & J	25 Captain Cook Drive Kurnell NSW Australia	address	16.8	south-west
Carpenters & Joiners	Di Natale S	12 Captain Cook Drive Kurnell NSW Australia	address	53.1	south
Patternmakers-Engineering	Tickle R H & G	7 Gannon St Kurnell NSW Australia	address	85	south-west
Concrete Contractors	Ditotto G	4 Cook St Kurnell NSW Australia	address	138.1	south
Glass Merchants &/or Glaziers	Lewis P & J	25 Captain Cook Drive Kurnell NSW Australia	address	16.8	south-west

1990 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Patternmakers - Engineering	Tickle R H & G	7 Gannon Street Kurnell NSW Australia		85	south-west

2005 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Air Conditioning-- Commercial & Industrial Ductwork & Ducting Sheet Metal Workers	Air Duct (Mfg) Pty Ltd	Lot 6 Captain Cook Drv, KURNELL, NSW 2231, Australia	address	0	onsite
Demolition Contractors & Equipment	Kurnell Recycling Park Pty Ltd	Lot 6 Captain Cook Drv, KURNELL, NSW 2231, Australia	address	0	onsite
Nurseries--Retail	Amanda's Nursery	29 Captain Cook Drv, KURNELL, NSW 2231, Australia	address	15.6	south-west
Paving--Concrete	Steve Hession Paving & Patterned Concrete	15 Gannon St, KURNELL, NSW 2231, Australia	address	129.7	south-west

2010 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
House Construction	Co-Bolt Constructions	Factory 3 Lot 6 Captain Cook Drv KURNELL 2231 NSW	address	0	onsite
Site Preparation Services	Leader Garage Doors	Lot 6 Captain Cook Drv KURNELL 2231 NSW	address	0	onsite
Site Preparation Services	Kurnell Recycling Park Pty Ltd (In Liquidation)	Lot 6 Captain Cook Drv KURNELL 2231 NSW	address	0	onsite
Building and Other Industrial Cleaning Services	Intensity Cleaning Solutions	12 Cook St KURNELL 2231 NSW	address	177	south

Historical data positional accuracy and georeferencing results explanation

Positional accuracy	Georeferenced	Description
Address	Located to the address level	<i>When street address and names fully match.</i>
Street	Located to the street centroid	<i>When street names match but no exact address was found. Location is approximate.</i>
Place	Located to the structure, building or complex	<i>When building, residential complex or structure name match but no exact address was found. Location is approximate.</i>
Suburb	Located to the suburb area	<i>When suburb name match but no exact address was found. Location is approximate.</i>
Not georeferenced	Not found	<i>When it was not georeferenced, and address could not be found.</i>

Land Insight and Resources use a number of different address georeferencing methods and characterised them according to the following criteria: completeness (match rates) and positional accuracy. When address do not contain specific street numbers or a match is not found, records identified as being in the surrounding areas are included for reference.

Section 5 – Other Environmental Constraints

5.1 FEDERAL, STATE AND LOCAL HERITAGE

Map 9 (200m Buffer)

Local Environment Plan (LEP) Heritage

Site ID	Site Name	Class	Significance	Distance (m)*	Direction
2506	Silver Beach and roadway	Item - General	Local	0	onsite
2504	Botany Bay National Park (Kurnell Historic Site)	Item - General	State	0	onsite
A2514	Captain Cook monument	Item - Archaeological	Local	0	onsite
A2511	Captain Cook's landing site	Item - Archaeological	Local	0	onsite
A2519	Captain Cook watering well	Item - Archaeological	Local	0	onsite
A2516	Landing place wharf abutment	Item - Archaeological	Local	0	onsite
A2518	Captain Cook watering hole	Item - Archaeological	Local	0	onsite
2503	Kurnell monuments (in National Park)	Item - General	Local	0	onsite
A2512	Banks Memorial	Item - Archaeological	Local	5	south-east
A2517	Alpha Farm Site	Item - Archaeological	Local	74	south-east
A2515	Forby Sutherland monument	Item - Archaeological	Local	116	north-east
A2513	Solander monument	Item - Archaeological	Local	132	north-east
A2510	Captain Cook's landing place	Item - Archaeological	Local	145	north-east
A2520	Flagpole	Item - Archaeological	Local	183	north-east

National Heritage List (NHL)

Site ID	Site Name	Class	Status	Distance (m)	Direction
105812	Kurnell Peninsula Headland	Historic	Listed place	0	onsite
106162	Kamay Botany Bay: botanical collection sites	Historic	Listed place	0	onsite

Register of the National Estate (RNE)

Site ID	Site Name	Class	Status	Distance (m)	Direction
3337	Kurnell Peninsula Towra Point Area	Natural	Registered	0	onsite
3335	Captain Cooks Landing Place Historic Site	Historic	Registered	0	onsite
1734	Botany Bay Entrance	Historic	Indicative Place	0	onsite

Non-Aboriginal heritage item (Local)

Site ID	Site Name	Class	Status	Distance (m)	Direction
105812	Kurnell Peninsula Headland	Historic	Listed place	0	onsite
106162	Kamay Botany Bay	Historic	Nominated place	0	onsite

Non-Aboriginal heritage item (SHR)*

Site ID	Site Name	Listing n ^o	Plan n ^o	Distance (m)	Direction
5061543	Kamay Botany Bay National Park and Towra Point Reserve	01918	2565	0	onsite

*State Heritage Register

Commonwealth Heritage List (CHL)

Site ID	Site Name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

World Heritage Area (WHA)

Site ID	Site Name	Inscribed	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

5.2 NATURAL HAZARDS

Map 10 (500m Buffer)

Bush Fire Prone Land (BLP)

Category	On the Property?	Within Buffer?
Vegetation buffer	Yes	Yes
Vegetation category 1	Not identified	Yes

Fire History

Category	On the Property?	Within Buffer?
1995-96 Wildfire	Yes	Yes
1979-80 Wildfire 1980-81 Prescribed Burn 1980-81 Wildfire 1981-82 Wildfire 1982-83 Wildfire 1983-84 Prescribed Burn 1983-84 Wildfire 1984-85 Wildfire 1986-87 Wildfire 1988-89 Wildfire 1989-90 Wildfire 1991-92 Wildfire 1992-93 Wildfire 1993-94 Wildfire 1994-95 Wildfire 1995-96 Wildfire 1997-98 Wildfire 1998-99 Wildfire	Not identified	Yes

Flood Hazard

Category	On the Property?	Within Buffer?
Sutherland Shire Local Environmental Plan 2015	Yes	Yes

5.3 COASTAL MANAGEMENT (STATE ENVIRONMENTAL PLANNING POLICY)

Map 10 (500m Buffer)

Type	On the Property?	Within Buffer?
Coastal Wetlands Proximity Area	Not identified	Yes
Coastal Wetlands	Not identified	Not identified
Coastal Environment Area Map	Yes	Yes
Coastal Use Area Map	Yes	Yes



**LAND INSIGHT
& RESOURCES**

A Tower Three, Level 24, 300 Barangaroo Avenue
Sydney NSW 2000 Australia
T 02 8067 8870
E info@liresources.com.au
W www.liresources.com.au



ATTACHMENT A

Report Maps





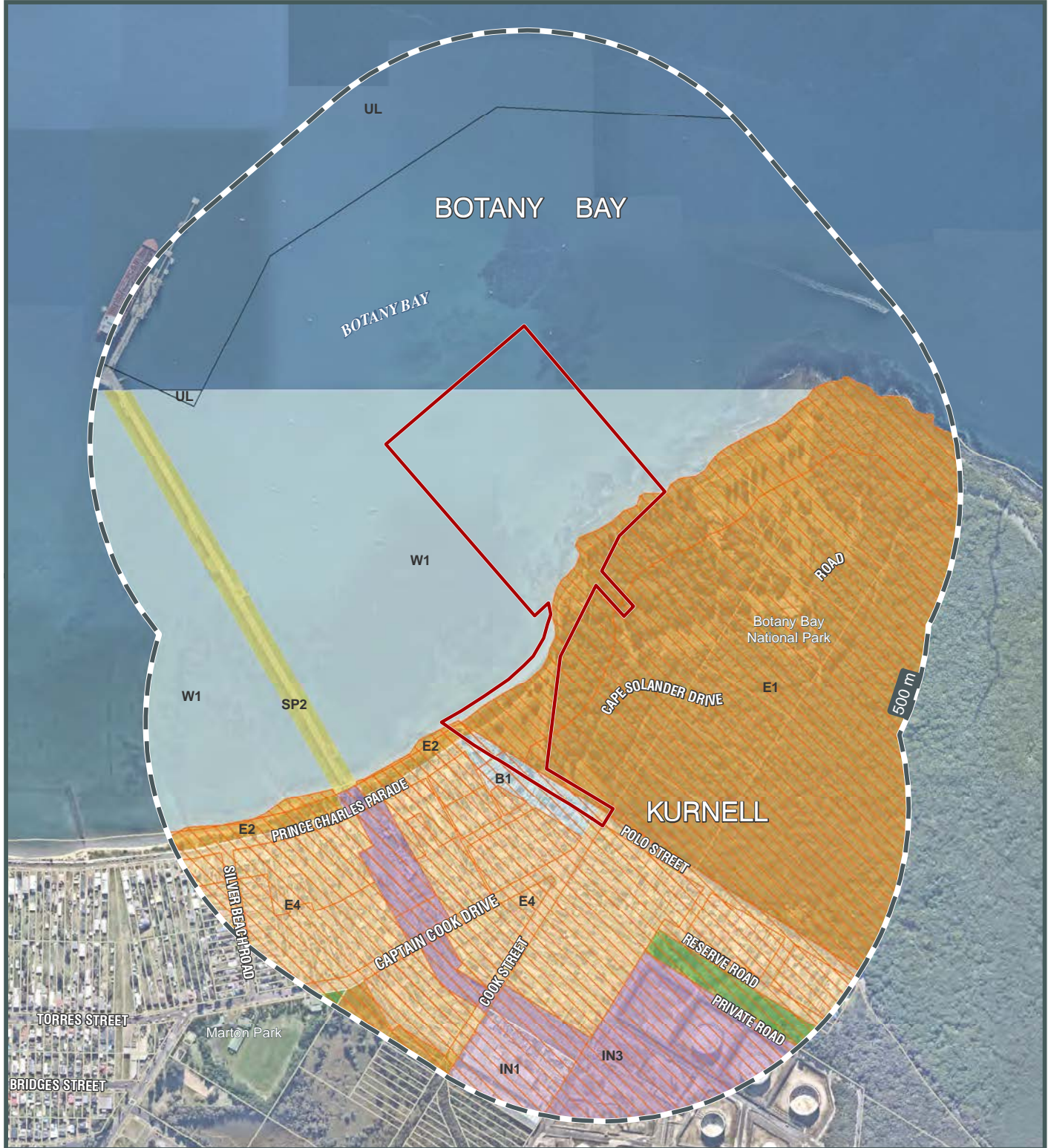
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- Transmission Line
- Stormwater channel
- Sewer Main
- Water Main
- Pipeline

Sensitive Receptors
 Parks



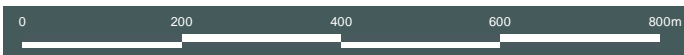
SUBJECT AREA AND SENSITIVE RECEPTORS





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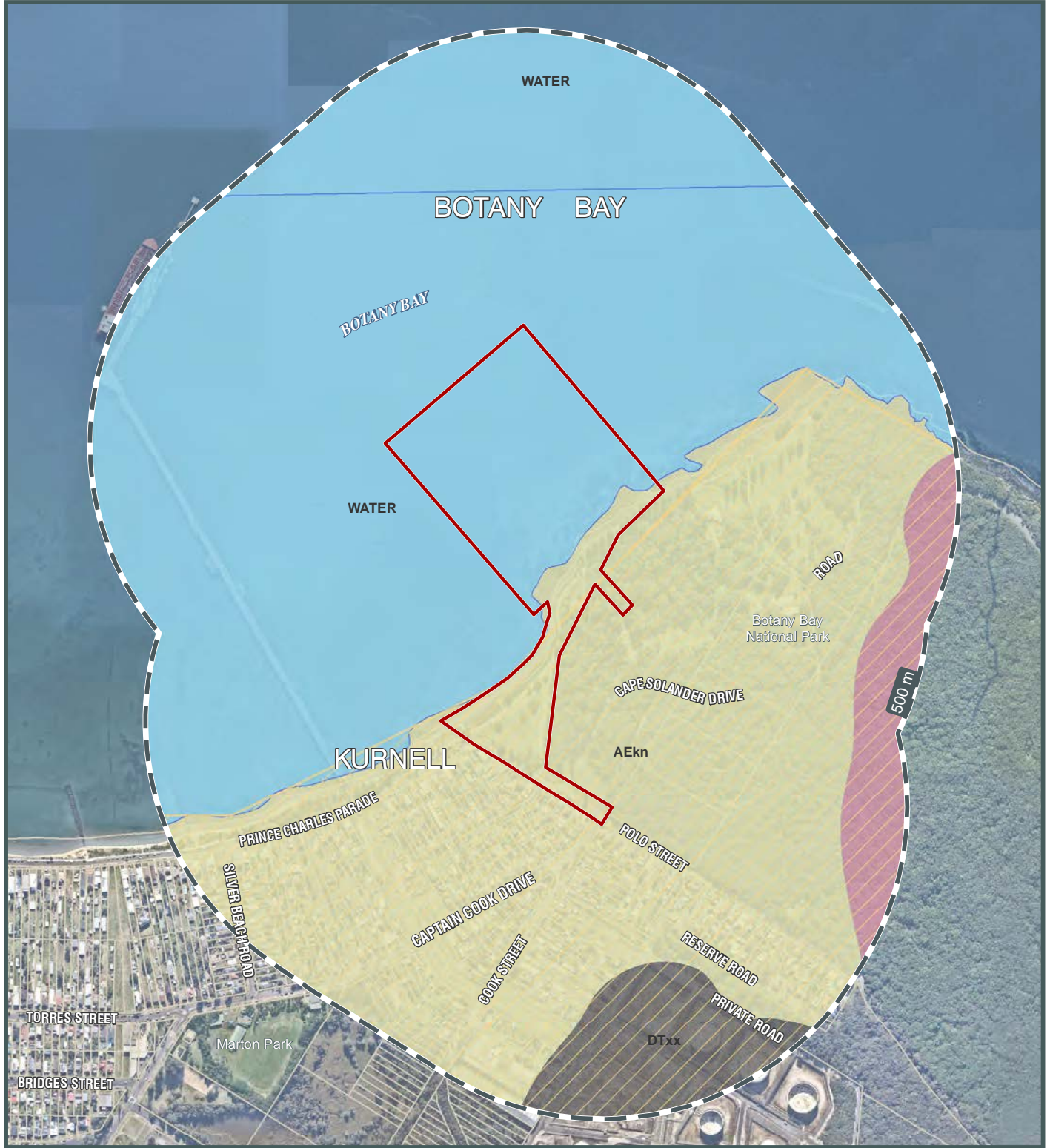
- | | | | |
|--------------------------------|--------------------------|--|------------------------|
| Subject area | Local Provisions | E1, National Parks and Nature Reserves | RE1, Public Recreation |
| Land Zoning | B1, Neighbourhood Centre | E4, Environmental Living | SP2, Infrastructure |
| E2, Environmental Conservation | IN1, General Industrial | UL, Unzoned Land | W1, Natural Waterways |
| | IN3, Heavy Industrial | | |



PLANNING CONTROLS



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Subject area

Soils Landscape

- AEkn | AEOLIAN
- DTxx | DISTURBED TERRAIN
- REbu | RESIDUAL
- WATER | WATER

Radon Level (Bq/m3)

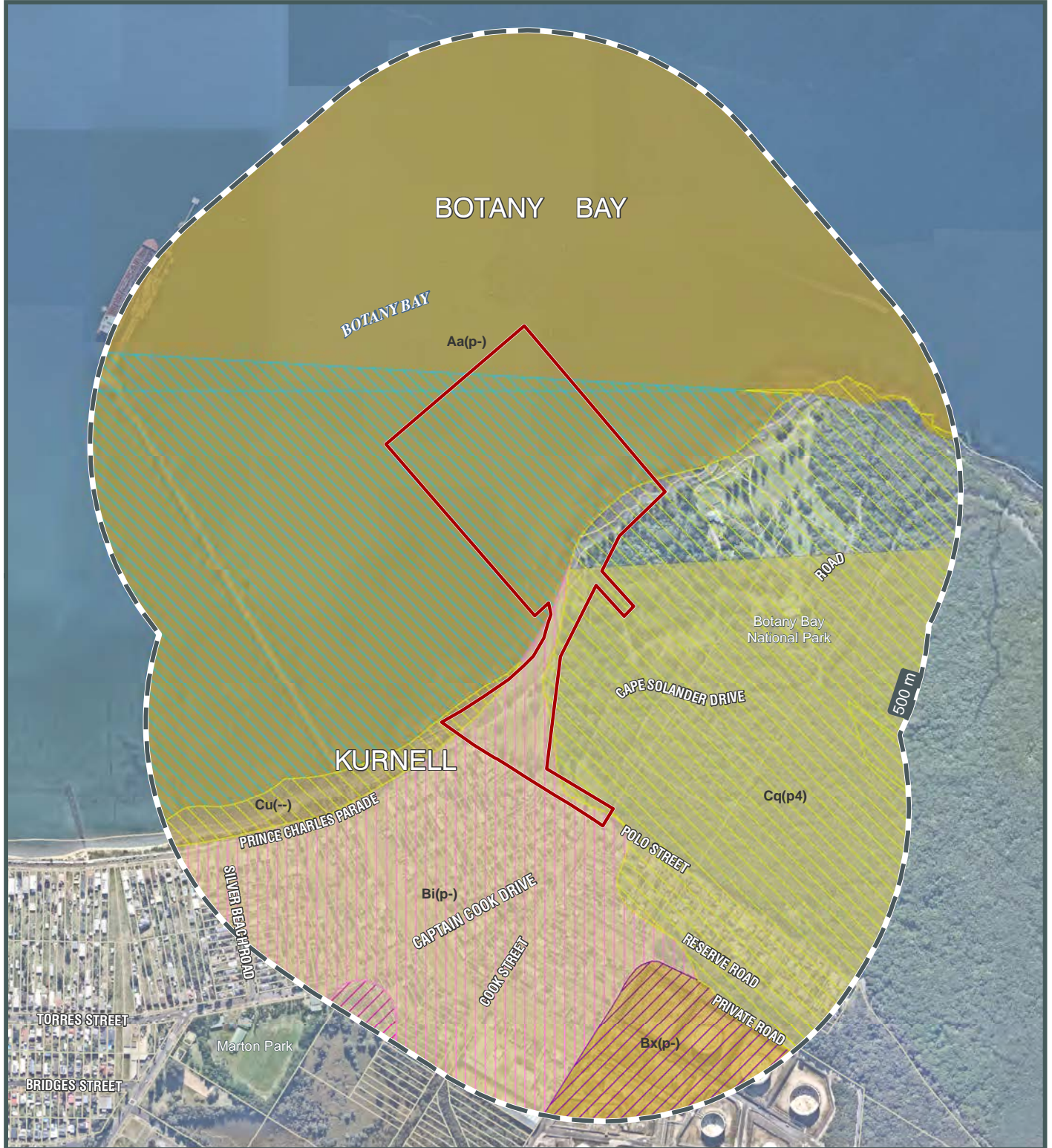
- 5-19



SOIL LANDSCAPES AND SALINITY



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Subject area

Acid Sulfate Soil Risk

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5

ASRIS Atlas of Australian Sulfate Soils

- Aa(p-) | ASS in subtidal marine environments
- Ah(p-) | ASS in sandplains and dunes
- Bi(p-) | ASS in sandplains and dunes

Bx(p-) | Disturbed ASS

- Cq(p4) | ASS in inland lakes, waterways, wetlands and riparian zones
- Cu(-) | unclassified



ACID SULFATE SOILS



MAP 3b

Enviro-Screen



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Subject area Topographic contour (m)

1:100 000 Geological Map

- Qhb | coarse quartz sand, varying amounts of shell fragments
- Qhd | medium to fine-grained 'marine' sand with podsols
- Qhs | peat, sandy peat, mud
- Qpd | medium to fine-grained 'marine' sand with podsols

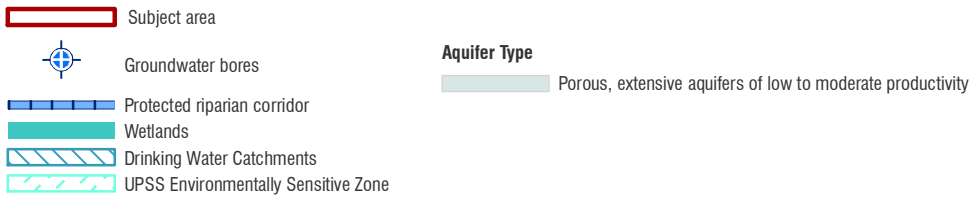
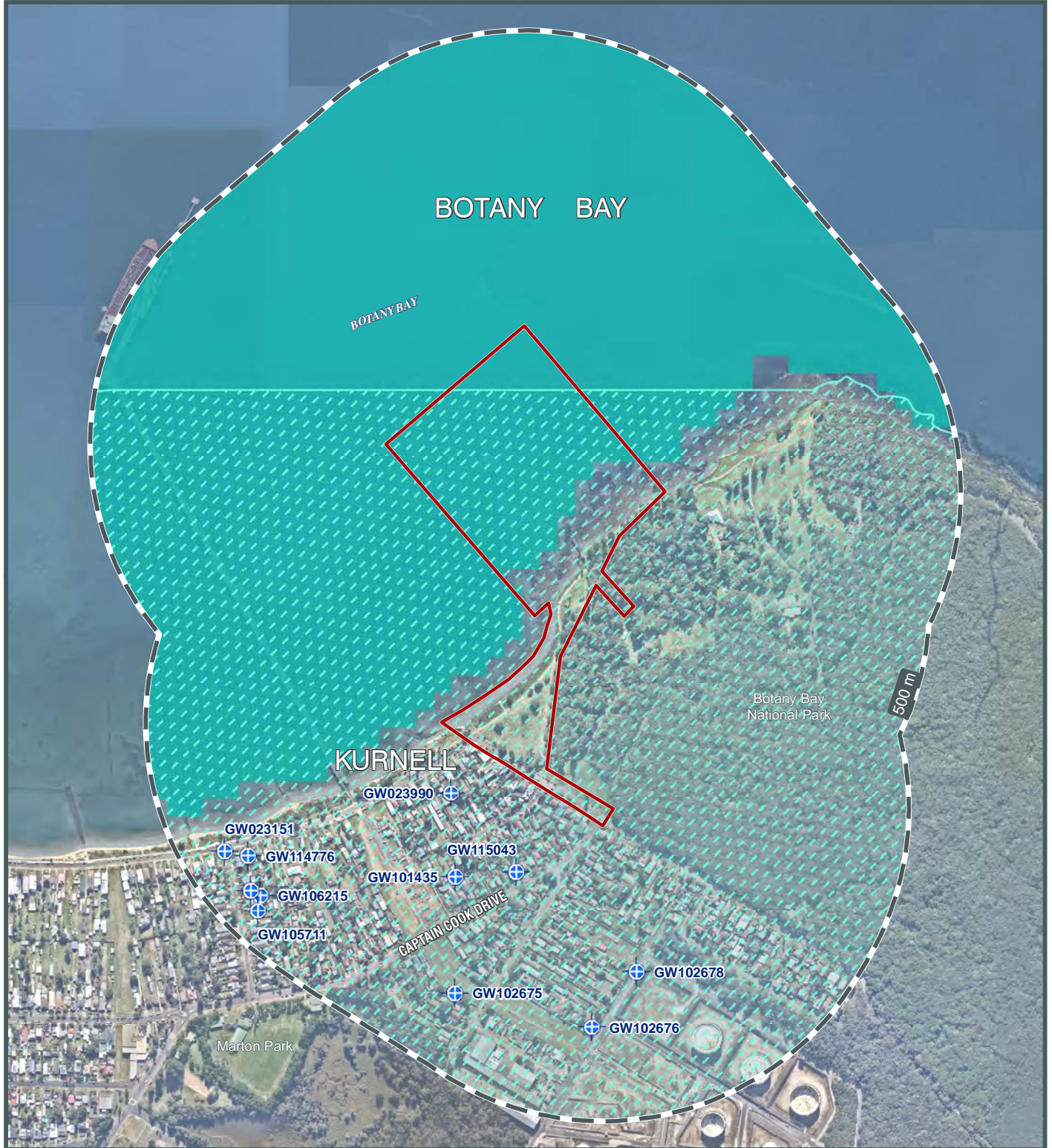
- Qtd | clean to muddy, shelly, mostly 'marine' sand, sometimes with low dunes
- Rh | medium to coarse-grained quartz sandstone with minor shale and laminite lenses
- mf | man-made fill. Dredged estuarine sand and mud, coal washing, industrial and household waste
- w | Water



GEOLOGY AND TOPOGRAPHY



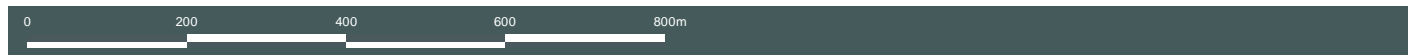
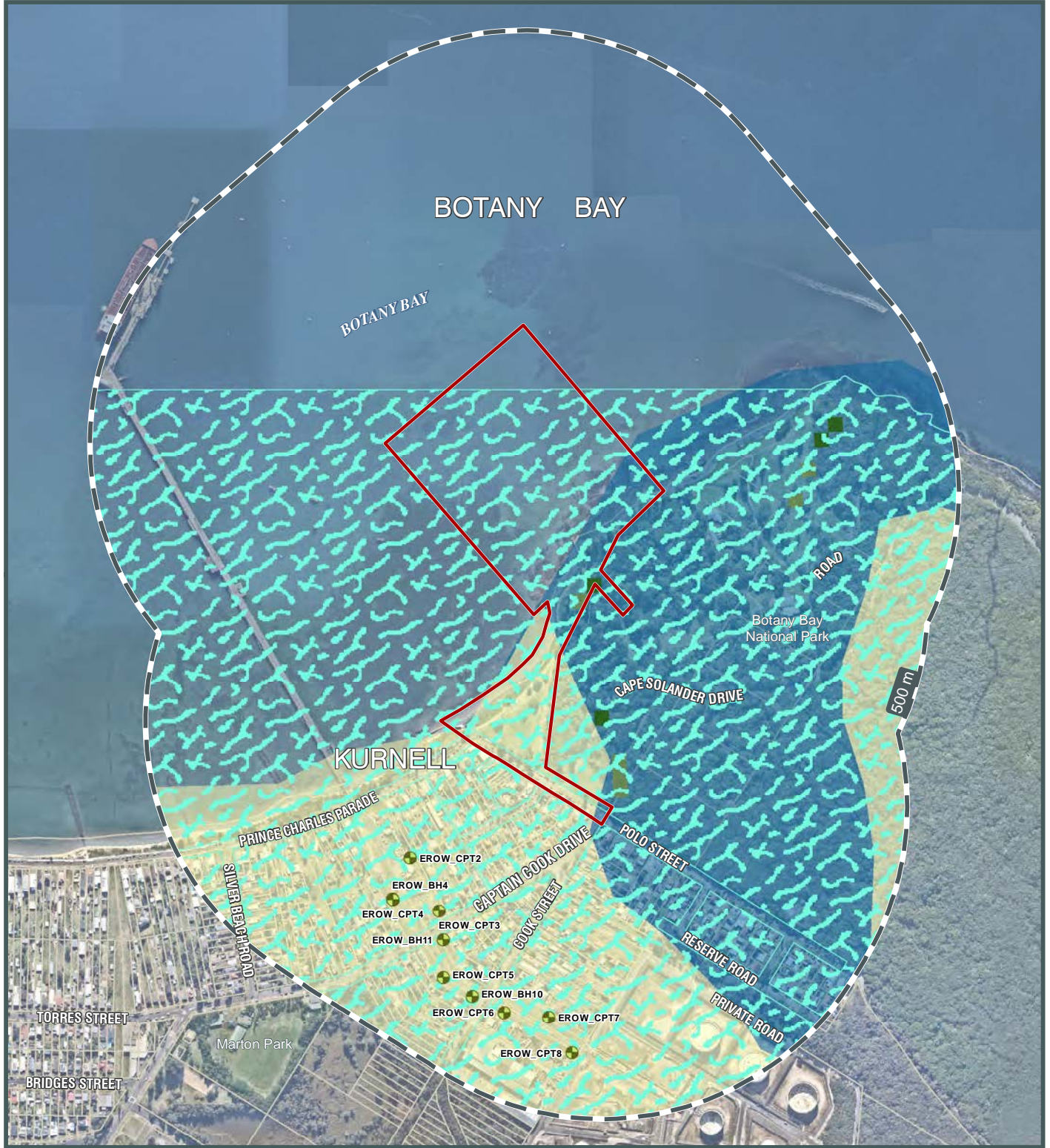
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HYDROGEOLOGY AND GROUNDWATER BORES



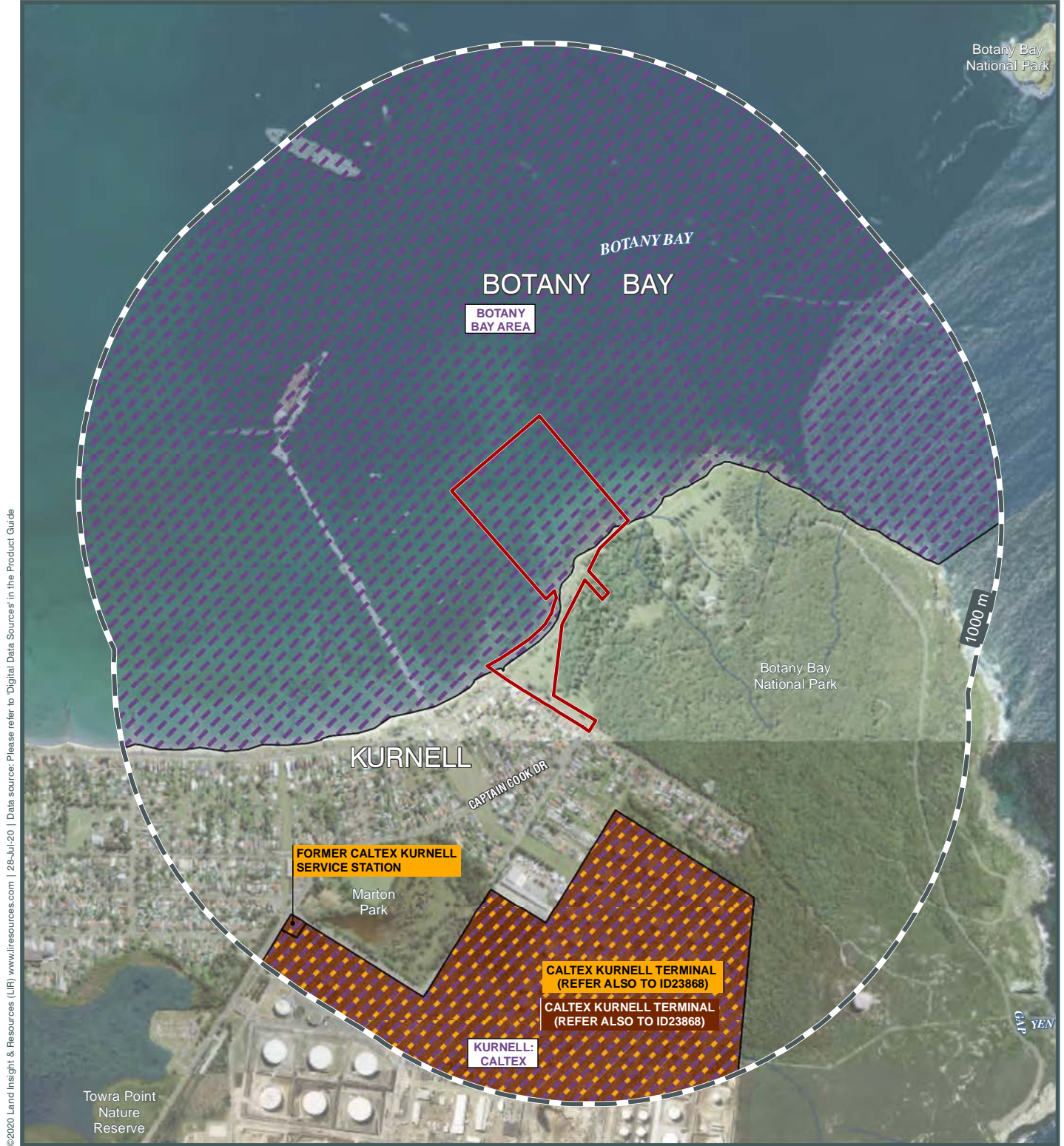
©2020 Land Insight & Resources (LIR) www.lirresources.com | 29-Jul-20 | Data source: Please refer to 'Digital Data Sources' in the Product Guide



HYDROGEOLOGY AND OTHER BOREHOLES



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- Subject area
- PFAS Sites
- Contaminated Land Register (EPA)**
- Current - Sites notified as contaminated
- Former - Sites notified as contaminated
- Contaminated Land Record of Notices
- Potentially Contaminated Areas**
- Defence Sites
- Former Gasworks Sites



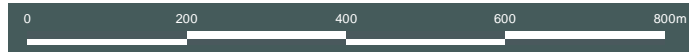
CONTAMINATED LAND REGISTER AND POTENTIALLY CONTAMINATED AREAS



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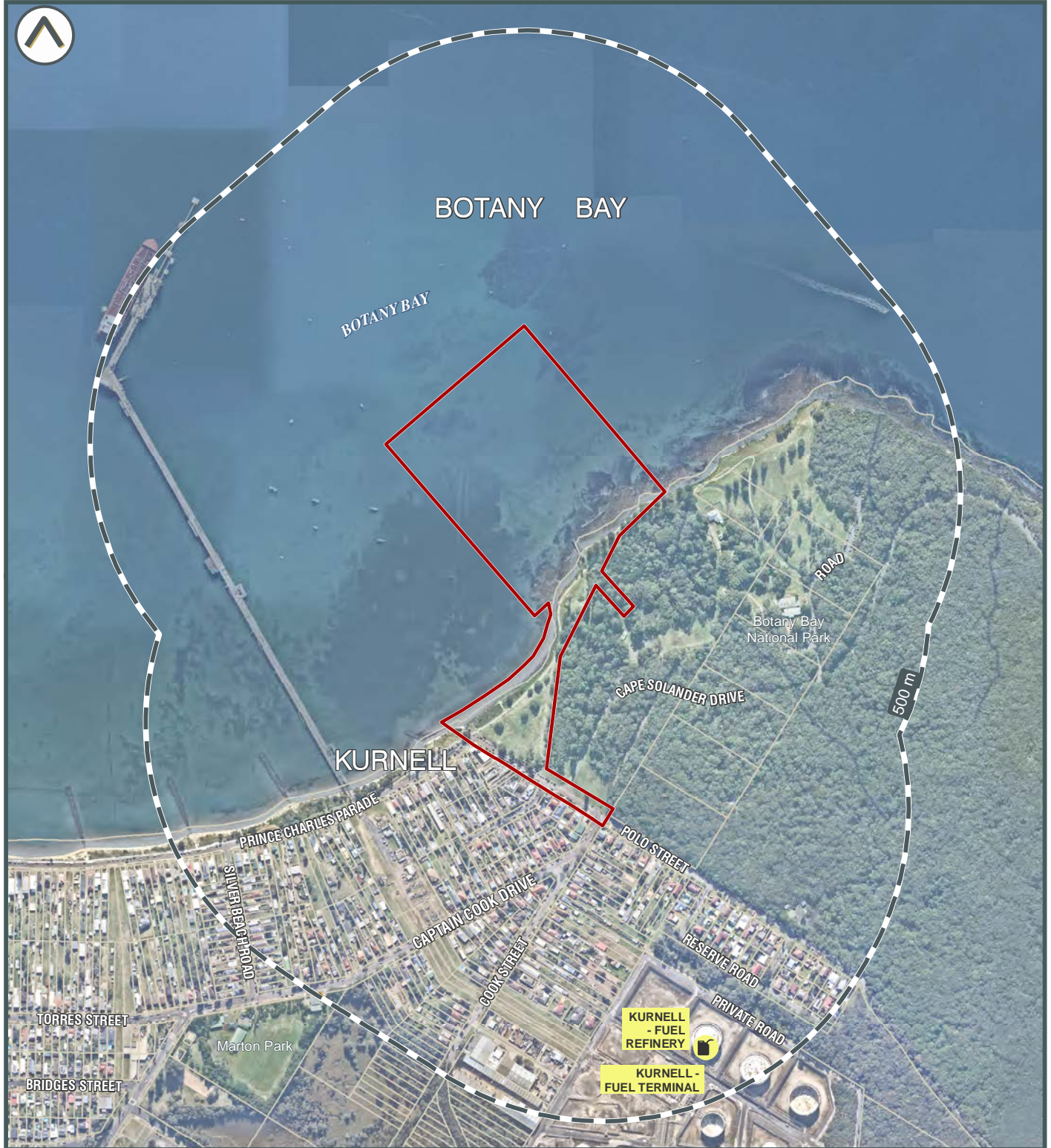


- Subject area
- POEO Register**
- POEO licences
- Surrendered Licences still Regulated by EPA
- Clean Up and Penalty Notices
- NPI Facilities



ENVIRONMENTAL REGISTER & LICENCES AND NPI FACILITIES





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- | | | | | |
|---|--|--|---|---|
|  Subject area |  Cattle dip/ saleyards |  Gas terminals |  Petrol stations |  Telephone exchanges |
|  Dry cleaners |  Liquid fuel depots / terminals |  Power stations |  Waste management facilities | |
|  Fire Rescue sites |  Mine/quarry |  Substation locations |  Wastewater Treatment Facility | |

Current: business that are operational on the day this report was issued.
 Former: business that have been closed or discontinued 1 to 2 years from the day this report was issued. All former sites older than 5 years will be reported in the historical business section in this report.



POTENTIALLY CONTAMINATING ACTIVITIES



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Subject area

Commercial & Trade Directory

- ✘ Other potentially contaminating activities
- ✘ Former potentially contaminating activities

Tanks

- ☒ Aboveground Storage Tank - Current
- ☒ Aboveground Storage Tank - Former



Underground Storage Tank - Current



Underground Storage Tank - Former/Unknown



Unknown

*This is not an exhaustive list of all tanks.



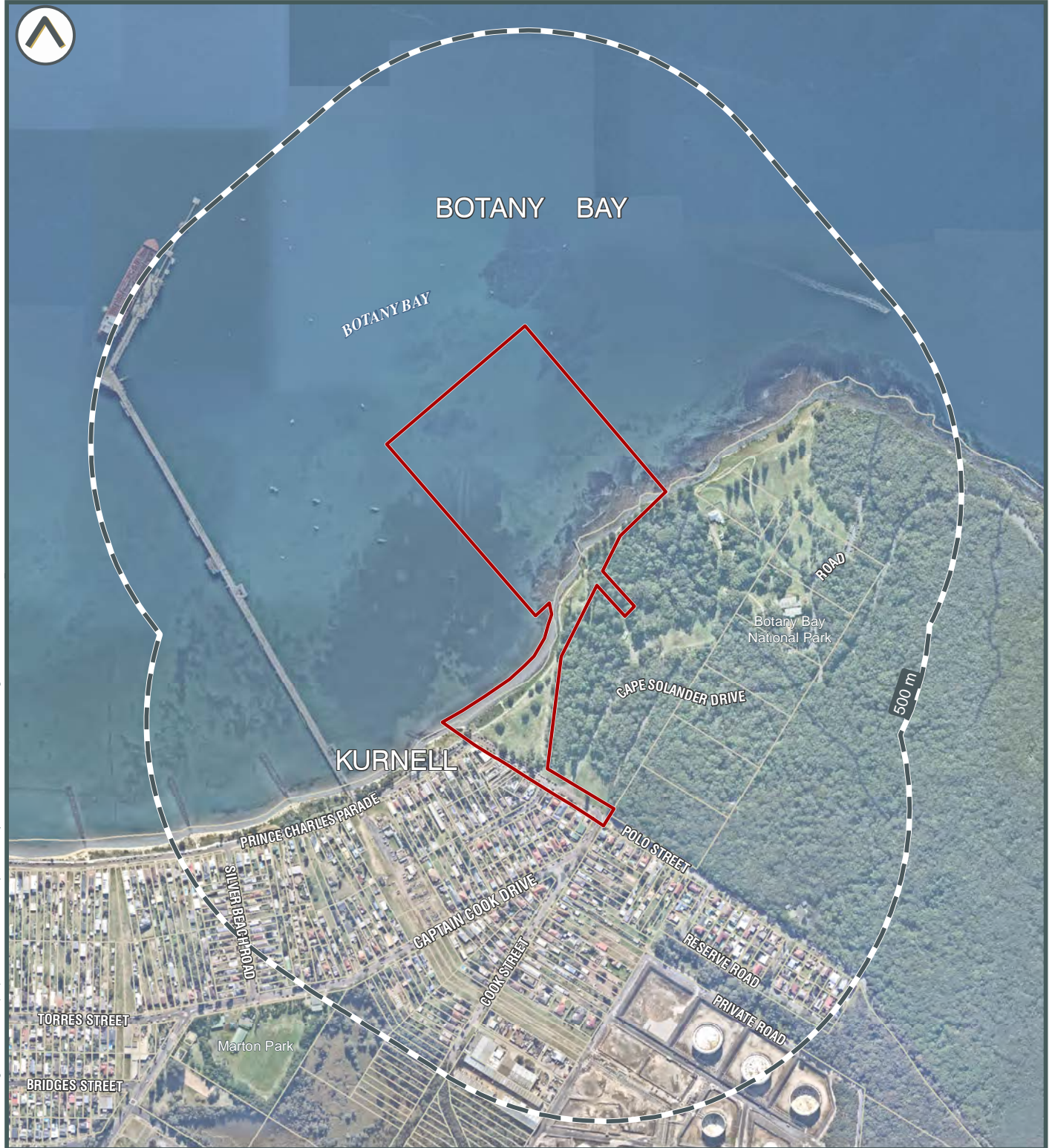
CURRENT COMMERCIAL AND TRADE DATA



MAP 8b

Enviro-Screen





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Subject area

Contaminated Legacy Areas

- Contaminated Legacy Areas
- Derelict Mines and Quarries
- Historical (Legacy) Landfills

Unexploded Ordnance (UXO) Areas

- Defence Controlled Area
- UXO Area: Substantial Occurrence
- UXO Area: Slight Occurrence
- UXO Area: Other



FORMER POTENTIALLY CONTAMINATED LAND

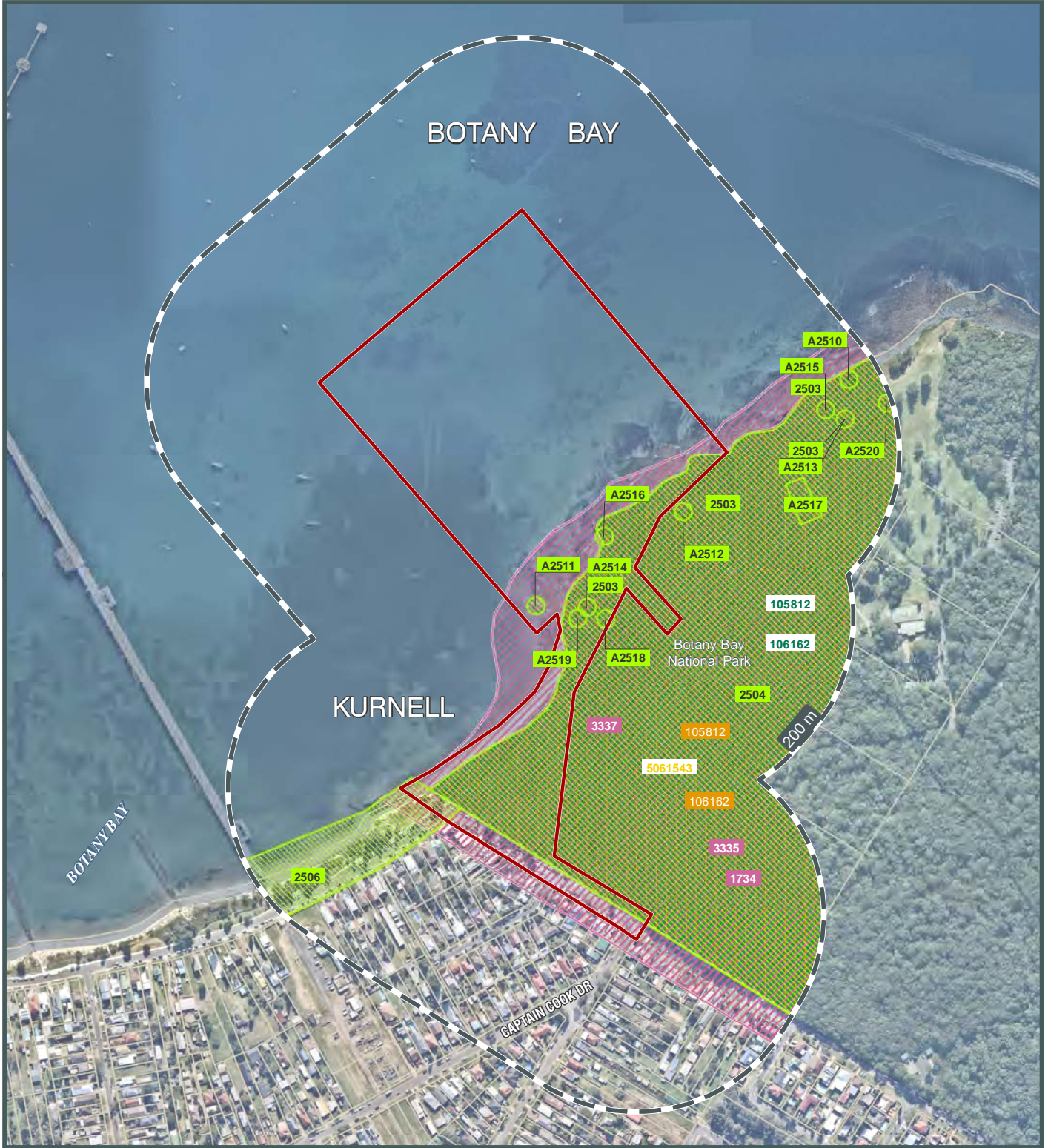


MAP 8c

Enviro-Screen



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- Subject area
- | | |
|--|---|
| Federal, State and Local Heritage | |
| <ul style="list-style-type: none"> Heritage conservation Area (LEP) Register of the National Estate (RNE) National Heritage List (NHL) | <ul style="list-style-type: none"> Non-Aboriginal heritage item (Local) Non-Aboriginal heritage item (SHR) Commonwealth Heritage List (CHL) World Heritage Area (WHA) |



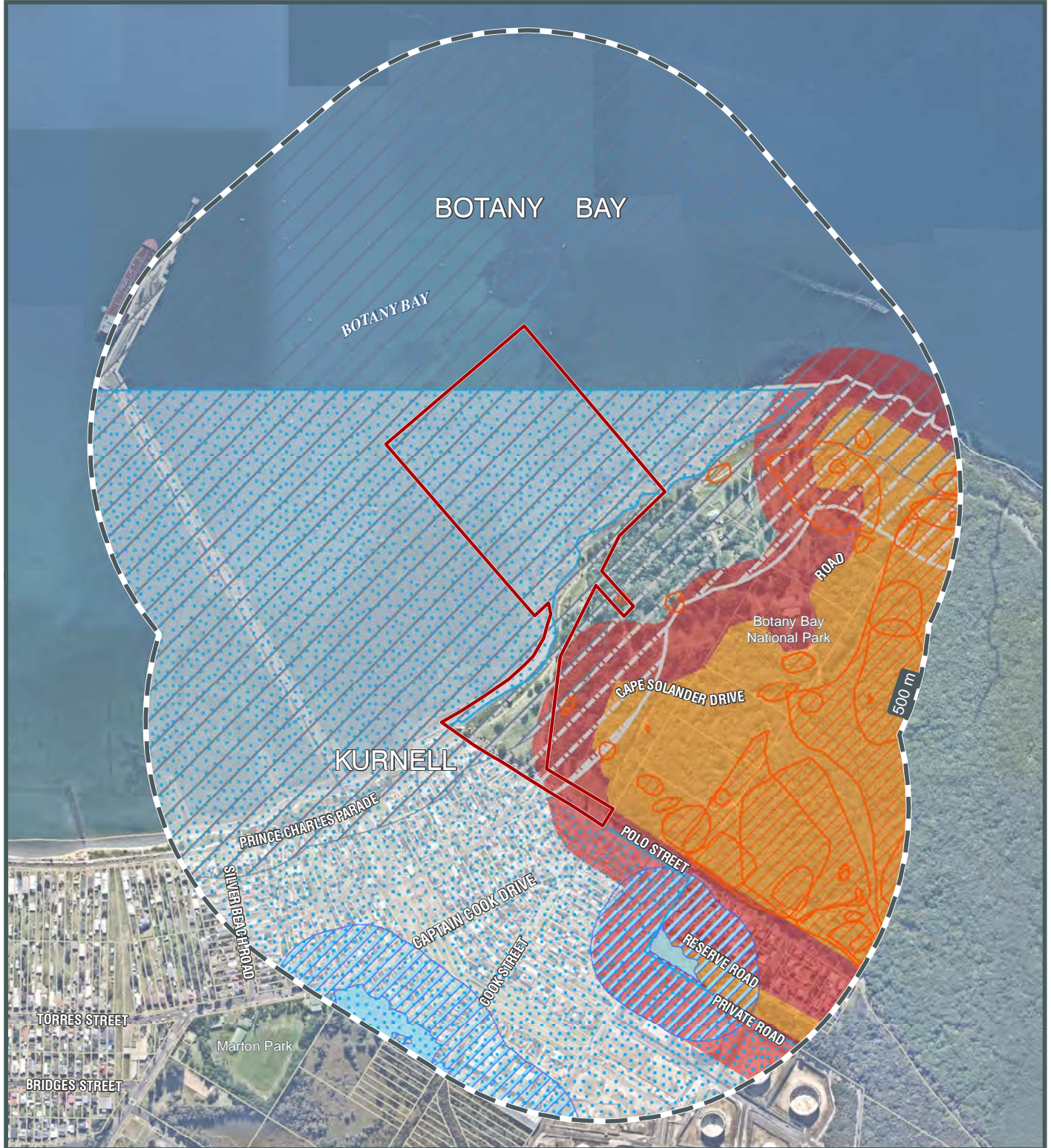
HERITAGE



MAP 9

Enviro-Screen





©2020 Land Insight & Resources (LIR) www.lirresources.com | 28-Jul-20 | Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

Flood Prone Land (EPI)

Fire

Bush Fire Prone Land

Vegetation Buffer

Vegetation Category 1

SEPP Coastal Management

Proximity Area for Coastal Wetlands

Proximity Area for Littoral Rainforests

Littoral Rainforests

Coastal Wetlands

Coastal Environment Area Map

Coastal Use Area Map



NATURAL HAZARDS





ATTACHMENT B

Historical Imagery





LIR-01397 Aerial Photograph, 1956 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1956





LIR-01397 Aerial Photograph 1961 28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1961



MAP 12





LIR-01397 Aerial Photograph 1970 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1970



MAP 13





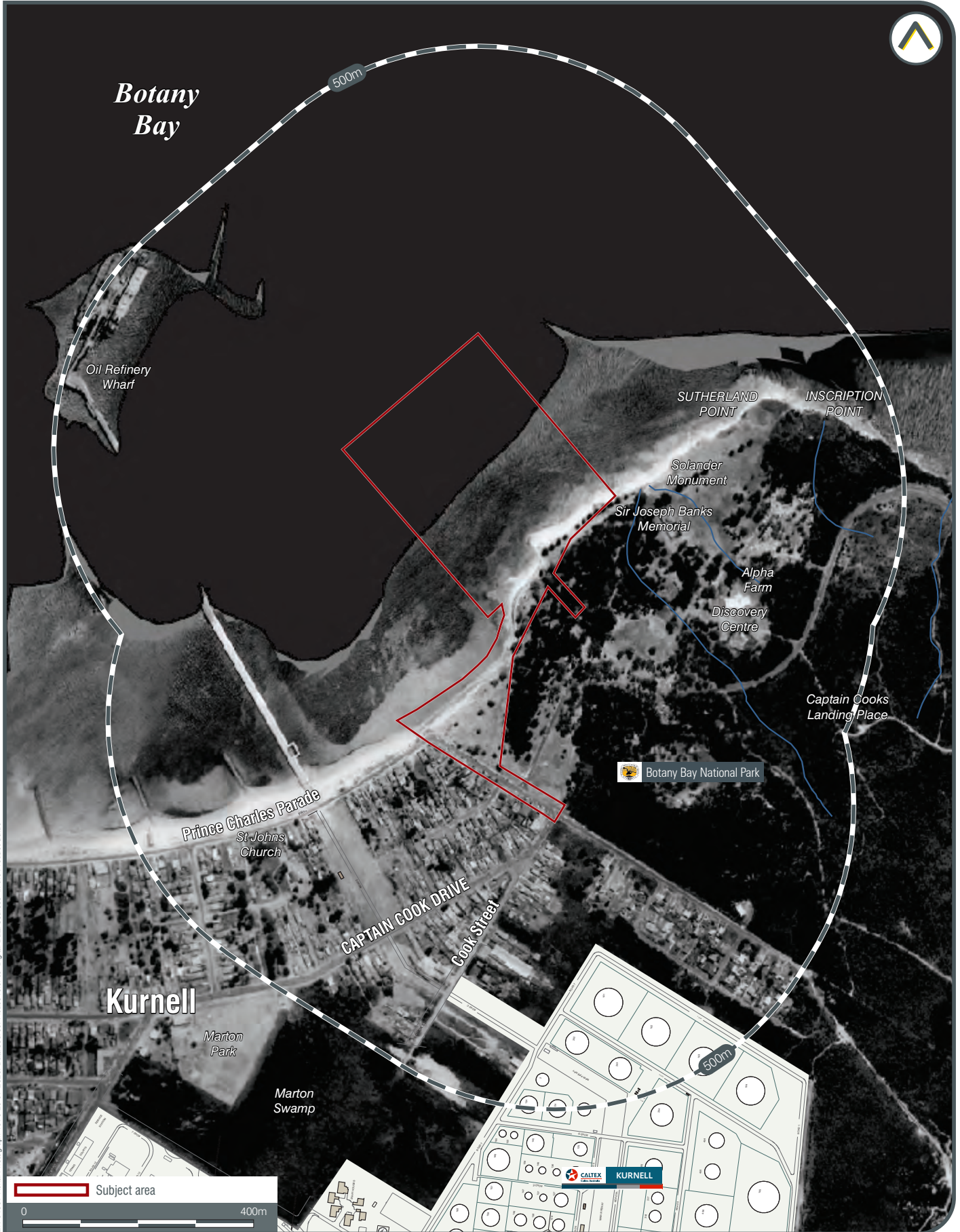
LIR-01397 Aerial Photograph 1972-28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1972



MAP 15





LIR-01397 Aerial Photograph, 1975 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1975



MAP 16





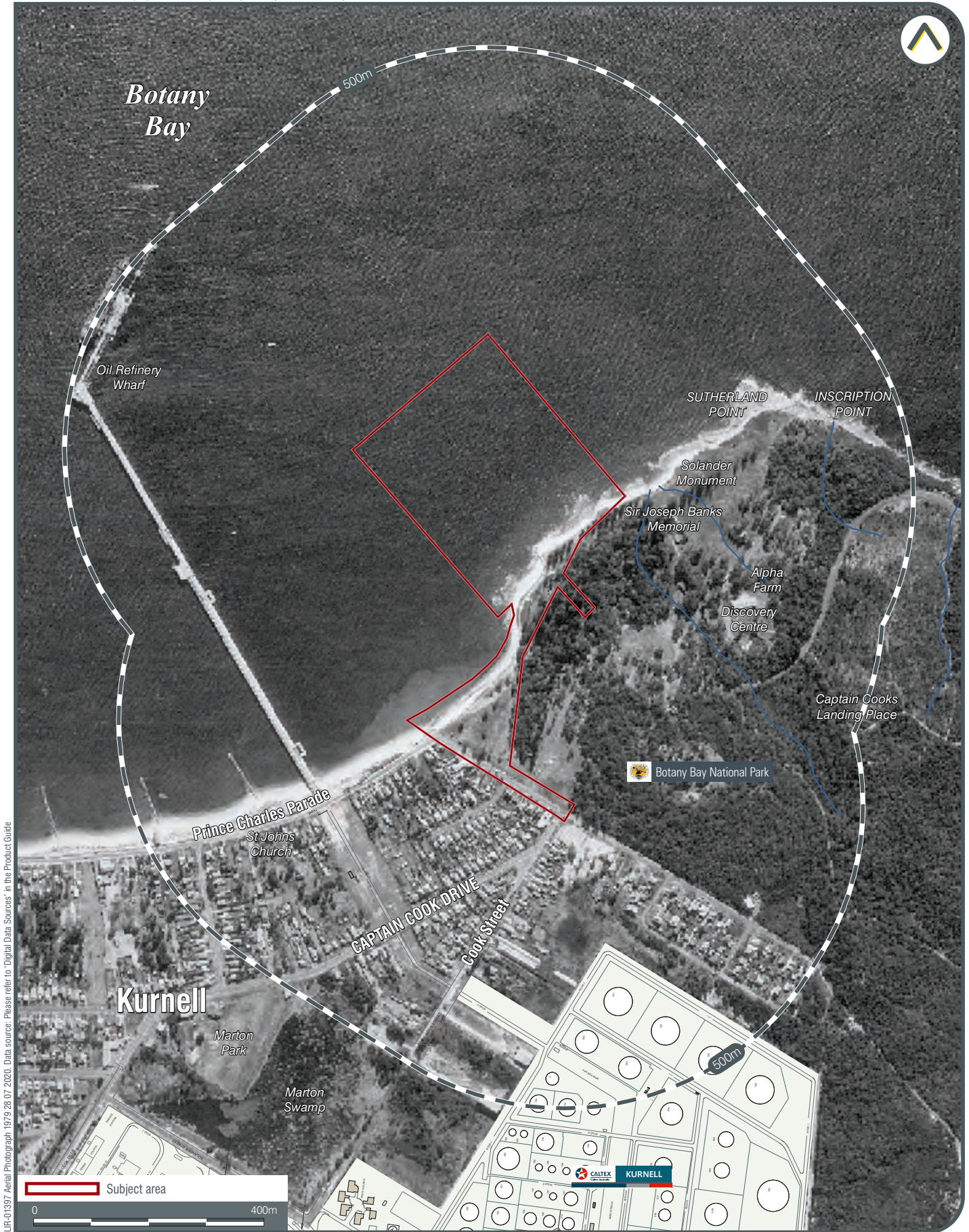
LIR-01397 Aerial Photograph 1978 28.07.2020. Data source: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1978



MAP 17





LIR-01397 Aerial Photograph, 1979-28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1979



MAP 18





LIR-01397 Aerial Photograph, 1980-28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1980



MAP 19





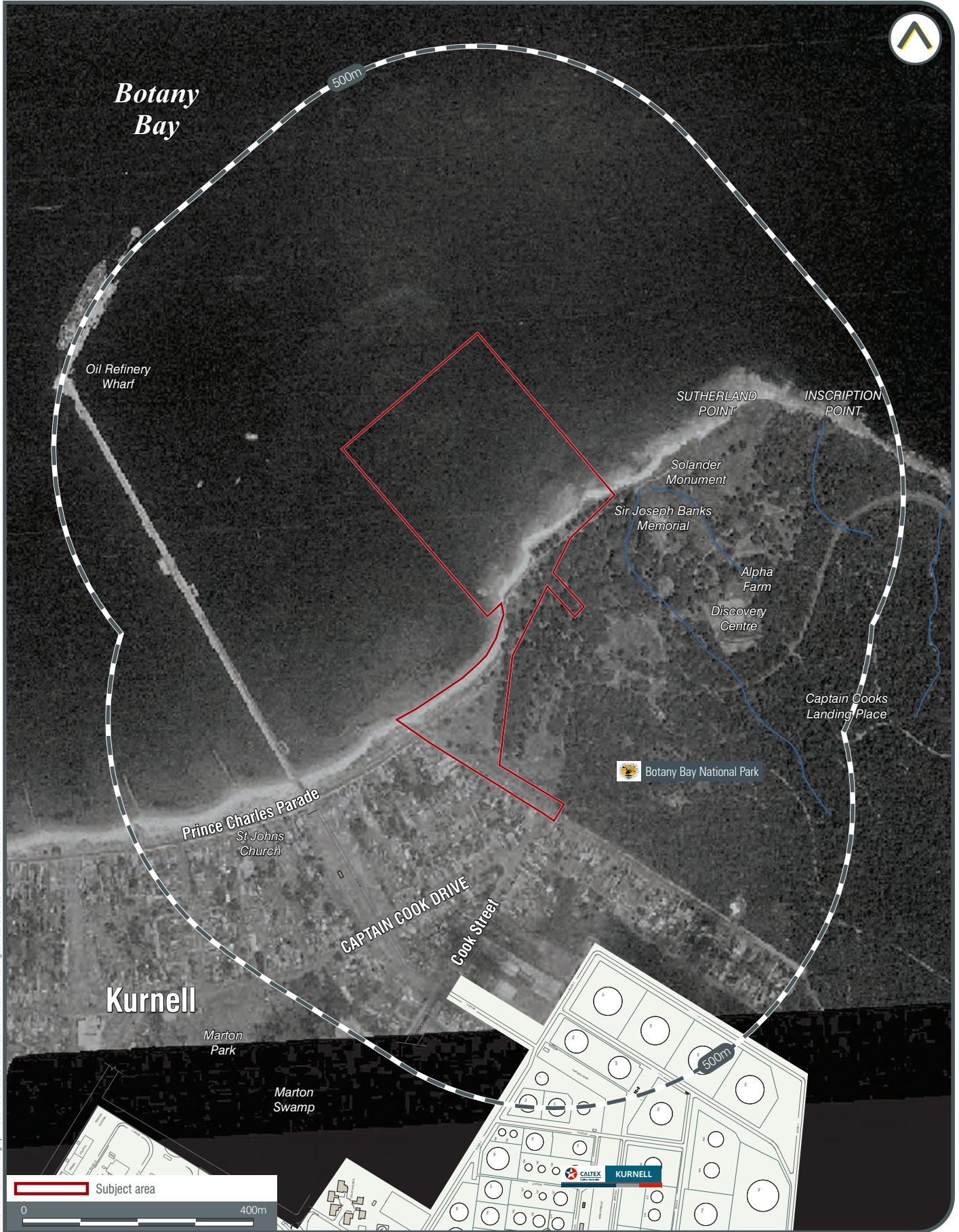
LIR-01397 Aerial Photograph, 1983 28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1983



MAP 20





LIR-01397 Aerial Photograph 1988 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1988



MAP 21





LIR-01397 Aerial Photograph 1990 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1990



MAP 22





LIR-01397 Aerial Photograph 1994. 28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1994



MAP 23





LIR-01397 Aerial Photograph, 1998: 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1998



MAP 24





LIR-01397 Aerial Photograph 2002 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2002



MAP 25





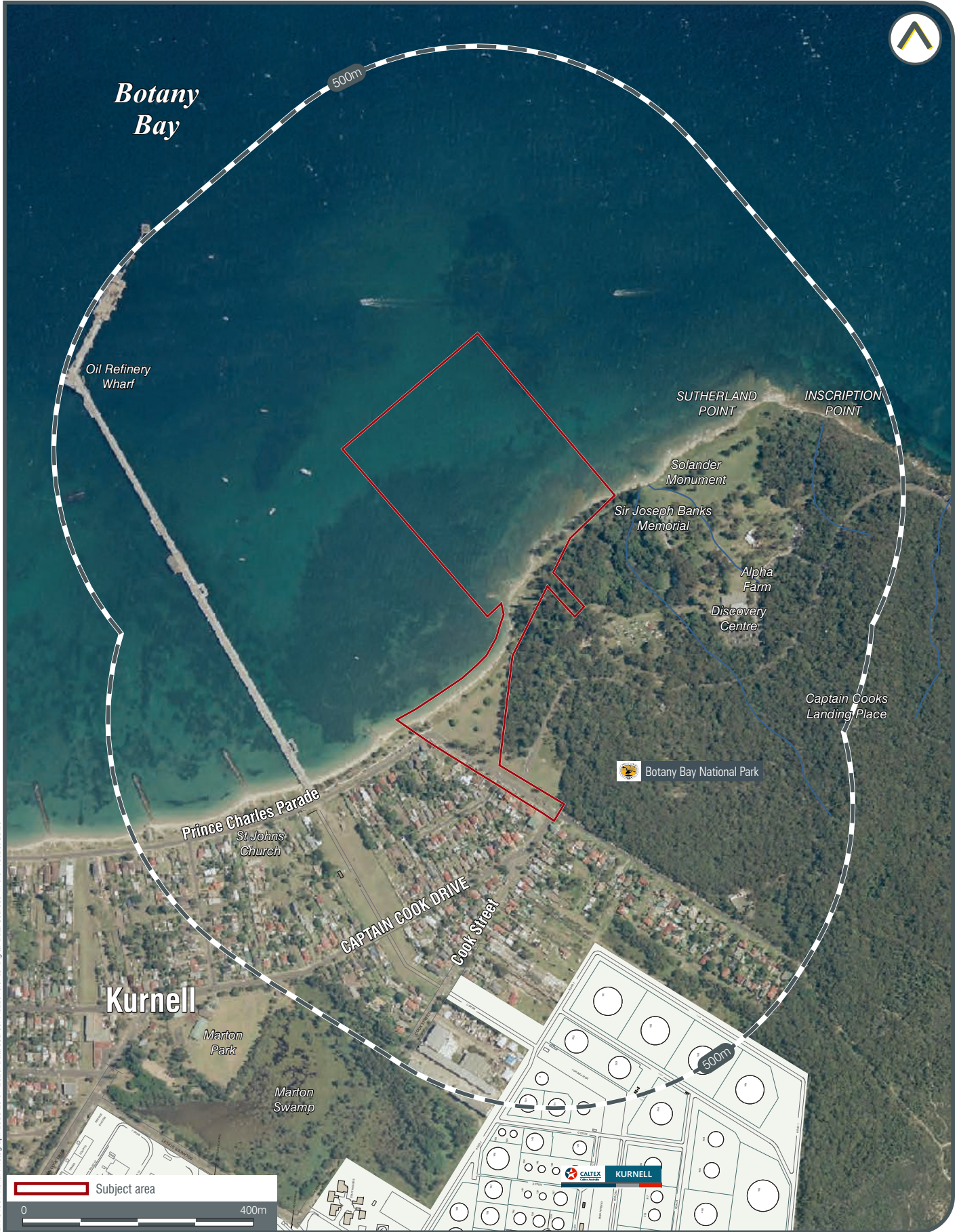
LIR-01397 Aerial Photograph, 2004, 28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2004



MAP 26





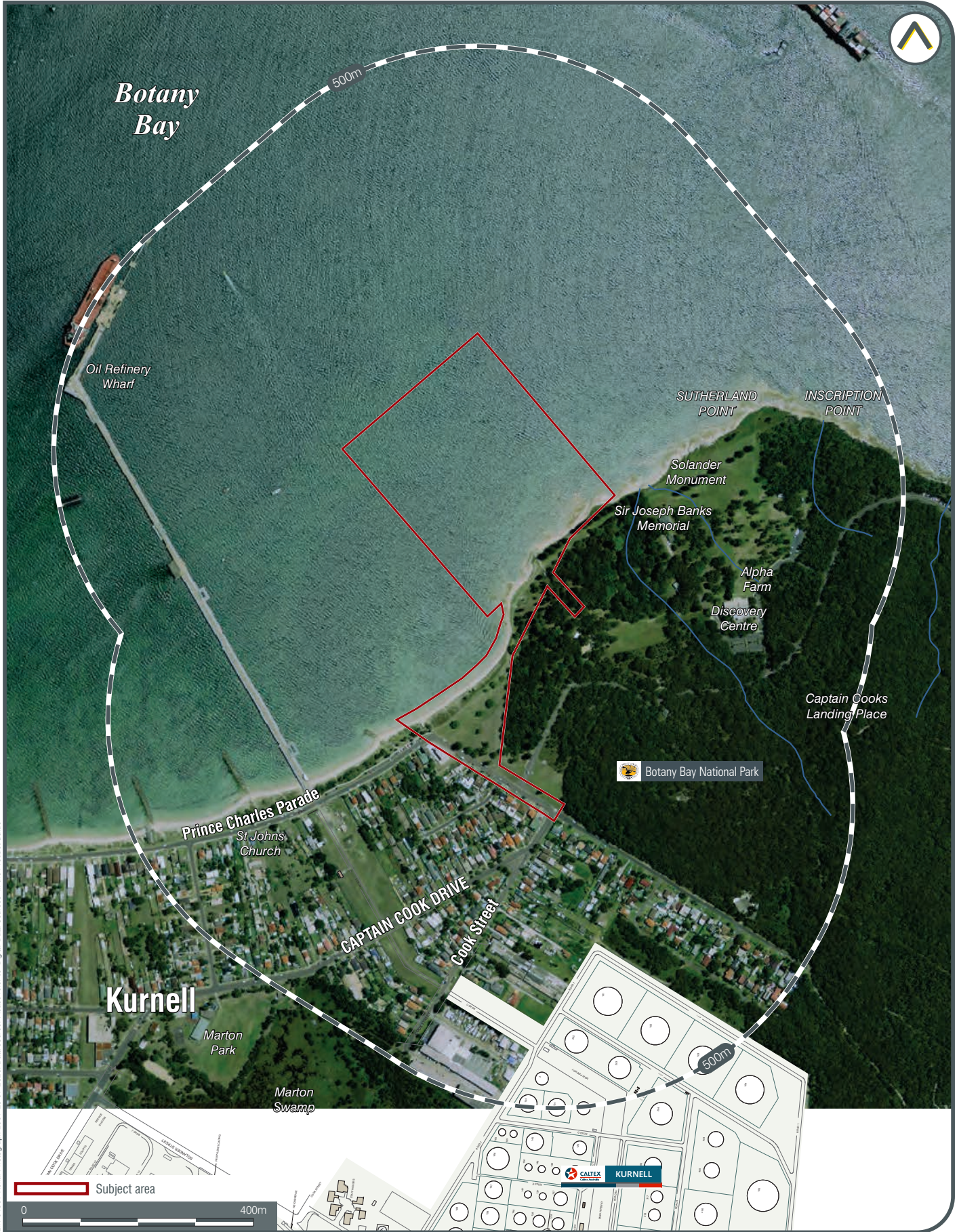
LIR-01397 Aerial Photograph, 2005 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2005



MAP 27





LIR-01397 Aerial Photograph 2007 28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2007





LIR-01397 Aerial Photograph 2009 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2009



MAP 29





LIR-01397 Aerial Photograph 2011, 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2011



MAP 30





LIR-01397 Aerial Photograph 2014.28.07.2020. Data source: "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2014



MAP 31

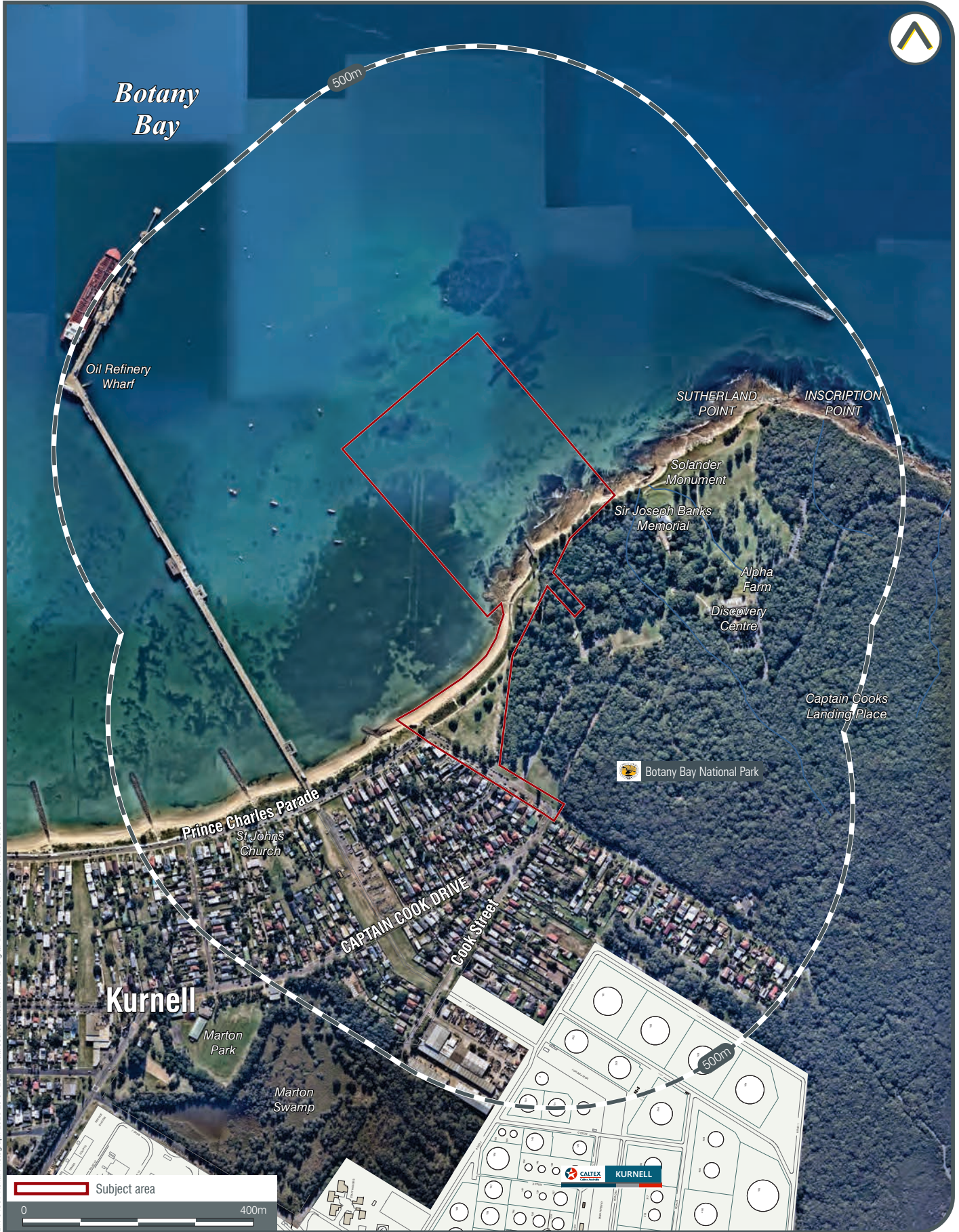




LIR-01397 Aerial Photograph 2017 28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2017





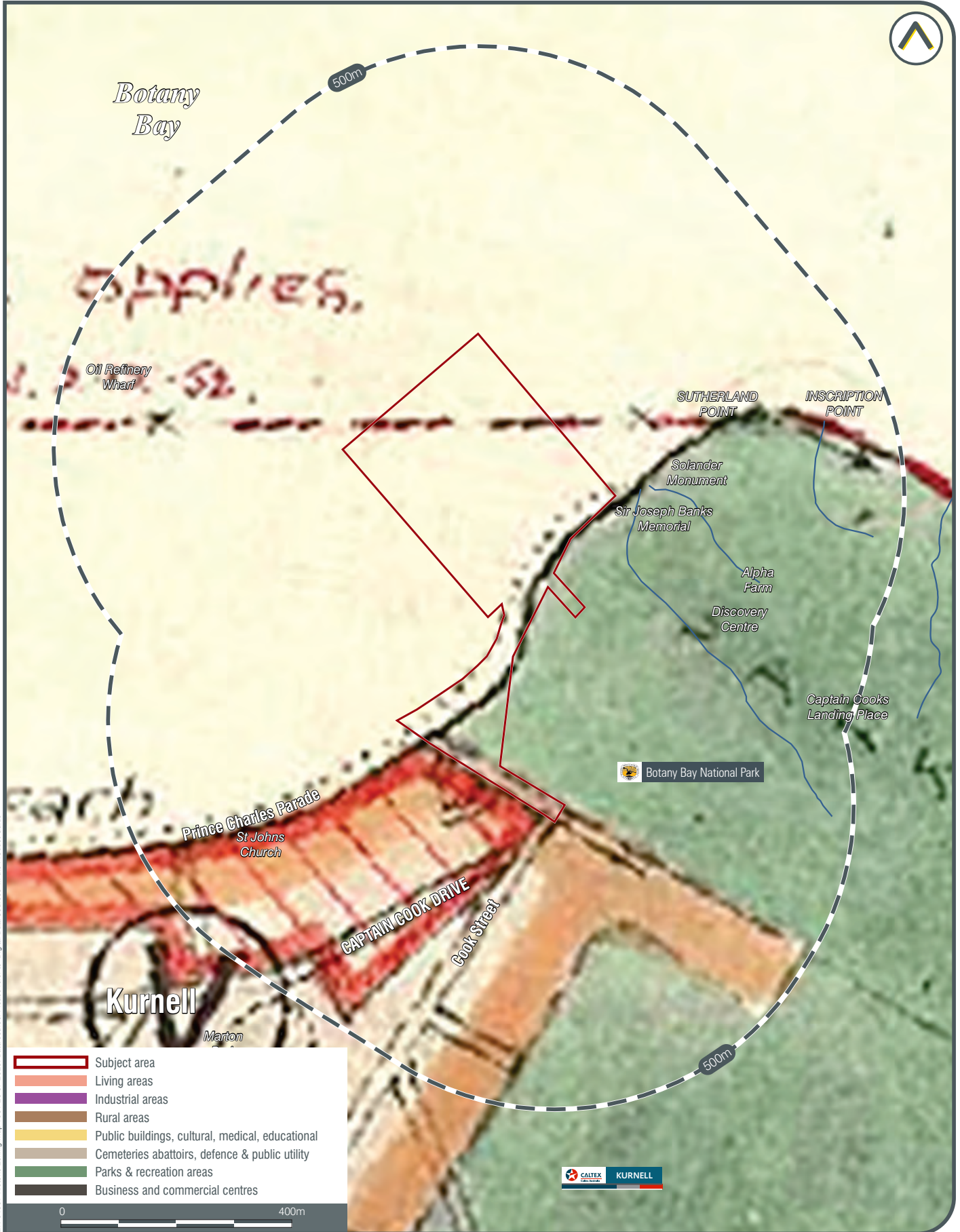
LIR-01397 Aerial Photograph 2020.28.07.2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2020



MAP 33

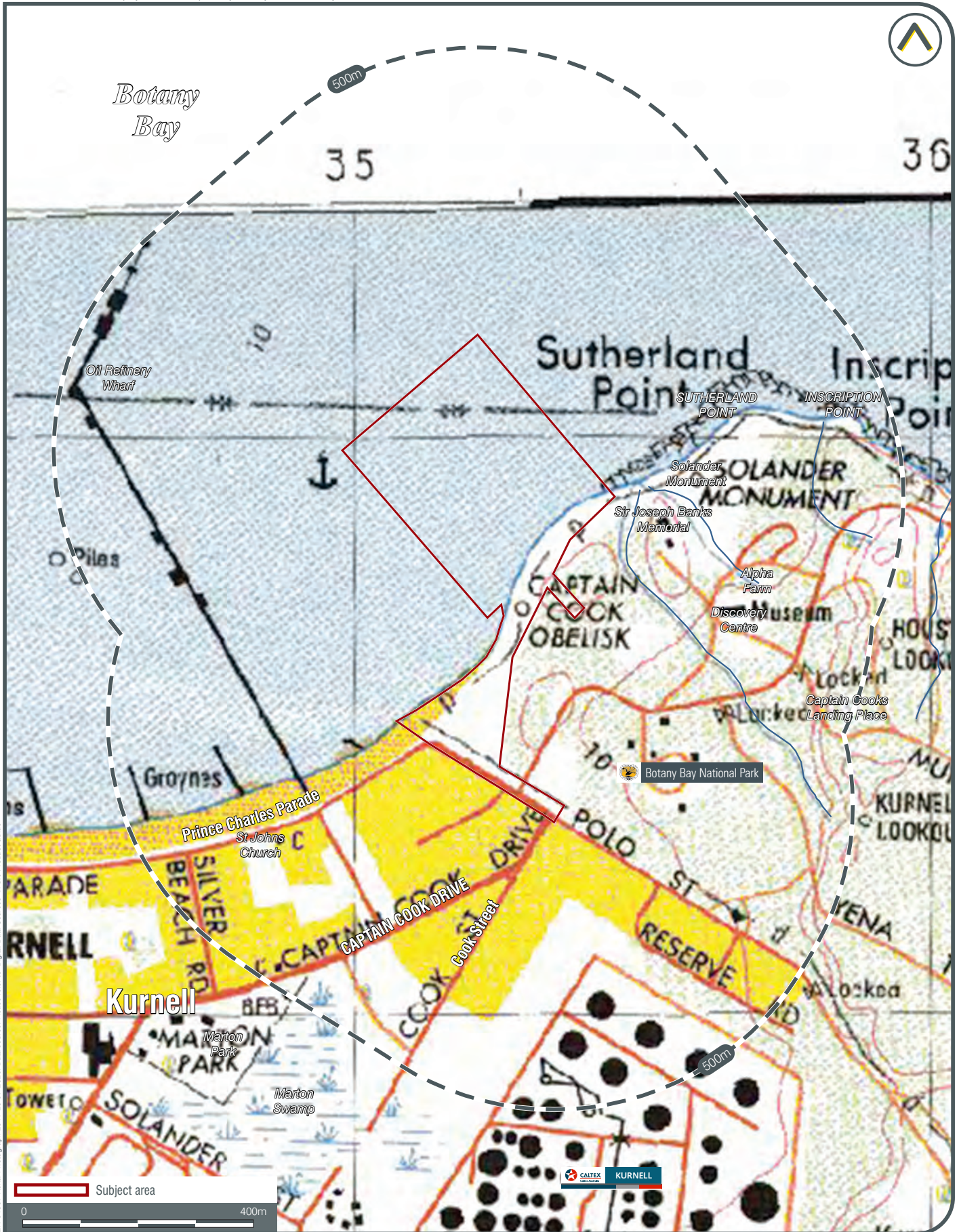




LUR-01397, Historic Zoning Map 1951 28.07.2020. Data source: Please refer to 'Digital Data Sources' in the Product Guide

COUNTY OF CUMBERLAND PLANNING SCHEME - 1951





LIR-01397 Aerial Photograph 2017-28-07-2020. Data sources: Please refer to "Digital Data Sources" in the Product Guide

1969-1991 1:25,000 TOPOGRAPHIC MAP (BOTANY BAY 9129-4N)

APPENDIX C LAND TITLES



FOLIO: AUTO CONSOL 1368-111

SEARCH DATE	TIME	EDITION NO	DATE
-----	----	-----	----
2/12/2022	11:11 AM	-	-

VOL 1368 FOL 111 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS

LOCAL GOVERNMENT AREA SUTHERLAND SHIRE

PARISH OF SUTHERLAND COUNTY OF CUMBERLAND

TITLE DIAGRAM DP908

FIRST SCHEDULE

THE MINISTER FOR LANDS

(R 326312)

SECOND SCHEDULE (0 NOTIFICATIONS)

NIL

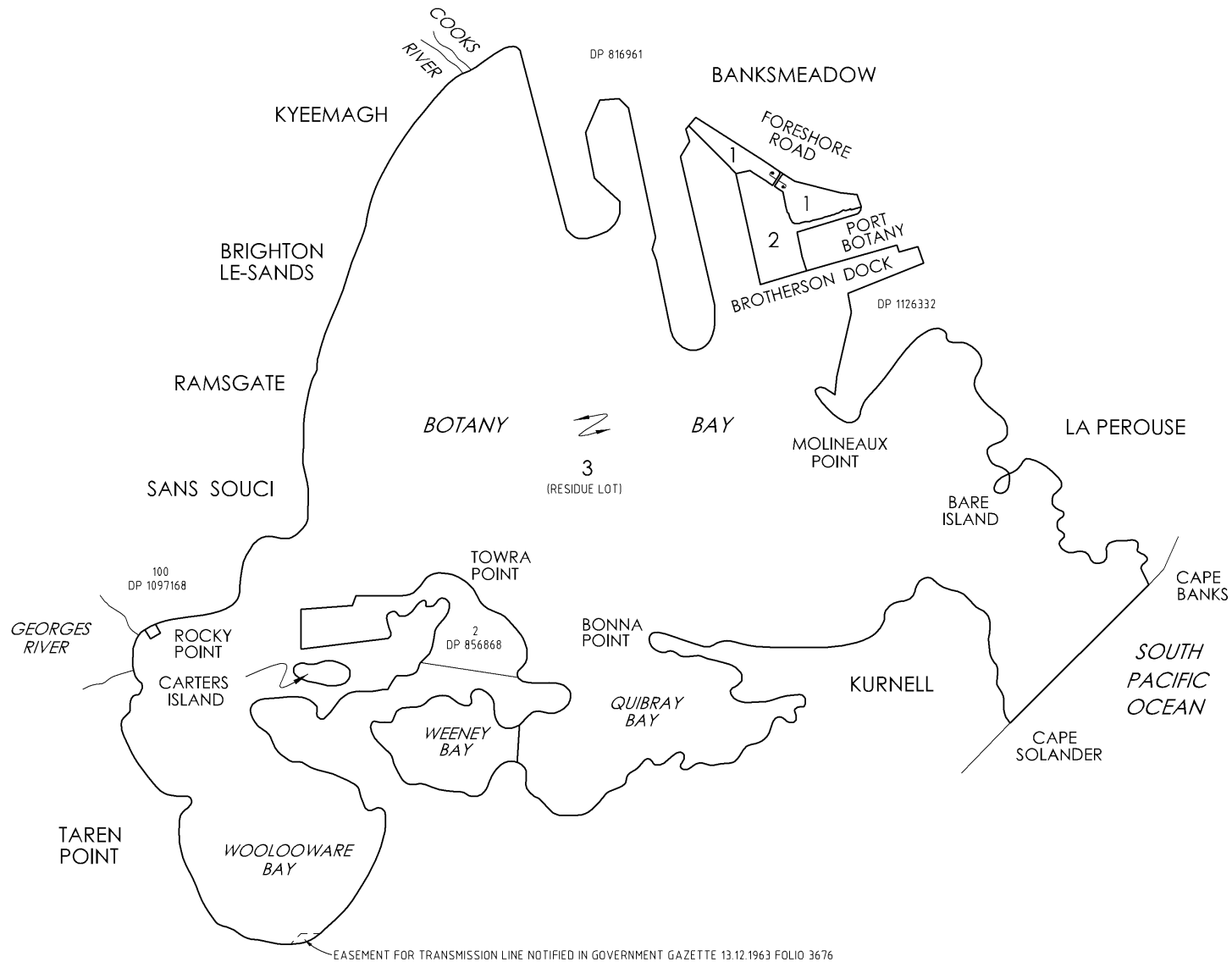
NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 71-76 IN DP908.

*** END OF SEARCH ***




EASEMENT FOR TRANSMISSION LINE NOTIFIED IN GOVERNMENT GAZETTE 13.12.1963 FOLIO 3676

Surveyor: MATTHEW WILLIAM CLEARY
 Date of Survey: 22-3-2011
 Surveyor's Ref: 114881500_11

PLAN OF SUBDIVISION OF LOT 456 IN
 D.P.1137279 & LOT 1 IN D.P.1122339 AND
 EASEMENTS AFFECTING LOTS 2, 7, 26 &
 28 IN D.P.1126332

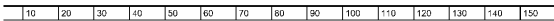
LGA: BOTANY BAY, RANDWICK
 SUTHERLAND SHIRE, ROCKDALE
 Locality: PORT BOTANY
 Subdivision No: C11/247
 Lengths are in metres. Reduction Ratio 1:N.T.S

Registered:
 5.7.2011

DP1165618



Ref: Roads and Maritime Services /Src: P
Req: R677344 /Doc: DP 1165618 P /Rev: 04-Apr-2013 /Sts: SC OK /Pgs: ALL /Prt: 31-Oct-2016 11:20 /Seq: 1 of 7

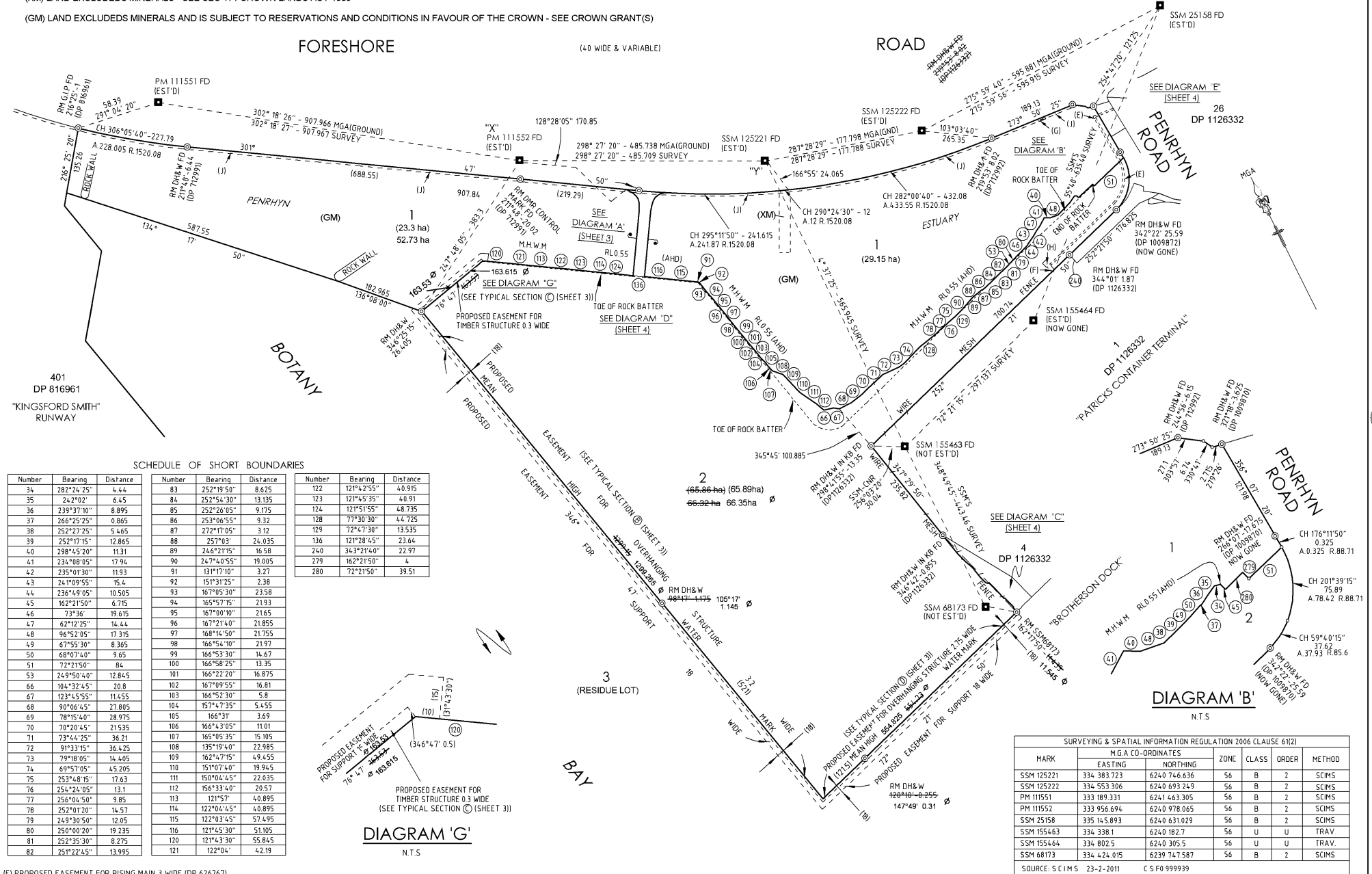


(XM) LAND EXCLUDES MINERALS - SEE SEC 171 CROWN LANDS ACT 1989
(GM) LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

FORESHORE

(4.0 WIDE & VARIABLE)

ROAD



SCHEDULE OF SHORT BOUNDARIES

Table with 3 columns: Number, Bearing, Distance. Lists boundary details for lots 34 through 122.

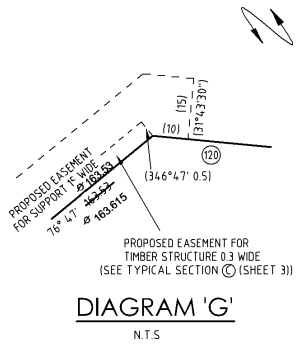


Table with 7 columns: MARK, EASTING, NORTHING, ZONE, CLASS, ORDER, METHOD. Lists surveying and spatial information for various marks.

(E) PROPOSED EASEMENT FOR RISING MAIN 3 WIDE (DP 626767)
(F) PROPOSED EASEMENT FOR SERVICES AND ACCESS - VARIABLE WIDTH (DP626767)
(G) EASEMENT FOR ELECTRICITY SUBSTATION (AC247584)
(H) PROPOSED LOT 1 BEING THE SITE OF SP5570 (DP626767)
(J) PIPELINE EASEMENT 3 WIDE & VARIABLE WIDTH (DP499007 & DP499008)
(D618732, R297864, R297865, R342216, S816045, S816046 & S816047)

Surveyor: MATTHEW WILLIAM CLEARY
Date of Survey: 22-3-2011
Surveyor's Ref: 114881500_11

PLAN OF SUBDIVISION OF LOT 456 IN
D.P.1137279 & LOT 1 IN D.P.1122339 AND
EASEMENTS AFFECTING LOTS 2, 7, 26 &
28 IN D.P.1126332

LGA: BOTANY BAY, RANDWICK
SUTHERLAND SHIRE, ROCKDALE
Locality: PORT BOTANY
Subdivision No: C11/247
Lengths are in Metres, Reduction Ratio 1:5000

Registered:
5.7.2011

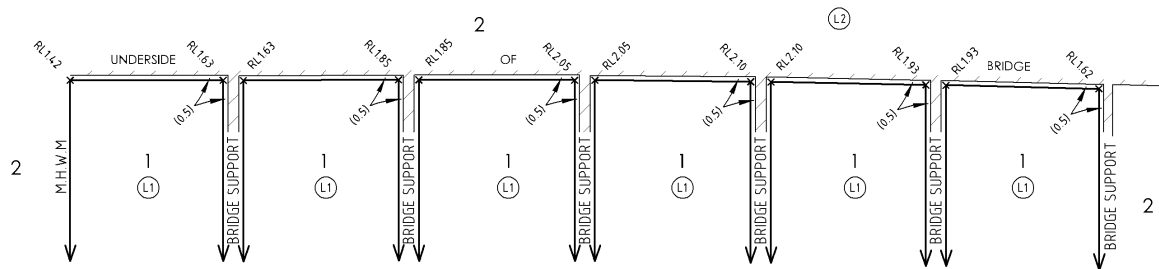
DP1165618

Req:R677344 /Doc:DP 1165618 P /Rev:04-Apr-2013 /Sts:SC.OK /Pgs:ALL /Prt:31-Oct-2016 11:20 /Seq:2 of 7
Ref:Roads and Maritime Services /Src:C

PLAN AMENDED IN LPI AT SURVEYOR'S REQUEST
VARIOUS AMENDMENTS WIDE 2013-306 3-4-2013

SECTION A-A
N.T.S.

AREA OF (L1) = (2827m²)



- (L1) UNLIMITED IN DEPTH & LIMITED IN HEIGHT TO VARIOUS LEVEL & SLOPING PLANES AS SHOWN HEREON & IN SECTION A-A
- (L2) UNLIMITED IN HEIGHT & LIMITED IN DEPTH TO VARIOUS LEVEL & SLOPING PLANES AS SHOWN HEREON & IN SECTION A-A

ALL LEVELS ARE ON AUSTRALIAN HEIGHT DATUM
ORIGIN OF LEVELS : SSM125221 RL 3.767 (AHD)
PM111552 RL 3.708 (AHD)

SEE SHEETS 2 & 4 FOR THE SHORT & CURVED LINE TABLES

DIAGRAM 'I' - NTS

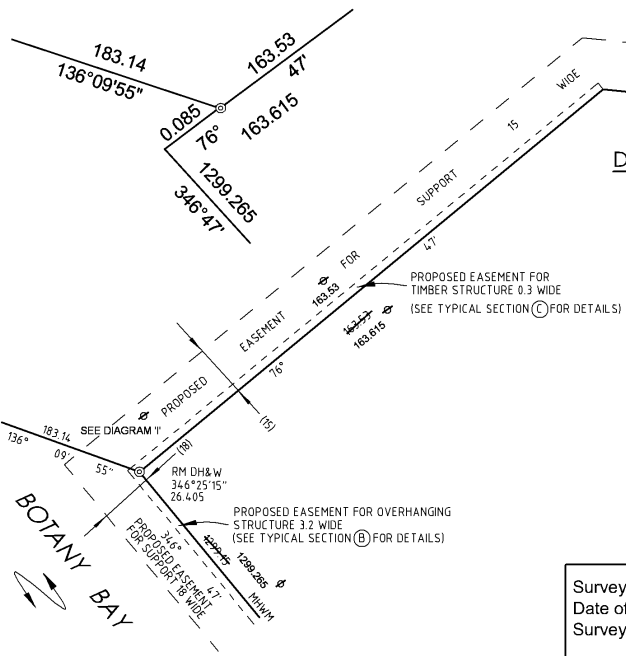
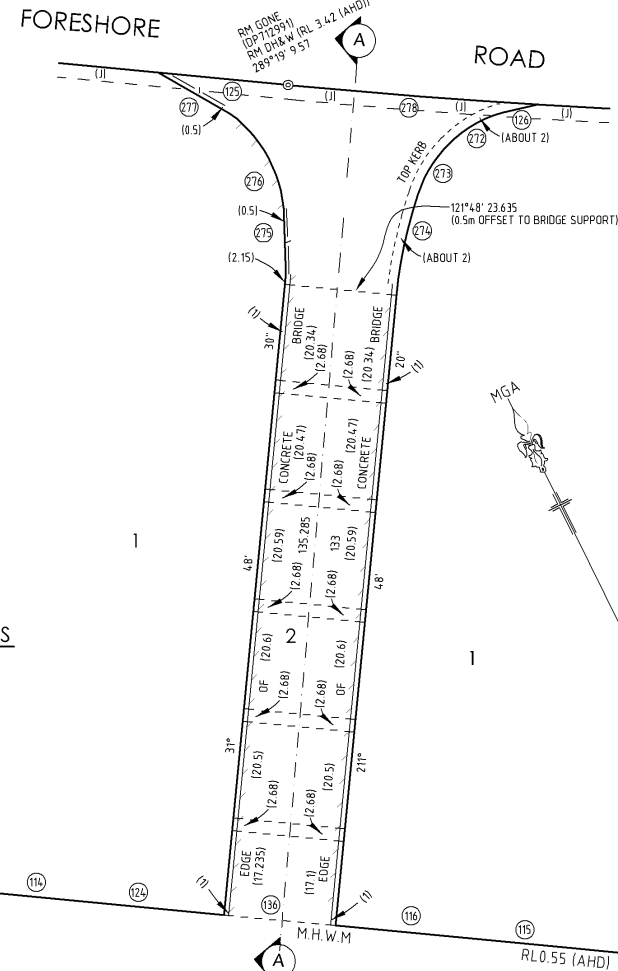
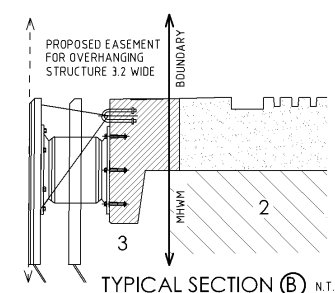
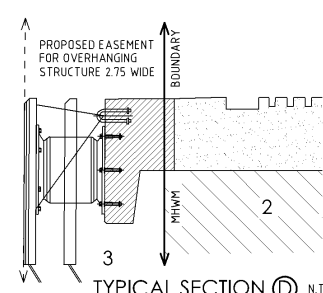
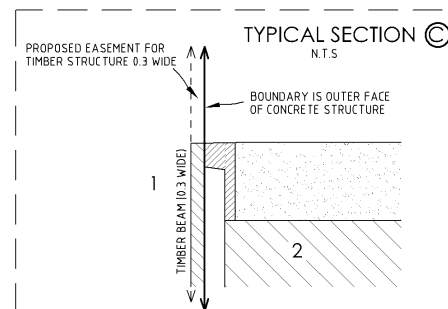


DIAGRAM 'A'
N.T.S.



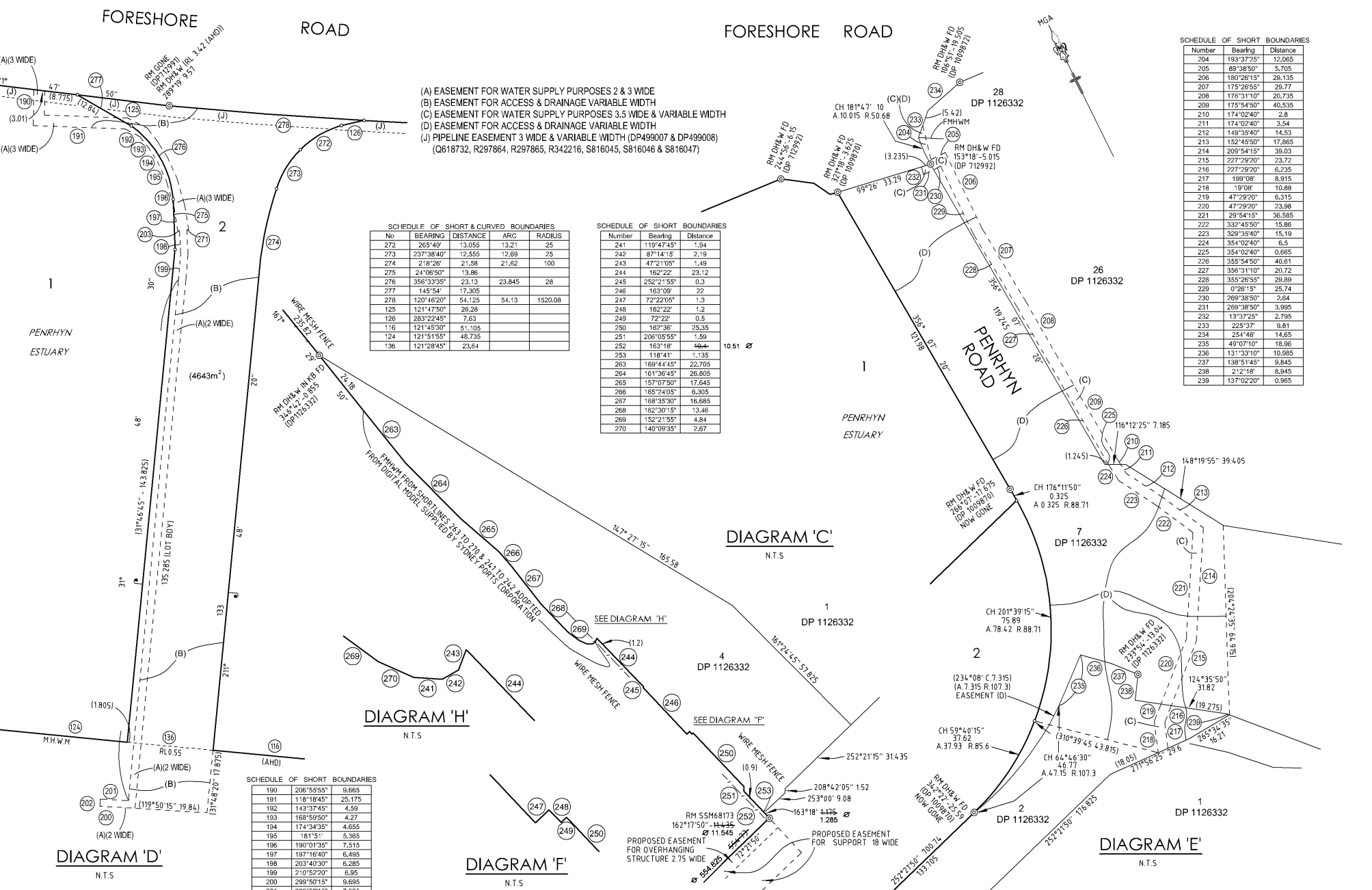
Surveyor: MATTHEW WILLIAM CLEARY
Date of Survey: 22-3-2011
Surveyor's Ref: 114881500_11

PLAN OF SUBDIVISION OF LOT 456 IN
D.P.1137279 & LOT 1 IN D.P.1122339 AND
EASEMENTS AFFECTING LOTS 2, 7, 26 &
28 IN D.P.1126332

LGA: BOTANY BAY, RANDWICK
SUTHERLAND SHIRE, ROCKDALE
Locality: PORT BOTANY
Subdivision No: C11/247
Lengths are in metres. Reduction Ratio 1:N.T.S.

Registered:
5.7.2011

DP1165618



- (A) EASEMENT FOR WATER SUPPLY PURPOSES 2 & 3 WIDE
- (B) EASEMENT FOR ACCESS & DRAINAGE VARIABLE WIDTH
- (C) EASEMENT FOR WATER SUPPLY PURPOSES 3.5 WIDE & VARIABLE WIDTH
- (D) EASEMENT FOR ACCESS & DRAINAGE VARIABLE WIDTH
- (J) PIPELINE EASEMENT 3 WIDE & VARIABLE WIDTH (DP499007 & DP499008)
(C618732, R297864, R297865, R342216, S816045, S816046 & S816047)

SCHEDULE OF SHORT & CURVED BOUNDARIES

No	BEARING	DISTANCE	ARC	RADIUS
272	263°49'	13.055	13.21	25
273	237°38'40"	12.555	12.89	25
274	2°18'28"	21.58	21.82	100
275	24°06'50"	13.86		
276	356°33'35"	23.13	23.845	28
277	145°54'	17.305		
278	120°46'20"	54.125	54.13	1520.08
125	121°47'50"	28.28		
126	283°22'45"	7.63		
116	121°45'30"	51.105		
124	121°51'55"	48.735		
136	121°28'45"	23.64		

SCHEDULE OF SHORT BOUNDARIES

Number	Bearing	Distance
241	119°47'49"	1.94
242	87°14'13"	2.19
243	47°21'05"	1.49
244	162°22'	23.12
245	252°21'55"	0.3
246	163°09'	22
247	72°22'05"	1.3
248	162°22'	1.2
249	72°22'	0.5
250	162°36'	25.35
251	206°05'55"	1.59
252	163°18'	40.4
253	118°41'	1.35
263	169°44'15"	22.705
264	161°36'45"	26.805
265	157°07'50"	17.645
266	165°24'05"	6.305
267	168°35'30"	16.685
268	162°30'15"	13.46
269	152°21'55"	4.84
270	140°09'35"	2.67

SCHEDULE OF SHORT BOUNDARIES

Number	Bearing	Distance
204	193°37'25"	12.065
205	89°36'50"	5.705
206	180°26'15"	28.135
207	175°26'55"	29.77
208	176°31'10"	20.735
209	175°54'50"	40.535
210	174°02'40"	2.8
211	174°02'40"	3.54
212	149°35'40"	14.53
213	152°45'50"	17.885
214	209°54'15"	39.03
215	227°29'20"	23.72
216	227°29'20"	6.235
217	189°08'	8.915
218	19°08'	10.88
219	47°25'20"	6.315
220	47°29'20"	23.98
221	29°54'15"	36.585
222	332°45'50"	15.86
223	329°35'40"	15.19
224	351°02'40"	6.5
225	354°02'40"	0.695
226	355°54'50"	40.61
227	356°31'10"	20.72
228	355°26'55"	29.89
229	0°26'15"	25.74
230	289°38'50"	2.64
231	289°38'50"	3.995
232	13°37'25"	2.795
233	225°37'	9.81
234	254°48'	14.65
235	48°07'10"	18.96
236	131°31'10"	10.985
237	138°51'45"	9.845
238	212°18'	8.945
239	137°02'20"	0.965

DIAGRAM 'H' N.T.S.

DIAGRAM 'C' N.T.S.

DIAGRAM 'E' N.T.S.

SCHEDULE OF SHORT BOUNDARIES

Number	Bearing	Distance
190	206°53'55"	9.665
191	118°18'45"	25.175
192	143°37'45"	4.59
193	168°59'50"	4.27
194	174°34'35"	4.655
195	181°51"	5.365
196	190°01'35"	7.515
197	197°16'40"	6.495
198	203°40'30"	6.285
199	210°52'20"	6.95
200	299°50'15"	9.695
201	299°50'15"	7.695
202	211°47'10"	2
203	110°28'35"	0.5
271	110°28'35"	0.5

Surveyor: MATTHEW WILLIAM CLEARY
 Date of Survey: 22-3-2011
 Surveyor's Ref: 114881500_11

PLAN OF SUBDIVISION OF LOT 456 IN
 D.P.1137279 & LOT 1 IN D.P.1122339 AND
 EASEMENTS AFFECTING LOTS 2, 7, 26 &
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LGA: BOTANY BAY, RANDWICK
 SUTHERLAND SHIRE, ROCKDALE
 Locality: PORT BOTANY
 Subdivision No: C11/247
 Lengths are in metres. Reduction Ratio 1:N.T.S.

Registered:
 5.7.2011

DP1165618

Ref: Roads and Maritime Services (Src: P
 Req: R677344 /Doc: DP 1165618 P /Rev: 04-Apr-2013 /Sts: SC.OK /Pgs: ALL /Prt: 31-Oct-2016 11:20 /Seq: 4 of 7

DEPOSITED PLAN ADMINISTRATION SHEET


Sheet 1 of 3 sheet

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

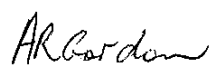
DP1165618

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919, AS AMENDED, IT IS INTENDED TO CREATE:

- 1. EASEMENT FOR WATER SUPPLY PURPOSES 2 & 3 WIDE
- 2. EASEMENT FOR ACCESS & DRAINAGE VARIABLE WIDTH
- 3. EASEMENT FOR WATER SUPPLY PURPOSES 3.5 WIDE & VARIABLE WIDTH
- 4. EASEMENT FOR ACCESS & DRAINAGE VARIABLE WIDTH

Registered:  5.7.2011
 Title System: TORRENS
 Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF LOT 456 IN D.P.1137279 & LOT 1 IN D.P.1122339 AND EASEMENTS AFFECTING LOTS 2, 7, 26 & 28 IN D.P.1126332



ALLAN GORDON
SURVEY MANAGER
MARITIME AUTHORITY OF NSW

LGA: BOTANY BAY, RANDWICK
 SUTHERLAND SHIRE, ROCKDALE
 Locality:PORT BOTANY
 Parish: SUTHERLAND, BOTANY, ST.GEORGE
 County: CUMBERLAND

Use PLAN FORM 6A for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

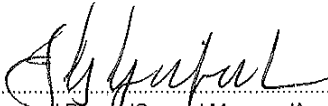
I.....in approving this plan certify
 (Authorised Officer)
 that all necessary approvals in regard to the allocation of the land shown herein have been given

Signature:.....
 Date:.....
 File Number:.....
 Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed SUBDIVISION set out herein (insert 'subdivision' or 'new road')



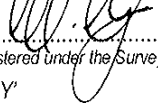
* Authorised Person/General Manager/Accredited Certifier

Consent Authority: SYDNEY PORTS CORPORATION
 Date of Endorsement: 16/5/2011
 Accreditation no:
 Subdivision Certificate no:
 File no: C.11./247

Surveying & Spatial Information Regulation, 2006

I, MATTHEW WILLIAM CLEARY of HARD & FORESTER PTY LTD 23-25 FREDERICK STREET, ROCKDALE NSW 2216 a surveyor registered under the *Surveying & Spatial Information Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying & Spatial Information Regulation, 2006* and was completed on ~~19/4/2011~~ 22/3/2011

The survey relates to LOTS 1, 2, PART 3 ~~AND~~ AND CONNECTIONS
 specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature  Dated: 19/5/2011
 Surveyor registered under the *Surveying & Spatial Information Act, 2002*
 Datum Line 'X' - 'Y'
 Type: Urban/~~Rural~~

Plans used in the preparation of survey/compilation

- DP816961
- DPP1009870
- DP1126332
- DP1137279

SURVEYOR'S REFERENCE: 114881500

* Delete whichever is inapplicable.

* OFFICE USE ONLY

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 3 sheet(s)

PLAN OF SUBDIVISION OF LOT 456 IN D.P.1137279 & LOT 1 IN D.P.1122339 AND EASEMENTS AFFECTING LOTS 2, 7, 26 & 28 IN D.P.1126332

DP1165618

Registered:  5.7.2011

Subdivision Certificate No: C11/247

Date of Endorsement: 16/5/2011

THE MARITIME AUTHORITY OF NSW (TRADING AS 'NSW MARITIME') IN ACCORDANCE WITH PART 2 DIVISION 5 OF THE SURVEYING REGULATION 2006, APPROVES THE DETERMINATION OF THE MHWM, AS SHOWN HEREON, NSW MARITIME

AUTHORITY FILE.....W02/213.....
ON.....20/5/2011.....

AR Gordon

* OFFICE USE ONLY

PLAN FORM 6A (Annexure Sheet)

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 3 of 3 sheet(s)

PLAN OF SUBDIVISION OF LOT 456 IN
D.P.1137279 & LOT 1 IN D.P.1122339
AND EASEMENTS AFFECTING LOTS
2, 7, 26 & 28 IN D.P.1126332


DP1165618

Registered:  5.7.2011

Subdivision Certificate No: C11/247

Date of Endorsement:

16/5/2011

 20/5/11
ACTING CEO
Sydney Ports Corporation

* OFFICE USE ONLY

SURVEYOR'S REFERENCE: 114881500

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Guyana	South Africa
Hong Kong	South Korea
India	Spain
Indonesia	Sweden
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ERM's Sydney Office

Level 14
207 Kent Street
Sydney NSW 2000

T: 02 8584 8888
F: 02 8584 8800

www.erm.com