Project Application

Volume 1

Inner West Marina
Parramatta River, Sydney

Date of Issue:	7th July, 2010
Project No:	01013
Status:	Project Application to NSW Department of Planning

Submission of Environmental Assessment (EA)

prepared under the Environmental Planning and Assessment Act 1979 Section 78A

EA Prepared by:	TLB Engineers
Name:	Howard Bersten
Qualifications:	BE(Hons) MIEAust, CPEng
Address:	TLB Engineers Pty. Ltd. Level 1, 514 Miller Street Cammeray, NSW 2062
In respect of:	Inner West Marina, Sydney

Development Application

Applicant Name:	Breakfast Point Pty Ltd
Applicant Address:	51 Riley Street, Sydney
Land to be developed:	16 Peninsular Drive, Breakfast Point and Kendall Bay
Lot No. DP/MPS/Vol/Fol etc:	Lot 53 in DP270347 and the area of water within Kendall Bay subject to a proposed NSW Maritime lease.

Environmental Impact Statement

An Environmental Assessment is attached

CERTIFICATE

We certify that we have prepared the contents of this statement and that to the best of our knowledge:

- It is in accordance with clauses 72 and 73 of the Environmental Planning and Assessment Regulation 2000, and
- It contains all available information that is relevant to the environmental assessment of the development, and
- That the information contained in the statement is neither false nor misleading.

Signature:

Name:

Date:

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1. EXECUTIVE SUMMARY

1. Executive Summary

*[Note:This Executive Summary should be read making reference to drawings DA01, DA02, DA03, DA04, DA05, DA06, DA07, DA08 and DA10 by TLB Engineers, AM01 by Giles Tribe, and DA100 and DA200 by Rose Architectural Design (refer **Appendix 1**)].*

Consistent with the changing demand for the storage of vessels in Sydney and, in particular, west of the Sydney Harbour Bridge, it is proposed to construct a marina and fixed jetty within Kendall Bay at Breakfast Point. Ancillary facilities will include a manager's office, a kiosk, marina car parking and associated development.

By letter dated 16 January 2007, the Department of Planning advised that *"on 29 December 2006, the Director-General of the Department of Planning, as delegate of the Minister for Planning, formed the opinion that the proposed commercial marina is a Major Project to which Part 3A of the Act applies"* (refer **Appendix 2**). Accordingly, the consent authority for the proposed development of the Inner West Marina is the Minister for Planning.

The Inner West Marina Project Application proposes:

1. Construction of a floating marina structure to provide berths for 172 vessels (including five destination berths for the general boating public).
2. A fixed jetty and pontoon on the site of the original wharf, as part of the interpretive reminder of the heritage of the site. The jetty and pontoon has been designed to enable a ferry stop should future demand show that this is desirable. The fixed jetty and ferry pontoon would be accessible 24 hours per day.
3. A kiosk with seating for 50 people at the seaward end of the jetty.
4. Installation of a blanket consisting of a geotextile and rock ballast, over the bed of the proposed marina lease area, to ensure sediments are not disturbed by propeller wash effects.
5. A small manager's office, containing some facilities for use by marina patrons.
6. A 58 space carpark located on Peninsula Drive, for use only by marina patrons.

The vessels to be accommodated within the marina will range in size from less than 8 metres up to 25 metres, with the majority of the vessels being in the range 10 to 16 metres.

The development will provide access for people with a disability and will provide publically available facilities for use by the general public, particularly residents of the local area, thus enhancing the experience of living within the Breakfast Point precinct and the surrounding locality.

The water based site is subject to the provisions of the *Sydney Regional Environment Plan (SREP) Sydney Harbour Catchment 2005*. The site is zoned **W1 Maritime Waters**. Development for the purpose of a 'marina' is permissible with consent in this zone.

The land-based site is subject to the provisions of the *Canada Bay Local Environmental Plan 2008.* The site is zoned **R1 General Residential.** Development for the purpose of 'car parking' is permissible with consent in this zone.

Community consultation undertaken as part of the environmental assessment has identified the following key environmental planning issues as being associated with the proposal:

- The marina should contribute to maintenance of landside community areas.
- Existing contamination in Kendall Bay.
- Public access to the marina.
- Impacts on views.

These issues, along with the Director-Generals Requirements (DGRs) (refer **Appendix 2**), have been addressed in expert reports submitted with this Project Application.

Land Owners' Consents from NSW Maritime and Breakfast Point Pty. Ltd. have been obtained and accompany this Project Application (refer **Appendix 3**).

The Environmental Assessment concludes that:

- The proposed Inner West Marina is a timely response to the much sought after on-water vessel storage within Sydney Harbour.
- The Project Application demonstrates current and future demand for the proposed marina.
- The Project is a positive contribution to the revitalisation of Kendall Bay, part of a former waterfront industrial precinct, the foreshores of which over the past decade have been transformed into a waterfront residential estate.
- On statutory planning grounds, the Project is consistent with the Objectives of the W1 Maritime Waters zone in that the Project has demonstrated that "*…it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations."*
- In addressing the environmental impacts of the proposed Project and the suitability of the site, the specialist reports have demonstrated that any environmental impacts of the Project are minimal and can be suitably managed and mitigated.
- In relation to the key issue of contaminated sediments, the proposed remediation approach ("geotextile blanket" over the bed of the proposed marina lease area) will ensure a significantly reduced level of contaminants will be disturbed.
- The construction of the proposed marina will also reduce the wave energy reaching shallow water and subsequently reduce the disturbance of contaminated sediment, a situation which is not managed at present.
- The site is easily accessible, has sufficient area and dimensions and is suitable to accommodate the Project.
- The Project does not restrict the navigation channel for other waterway users or impact on the existing and future opportunities for public recreation.

NOTES :

1. DATUM - AUSTRALIAN HEIGHT DATUM (AHD).
2. THE BED CONTOURS ARE TAKEN FROM A HYDROGRAPHIC SURVEY BY 'HARVEY HYDROGRAPHIC SURVEYS' UNDERTAKEN ON 06.08.01 TO 08.08.01 INCLUSIVE AND A HYDROGRAPHIC SURVEY UNDERTAKEN BY NSW MARITIME IN 2006.
3. WHERE VESSEL IS SHOWN IN BERTH ON PLAN ' ', BERTH IS TO BE USED FOR MOTOR VESSELS ONLY.
4. REFER TO DWG No. DA03 FOR VESSEL SCHEDULE.

LEGEND :

- ⊙ CMB1, 3 & 4 : CHANNEL MARKER BUOY.
- CRP831 : EXISTING MARKER BUOY.
- SPC : EXISTING CHANNEL MARKER PILE.
- SOP : SET OUT POINT.
- (16) : VESSEL LENGTH.
- P : PEDESTRIAN PUBLIC ACCESS.
- : DESTINATION (DAY TRIPPER) BERTHS - CASUAL BERTHING.
- REFERENCE POINTS : REFER TO MGA94 (ZONE 56) CO-ORDINATES

MARK	MGA94 (ZONE 56) CO-ORDINATES (TO BE USED FOR FINAL SETOUT)	
	EASTING (m)	NORTHING (m)
CRP831	325535.00	6253927.00
SPC	325300.00	6254230.00
SOP	325417.91	6253892.06
RP1	325471.70	6254124.19
RP2	325493.48	6254069.24
RP3	325507.36	6254019.02
RP4	325497.08	6253881.15
RP5	325540.54	6253885.30
RP6	325581.20	6253873.97
RP7	325565.99	6253819.58
RP8	325361.01	6254082.15
RP9	325280.63	6254224.47

03 : PROJECT APPLICATION 09.10.09
02 : PROJECT APPLICATION 14.07.09
01 : PROJECT APPLICATION 09.07.09

Inner West Marina SYDNEY

GENERAL ARRANGEMENT

Design H.B.
Drawn S.K.
App'd.
Scales 1:1000
Date 26.03.09
Sheet Size B1
Job No. 01013
Dwg No. DA01
Rev. No. 03

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2. INTRODUCTION AND SCOPE

2. Introduction and Scope

This Environmental Assessment (EA) describes and assesses the environmental impacts of the proposed marina in Kendall Bay on the Parramatta River, Breakfast Point, and is submitted to the Minister for Planning and Director General of Planning to:

- Provide an environmental assessment of the project; and
- Apply, under Section 75E of the Environmental Planning and Assessment Act, 1979 (the Act) for the approval of the Minister to carry out the Project.

The applicant requests that the Minister determines the Project Application under Section 75P(1)(c) and grants an approval under Section 75J.

2.1 Consent Authority

By letter dated 16 January 2007, the Department of Planning advised that *"on 29 December 2006, the Director-General of the Department of Planning, as delegate of the Minister for Planning, formed the opinion that the proposed commercial marina is a Major Project to which Part 3A of the Act applies"* (refer **Appendix 2**). The consent authority for the proposed development is the Minister for Planning.

2.2 Land Owner's Consent

Land Owners' Consents from NSW Maritime and Breakfast Point Pty. Ltd. have been obtained and accompany this Project Application (refer **Appendix 3**).

2.3 The Environmental Assessment

This EA has been prepared on behalf of the Applicant (Breakfast Point Pty. Ltd.) by TLB Engineers Pty. Ltd. (TLB), and is based on information from the Applicant, TLB Engineers and the following organisations:

1.	Planners	WorleyParsons
2.	Visual Expert	Richard Lamb & Associates
3.	Visual Artists	Architectural Images
4.	Environmental Scientists and Contamination	AECOM
5.	Marine Ecologist	Cardno Ecology Lab
6.	Hydrographic Surveyor	Harvey Hydrographic Surveys
7.	Coastal Engineer	GBA Coastal
8.	Traffic Consultant	Colston Budd Hunt & Kafes
9.	Acoustic Consultant	Heggies Pty Ltd
10.	Community Consultation	FordComm
11.	Heritage Consultant	AECOM
12.	Demand Study	Australian Marina Management
13.	Avian Fauna	Aquenal

The following specialist studies have been prepared as part of the EA.

- **Aquatic Ecology** – *Inner West Marina Sydney Aquatic Environmental Assessment (July 2009)* and *Inner West Marina Sydney Aquatic Ecology Studies (July 2009)* prepared by **Cardno Ecology Lab (see Appendix 4);**

- **Noise** – *Inner West Marina Kendall Bay Construction and Operation Noise Assessment (July 2009)* prepared by **Heggies Pty Ltd (see Appendix 5);**

- **Heritage** – *Inner West Marina Historical and Aboriginal Heritage Impact Statement, Kendall Bay(July 2009)* prepared by **AECOM (see Appendix 6);**

- **Traffic and Parking**– *Traffic and Parking Report for Proposed Inner West Marina (July 2009)* prepared by **Colston Budd Hunt & Kafes (see Appendix 7);**

- **Visual Amenity (including lighting)** – *Visual Impact Assessment proposed Inner West Marina, Sydney (July 2009)* prepared by **Richard Lamb and Associates and Architectural Images (see Appendix 8);**

- **Soils, Sediments and Water** - *Estuary Hydrodynamics and Physical Sedimentary Environment, Inner West Marina (July 2009),* prepared by **GBA Coastal (see Appendix 9);** *Construction Environmental Management Plan, Proposed Inner West Marina, Kendall Bay, Parramatta River (July 2009)* prepared by **AECOM (see Appendix 10)** and *Inner West Marina Sydney Aquatic Environmental Assessment (July 2009)* prepared by **Cardno Ecology Lab (see Appendix 4);**

- **Berth Demand** – *Berth Demand Study (July 2009)* prepared by **Australian Marina Management (see Appendix 11);**

- **Construction** –*Construction Management Plan, Inner West Marina (July 2009)* prepared by **TLB Engineers (see Appendix 12);**

- **Contamination** - *Estuary Hydrodynamics and Physical Sedimentary Environment, Inner West Marina (July 2009),* prepared by **GBA Coastal (see Appendix 9);** *Sediment Management Report, Inner West Marina (October 2009)* prepared by **AECOM (see Appendix 13),** *Construction Environmental Management Plan, Proposed Inner West Marina, Kendall Bay, Parramatta River (July 2009)* prepared by **AECOM (see Appendix 10)** and *Inner West Marina Sydney Aquatic Environmental Assessment (July 2009)* prepared by **Cardno Ecology Lab (see Appendix 4);**

- **Avian Fauna** – *Desktop Assessment of the potential impact of the proposed Kendall Bay Marina on Avian Fauna (August 2009)* prepared by Aquenal **(see Appendix 14)**

- **Operation Management** – *Marina Management Plan* **(see Appendix 15)**

- **Consultation** – *Community Consultation Program* prepared by **Ford Communications (see Appendix 16)**

- **Navigation and safety** has been addressed at **Section 11.3.**

- **Layout and Design** has been addressed at **Section 4.**

The EA report and Appendices have been prepared in accordance with:

- NSW Maritime Authority requirements for Obtaining Permission to Lodge a Development Application;

- The Director-General's Requirements, letter dated 14th January 2008;

- *Deemed SEPP Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*;

- The *Sydney Harbour Foreshores and Waterways Area Development Control Plan (DCP);* and

- *Canada Bay Local Environment Plan (LEP) 2008.*

3. THE SITE AND EXISTING ENVIRONMENT

3. The Site and Existing Environment

3.1 The Site

The site of the proposed marina forms part of the western foreshore of Kendall Bay, west of the Sydney Harbour Bridge, on the Parramatta River in the Canada Bay Local Government Area, (refer **Figure 1)**. The proposed marina car parking is on land approximately 150m west of the proposed marina, on Peninsula Drive, within the Silkstone Precinct at Breakfast Point. The layout of the proposed marina, jetty, kiosk, ancillary development and marina car parking area is shown in **Figure 2**.

The site is described as:

- the area of water within Kendall Bay subject to a proposed NSW Maritime Lease (including the site of the former wharf Lot 1 in DP 945166); and
- part Lot 53 in DP 270347.

These areas are outlined in **Figures 3 and 4**.

An aerial photograph of the site and surrounding land is shown in **Figure 5.**

3.2 Surrounding Context

The visual character of the surrounding land is made up of a constructed western shoreline, foreshore walkway; medium to high density residential backdrop to the west and southwest on the former AGL industrial site; and a relatively natural southern shoreline consisting of intertidal beach and mangroves, Cabarita Park, Cabarita Rivercat Ferry Wharf and the waters of Kendall Bay and Parramatta River.

The maritime context in the vicinity of the site and within Kendall Bay comprises River Quays Marina and a small scale marina between Mortlake Point and River Quays Marina to the northwest of the site, Cabarita Rivercat Ferry Wharf and the Cabarita Westport Marina to the east of the site.

The Breakfast Point flagstaff knoll area partly restricts the visibility of the site from water based and land based locations to the northwest of the site. There is a foreshore pedestrian walkway all along the Bay between River Quays Marina and Cabarita Rivercat Ferry Wharf. This foreshore walkway mainly between the flagstaff knoll and the Cabarita Rivercat Ferry Wharf provides high viewing opportunity of the site as part of expansive views available from there. There are also views of the site from the beaches and parts of Cabarita Park along the southern and south western shoreline of the Bay.

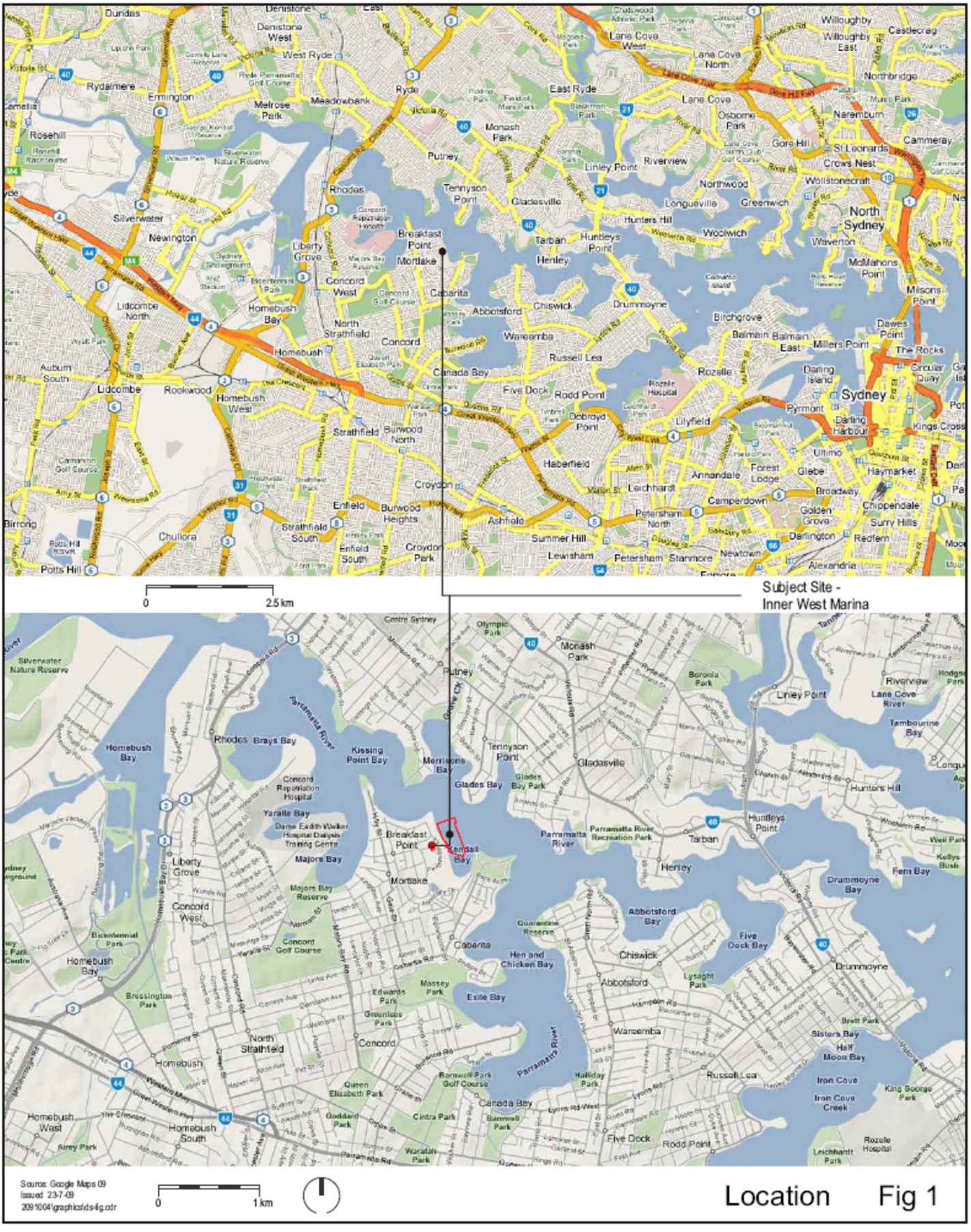
The waters of Kendall Bay adjoin the waterside residential estate known as Breakfast Point. Breakfast Point is a waterfront, remediated medium–to-high density residential estate.

The residential context of the subject site comprises free standing dwelling houses and apartments within the Manors Precinct and Hunters Wharf Precinct of the Breakfast Point development, that are still only partly constructed. The future character of the land based context of the development is of medium density residential, only part of which is presently constructed, with a totally constructed foreshore and landscaped interface, replacing the former industrial site that existed on the land.

There are outward views of the proposed marina from these residential developments. The site is also visible from parts of the existing apartment development at Kendall Inlet. Further residential development, for example apartment buildings approved to be constructed in the Silkstone Precinct within the Breakfast Point Development, will also have views of part of the proposed marina. These apartment buildings would be seen in the background of the views of the proposed marina from locations to the north, northeast, east and southeast, in particular those from the river and its foreshores.

The wider visual context of the site is constituted by the waters of Parramatta River, far shoreline of Putney, Tennyson Point, Gladesville and Henley and the predominantly detached residential developments on the low headlands and particularly the foreshores and lower slopes of these localities. The underlying geology of the land based visual context of the site is that of shale landscapes over minor outcrops of harder sandstone, which explains the low levels and relatively flat terrains of the surrounding localities. There are many small reserves, viewing platforms and intertidal rocks along the far shoreline which are accessible off the termini of roads within the localities such as Wharf Road, Ross Street, Tennyson Road, Putney Parade and Pellisier Road. There are some foreshore parks such as Glades Bay Park, Bill Mitchell Park and Morrisons Bay Park from which there is visibility of the site.

The wider maritime context is constituted by swing moorings within Morrisons Bay, Glades Bay and small scale boat accommodation facilities of various kinds along the far shoreline. Putney Point vehicular ferry wharf is also within the wider maritime context. There are a number of rowing and sailing clubs such as Parramatta River Sailing Club, Scots College Rowing Club and Sydney Grammar Boat Shed along the foreshore of the Gladesville locality.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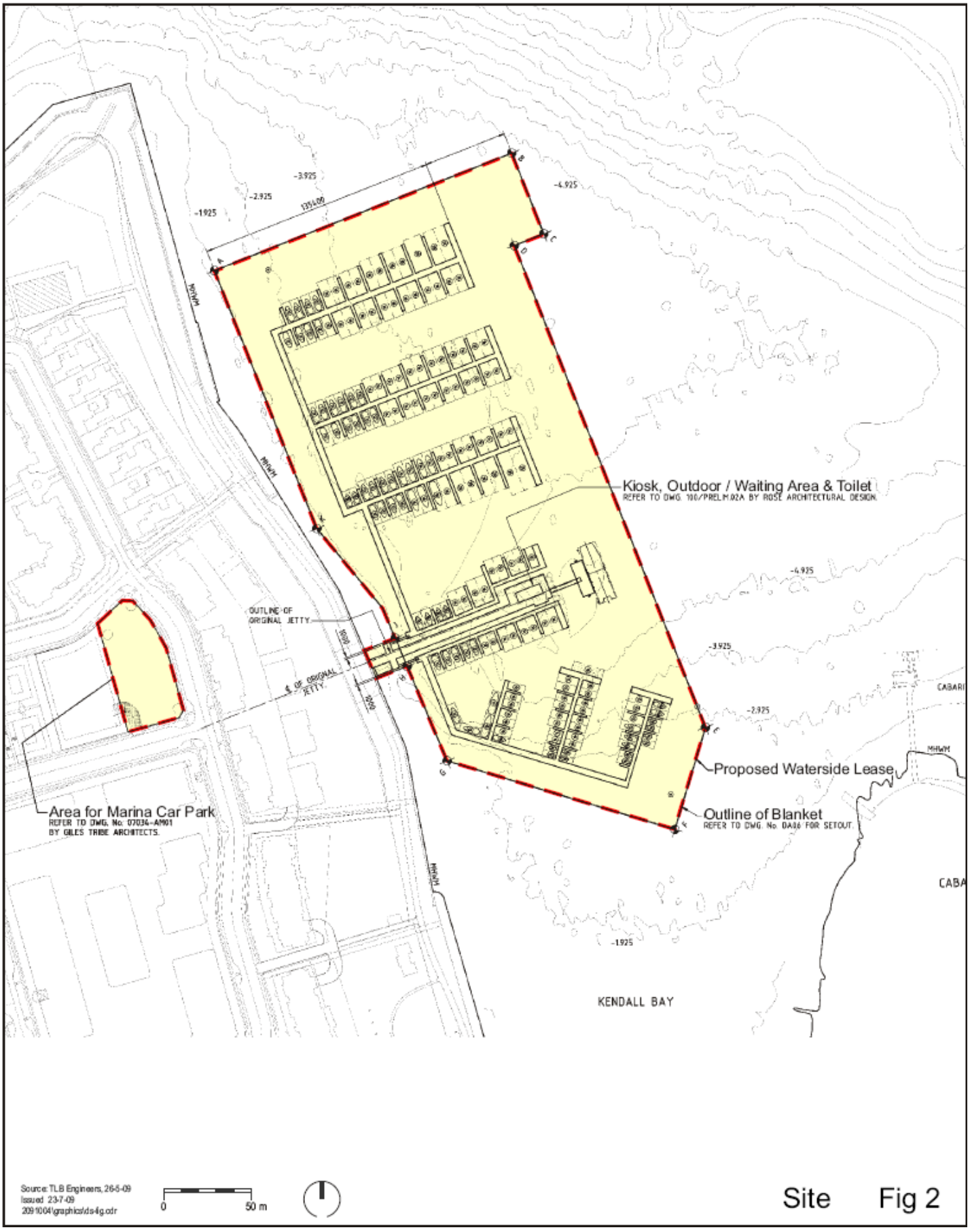
Location Fig 1


Kiosk, Outdoor / Waiting Area & Toilet
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OUTLINE OF ORIGINAL JETTY
℄ OF ORIGINAL JETTY
Area for Marina Car Park
REFER TO DWG. No. 07034-AM01 BY GILES TRIBE ARCHITECTS.
Proposed Waterside Lease
Outline of Blanket
REFER TO DWG. No. DA06 FOR SETOUT.
MHWM
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-2.925
-3.925
-4.925
KENDALL BY
Source: TLB Engineers, 26-5-09
Issued: 23-7-09
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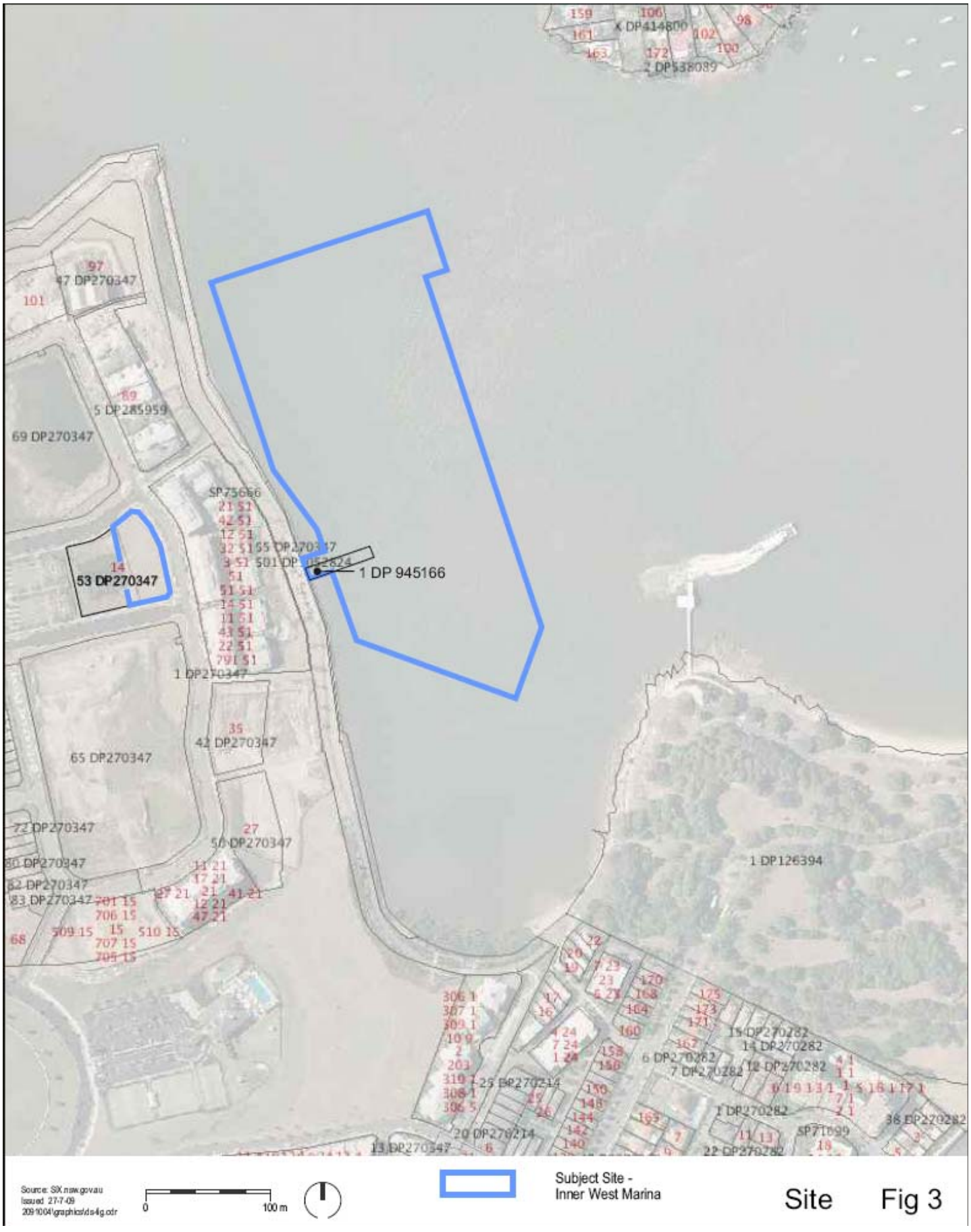
Site Fig 2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Subject Site -
Inner West Marina
Site Fig 3


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DP 270347
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Lot & DP's
Fig 4

Aerial Photograph Fig 5

3.3 Bathymetry

Kendall Bay forms a shallow embayment on the southern side of the Parramatta River, between Breakfast Point in the west and the NW tip of Cabarita Park at Cabarita Point in the east. The bay occupies a waterway area of slightly more than 10 ha.

The main channel of the Parramatta River adjoins Kendall Bay, separating Morrisons Bay, Raven Point, and Glades Bay *(from west to east)*.

Mean water depths within Kendall Bay range up to 5 metres in the central area adjoining the former jetty. The southern half of the bay is less than 2 metres deep, as is a narrow fringe along the seawall north of the former jetty. The main river channel exhibits two deep holes between Breakfast Point and Glades Bay, where mean depths exceed 15 metres. Morrisons Bay and Glades Bay exhibit similar depths to the southern half of Kendall Bay. It would appear that the deepened approach across Kendall Bay to the former jetty is artificial, probably a result of past dredging to allow larger carriers to access the jetty.

3.4 Shore Line

The eastern shoreline of Kendall Bay comprises a dissected and gently sloped bedrock platform, stretching from the Cabarita Ferry Wharf and beyond, back towards the head of the bay (**Photo 1**). Sand occurs between the rock outcrops within the platform, the accumulation becoming deeper and more prominent with distance into the bay. A well developed beach is located at the southern end, separating the rocky eastern shore from a stand of mangroves at the head of the bay (**Photo 2**). Mangrove peg roots intersperse the trees, extending into the waterway. These protrude across a lower, flatter and slightly muddier foreshore (**Photo 3**).

Photo 1

Photo 2

The mangroves terminate at the base of a sloped dimensioned sandstone revetment which lines the SW corner of the bay. This appears to be an older structure, certainly predating the Breakfast Point development, although it has been repaired. The inclined revetment merges with a vertical seawall which continues along the central areas of the western shore (**Photos 4** to **6**). This wall reverts to a more substantial sandstone boulder revetment further to the north. A small fillet beach occurs at an indent section along the boulder revetment (**Photo 9**).

There are seven stormwater outlets at the shoreline. These range in size from approximately 300mm diameter to 1650mm diameter, with both the smallest and the largest discharging at the same location behind the mangroves at the head of the bay.

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

3.5 Water Level

Water level at Kendall Bay fluctuates primarily in response to astronomical tide. Sea level rise as a consequence of climate change will affect water level in Kendall Bay. The maximum water levels at the site are governed by tidal water levels, combined with storm surge effects and global warming effects.

Sydney Harbour and Parramatta River encounter semi-diurnal tides, that is two high tides and two low tides per day. Predicted tidal planes for the Parramatta River in the vicinity of Kendall Bay range between Lowest Astronomical Tide RL -0.95 (AHD) up to Highest Astronomical Tide coinciding with a storm surge resulting in a water level of RL +1.30 (AHD). Global warming effects to 2050 are predicted to increase this level up to RL +1.50 (AHD).

3.6 Wave Climate

Wave climate at the site is contributed to by wind waves and boat generated waves.

Wind Waves

Winds blowing across the water impart a stress on the water surface which can lead to waves. The height and period of the waves depend on the wind speed, the distance over which the wind blows, and the duration of the wind.

The maximum wind wave for the site arises from easterly conditions and has a significant height of 0.65m.

Boat Generated Waves

As water flows past a boat hull, a pressure gradient develops and waves are generated. The wave height and period depends on the boat speed (v), the size and shape of the hull, and the water depth (d). The boat waves in Kendall Bay have been calculated to have heights up to 0.4m for recreational craft and workboats. Nonetheless the waves generated by Rivercat vessels (height near the vessel = 0.35m) have the greatest energy and the greatest effect on the shoreline and sediment in the shallow water areas.

Sydney Ferries run scheduled services along the Parramatta River using Rivercat vessels. These vessels generate shoaled and breaking primary wave heights at the shore up to 0.35 to 0.5 m (**Photo 4**). The varied alignment of the western shore protection structures (**Photo 5**) led to complex reflections and wave superpositions, adding to localised increased wave heights and wave breaking along the shoreline. Considerable stirring of bed sediments occurs along the western shoreline during the ferry passings.

3.7 Currents

Currents at the site are driven by:

- Tide;
- Freshwater flows in the Parramatta River;
- Wind *(unidirectional and oscillatory currents)* – these are low and less than the currents from other sources;
- Boat wash *(wave induced water particle movements and propeller wash)*; and
- Stormwater – these currents only disturb sediments local to the stormwater discharge locations and then only within 20m of the shore.

Tidal Currents

Tidal currents in the Parramatta River adjacent to Kendall Bay are low and complex during high *(slack)* tide, but are easily discernible during peak ebb tide. Under slack tide conditions, water

velocities are generally low *(<0.2 m/s)*. During peak ebb tide, currents up to 0.7 m/s flow in a general ESE direction off the end of Breakfast Point. Under peak ebb tides, current speeds in Kendall Bay would be lower.

Freshwater Flows in Parramatta River

Peak freshwater flows in the main river channel, opposite Kendall Bay, would not be expected to exceed the peak tidal flows. Like the tidal currents, the freshwater flows in Kendall Bay would be lower than in the channel.

Boat Wash Currents

Boats wash currents occur due to boat-generated waves and propeller action.

In the same way as wind waves, boat waves generate oscillatory currents which vary according to wave height, wave period, and position in the water column.

For a water depth of 1.0m, maximum oscillatory currents at the bed exceed 1.0 m/s some 70 times each day as a direct consequence of Rivercat and Harbourcat ferry movements. The maximum daily velocities drop to 0.4 m/s in 2m of water, and slightly less than 0.3 m/s in 3m of water. These currents currently mobilise the bed material.

3.8 Aquatic Environment

In May 2009, qualitative observations were made of the fauna and flora associated with artificial habitats adjacent to the proposed Marina location. Quantitative surveys were also undertaken of the infauna (animals living within sediments), epibenthic fauna (animals living on or in close proximity to the estuary bed), mobile fish and invertebrate fauna at the proposed Marina location and two nearby Reference Locations (Sydney Rowing Club in Hen and Chicken Bay and Kissing Point Bay). The results of these studies are described in detail in a separate report prepared by Cardno Ecology Lab (Cardno Ecology Lab 2009B). The major findings are summarised in the following sections “Aquatic Habitats” and “Aquatic Biota”.

Aquatic Habitats

The foreshore adjacent to the proposed Marina location has been modified extensively and now consists of a vertical sandstone seawall and sloping sandstone revetment with a narrow fringe of rubble below some parts. There is also a small sandy beach in front of part of the revetment which is subject to winnowing by wave action, primarily from Rivercat ferries. There is a mudflat with mangrove trees and a sandy beach at the southern end of Kendall Bay and a rocky shore consisting of natural outcrops of sandstone extending along the western shore of Cabarita Park.

The sediments along the western foreshore contain various contaminants, many of which emanate from the former Mortlake gasworks. The concentrations of cyanide and BTEX compounds (benzene, toluene, ethylbenzene and xylene) were generally below the limit of laboratory reporting, but concentrations of total petroleum hydrocarbons (TPHs) and polycyclic aromatic hydrocarbons (PAHs) were measurable. TPH concentrations were an order of magnitude greater in some areas of the proposed Marina location. Total PAH concentrations in the sediments exceeded the Interim Sediment Quality Guidelines (ISQG) Low value for a large proportion of the proposed Marina location and the ISQG-High value in a few areas. Concentrations of arsenic, chromium and copper in the sediment were generally in excess of their respective ISQG-Low values but not their ISQG-High values, whilst those of lead, mercury and zinc were above their respective ISQG-High values in at least half the sites. Potential acid sulphate soils occur at a depth of 0.2-0.4 m in the sub-surface sediment. These, however, will not be excavated, so an acid sulphate management plan will not be required.

The concentrations of heavy metals in water samples, however, were below the limits of detection, suggesting that there is little flux of dissolved metals from the sediment.

Aquatic Biota

The base of the sandstone revetment adjacent to the proposed Marina location was covered by a mixture of the green, red, brown and blue-green algae. Rock oysters, mussels, barnacles and various species of gastropods were also conspicuous. Most of these organisms were also found on the adjoining vertical seawall.

The piles at Cabarita Wharf were covered in green, red and brown algae, mussels and two species of barnacles. Similar organisms may grow on the marina structures. The bedrock and natural boulders to the east of the wharf supported a greater variety of animals, including a finger sponge, an encrusting bryozoan, mussels, barnacles, crabs and various species of gastropods and five different species of algae.

The proposed Marina location supports a diverse range of infauna, despite the contamination of the sediment. Thirty taxa (17 polychaete, 5 crustacean, 5 mollusc and 3 others) were found living in the sediment, with one family of bivalve molluscs and five families of polychaete worms being the most abundant taxa. The spatial patterns in the infauna did not appear to be linked with the concentrations of the major contaminants at the proposed Marina location. The assemblages at the proposed Marina location differed from those at the Reference Locations, suggesting that the infauna at the proposed Marina location was not typical of that region of the estuary. The infauna at all three locations was less abundant generally than that observed in a 1996 study.

The epibenthic fauna within Kendall Bay, sampled using beam trawls, consisted of 64 taxa (6 fish, 11 polychaete, 25 crustacean, 16 mollusc and 6 others), with a bivalve mollusc, mysid, amphipod and shrimp being the most abundant species. The epibenthic fauna in Kendall Bay was similar to that at the Reference Locations combined, suggesting that it was typical of that region of the estuary.

A total of 15 species (1 jellyfish, 6 crustacean and 8 fish) were caught off the sandy beach near the proposed Marina location in seine nets, with two fish and one mysid species being the most abundant. The mobile fish and invertebrate assemblages at the proposed Marina location did not appear to be typical of that region of the estuary.

4. PROPOSED DEVELOPMENT

4. Proposed Development

4.1 Description of Proposed Development

Section 4 should be read with reference to the Marina Management Plan (refer **Appendix 15**), the Construction Management Plan (refer **Appendix 12**) and. the following drawings included at **Appendix 1:-**

Plan No	Plan Name	Prepared By	Date	Plan Revision
DA01	General Arrangement	TLB Engineers	09.10.09	03
DA02	New Jetty	TLB Engineers	09.10.09	03
DA03	Marina Layout	TLB Engineers	09.10.09	03
DA04	Sections	TLB Engineers	09.10.09	03
DA05	Marina Services	TLB Engineers	09.10.09	03
DA06	Bed Treatment	TLB Engineers	09.10.09	03
DA07	Site Diagram	TLB Engineers	09.10.09	03
DA08	Signage	TLB Engineers	09.10.09	03
DA10	Site Analysis	TLB Engineers	09.10.09	03
DA100	Kiosk Building	Rose Architectural Design	06.08.09	C
DA200	Manager's Office	Rose Architectural Design	06.08.09	C
AM-01	Marina Car Park	Giles Tribe Architects	June 2009	-
CMP00	Construction Staging	TLB Engineers	09.10.09	04
CMP01	Construction Staging	TLB Engineers	09.10.09	03
CMP02	Construction Staging	TLB Engineers	09.10.09	04
CMP03	Construction Staging	TLB Engineers	09.10.09	04
CMP04	Construction Staging	TLB Engineers	09.10.09	01

The applicant proposes to construct a new 172 berth marina to be known as Inner West Marina, in Kendall Bay, to assist in satisfying the current and future demand for wet berths in Sydney, and in particular that part of Sydney west of the central business district. The current and future demand for vessel storage is discussed in detail in the Marina Berth Demand Assessment at **Appendix 11**.

The marina is planned to be operated as a commercial marina with berths made available to the wider community and not as a residential marina where berths would be generally restricted to use by residents of dwellings within the adjacent residential estate.

The project includes construction and operation of the following components:

1. Construction of a new low level jetty designed to incorporate a ferry stop, on the line of the original high level wharf;

2. Construction of a 172 berth floating marina structure (including 5 destination berths), with floating breakwater sections to reduce wave energy and wave heights at the moored vessels;

3. A kiosk with seating (indoor plus outdoor) for up to 50 people at the end of the new jetty providing facilities and access for marina users and the general public ;

4. A manager's office, amenities and security gate;

5. Dedicated marina car parking for 58 car parking spaces;

6. Remediation of the contaminated sediments within the site, in the form of a Sediment Protection System (SPS) over the lease area of the bed of the bay (which includes a geotextile blanket secured by rock ballast).

The layout of the proposed marina, the SPS, and the location of the proposed car parking area are shown in **Figure 2**. The proposal does **not** require dredging or reclamation works.

The vessel lengths which will be accommodated in the proposed development range from 8m in length up to 25m. The number and lengths of vessels in the proposed development are set out in the following table:

Maximum Vessel Length (m)	No. of Berths Proposed In Marina
8	12
10	30
12	46
14	40
16	28
18	7
20	7
Up to 25	2
Total:	**172**

The vessel profiles will range from yachts with low deck profiles to sports motor vessels with low profiles but higher than the yachts, up to motor vessels with fly bridges. The distribution of the vessel profiles has been assessed based on vessels currently berthed in nearby marinas.

Vessel Type	Profile	% of Total	No. of Vessels
Sailing Vessels	Low	12	21
Motor Vessels - Sports Cruisers	Low	57	98
Motor Vessels - Fly Bridge Cruisers	High	31	53
Total			**172**

Yachts would be in the berths at the eastern ends of the arms where the water depth is greater.

The proposed development will include the following facilities and services which will be made available to the boating and general public:

- Sewage pump out;
- Parking (58 car spaces) for marina users;
- Casual berthing at day tripper berths for the general boating public;
- Toilets;
- Casual pick up and drop off;
- Public access along the new jetty at all times and along the ,marina walkways during marina office hours;
- Kiosk with seating for up to 50 people.

The proposed development will be designed to provide ramp access to the floating structures for the disabled and mobility impaired, in accordance with the Disability Standards for Accessible Public Transport under the Disability Discrimination Act, and will include locations for the installation of approved lifting devices for transferring disabled people to and from vessels.

The development will include access for Sailability Australia activities.

4.1 Public Benefits

The construction of the proposed marina will provide the following public benefits:

- Enhanced access to the waterway for the general public through the provision of pick up and drop off berths.
- Enhanced waterway experience for the general boating public through the provision of day tripper berths.
- Enhanced experience of the Breakfast Point foreshore and enhanced community experience through the provision of the jetty and kiosk..
- Access for people with a disability.
- Reduced disturbance of contaminants in Kendall Bay, resulting in a public health benefit.

4.2 Layout

The design of the proposed marina has been developed to:

- Place the moored vessels generally in the visual north/south shadow line of the original jetty, had it been retained.
- Provide open spaces between lines of moored vessels such that when people walk along the foreshore, their views to the east are minimally impacted by the proposed development.
- Oriented to accommodate the wave environment at the site, particularly as a result of waves generated by vessels moving along the main Parramatta River channel.
- Allow good access for Sydney Ferries to and from Cabarita Wharf.

The set-out has been based on the vessel characteristics specified in Australian Standard AS 3962:2001 Guidelines for the Design of Marinas and NSW Maritime Authority Guidance Note 8.3.02.

The minimum water depth required in the berths and in the fairways has been based on the requirements of the NSW Maritime Authority as set out in Guidance Note 8.3.05, taking into account the wave attenuation effect of the floating structure.

4.3 Operation

A detailed Marina Management Plan is included at **Appendix 15.**

The proposed hours of operation are as follows:

a) Marina office:

Summer	8.00 am to 6.00 pm	7 days per week
Winter	9.00 am to 5.00 pm	7 days per week

b) The kiosk will be open all year from 7.00 am to 6.00 pm seven days per week.

Marina berth holders will be able to gain access to their vessels 24 hours a day, 7 days a week, via authorised swipe card/security gate access.

The public will have unimpeded access to the fixed jetty and ferry pontoon 24 hours a day.

4.4 Services

The following services will be provided to vessel owners:

- Vessel cleaning.
- Maintenance which is capable of being carried out on the vessels. There will be no specific maintenance berth.
- Sewage and waste water pump out.

There will be **no** provision for refuelling of vessels, and **no** slip facilities to remove boats from the water for repairs and maintenance.

4.5 Waste Removal

Three types of waste will be generated on the site:

i. Solid waste from office activities and kiosk activities.

ii. Waste water from kiosk and vessels.

iii. Sewage from vessels and toilets in kiosk and manager's office.

The solid waste will be placed in sealed bins and removed by a waste removal contractor for disposal in an approved site. The bins will be on the fixed jetty at the kiosk and Marina Manager's office, then moved by small vehicle ("golf buggy type") to a location at the carpark for collection by the waste removal contractor.

The liquid waste water from the kiosk will be discharged into a line connected to the Breakfast Point sewage system which is connected to the Sydney Water Sewage System.

Waste water (bilge water) and sewage from the vessels will be pumped out of the vessels at a designated sewage pumpout location. The waste water will be pumped into the Sydney Water Sewage System in accordance with Authority requirements.

4.6 Parking and Deliveries

Parking for the proposed marina will be provided in a proposed carpark containing 58 spaces, located in Peninsula Drive.

Vehicles making deliveries to the Marina, will park in the carpark in dedicated loading spaces. All items unable to be easily carried from the carpark, will be transported in special small vehicles ("golf buggy type") to the marina and kiosk.

4.7 Staging and Construction

A detailed **Construction Management Plan** is included at **Appendix 12** and a detailed **Construction Environmental Management Plan** is included in **Appendix 10.** The construction period is estimated as follows:

Stage 1	Installation of: i) land works (car parking) ii) geotextile blanket and rock ballast using divers, a barge and GPS controlled excavator	 8 weeks 30 weeks
Stage 2	Construction of fixed jetty including kiosk and manager's office with steel piles, timber beams and timber decking and using a barge-mounted crane	24 weeks*
Stage 3	Installation of floating marina structure south side (Arms 4, 5, 6, 6 and 8)	14 weeks*

Stage 4	Installation of floating marina structure north side- Arm 3	10 weeks
Stage 5	Installation of floating marina structure north side – Arms 1 and 2	18 weeks
Stage 6	Installation of the pontoon	2 weeks
* could be undertaken concurrently		

Piles would be installed at the average rate of 2 per day. There are approximately 160 piles required for the proposed works.

The construction period estimates are based on on-site working hours of:

- 7.00 am to 6.00 pm Monday to Friday;
- 8.00 am to 1.00 pm on Saturday;
- No work on Sunday.

No pile driving is proposed before 8.00 am on any day.

5. JUSTIFICATION FOR THE PROPOSAL

5. Justification for the Proposal

5.1 Satisfies Demand

The Inner West Marina propsed under this Project Application responds to the high demand for on-water storage of vessels in Sydney Harbour, particular west of the Sydney Harbour Bridge.

The *Marina Berth Demand Assessment* prepared by Australian Marina Management Pty Ltd (refer **Appendix 11**) identifies both current and anticipated future demand for marina berthing in Sydney and specifically at the proposed Inner West Marina. It also comments upon the proposed berth size distribution as well as the profile of vessels most likely to make up the demand for berthing at the proposed marina.

The NSW Maritime survey of Sydney Harbour, June 2009, shows that there are presently sixty-eight (68) marina and boatshed facilities with a capacity of 2,186 berths throughout Sydney Harbour. Thirty-eight (38) of these facilities are located west of Sydney Harbour Bridge, having a capacity of 1,073 berths.

Of these 1,073 berths west of the Bridge, 371 are private residential berths and are not available to the wider community. This comprises 36.4% of marina berths in the west Sydney Harbour area. There are 54 berths used by commercial charter vessels which are also not available to the wider community. Thus, in Sydney Harbour west of the Sydney Harbour Bridge, there are only 584 berths spread over 12 commercial marinas and 64 berths spread over 10 commercial boatsheds.

Of the 584 berths at the 12 commercial marinas surveyed in June 2009, 550 berths, representing 94.2% of the total, were occupied, thereby evidencing the high level of demand for marina berths in the west Sydney Harbour area.

In relation to **NSW Recreational Boat Licences** the Assessment found:

> *"…the growth in boat licences for the Sydney Harbour sector over the 5 years has been higher than for the State. Since 2004 NSW licences have shown an average annual growth rate of 3.52%. In the same period Sydney Harbour licences have had a higher average annual growth rate of 3.75%.*
>
> *With the growth in recreational boat licences in Sydney Harbour being higher than that for NSW as a whole, it would be reasonable to expect that the growth in vessel registrations for Sydney Harbour would also be stronger than that for NSW."*
>
> *"The summary in section 4.1 however shows that Sydney Harbour vessel registration growth is lower than for NSW. This evidences the likelihood of a strong latent demand for boat ownership in Sydney Harbour sector unable to be fulfilled due to the considerable lack of available marina berths and on-water storage in Sydney Harbour."*

The survey of NSW Maritime private moorings in Sydney Harbour, June 2009, shows that 4,851 mooring licences have been issued, again evidencing the high demand for on-water boat storage in Sydney Harbour. Notably, the survey also shows that, in addition to the 4,851 mooring licences issued, there are a further 1,202 applications for mooring licences for Sydney Harbour on NSW Maritime's waiting lists. This represents 25% of issued licences and further underlines the high level of demand referred to above.

The proposed Inner West Marina is a timely response to the much sought after on-water vessel storage within Sydney Harbour. The Assessment anticipates that the catchment for berth demand at the proposed Inner West Marina will be derived from an area running from Sydney – North Sydney – Chatswood – Hornsby – Baulkham Hills – Parramatta – Bankstown – Canterbury – Sydney, due to the established road networks which make the proposed Inner West Marina very accessible from Sydney's northern, western and southern suburbs.

In relation to berth size distribution and the proposed range of berths from 10m to 25m, the Assessment observes:

> *"…it is noted that, at 30th June 2009 there are 14,562 vessels registered in NSW which are 8m and above in length. This represents 6.55% of total NSW registrations. It is the owners of these sized vessels who stimulate demand for modern marina berths.*
>
> *Applying the 6.55% ratio of craft 8m and above in length to the calculated latent demand for boat ownership in Sydney Harbour of between 2,800 and 3,000 vessels, it is calculated that there is likely a latent demand in Sydney Harbour, at June 2009, for the ownership of between 183 and 196 additional vessels which would require marina berths."*

The *Marina Berth Demand Assessment* sets out the basis for the following comments.

The only commercial marinas west of Sydney Harbour Bridge with floating marina berths are Birkenhead Point Marina, Gladesville Bridge Marina and D'Albora Marina Cabarita. The remaining nine marinas are aged fixed wharf-type berth structures and are therefore regarded as neither attractive nor safe by vessel owners seeking the modern marina facilities which are expected by today's discerning society.

The levels of mooring licenses in Sydney Harbour have been limited for many years and, with indications that NSW Maritime has no plans to lift mooring numbers, there is no early prospect for applicants.

Mooring licenses issued for waterways on the southern and northern shores, west of Sydney Harbour Bridge, total 2,512. Of these 2,512 licenses, only 933 are located on the southern shores – some 640 moorings less than the 1,579 issued for the northern shores.

For moorings west of Sydney Harbour Bridge there are a further 286 applications on NSW Maritime's waiting list evidencing unfulfilled demand for on-water boat storage. Of these 286 mooring applications, 193 (67%) are for moorings on the southern shores thereby demonstrating a strong and unsatisfied demand for on-water boat storage on the southern side of west Sydney Harbour.

The proposed Inner West Marina will be well positioned to satisfy some of this evident demand for 286 on-water vessel storage.

Commercial boatshed berth facilities at the 10 establishments west of Sydney Harbour Bridge are usually fully occupied with vessels being repaired and serviced. This in turn evidences further demand for on-water boat storage in Sydney Harbour at which vessels requiring repair and servicing can necessarily be accommodated.

Charter vessel berthing in Sydney generally is in short supply and thus the existing berth facilities are fully occupied mostly throughout the year.

West of Sydney Harbour Bridge there is eleven (11) private residential marinas with 371 berths. These berths are generally restricted to use by residents of the property and not available for use to meet the demand of the wider community.

Of the 371 berths at the residential marinas only 219 (59%) are occupied. Pulpit Point residential marina with 112 berths built in the late 1990s has had more than 60 vacant berths for 20 years or so. Due to other constraints there is no prospect for the unused berths at private residential marinas becoming available for use by the wider community.

The vessel registration data for the Sydney Harbour sector makes it clearly evident that the scarcity of marina berths in Sydney Harbour has acted as a heavy constraint to growth in boat ownership when compared to the total growth for the State.

The summary of vessel registrations shows that for the 5-year period 2004 – 2009 the average annual growth for NSW was 2.67% pa whilst for the same period the average annual growth for the Sydney Harbour sector was a lower 1.17%pa.

The following summary shows the expected level of registered vessels at June 2009 for the Sydney Harbour sector by applying the NSW average annual growth rate of 2.67% to the Sydney Harbour sector 2004 base of 16,198 vessels.

Registered Vessels - Sydney Harbour sector - June 2004	16,198
Applying NSW 5-year growth 2004-2009 (13.33%)	2,159
Notional Registered Vessels – Sydney Harbour – June 2009	18,357
Actual Registered Vessels – Sydney Harbour – June 2009	17,144
Potential Latent Demand – Vessels	1,213

Of all NSW registered vessels, 6.54% of these are 8m and above in length. Of the potential latent demand for ownership of 1,213 vessels in the Sydney Harbour sector it is therefore calculated that 6.54%, or approximately 80, of these vessels would be of a size requiring on-water storage.

For the Sydney Harbour sector, there has been a small but consistent decline in the boat ownership ratio per 100 licenses. This is in contrast to the ratio for NSW as a whole.

If the NSW ratio of vessel registrations per 100 licenses at June 2009 (49.09) is applied to the June 2009 Sydney Harbour licenses (41,129) then, at June 2009, the number of vessels registered for the Sydney Harbour area would be 20,190 (49.09 x 411.29). This is 3,046 vessels more than the 17,144 Sydney Harbour vessels actually registered at June 2009.

The 2009 figures have been influenced by the large abnormal increase in licenses in the period. It would seem more prudent to use the end year 2008 data for such a comparison.

Thus, applying the total NSW ratio of registrations per 100 licenses at June 2008 (51.35) to the 2008 Sydney Harbour licenses (38,708), then, at June 2008, it is calculated that the number of vessels registered for Sydney Harbour would be 19,876 (51.35 x 387.08). This is 2,843 vessels more than the 17,043 vessels actually registered at June 2009.

These lower than total NSW ratios of boat ownership to licenses indicate a likely strong latent demand in the Sydney Harbour area for boat ownership of all sizes of some 2,800 and 3,000 vessels.

Applying the 6.54% ratio of craft 8m and above in length to the calculated latent demand for boat ownership in Sydney Harbour of between 2,800 and 3,000 vessels, it is calculated that there is likely a latent demand in Sydney Harbour, at June 2009, for the ownership of between 183 and 196 additional vessels which would require marina berths.

The study clearly demonstrates there is actual and potential unfulfilled demand for on-water boat storage in Sydney Harbour as follows:

- Waiting lists for Sydney Harbour moorings (June 30) including 286 for west Sydney Harbour 1,202
- Calculated latent demand based on ratio of registered vessels per 100 licenses 183

The proposed Inner West Marina will be able to satisfy some of the unfulfilled demand for on-water boat storage and will likely release some of the latent demand for boat ownership by persons refraining from purchasing a vessel due to the unavailability of modern marina facilities in Sydney Harbour.

Recreational vessel registration data within the study clearly evidences the continuing growth in ownership of larger vessels particularly for vessels of a length of 12m and above.

It is the owners of these vessels who will be seeking appropriate and suitable vessel on-water storage facilities thus increasing the strong demand for modern marina berths.

This of course has implications for marina planning and berth size distribution which needs to be done with at least a 30 year window to the future considering the improved and expected life of today's modern marina systems and associated piling.

It is considered that the marina design and berth size distribution allows Inner West Marina management the flexibility to satisfy demands for boat owners well beyond the year 2040 thus avoiding the potential disruption and cost of reconfiguring the marina within its expected life.

It is clear that demand for the proposed Inner West Marina Sydney at Kendall Bay will be extremely high.

This demand for berthing will be generated from the wider NSW sailing and boating community, not only from nearby residents on both sides of Parramatta River, but from residents of Sydney suburbs able to access Breakfast Point by road within 30 to 40 minutes.

The Assessment concludes:

> *"From a professional operational perspective it is considered that the berth size distribution planned for the proposed Inner West Marina is both sensible and prudent…*
>
> *It is considered that the marina design and berth size distribution allows Inner West Marina management the flexibility to satisfy demands for boat owners well beyond the year 2040 thus avoiding the potential disruption and cost of reconfiguring the marina within its expected life.*
>
> *In conclusion it is clear that demand for the proposed Inner West Marina Sydney at Kendall Bay will be extremely high."*

5.2 Location and Orientation

The proposed marina is located where there is sufficient water depth at all times for the safe mooring and navigation of vessels, without the need for dredging.

The marina is away from the main waterway channel along the Parramatta River and a sufficient distance from vessel access paths to and from Cabarita Wharf, to not affect safe navigation by Sydney Ferries vessels, nor significantly affect their timetables.

The marina has been oriented in a north south direction to be in the visual shadow of the original high level wharf; and in the east west direction, open fairways provide views east along the Parramatta River.

5.3 Remediation

As part of the proposed development, the blanket which will be placed over the bed reduces the risk of bed disturbance and therefore contaminants entering the water column. This is an improvement on the existing situation and one of the public benefits of the project.

5.4 Public Benefit

The construction of the marina development will provide the following public benefits:

- Enhanced access to the waterway for the general public through the provision of pick up and drop off berths.

- Enhanced waterway experience for the general boating public through the provision of day tripper berths.

- Enhanced experience of the Breakfast Point foreshore and enhanced community experience through the provisions of the jetty and kiosk for informal get togethers.
- Access for the disabled to vessels at public berths.
- Reduced disturbance of contaminants in Kendall Bay resulting in a public health benefit.

5.5 Ecologically Sustainable Development

Ecologically sustainable development principles are set out in the Schedule 2 of the EP&A Regulations. These are to be considered in assessing a project. They are:

- The precautionary principle.
- Intergenerational equity.
- Conservation of biological diversity and ecological integrity.
- Improved valuation and pricing of environmental resources.

The application of these principles to the development is discussed below.

5.6 Precautionary Principle

The precautionary principle means "*if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".*

The potential environmental impacts of the development have been carefully evaluated and, where considered necessary, mitigating measures have been proposed.

Intergenerational Equity

Intergenerational Equity means that the *"present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for benefit of future generations".*

The Marina development, which aims to provide boat storage facilities and services to meet demand for a range of vessel sizes and incorporate environmental controls during construction and operation, is consistent with the objective of social equity, including intergenerational equity.

Conservation of Biological Diversity and Maintenance of Ecological Integrity

Biological diversity refers to the diversity of genes, species, populations, communities and ecosystems and the linkages between them.

The long term impacts of the proposal on flora and fauna on the site and in the area were found to be minimal and, in some cases, positive. The containment of contaminated material and the additional surface areas for flora growth on the floating marina structure enhance and benefit fish habitat.

Improved Valuation and Pricing of Environmental Resources

This principle is a component of "intergenerational equity" and establishes the need to determine economic values for services provided by the natural environment.

The assessment of environmental impacts has recognised the value of environmental resources. The proposed mitigation measures address the impacts.

6. CONSULTATION

6. Consultation

6.1 Community Consultation

The Applicant has undertaken a range of community consultation activities to assist in developing and defining its proposal for the Inner West Marina. *Ford Communications,* an independent company that specializes in community consultation activities undertook and managed the community consultation process and activities.

A detailed report by Ford Communications is included at **Appendix 16.**

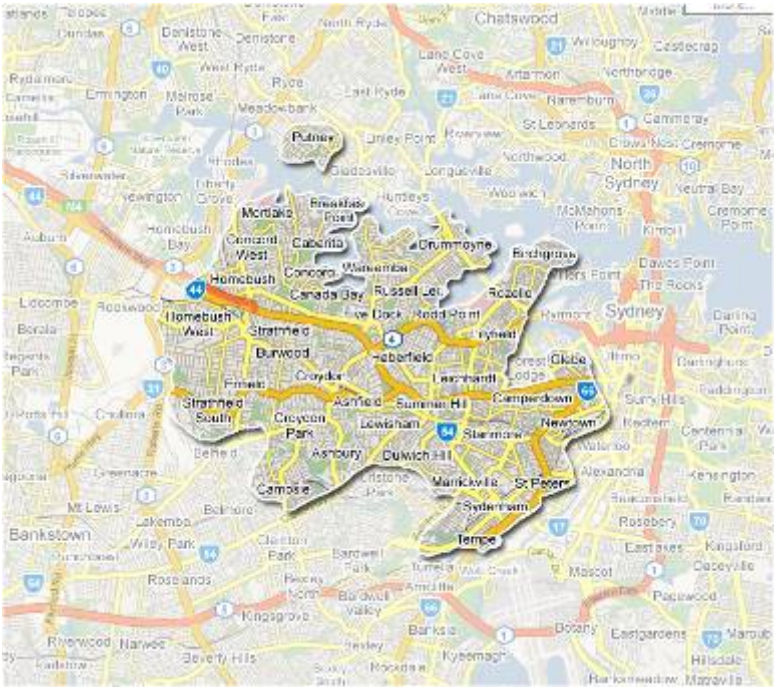
The applicant also consulted with the following Government Agencies:

1. Roads and Traffic Authority;
2. Department of Environment, Climate Change and Water;
3. NSW Maritime Authority;
4. Sydney Ferries;
5. Canada Bay City Council.

The issues raised through consultation with these agencies have been addressed in the various expert reports and this Project Application.

Consultation was undertaken with community groups and affected landowners in the areas of:

Abbotsford, Annandale, Ashbury, Ashfield, Balmain, Birchgrove, Birkenhead Point, Breakfast Point, Burwood, Burwood Heights, Cabarita, Camperdown, Campsie, Canada Bay, Chiswick, Concord, Concord West, Croydon, Croydon Park, Dobroyd Point, Drummoyne, Dulwich Hill, Enfield, Enfield South, Enmore, Erskineville, Five Dock, Glebe, Haberfield, Homebush, Homebush West, Leichhardt, Lewisham, Lilyfield, Marrickville, Mortlake, Newtown, North Strathfield, Petersham, Putney, Rhodes, Rodd Point, Rozelle, Russell Lea, Stanmore, Strathfield, Strathfield South, Strathfield West, St Peters, Summer Hill, Sydenham, Tempe, Tennyson Point and Wareemba.



Community and stakeholder consultation is part of working openly with the community and other stakeholders and providing opportunities for their views and preferences to have input into the assessment process and decision making. It is an important component of environmental assessment and ensures that all relevant issues are considered.

Consultation Methodology

An online community consultation website was the key communication channel employed for the community consultation process. This online consultation tool:

- allows more people into the conversation, reflecting a range of views,
- identifies more issues of concern to the community as early in the lifecycle of the project as possible so that they can be addressed by the project team expeditiously; and
- contributes to building community ownership of the outcomes.

Online consultation is an effective tool because it reaches many more people than most other methods of engagement and is accessible to the community at any time. It's easy, safe, respectful and well-liked by the community. The aim of this pre-application consultation process was to offer interested members of the community the chance to have their say in the issues that should be considered in this Environmental Assessment.

The community consultation website was set up at www.innerwestmarinasydney.com.au, opening on Wednesday 17 June and ending on Friday 10 July 2009. This website provided information on the proposal (including maps, a layout of the proposed marina and photo montages) and a forum through which the community and affected landowners could submit topics that they believe should be addressed in the Environmental Assessment and participate in the discussion with fellow community members and landowners, effectively giving those individuals and organisations likely to have an interest in the proposal ample opportunity to express their views surrounding the proposal.

The site was independently moderated by Dr Crispin Butteris, Co-director of Bang the Table Pty. Ltd, a specialist provider of online stakeholder engagement services. All moderation was carried out according to Bang the Table rules outlined in its 'Community Contract' and was done so to ensure that the site remained a safe and relevant environment to discuss the issues surrounding the proposal.

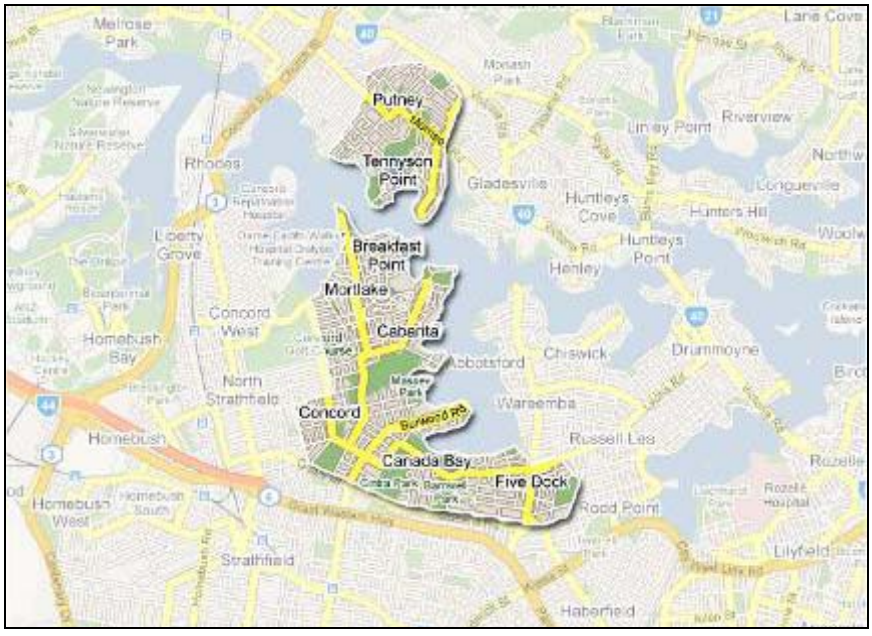
Notification

Notification of the consultation process to the community and affected landowners was given by unaddressed mail delivery, advertising in local press, and publicity. Notification was given by various methods to a total more than 339,250 residents (ABS 2006).

Unaddressed Mail Delivery

An unaddressed mass DL flyer letterbox drop was commissioned through Australia Post to all private delivery points in areas surrounding Kendall Bay, including: Breakfast Point, Cabarita, Canada Bay, Concord, Five Dock, Mortlake, Putney and Tennyson Point, totalling 12,835 delivery points and a total reach of approximately 30,973 residents (ABS 2006). The double-sided flyer notified the community that an Environmental Assessment was being prepared for the Marina proposal and their input was valued. They were directed to the website and given the opening and closing dates of the forum.

Flyer that was distributed through Australia Post

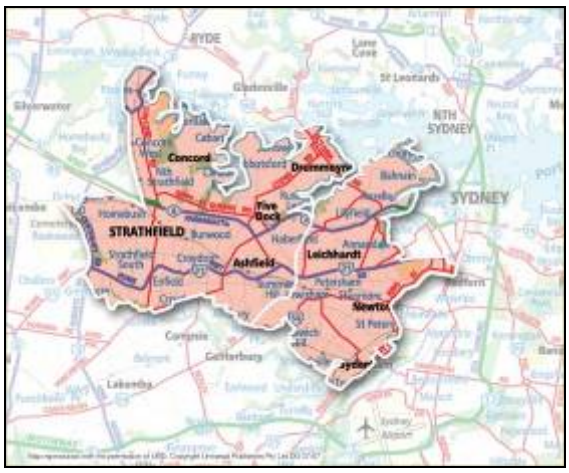


Distribution Map for Unaddressed Mail Delivery

Advertising

The website forum was also advertised in the Inner *West Weekly, Inner West Courier and Village Voice Drummoyne* newspapers, again directing interested members of the public to 'have their say' on the website.

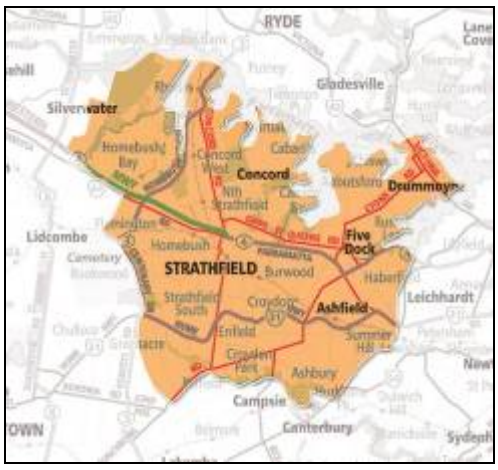
The Inner West Weekly, a weekly newsprint with a circulation of 52,978, is distributed to Ashbury, Ashfield, Birkenhead Point, Burwood, Burwood Heights, Cabarita, Canada Bay, Chiswick, Concord, Concord West, Croydon, Croydon Park, Dobroyd Point, Drummoyne, Enfield, Enfield South, Five Dock, Haberfield, Homebush, Homebush West, Mortlake, North Strathfield, Rhodes, Rodd Point, Russell Lea, Strathfield, Strathfield South, Strathfield West, Summer Hill and Wareemba. Advertisements were placed on the 18th of June and the 2nd of July 2009.



Distribution Map for The Inner West Weekly

One of the advertisements placed in The Inner West Weekly

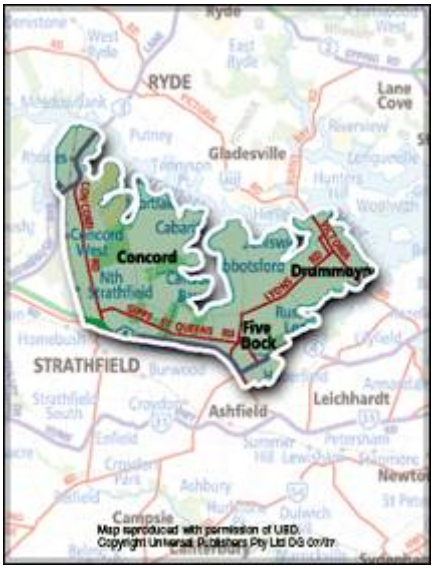
The Inner West Courier, a glossy weekly with a circulation of 76, 986, is distributed to Abbotsford, Annandale, Ashfield, Balmain, Birchgrove, Burwood, Cabarita, Camperdown, Campsie, Canada Bay, Chiswick, Concord, Concord West, Croydon, Croydon Park, Dobroyd Point, Drummoyne, Dulwich hill, Enfield, Enmore, Erskineville, Five Dock, Glebe, Haberfield, Homebush, Leichhardt, Lewisham, Lilyfield, Marrickville, Newtown, North Strathfield, Petersham, Rodd Point, Rozelle, Russell Lea, Stanmore, Strathfield, St Peters, Summer Hill, Sydenham and Tempe. Advertisements were placed on the 16th and 30th of June 2009.



Distribution Map for The Inner West Courier

One of the advertisements placed in The Inner West Courier

The Village Voice Drummoyne, a monthly gloss magazine with a circulation of 20,000, is distributed to Abbotsford, Breakfast Point, Cabarita, Canada Bay, Chiswick, Concord, Drummoyne, Five Dock, Mortlake, North Strathfield, Russell Lea and Wareemba. An advertisement was placed on the 19th of June 2009.



Distribution Map for
The Village Voice Drummoyne

Advertisement placed in
The Village Voice Drummoyne

Publicity

News and editorial coverage was proactively sought in local media, including radio and local press The Inner West Weekly, Inner West Courier and Village Voice Drummoyne. A spokesperson was made available around the clock to answer any questions posed by the media.

Media Release

Inner West Marina : Community Consultation

17 June 2009

Residents of Sydney's inner west have been invited to participate in a pre-application consultation for a new marina proposed for Kendall Bay on the Parramatta River.

The proponent has been granted permission by the Maritime Authority of NSW to lodge an application with the Department of Planning to construct and operate a marina with 172 berths and associated facilities.

The pre-application forum will allow all members of the community to have their say on the issues to be addressed in the Environmental Assessment.

The on-line consultation begins on Wednesday 17 June and will continue until to Friday 10 July. Further information on the proposal and the forum is available on www.innerwestmarina.com.au.

The proposal is in response to increasing demand for berthing of vessels in Sydney, and west of the Harbour Bridge in particular.

The construction of the marina will provide the general and boating public with enhanced access to the waterway through the provision of pick up and drop off berths, destination berths for day tripper vessels, a kiosk/café, sewage and waste water pump-out, parking and toilets.

The proposed marina will also provide vessel access for those with a disability and the mobility impaired, improving access to Sydney's waterways for all members of the public.

The vessels which will be accommodated in the proposed marina will range in size from less than 8 metres up to 25 metres, with the majority of the vessels being in the range 10 to 16 metres in overall length.

When completed the Environmental Assessment will be submitted to the Department of Planning and put on display for community comment.

Further information? Call Chris Ford on

(02) 4929 2063 or 0411 423272.

Consultation

The community consultation website went live on 17 June 2009 and interested members of the community were invited to participate in the consultation until 10 July 2009 for consideration in this Environmental Assessment.

The **Community Consultation Report** concludes that:

> *"After extensive notification the consultation website attracted 487 unique visitors, with 31 taking the opportunity to register, 15 of these electing to participate in the on-line forum and survey, to express their views on which issues should be included in the Environmental Assessment of the proposal.*
>
> *Issues raised by participants included:*

Disclosure	Some participants questioned the previous disclosure of the marina plan to purchasers of property in Breakfast Point Estate, including the suggestion that the original plan was for a "private" marina not a "commercial" marina.
Imposition of Costs	Some residents of Breakfast Point raised the issue of possible imposition of marina costs on the Breakfast Point Estate for such things as maintenance of roads, footpaths and gardens.
Potential pollution	Some participants expressed their concern over potential fuel pollution from boats, sewage from boats, and fumes from boat engines.
Noise	Participants questioned the noise generated by the proposed marina.
Other Options	Alternative sites for additional marina berths were suggested, including Majors Bay, River Quays and the Cabarita Marina.
Over-development of waterfront	Some participants supported the establishment of a marina, while others claimed such a development would spoil one of the last bays on the river free of marina and moorings.
Public Access	Some participants also expressed concern about public access and alienation from Kendall Bay, maintaining that any marina developed should be accessible by the general public. Several participants supported the establishment of a marina kiosk/café.
Public Transport	Several participants supported the establishment of a ferry stop at the proposed marina.
Remediation of Kendall Bay	Those who participated in the discussion, for or against the marina, agreed that the bay requires urgent remediation.
Traffic and Parking	The additional traffic and demand for parking was raised, particularly by some Breakfast Point residents.
Views	The visual impact of the marina was welcomed by some and opposed by others.
Water Access	Some participants claimed broken promises in relation to provision of public access to the waterways
Water safety	Some participants expressed fear for safety of rowers on the river with increased marine traffic

The issues raised by the Community have been addressed in this EA.

6.2 Agency Consultation

During the preparation of the EA, the following consultation has been undertaken with the local Council and the relevant State Government Agencies:

	Consultation / Communication	Issues Raised
City of Canada Bay Council	Meeting with Canada Bay Council on 24 August 2009	▪ Integration with the Breakfast Point developments; ▪ Issue of after hours complaints and how these would be managed.
Department of Environment, Climate Change and Water	Reviewed DECCW letter to the Department of Planning dated 25 May 2007 Meeting with DECCW and DoP on 12 November 2008 and 27 July 2009 Reviewed DECCW letter dated 25 August 2009	▪ Contaminated land ▪ Remediation (including placement of the blanket and piles, potential impacts, estuary hydrodynamics and water levels, ongoing maintenance of blanket) ▪ Environment Protection Licence ▪ Noise impacts
Roads and Traffic Authority	Pre-lodgement application advice was sought from the Roads and Traffic Authority by the traffic consultant in email dated 27 April 2009. The RTA provided the key issues to be addressed in their email dated 2 June 2009 (included in the Appendix to the *Traffic and Parking Report*).	▪ Car parking provision ▪ Provision of bus, pedestrian and bicycle facilities ▪ Vehicular access to/from the site ▪ Likely daily and peak traffic movements
NSW Maritime	**Land Owner's Consent** has been obtained from NSW Maritime -letter dated 3 July 2008 and as amended by NSW Maritime letter dated 18 May 2009	▪ Impacts on existing users of the River ▪ Impacts on wave environment
Sydney Ferries Corporation	Reviewed Sydney Ferries letter to the DoP dated 29 June 2007 Meeting with Sydney Ferries, NSW Maritime and DoP 12 August 2009	▪ Potential claims from vessel wash ▪ Impacts on Sydney Ferries service efficiency
NSW Rowing	Reviewed NSW Rowing letter to the DoP dated 7 January 2008	▪ Vessel wash

7. STATUTORY CONTEXT AND PLANNING CONTROLS

7. Statutory Context and Planning Controls

7.1 Overview

Section 7–Statutory Context of the EA has been prepared by WorleyParsons, the Project's environmental planning consultant, in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act, 1979 (the EP&A Act)* and the *Environmental Planning and Assessment Regulation, 2000 (the Regulation).*

The proposal has been assessed in the context of the relevant environmental planning instruments (EPIs) and the strategic planning direction for the locality and the region. The EPIs and related documents include the Deemed SEPP : *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP 2005)*, the *Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005 (DCP 2005)*, *Canada Bay Local Environmental Plan (LEP) 2008*; the Breakfast Point Master Plan 2002, and Breakfast Point Concept Plan 2005.

In preparing **Section 7**, WorleyParsons, has relied upon the adequacy and accuracy of the assessments and advice contained in the reports, plans, diagrams, tables, and so forth, prepared and provided by the respective experts to WorleyParsons. WorleyParsons does not, and cannot, accept responsibility for any errors or omissions in the materials prepared and provided by these experts.

7.1.1 Legislative Framework and Key Planning Controls

LEGISLATIVE FRAMEWORK	
Environmental Planning and Assessment Act 1979 (EP&A Act) (NSW)	
Project Approval and Environmental Assessment - Part 3A	Project Approval is required under **Part 3A** of the *EP&A Act* and pursuant to the provisions of the *State Environmental Planning Policy (Major Projects) 2005*. An Environmental Assessment is required under **Section 75H** of the *EP&A Act.*
Approvals etc legislation that does not apply	Pursuant to **Section 75U** of the *EP&A Act*, the following authorisations are not required for an approved project (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply): • A permit under **Section 201** and **205** of the *Fisheries Management Act 1994;* • An Controlled Activity Approval under **Section 91** of the *Water Management Act 2000;* • A permit under **Part 3A** of the *Rivers and Foreshores Improvement Act 1948.*
Protection of the Environment Operations Act 1997 (POEO Act) (NSW)	
Environment Protection Licence (EPL)	Under **Section 43** Scheduled Activity, of the *Protection of the Environment Operations Act 1997*, an Environment Protection Licence is required.
Environment Protection and Biodiversity Act, 1999 (EPBC) (Commonwealth)	
Referral	The EPBC Act requires approval from the Commonwealth Minister for the Environment for actions that will have a significant effect on matters of national environmental significance. It is considered that the proposal would not have a significant impact on matters of national environmental significance as listed in the EPBC Act or a significant environmental impact on Commonwealth land, and accordingly, a referral is not required to the Commonwealth Minister for the Environment.

KEY ENVIRONMENTAL PLANNING INSTRUMENTS, CONTROLS, GUIDELINES & POLICIES	
State Environmental Planning Policy (Major Development) 2005	
Part 3A Classes of Development	Project falls within **Schedule 1, Group 6 Tourism and Recreational Facilities, Clause 14 Marina Facilities**
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005	
Zoning	The water based site is zoned **W1-Maritime Waters** (Clause 16). On statutory planning grounds, the Project is consistent with the Objectives of the W1 Maritime Waters zone in that the Project has demonstrated that "…*it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations"* and allows for "*equitable use of the waterway, including use by passive recreation craft."*
Development Control in the Waterway (permissibility)	The proposed marina, kiosk, manager's office, amenities and associated facilities are defined as "*commercial marina*" and the ferry wharf as a "*public water transport facility*" (Clause 18). Both a commercial marina and public water transport facility are permissible with consent in the W1 Maritime Waters zone.
State Environmental Planning Policy No. 55 – Remediation of Land	
Contaminated Land and Remediation Order	A Remediation Order (Order Number 23022; Declaration Number 21055; Area 3335) under Section 23 of the *Contaminated Land Management Act* was issued to the Maritime Authority of NSW on 22 June 2007 and includes part of the site. A Sediment Investigation Report and Sediment Contamination Management Report has been prepared by AECOM (refer **Appendix 13**) which addresses the proposed management of the contaminated sediments, the adequacy of the proposed Sediment Protection System (SPS) during construction and operation, the geotextile degradation, durability and chemical impacts on the SPS, permeability and sediment retention of the SPS and future remediation ability.
State Environmental Planning Policy No. 64 – Advertising and Signage	
Schedule 1 Assessment Criteria	Approval is sought for the following signage which will be visible from a public place: directional advisory signage; building designation signage; advisory signage (weather); advisory signage (marina rules); directional signage and services advisory signage (refer to plan DA08-Sigange).
Canada Bay Local Environmental Plan 2008	
Zoning	The land based site is zoned **R1-General Residential** (Clause 2.3)
Land Use Table	The proposed marina car park is defined as a *"car park"* and is permissible with consent in the R1 General Residential zone.
Sydney Harbour Foreshores and Waterways Area Development Control Plan	
Ecological Assessment, Landscape Assessment and Design Guidelines	The DCP provides detailed design guidelines for development and criteria for natural resource protection for the area identified as Foreshores and Waterways area. Theses guidelines have been addressed in the relevant technical reports.
Breakfast Point Master Plan 2002	
Development Control	Whilst water based uses were beyond the 2002 Masterplan area and subsequently the size and scale of any future marina was not detailed in the 2002 Masterplan, provision for the necessary land based support facilities was approved in the form of 100 car parking spaces, expressly set aside for future marina car parking.
Breakfast Point Master Plan 2005	
Development Control	The proposed car parking area associated with the marina is subject to the Breakfast Point Concept Plan 2005. The proposed marina car parking use and its location, within the Silkstone Precinct is consistent with the Breakfast Point Concept Plan 2005.

Australian Standard 'Guidelines for Design of Marinas' AS 3962-2001	
Guidelines	This Standard sets guidelines for use by designers, manufacturers and operators of marinas for recreational and commercial vessels up to 50 metres in length. Fixed berth and floating pontoon marina systems, single pontoons and floating wave attenuators are included. Guidance is also given for on-shore facilities such as dry boat storage, boatlifts, boat ramps and parking facilities. Section 4 of the EA confirms that the marina has been designed in accordance with AS 3962-2001.

7.2 Environmental Planning and Assessment Act, 1979

7.2.1 Application of Part 3A Major Infrastructure and other projects

Part 3A Major Infrastructure and other projects of the *Environmental Planning and Assessment Act, 1979 (EP&A Act)* commenced operation on 1 August 2005. **Part 3A** consolidates the assessment and approval regime of all major projects previously considered under Part 4 (Development Assessment) or Part 5 (Environmental Assessment) of the *EP&A Act*.

Under the provisions of **Section 75B** of the *EP&A Act* development may be declared to be a Major Project by virtue of a State Environmental Planning Policy (SEPP) or by order of the Minister published in the Government Gazette.

7.2.2 State Environmental Planning Policy (Major Development) 2005

State Environmental Planning Policy (Major Development) 2005 outlines the types of development declared to be a Major Project for the purposes of Part 3A of the *EP&A Act*. For the purposes of the *Major Development SEPP*, certain forms of development may be considered a Major Project if the Minister (or a delegate) forms the opinion that the development meets criteria within the *Major Development SEPP*.

Clause 6 of *the Major Development SEPP* defines 'Major Development' and includes development described in **Schedule 1 - Part 3A Classes of Development**.

The Project, which proposes a marina with capacity to moor, berth and store 172 vessels (including 5 day berths) at floating berths at Kendall Bay (within Sydney Harbour) is development described in **Schedule 1 – Part 3A Classes of Development, Group 6 Tourism and Recreational Facilities, Clause 14 Marina Facilities.**

On 29 December 2006, the Director General of the Department of Planning, as delegate of the Minister for Planning, formed the opinion that the proposal is a Major Project to which **Part 3A** of the *EP&A Act* applies (refer **Appendix 2**). The Consent authority is the Minister for Planning.

On 31 May 2007, the Director General issued environmental assessment requirements (DGR's) pursuant to Section 75F of the *EP&A Act* (refer **Appendix 2**).

On 14 January 2008, the Director General re-issued environmental assessment requirements (DGR's) (refer **Appendix 2**).

7.2.3 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (the Harbour REP) applies to the hydrological catchment of Sydney Harbour. The site is within the catchment. It aims to establish a balance between promoting a prosperous working harbour, maintaining a healthy and sustainable waterway environment and promoting recreational access to the foreshore and waterways.

The *Harbour REP* contains 6 parts as follows:

1. Part 1 – Preliminary, which contains the aims and the principles, which enable those aims to be achieved in relation to the foreshore and waterway area;

2. Part 2 – Planning principles, which relate to the plan making process;

3. Part 3 – Foreshores and waterways area, which includes zonings and their objectives , matters for consideration in relation to DA's the Advisory Committee's constitution and role and special provisions;

4. Part 4 – Strategic sites, which contains matters for consideration in relation to sites identified as strategic foreshore sites in the Harbour REP;

5. Part 5 – Heritage provisions, which contains provisions for the assessment of DA's relating to heritage items and places of potential heritage significance as identified in the Harbour REP;

6. Part 6 – Wetlands Protection, which contains provisions relating to the assessment of DA's relating to wetlands protection areas as identified in the Harbour REP.

The provisions relevant to the assessment of this Project Application are in Parts 1, 3 and 4. Whilst the specialist reports which accompany the application have confirmed that the site does not contain any heritage items, places of potential heritage significance or wetland areas, the site is in the vicinity of several heritage items and two wetland protection areas identified in the Harbour REP and therefore consideration has been given to the provisions of Parts 5 and 6.

The Project complies with the **Aims (Clause 2)** of the Harbour REP as follows:

- the development is a positive contribution to the revitalisation of the former industrial site at Kendal Bay within Sydney Harbour;

- the development encourages a culturally rich and vibrant place for residents of Breakfast Point and visitors to the area by providing opportunities to participate in water-based recreational activities; rebuilding the former public ferry wharf; and providing a kiosk and meeting place for social interaction;

- the increased activation of the waterfront will contribute to the vitality and viability of the locality for existing and future generations;

- whilst the development maintains access along the foreshore, public access will also be available to the main marina walkways including access for people with disabilities and mobility impaired;

- the implementation of the proposed Sediment Protection System will improve the health of the aquatic environment which in turn has the ability to rehabilitate nearby wetlands; and

- the layout of the marina ensures that the operational requirements of Sydney Ferries are not compromised and an effective transport corridor is maintained.

In designing the layout and scale of the proposed marina and ancillary faculties, the applicant has had regard to the principles listed at Clause 2(2), which are:

a) Sydney Harbour is to be recognised as a public resource, owned by the public, to be protected for the public good,

b) the public good has precedence over the private good whenever and whatever change is proposed for Sydney Harbour or its foreshores,

c) protection of the natural assets of Sydney Harbour has precedence over all other interests.

The Planning Principles for land within the **Sydney Harbour Catchment (Clause 13), Foreshores and Waterways Area (Clause 14) (refer Figure 11)** and **Heritage Conservation (Clause 15)** and the Project's compliance with these Planning Principles are set out below:

Planning Principles Sydney Harbour Catchment (Clause 13)	Project Compliance
a) development is to protect and, where practicable, improve the hydrological, ecological and geomorphological processes on which the health of the catchment depends,	The implementation of the proposed Sediment Protection System will improve the health of the aquatic environment which in turn has the ability to rehabilitate nearby wetlands.
b) the natural assets of the catchment are to be maintained and, where feasible, restored for their scenic and cultural values and their biodiversity and geodiversity,	The site is part of a former industrial site. The land component has undergone major brownfield redevelopment and now provides medium-high residential housing. The implementation of the proposed Sediment Protection System will improve the health of the aquatic environment.
c) decisions with respect to the development of land are to take account of the cumulative environmental impact of development within the catchment,	Section 8 and Section 11 of the EA address the cumulative impacts of the proposed development.
d) action is to be taken to achieve the targets set out in Water Quality and River Flow Interim Environmental Objectives: Guidelines for Water Management: Sydney Harbour and Parramatta River Catchment (published in October 1999 by the Environment Protection Authority), such action to be consistent with the guidelines set out in Australian Water Quality Guidelines for Fresh and Marine Waters (published in November 2000 by the Australian and New Zealand Environment and Conservation Council),	Refer to the findings of the Sediment Investigation Report and the Sediment Management Report prepared by AECOM.
e) development in the Sydney Harbour Catchment is to protect the functioning of natural drainage systems on floodplains and comply with the guidelines set out in the document titled Floodplain Development Manual 2005 (published in April 2005 by the Department),	The Lower Parramatta River Flood Study provides that the marina is in the section of the River for which the maximum water levels are governed by tidal effects and not storm event resulting in flooding. The marina is in an area which is not flood prone. The marina will not impede the flow of water along the Parramatta River or around Kendal Bay, and therefore the marina will not affect flood water levels upstream in the Parramatta River , where storm events resulting in flooding, govern the maximum water levels. This assessment has been made in accordance with the NSW Government Floodplain Development Manual; namely 1. Data Collection and study- Lower Parramatta River flood study 2. Risk Assessed and determined that there is no risk to the development nor to areas up stream of the development.
f) development that is visible from the waterways or foreshores is to maintain, protect and enhance the unique visual qualities of Sydney Harbour,	The development will be visible from the constructed western shoreline, foreshore walkway, medium to high density residential housing within Breakfast Point to the west and southwest on the former AGL industrial site and from the relatively natural southern shoreline consisting of intertidal beach and mangroves, Cabarita Park, Cabarita Rivercat Ferry Wharf and waters of Kendall Bay and Parramatta River. A **Visual Impact Assessment** has been prepared by **Richard Lamb and Associates (**refer **Appendix 8)**. The

	Assessments defines the intrinsic scenic quality of the site and its surrounding context to be: *"…of a low to moderate rating."* With regard to the greatest visual impacts of the Project, the Assessment concludes that in relation to the close range public and private domain viewing locations: *"..that there would be visual impacts in the range of medium, medium to high and high for close range public and private domain viewing locations which would be mostly due to the potential presence of the proposed marina in the foreground of the views from these viewing locations and the resultant change it would cause to the view compositions and visual character of those views….That impact is not considered to be such that the application ought to be refused."*
g) the number of publicly accessible vantage points for viewing Sydney Harbour should be increased,	The Project increases the number of publicly accessible vantage points (including disabled access) by providing an opportunity for the public to access and walk along the wharf and arms of the marina.
h) development is to improve the water quality of urban run-off, reduce the quantity and frequency of urban run-off, prevent the risk of increased flooding and conserve water,	As discussed at subclause e) the proposed development will have no effect on flooding. The waterside development does not contribute to urban run-off and the land component (car park area) will direct water into the suburban stormwater system thereby preventing run-off entering the Parramatta River in an uncontrolled manner.
i) action is to be taken to achieve the objectives and targets set out in the Sydney Harbour Catchment Blueprint, as published in February 2003 by the then Department of Land and Water Conservation,	n/a
j) development is to protect and, if practicable, rehabilitate watercourses, wetlands, riparian corridors, remnant native vegetation and ecological connectivity within the catchment,	As indicated above, the proposed Sediment Protection System has the ability to improve the health of the aquatic environment.
k) development is to protect and, if practicable, rehabilitate land from current and future urban salinity processes, and prevent or restore land degradation and reduced water quality resulting from urban salinity,	As indicated above, the proposed Sediment Protection System has the ability to improve the health of the aquatic environment.
l) development is to avoid or minimise disturbance of acid sulfate soils in accordance with the Acid Sulfate Soil Manual, as published in 1988 by the Acid Sulfate Soils Management Advisory Committee.	Confirmation of the presence of acid sulphate soils was determined through laboratory analysis for Suspension Peroxide Oxidation Combined Acidity and Sulfate (SPOCAS) as part of the Sediment Investigation conducted by AECOM in 2009. AECOM conclude: *"Given that the works will not involve excavation of the sediments, an acid sulphate management plan will not be required. However, if future works require removal of sediments and expose to air a plan should be prepared in accordance with New South Wales Acid Sulphate Soil Manual ASSMAC 1998"*
Foreshores & Waterways Area (Clause 14)	**Project Compliance**
a) development should protect, maintain and enhance the natural assets and unique environmental	As indicated above, the proposed Sediment Protection System has the ability to improve the health of the aquatic environment.

	qualities of Sydney Harbour and its islands and foreshores,	
b)	public access to and along the foreshore should be increased, maintained and improved, while minimising its impact on watercourses, wetlands, riparian lands and remnant vegetation,	The Project increases the number of publicly accessible vantage points (including disabled access) by providing an opportunity for the public to access and walk along the wharf and arms of the marina.
c)	access to and from the waterways should be increased, maintained and improved for public recreational purposes (such as swimming, fishing and boating), while minimising its impact on watercourses, wetlands, riparian lands and remnant vegetation,	The proposal increases access to and from the waterways and improves public recreational boating opportunities particularly for residents of the inner west.
d)	development along the foreshore and waterways should maintain, protect and enhance the unique visual qualities of Sydney Harbour and its islands and foreshores,	The site is part of a former industrial site. The land component has undergone major brownfield redevelopment and now provides medium-high residential housing. The proposed marina is considered a complimentary use to the redeveloped site.
e)	adequate provision should be made for the retention of foreshore land to meet existing and future demand for working harbour uses,	The proposal does not restrict the future use of foreshore land.
f)	public access along foreshore land should be provided on land used for industrial or commercial maritime purposes where such access does not interfere with the use of the land for those purposes,	The proposal does not impede the existing public access along the foreshore walk.
g)	the use of foreshore land adjacent to land used for industrial or commercial maritime purposes should be compatible with those purposes,	n/a
h)	water-based public transport (such as ferries) should be encouraged to link with land-based public transport (such as buses and trains) at appropriate public spaces along the waterfront,	The Project includes a fixed jetty (designed to incorporate a ferry stop). The potential future ferry service would have the ability to link in with the following existing Bus Services located within 1km of the site: ▪ Route 462 Tennyson Road- (Night Service) Ashfield Station to Mortlake via Croydon Park, Enfield, Burwood Station, Concord and Cabarita; ▪ Route 464 Tennyson Road- Mortlake to Ashfield Station via Concord, Burwood Station and Croydon Park; ▪ Route 466 Cabarita Road- Cabarita Park to Ashfield via Concord, Burwood Station and Croydon Park; ▪ Route L03 Tennyson Road- (Limited Stop Service) Mortlake to Circular Quay. Some of the bus routes also connect with Burwood and Ashfield train stations (refer **Figure 14**). The site is also in close proximity to the Cabarita Ferry Wharf (Sydney Ferries) (refer **Figure 14**).
i)	the provision and use of public boating facilities along the waterfront should be encouraged.	The Project includes casual berthing and day tripper berths for the general boating public.
Heritage Conservation (Clause 15)		**Project Compliance**
a)	Sydney Harbour and its islands and foreshores should be recognised and	A *Historical and Aboriginal Heritage Impact Statement, Kendall Bay* was prepared by **AECOM (see Appendix 6).**

protected as places of exceptional heritage significance,	The assessment determined:
b) the heritage significance of particular heritage items in and around Sydney Harbour should be recognised and conserved,	*"…that the proposed Marina will be visible from the three historic heritage items, but will not impact on the heritage significance or values of any heritage items in the vicinity.* *The three affected items are:* ▪ *The Former AGL Powerhouse (City of Canada Bay LEP No. 383).* ▪ *Cabarita Park – landscape, rotunda and swimming pool (City of Canada Bay LEP No.58).* ▪ *Scots College Boatshed (REP No.48).*
c) an appreciation of the role of Sydney Harbour in the history of Aboriginal and European settlement should be encouraged,	
d) the natural, scenic, environmental and cultural qualities of the Foreshores and Waterways Area should be protected,	*The proposed development will have no impact on the heritage significance of the Former AGL Power House, Cabarita Park or Scots College Boatshed as:* *1) The significance of the items lies largely in non-tangible historical and cultural associations.* *2) It does not physically impact on the heritage items.* *3) While there may be limited impediment to the viewing of Cabarita Park, there will be no impediment from existing public vantage points.* *4) The view from the items is not considered to be of historical significance. In the case of Cabarita Park and the Boatshed, the significance lies in views towards the item, which may be enhanced through increased visitation.* *5) The location of the development within Kendall Bay means the Marina does not impact on sight lines along Parramatta River.*
e) significant fabric, settings, relics and views associated with the heritage significance of heritage items should be conserved,	
f) archaeological sites and places of Aboriginal heritage significance should be conserved.	*No Aboriginal sites were identified as impacted during the desktop survey. Due to the intensive land use it is considered highly unlikely that an Aboriginal site will remain within the Marina footprint. No further assessment is considered necessary."*

Pursuant to **Clause 16**, the water-based site is zoned **W1—Maritime Waters (**refer **Figure 11)**. The objectives of zone W1 are as follows:

a) to give preference to and protect waters required for the effective and efficient movement of commercial shipping, public water transport and maritime industrial operations generally,

b) to allow development only where it is demonstrated that it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations,

c) to promote equitable use of the waterway, including use by passive recreation craft.

On statutory planning grounds, the Project is consistent with the Objectives of the W1 Maritime Waters zone in that the Project has demonstrated that "…*it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations"* and allows for "*equitable use of the waterway, including use by passive recreation craft."*

Clause 18 addresses **Development Control in the Waterways**. The Project includes:

1) a floating berth marina complex for the storage of 172 vessels (including destination berths for day tripper vessels and pick up and drop-off berths);
2) kiosk and amenities;

3) sewage and waste water pumpout facilities;
4) marina manager's office and amenities;
5) car parking; and
6) a public ferry wharf.

Items 1-5 fall within the definition of a "c*ommercial marina*""*.*

Item 6 falls within the definition of a *"public water transport facility."*

"Commercial marina" is defined as (see Dictionary *SREP (Sydney Harbour Catchment) 2005)*:

"…a permanent boat storage facility (whether located wholly on land, wholly on the waterway or partly on land and partly on the waterway) together with any associated facilities, including:

a) any facility for the construction, repair, maintenance, storage, sale or hire of boats, and

b) any facility for providing fuelling, sewage pump-out or other services for boats, and

c) any facility for launching or landing boats, such as slipways or hoists, and

d) any associated car parking, commercial, tourist or recreational or club facility that is ancillary to a boat storage facility, and

e) any associated single mooring,

but does not include a boat repair facility or a private marina."

"Public water transport facility is defined as (see **Dictionary** *SREP (Sydney Harbour Catchment) 2005)*:

"…any structure used primarily in connection with transporting the public by water."

Pursuant to **Clause 18 Development Control in Waterways**, a "*commercial marina*" and a *"public water transport facility"* are "*development that may be carried out only with development consent*" as indicated by the letter "Y" in the **Development Control Table**.

Notwithstanding the above, it is noted that the proposed car parking (Item 5) is located on land zoned **R1-General Residential** under the *Canada Bay LEP 2008* (refer **Figure 5**). Development for the purpose of "car parking" is permissible with consent in the **R1-General Residential** zone. This is discussed further at Section 7.2.6.

The **Matters for Consideration** listed at **Part 3, Division 2 of the** *Harbour REP* and compliance of the Project assessed against these matters is as follows:

- The proposed SPS will minimise the disturbance of contaminated sediments and assist in the rehabilitation and restoration of the nearby wetland;
- The proposed development will maintain and improve public access to and along the foreshore and will improve public access to and from the waterways for recreational purposes;
- The proposed development will promote equitable use of the waterway, including use by passive recreation craft;
- The proposed development avoids conflict between the various uses in the waterways and along the foreshores;
- the scale, form, design and siting of the development is consistent with the desired future character of the redeveloped former brownfield site ;
- The cumulative impact of proposed development will not detract from the character of the waterways and adjoining foreshores; and

- The proposed development increases the number of boat storage facilities over the waterways responding to demonstrated demand for on-water boat storage.

An assessment against the provisions of **Clause 26** relating to **Maintenance, protection and enhancement of views** has been undertaken in the Visual Impact Assessment Report.

Division 3 addresses the **Foreshores and Waterways Planning and Development Advisory Committee. Clause 29** addresses **Consultation required for certain development applications.**

Development for the purpose of "*Commercial Marinas"* is listed at **Schedule 2** of the *Harbour REP*. Therefore, the Project Application must be referred to the Foreshores and Waterways Advisory Committee for comment.

Clause 33 addresses **Commercial marinas within Zone No W1** and provides**:**

> *The consent authority must not grant development consent to development for the purpose of a commercial marina on land within Zone No W1 unless it is satisfied that access between the marina and the foreshore will not be provided on or across land within Zone No W2, W3, W7 or W8.*

The Project does not propose access between the marina and foreshore on or across land zoned W2, W3, W7 or W8.

Clause 36 addresses **Development on land comprising acid sulfate soils. Section 5.4** of the **Construction Environmental Management Plan** prepared by ENSR (refer **Appendix 10**) provides:

> *"The Acid Sulfate Sediment Soil Map (Edition 2) for Prospect/Parramatta River, published by the Department of Land and Water Conservation (1997) indicates that there is a 'High Probability' of occurrence of ASS within the 'Bottom Sediments', and that there is a potential for severe environmental risk if bottom sediments are disturbed by activities such as dredging.*
>
> *Confirmation the presence of acid sulphate soils was determined through laboratory analysis for Suspension Peroxide Oxidation Combined Acidity and Sulfate (SPOCAS) as part of the Sediment Investigation conducted by AECOM in 2009.*
>
> *Given that the works will not involve excavation of the sediments, an acid sulphate management plan will not be required. However, if future works require removal of sediments and expose to air a plan should be prepared in accordance with New South Wales Acid Sulphate Soil Manual ASSMAC 1998."*

Part 4 addresses **Strategic Foreshore Sites.** Consent cannot be granted for the carrying out of development on a strategic foreshore site unless there is a Master Plan for the site and the consent authority has taken the Master Plan into consideration. In this regard, the Breakfast Point Master Plan 2002 and Breakfast Point Concept Plan 2005 are the relevant "master plans" for the site.

Part 5 of the *Harbour REP* addresses **Heritage provisions. Clause 59** addresses **Development in vicinity of heritage items.**

An **Historical and Aboriginal Heritage Impact Statement** has been prepared by ENSR (refer **Appendix 6**). The heritage inventories consulted are listed below:

- National Heritage List
- Commonwealth Heritage List
- Register of the National Estate (RNE)
- State Heritage Register (SHR)

- Section 170 Registers (S170)
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) (SREP)
- City of Canada Bay Local Environmental Plan 2008 (LEP)
- Ryde Planning Scheme Ordinance (PSO)

A search of the above heritage lists revealed a total of 32 heritage items located within a 1.5 kilometre radius of the site, between Cabarita and Mortlake Points. These items are listed in **Table 7.2.** None of the heritage items were located on the site. **Figure 7** shows the heritage items listed under the *Canada Bay LEP* within 1km of the site.

Table 7.2 Heritage Items in the Vicinity of the Site

No	Listing	Item	Address
1	Canada Bay LEP	Mortlake Punt- ramp, slipway setting	Hilly St, Mortlake
2	Canada Bay LEP	Wangal Centenary Bushland Reserve	Hilly St, Mortlake
3	Canada Bay LEP	Cabarita Park- landscape, rotunda and swimming pool	Cabarita Rd. Cabarita
4	Canada Bay LEP	Former AGL Power House	97-99 Peninsula Dr, Breakfast Point
5	Canada Bay LEP	Former AGL Blacksmith's Shop	123 Peninsula Dr, Breakfast Point
6	Canada Bay LEP	Former AGL Fence to Tennyson Road, entrance gates and entry pavilion	Tennyson Rd (east side) Breakfast Point
7	Canada Bay LEP	Former AGL Office No 1	19-21 Tennyson Rd, Breakfast Point
8	Canada Bay LEP	Former AGL Main Meter Reader's Office	19-21 Tennyson Rd, Breakfast Point
9	SREP	Punt Road Wharf	Punt Rd, Gladesville
10	SREP	Scots College Boatshed	3 Delmar Pde, Gladesville
11	SREP	Sydney Grammar School Boatshed	88 Wharf Rd, Gladesville
12	SREP	Cabarita Wharf (former)	Cabarita Rd, Cabarita
13	SREP	Sanders Marina	Cabarita Park, Cabarita Rd, Cabarita
14	SREP	Putney Wharf	Putney Pde, Putney, Putney
15	Ryde LEP	House	19 Amiens St, Gladesville
16	Ryde PSO	Houses	23-31 Amines St, Gladesville
17	Ryde PSO	Monument, Glades Bay Park	45 Ashburn Pl, Gladesville
18	Ryde PSO	Rock Engraving	Glades Bay Native Gardens, Gladesville
19	Ryde PSO	Putney park (house remains)	99 Pellisier Rd, Putney
20	Ryde PSO	Banjo Patterson Park	Punt Rd, Gladesville
21	Ryde PSO	Punt	Mortlake Ferry Pellisier Rd
22	Ryde PSO	"Harwin" House	79 Champion Road, Tennyson
23	Ryde PSO	House	85 Champion Road, Tennyson
24	Ryde PSO	Shops	113-115 Tennyson Road, Tennyson
25	Ryde PSO	House	139 Tennyson Road, Tennyson
26	Ryde PSO&SREP	Rockend Cottage	Punt Road, Gladesville
27	S170 - RTA	Cable Ferry - Mortlake/Putney	Hilly St, Mortlake
28	S170 – Maritime NSW	Old Punt at Mortlake	
29	S170 - DUAP	Rockend Cottage	38-40 Punt Road, Gladesville
30	SREP	Federation Pavilion	Cabarita Road, Cabarita
31	RNE	Federation Pavilion (former)	Cabarita Road, Cabarita
32	RNE	Parramatta and Lane Cover River Landscapes	North Rocks Road to Greenwich

The **Historical and Aboriginal Heritage Impact Statement** concludes:

> *"The assessment determined that the proposed Marina will be visible from the three heritage items, but will not impact on the heritage significance or values of any heritage items in the vicinity. The three affected items are:*
>
> - *The Former AGL Powerhouse (City of Canada Bay LEP No. 383)*
> - *Cabarita Park – landscape, rotunda and swimming pool (City of Canada Bay LEP No. 58)*

- *Scotts College Boatshed (REP No. 48)*

The proposed development will have no impact on the heritage significance of the Former AGL Power House, Cabarita Park or Scots College boatshed as:

1. *The significance of the item lies largely in non-tangible historical and cultural associations*

2. *it does not physically impact on the heritage items*

3. *While there may be limited impediment to the viewing of Cabarita Park, there will be no impediment from existing public vantage points*

4. *the view from the items is not considered to be of historical significance. In the case of Cabarita Parl and the Boatshed, the significance lies in views towards the item, which may be enhanced through increase visitation.*

5. *The location of the development within Kendall Bay means the Marina does not impact on sight lines along Parramatta River.*

7.2.4 State Environmental Planning Policy No. 55 Remediation of Land

The **Object** of *State Environmental Planning Policy No. 55 Remediation of Land (SEPP 55)* **(Clause 2)** is to provide a State-wide planning approach to the remediation of land. SEPP 55 promotes the remediation of land for the purpose of reducing the risk or harm to human health and the environment by specifying when consent is required for a remediation work.

The site is located immediately east of and adjoins the former AGL Mortlake Gasworks site. From 1886-1990s coal gas was produced on the Gasworks site. During operation of the gas works, a total of three wharves were located along the foreshore. The wharves were used for coal and oil loading, with one wharf also used an oil/tar pipeline wharf.

It is understood that the Gasworks and the Coal Ships discharged many of their pollutants into Parramatta River and Kendall Bay, resulting in contamination of the surrounding area, including sediments within Kendall Bay. All three wharves have since been removed. The land component of the former gas works site was remediated and now comprises the Breakfast Point residential development.

On 25 May 2004, a **Declaration of Remediation Site** (Declaration Number 21055, Area number 3335) under **Section 21** of the *Contaminated Land Management Act 1997 (CLMA)* was issued by the Environment Protection Authority (EPA) for the site and surrounding waters (refer **Appendix 13**).

Alinta LGA Ltd (previously The Australian Gas Light Company) entered into a Voluntary Remediation Agreement (VRA) with the then Department of Environment and Climate Change (DECC) and in August 2004 submitted a Voluntary Remediation Proposal (VRP) supported by a conceptual site model and Workplan. Since 4 August 2008, Alinta LGA Ltd has been trading at Jemena Ltd.

Subsequent to the VRP, URS Australia Pty Ltd were engaged by Jemena to quantify the nature and extent of the contamination, to undertake an Environmental Risk Assessment (ERA) and a Human Health Risk Assessment (HHRA) for the site, and to develop a remediation strategy.
On 22 June 2007, EPA issued a **Remediation Order (Order Number 23022; Declaration Number 21055; Area 3335)** under **Section 23** of the *CLMA* to the Maritime Authority of New South Wales (refer **Section 11.3.2** of this report and **Appendix 13**).

In October 2008 Jemena Ltd submitted a **"Preliminary Environmental Assessment - Remediation of Sediments in Kendall Bay, Mortlake" (PEA)** to the NSW Department of Planning under Part 3A and requested the Director-General issue Environmental Assessment Requirements for the Project. The PEA proposes remediation over only a very small part of the southern end of Kendall Bay and a 800m^2 area adjacent to the old wharf and does not address

remediation of "*the sediments of the bed of Kendall Bay and the Parramatta River which fall within 200 metres of the land based boundary of the former Mortlake gasworks site"*

Director General's Requirements for the **Kendall Bay Sediment Remediation Project (MP 08_0020)** were issued on 28 December 2008. The DGRs address *"remediation of contaminated sediments from Kendall Bay, including the excavation of sediments, importation of clean fill; the transportation and offsite treatment of sediments; and disposal of treated sediments."*

Clause 7 of SEPP 55 addresses **Contamination and remediation to be considered in determining development application.**

Clause 7 - **Contamination and remediation to be considered in determining development application**

1) *A consent authority must not consent to the carrying out of any development on land unless:*
    a) *it has considered whether the land is contaminated, and*
    b) *if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
    c) *if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*
2) *Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.*
3) *The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.*
4) *The land concerned is:*
    a) *land that is within an investigation area,*
    b) *land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,*
    c) *to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land:*
        I. *in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and*
        II. *on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).*

The *Estuary Hydrodynamics and Physical Sedimentary Environment* report *(July 2009),* prepared by **GBA Coastal (see Appendix 9)** reported that the turbidity impacts of the proposed marina due to propeller wash were *"found to be small."*

Notwithstanding the above, to address any additional re-suspension of contaminated sediments over and above that attributed to background processes, it is proposed to install a Sediment Protection System (SPS) across the entire development footprint of the proposed marina, including the floating structures, berths and access fairways and areas of potential bed disturbance in shallow water between the floating structure and the mean high water mark. The SPS will cover an area of approximately 5.6 hectares.

At the ingress and egress points of the proposed marina, the SPS would be extended to the boundary of the Remediation Order specified remediation area, to provide 50 m wide protected navigation conditions.

The SPS will comprise a geotextile blanket, which will be laid in overlapping strips across the contaminated sediments within the footprint of the marina and to the boundary of the remediation site to allow for vessel access and vessel turning.

The geotextile blanket would then be stabilised with a layer of basalt rock armour, approximately 300 – 400 mm in thickness.

The installation and ongoing management of the SPS would be controlled by a *Construction Environmental Management Plan (CEMP)* (refer **Appendix 10**) and an *Operational Environmental Management Plan (OEMP)*(refer **Appendix 17**), respectively.

A *Sediment Management Report* **(**refer **Appendix 10)** has been prepared by AECOM which addresses the DGRs for Contamination.

In relation to Geotextile Degradation, Durability and Chemical Impact the Report concludes:

> *"The information from Geofabrics Australia Pty Ltd (Geofabrics), the manufacturers of the Elcomax 1200R geotextile (refer to the EA) have indicated that the Elcomax R range of polyester staple fibre geotextiles have a design life of greater than 100 years when submerged in saline water below a rock cover and is resistant to biological and hydrocarbon attack (Geofabrics). Mathur et al (1994) noted that polyester geotexiles underwent degradation only at elevated temperatures (70 – 95 degrees Celsius) and relatively high and low pH (pH 3 and 13). These conditions are unlikely to be encountered at the proposed marina site.*
>
> *Based on the chemical and physical properties of polyester geotextiles assessed in Davis (1986) (Aging and Durability of Polyester Geotextiles, Garald W. Davis, 2nd GRI Seminar of Durability and Ageing of Geosynthetics, 1986), the geotexile blanket has excellent strength, toughness and durability. Furthermore, Davis (1986) notes that polyester geotextiles, such as Elcomax R range have good resistance to permanent deformation under long-term loading and excellent chemical resistance to water, salts, organic acids, organic solvents and petroleum based chemicals such as those present in the bed sediments of Kendall Bay."*

In relation to Future Remediation the Report concludes:

> *"The type of construction of the proposed marina and the SPS, which have been designed so that the marina infrastructure and the SPS can easily be removed, in sections if required would facilitate future remediation.*
>
> *Therefore, any future requirement for active remediation of sediments at the proposed marina site would be easily addressed by a simple process. This will include the removal of the marina and associated SPS, as required. Further, to mitigate environmental impact the OEMP (AECOM, 2009c) requires an environmental management plan (EMP) to be prepared prior to the removal of the marina infrastructure and the SPS."*

The Report concludes:

- *During marina construction there will be negligible sediment disturbance into the water column, with disturbed sediment likely to be held within the rock armour. Therefore, any impact on the environmental condition is also likely to be negligible.*

- *During marina operation, limited disturbance of sediment will occur in the first year, as the sediment disturbed during construction will be held within the spaces within the rock armour and is likely to be dispersed into the water column. However, this impact is expected to be orders of magnitude lower than current conditions, and therefore will effect on improvement in the environmental condition of the area within the first twelve months of operation, as current sources of disturbance will have been eliminated due to the presence of the marina and the SPS.*
- *Following the first twelve months of operation, there will be no disturbance of the sediments from the marina operations or the current sources, as these will be eliminated due to the presence of the marina and SPS. Consequently, the operation of the marina will effect on environmental improvement on the area.*

7.2.5 State Environmental Planning Policy No. 64 – Advertising and Signage

The proposed signage complies with the **Aims and Objectives** of *State Environmental Planning Policy No. 64 Advertising and Signage (SEPP 64)* by providing business identification signage and advisory signage of a high quality and design, compatible with the proposed use of the foreshore

The proposed signage includes:

- The name of the marina "Inner West Marina, Sydney";
- Individual berth numbering;
- Directional advisory signage;
- Building designation signage;
- Advisory signage (weather);
- Advisory signage (marina rules);
- Services advisory signage (including signage for fire and sewage pumpout); casual public berthing;
- No berthing areas.

The proposed signage is included on the Signage Drawing DA08 prepared by TLB Engineers.

Under the provisions of **Clause 8 Granting of consent to signage**, a consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied that the signage is consistent with the objectives of the SEPP and that the signage satisfies the assessment criteria specified in Schedule 1.

An assessment of the proposed signage against the provisions of Schedule 1 is included in **Table 7.3**

Table 7.3 SEPP 64 Advertising and Signage -Schedule 1 Assessment Criteria

ASSESSMENT CRITERIA	COMPLIANCE
1. Character of the Area Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located? Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?	The proposed business identification is consistent with the Breakfast Point Masterplan 2002 and Breakfast Point Concept Plan 2005 which contemplated marina carparking for a marina.
2. Special Areas Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?	The proposed signage will not detract from the amenity or visual quality of any heritage areas, natural or other conservation areas, open space areas, waterways or residential areas.
3. View and Vistas Does the proposal obscure or compromise important views? Does the proposal dominate the skyline and reduce the quality of vistas? Does the proposal respect the viewing rights of other advertisers?	By virtue of the size, location and orientation, the signage will not obscure or compromise any potential vista. The proposed signage will not dominate the skyline, nor will the proposed signage compromise the viewing rights of other advertisers.
4. Streetscape, setting or landscape Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape? Does the proposal contribute to the visual interest of the streetscape, setting or landscape? Does the proposal reduce clutter by rationalising and simplifying existing advertising? Does the proposal screen unsightliness? Does the proposal protrude above buildings, structures or tree canopies in the area or locality?	The proposed business identification and advisory signage is appropriate with regard to height, bulk, scale and proportions relative to the foreshore The proposed signage will contribute to the visual interest of the foreshore by providing business identification signage and advisory weather signage. The proposed signage will not protrude above buildings, structures or tree canopies.
5. Site and Building Is the proposal compatible with the scale, proportion	The signage is compatible with the scale, proportion and characteristics of the

and other characteristics of the site or building, or both, on which the proposed signage is to be located? Does the proposal respect important features of the site or building, or both? Does the proposal show innovation and imagination in its relationship to the site or building, or both?	proposed marina and ancillary uses. The proposed signage is typical of marina signage with regard to berth number identification, safety advisory signs and business identification signs.
6. Associated devices and logos Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?	n/a
7. Illumination Would illumination result in unacceptable glare? Would illumination affect safety for pedestrians, vehicles or aircraft? Would illumination detract from the amenity of any residence or other form of accommodation? Can the intensity of the illumination be adjusted, if necessary? Is the illumination subject to a curfew?	No illuminated signs are proposed
8. Safety Would the proposal reduce the safety for any public road? Would the proposal reduce the safety for pedestrians or bicyclists? Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?	The proposed signage assists in the identification of the proposed marina, kiosk and manager's office. The advisory signage (weather and marina rules)

7.2.6 Canada Bay Local Environmental Plan 2008

The *Canada Bay Local Environmental Plan (LEP) 2008* applies to the land based development only -the marina car parking area. The remainder of the Project is located on land zoned W1 Maritime Waters and subject to the provisions of the *SREP (Sydney Harbour Catchment).*

Pursuant to **Clause 2.1**, the area upon which the marina car parking will be located is zoned **R1 General Residential** (refer **Figure 6)**. Under the provisions of the Land Use Table "car parking" is permitted with development consent in the R1 General Residential zone.

The **Objectives** of the **R1 General Residential zone** are:

- *To provide for the housing needs of the community.*
- *To provide for a variety of housing types and densities.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

Clause 2.3(2) of the LEP requires the consent authority to have regard to the zone objectives when determining a development application in respect of land within the zone. It is noted that the Council specifically included "car parking" as a permissible use in the R1 General Residential zone, in addition to the mandatory permissible uses under the R1 zone. It is understood that this was in recognition of the provisions in both the 2002 Master Plan and the 2005 Concept Plan for Breakfast Point, identifying the subject land specifically for car parking purposes in association with a future marina development. In doing this, Council acknowledged that the provision of parking for a marina in this area would be in the public interest. Under these circumstances, it is submitted that the proposed car park could not be regarded as being inconsistent with the Objectives of the R1 zone.

Furthermore it is evident that it is necessary for car parking to be provided in association with the proposed marina in order to minimise impacts on residential amenity in the area adjacent to the marina. Again, the provision of such car parking is in the public interest.

The housing needs of the community have been addressed in the 1999 Master Plan, 2002 Master Plan and 2005 Concept Plan. These plans provide details of where housing is to be developed in Breakfast Point. They also provide that, within the "Silkstone Precinct", the subject site be developed for car parking associated with a future marina. Under these circumstances it is submitted that use of the subject land for car parking is not inconsistent with the R1 zone Objectives.

The area upon which the marina (including kiosk, manager's office and amenities) and ferry wharf will be located is not within the area to which the Canada Bay LEP applies (refer Section 7.2.3).

The proposed car parking site is not a heritage item under the LEP, although a number of heritage items are located in proximity to the site (refer **Figure 7**). A Heritage Impact Assessment has been undertaken by AECOM (refer **Appendix 6**).

The proposed land based development (car parking) is located above the foreshore building line (refer **Figure 8**) and west of Peninsula Drive and the residential buildings along the foreshore. In this regard, the car parking area is not visible from the foreshore and will not impact on natural foreshore processes or affect the significance and amenity of the foreshore area.

Clause 6.1 addresses **Acid sulphate soils**. The area over which the car parking area is proposed is recorded (refer **Figure 9**) as "Class 2 Acid Sulfate Soils". Development consent is required for:

- Works below the natural ground surface; and
- Works by which the watertable is likely to be lowered.

Confirmation of the presence of acid sulphate soils was determined through laboratory analysis for Suspension Peroxide Oxidation Combined Acidity and Sulfate (SPOCAS) as part of the *Sediment Investigation Report* conducted by AECOM.

The Report concludes:

> *"Given that the works will not involve excavation of the sediments, an acid sulphate management plan will not be required. However, if future works require removal of sediments and expose to air a plan should be prepared in accordance with New South Wales Acid Sulphate"*

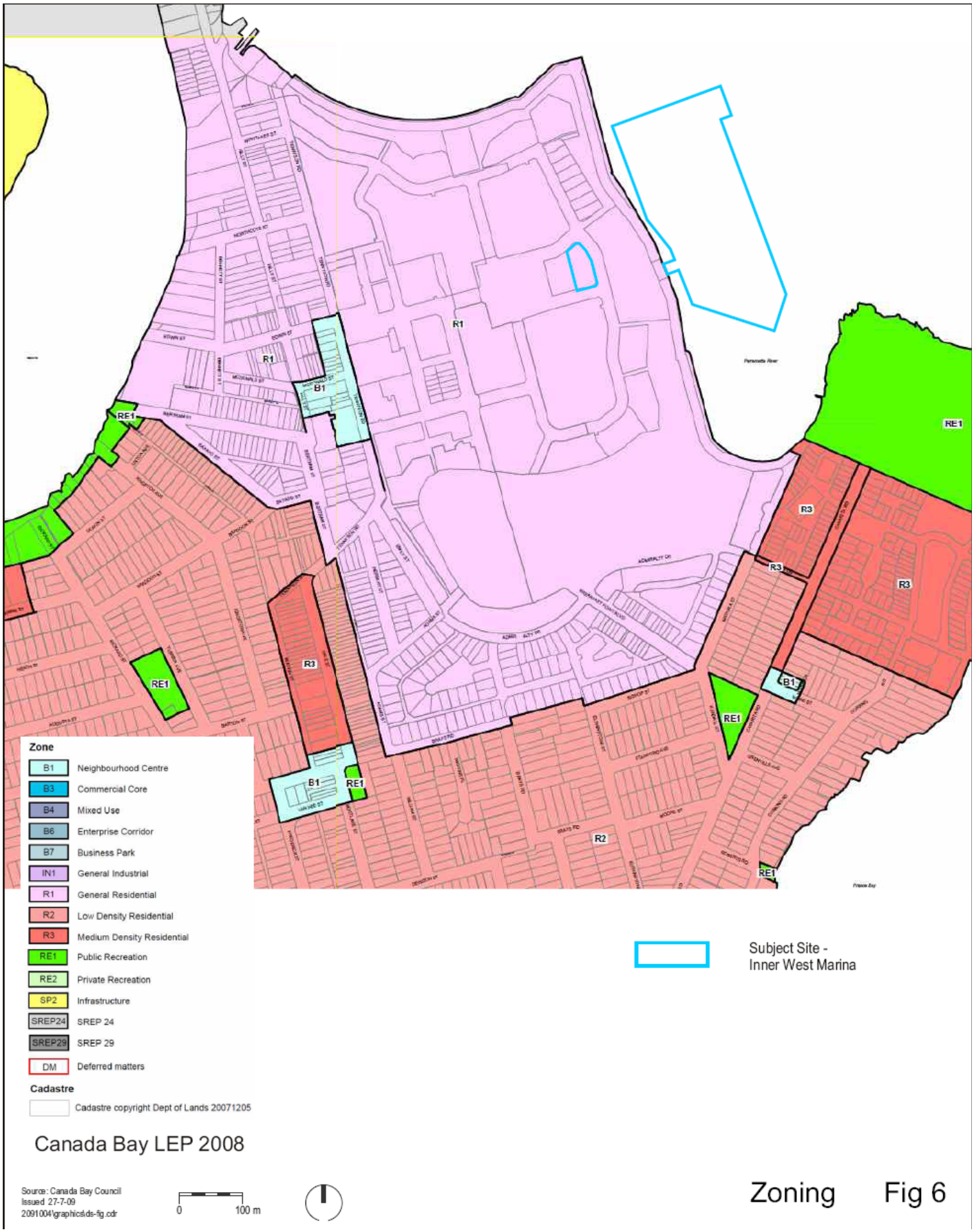
Clause 6.9 addresses **Provisions relating to certain sites requiring specific planning provisions and provides:** *"Schedule 6 has effect."*

The Project is associated with **Schedule 6 Transitional provisions for certain sites – Part 1 Development of certain land at Breakfast Point** (refer **Figure 10**). **Table 7.4** provides an assessment of the proposed marina car parking with **Schedule 6.**

Table 7.4 Canada Bay LEP 2008 -Schedule 6 Transitional provisions for certain sites

Part 1 Development of certain land at Breakfast Point **1 Land to which this Part applies** This Part applies to the land that is former Lot 1, DP 716536, as shown on Sheet 4 of the Special Transitional Sites Map and identified as "B1", "B2", "B3" and "B4".	The area where the proposed marina car parking is located is identified as B2
Precinct B2 generally comprises the northern part of Breakfast Point fronting the Parramatta River. Its objectives are: ▪ to integrate future development with heritage items remaining in this precinct, and ▪ to encourage development that takes	The Breakfast Point Masterplan 2002 (D191/2002) was approved by the City of Canada Bay Council on 3 September 2002 and included approval of the "Silkstone Precinct" which proposed to accommodate a built element (of up to 5 storeys) and public off-street 100 car parking spaces associated with a *"future marina (subject to Waterways and Planning NSW Consent)."* On 31 August 2005 the Minister for Planning determined that the remaining development of the Breakfast Point site was a major

advantage of views and view corridors to and from the Parramatta River, and	project and that future development should be subject to the provisions of Part 3A of the EP&A Act.
▪ to provide supporting land uses around any ferry wharf, and	In this regard, the proposed car parking area associated with the marina is subject to the Breakfast Point Concept Plan 2005.
▪ to integrate other development with the public access and landscaped open space provided along the foreshore.	The Breakfast Point Concept Plan 2005 contained provisions for a 100 space off-street car parking area to be associated with a future marina. The Project proposes 58 marina car parking spaces consistent with the direction and intention of the Breakfast Point Concept Plan 2005.


Zone
B1 Neighbourhood Centre
B3 Commercial Core
B4 Mixed Use
B6 Enterprise Corridor
B7 Business Park
IN1 General Industrial
R1 General Residential
R2 Low Density Residential
R3 Medium Density Residential
RE1 Public Recreation
RE2 Private Recreation
SP2 Infrastructure
SREP24 SREP 24
SREP29 SREP 29
DM Deferred matters
Cadastre
Cadastre copyright Dept of Lands 20071205
Subject Site -
Inner West Marina
Canada Bay LEP 2008
Source: Canada Bay Council
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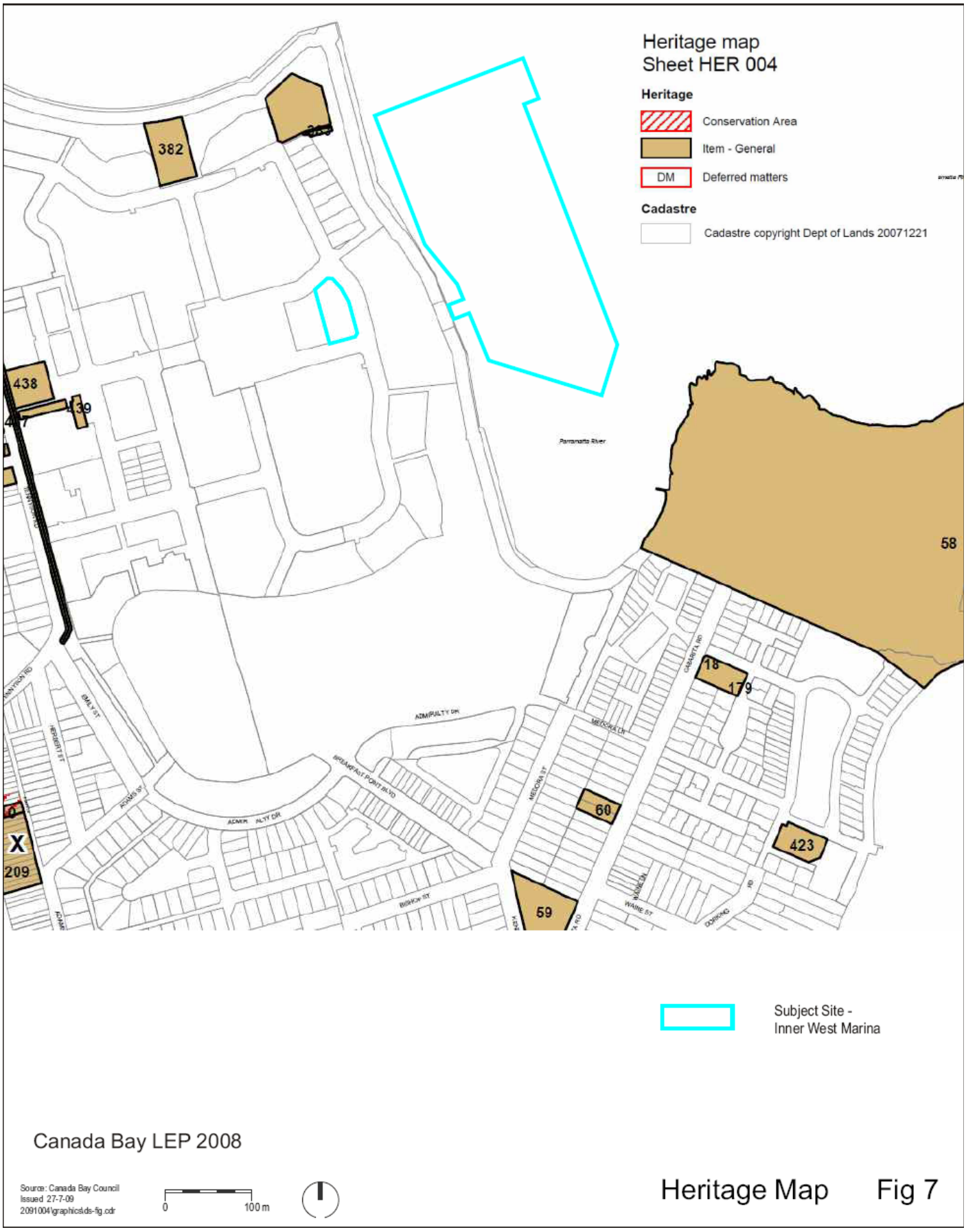
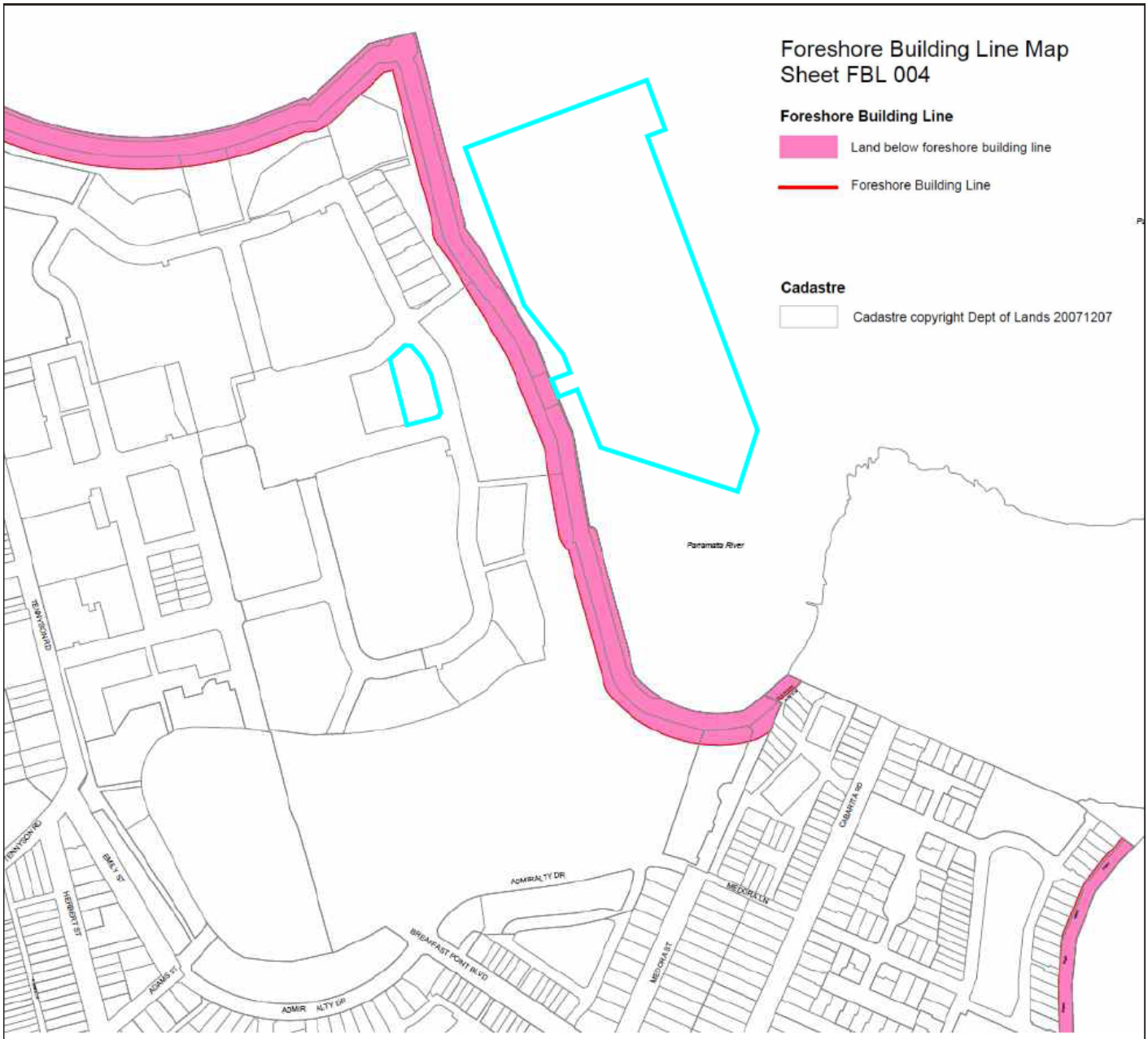
Zoning Fig 6



Heritage Map Fig 7



Canada Bay LEP 2008

Source: Canada Bay Council
Issued 27-7-09
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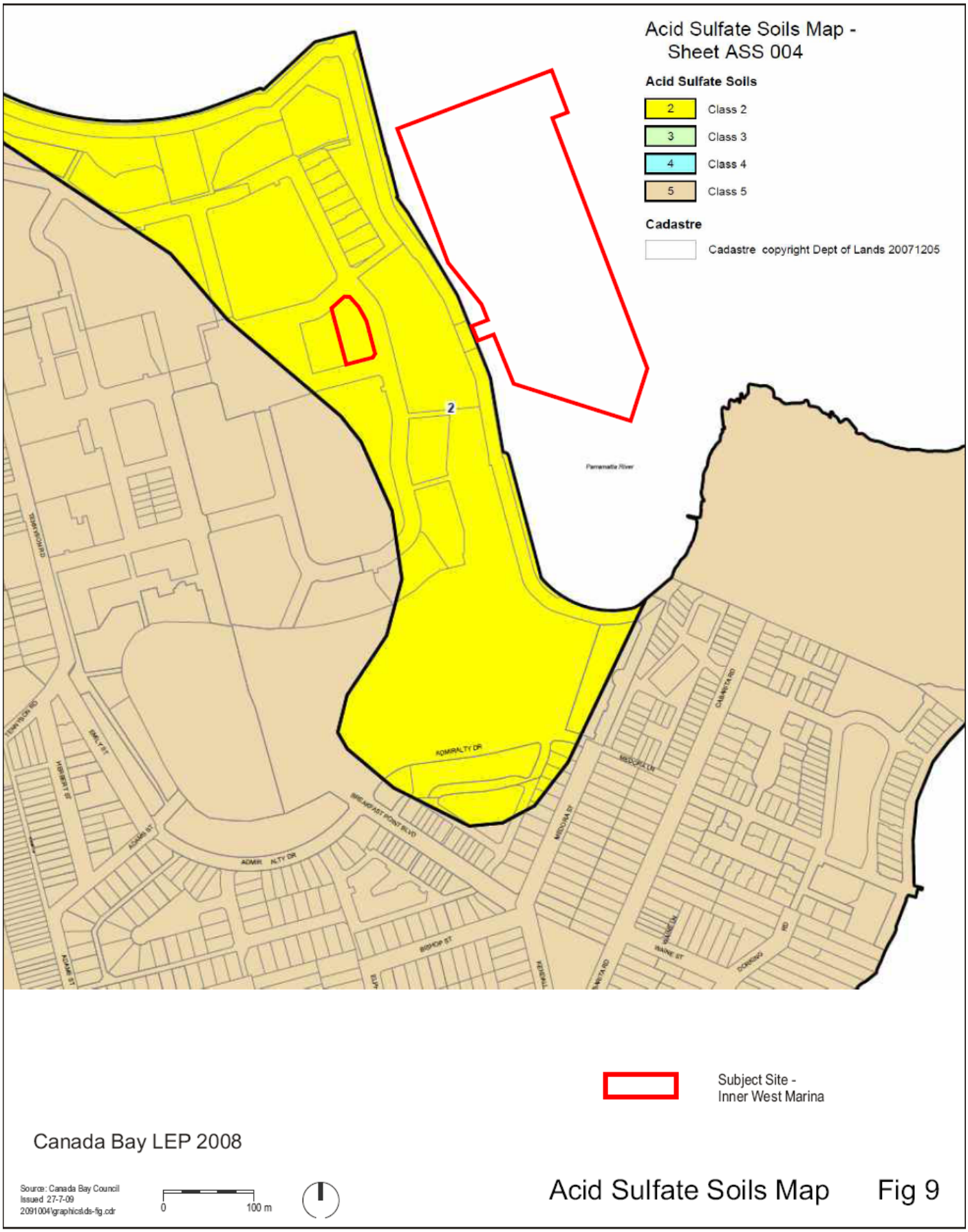
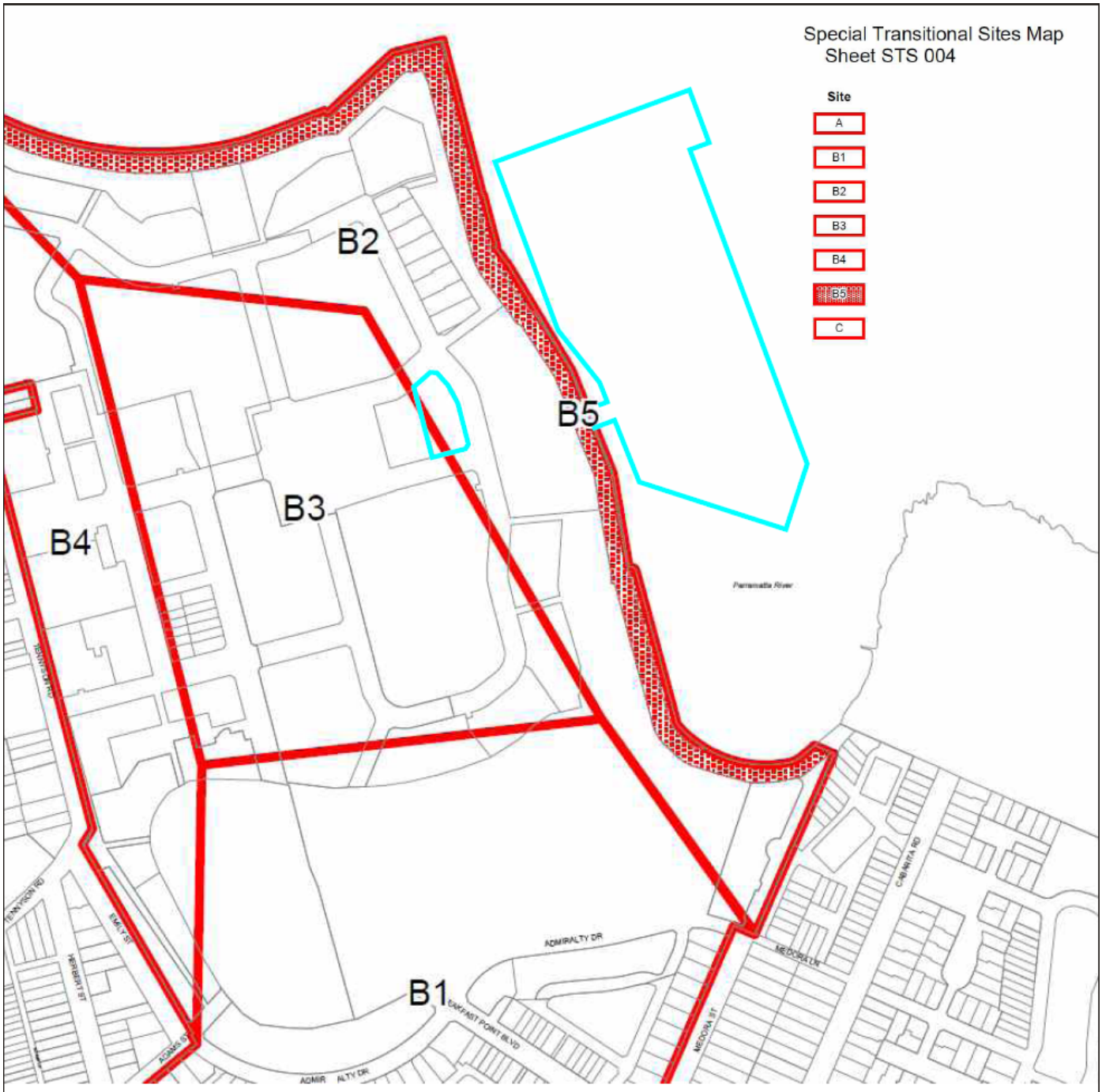
0 100 m

Foreshore Building Line Map Fig 8



Acid Sulfate Soils Map Fig 9



Canada Bay LEP 2008

Source: Canada Bay Council
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0 100 m

Special Transitional Sites Map Fig 10

7.2.7 Breakfast Point Masterplan 1999

The redevelopment of the Breakfast Point site for predominantly residential purposes followed the prolonged use of the site as a gas works by the Australian Gaslight Company (AGL) (refer **Figure 14**).

The land at Breakfast Point was rezoned from 4(a) Industrial General to Residential 2(e) in 1998 and was also identified as a site of "strategic significance" pursuant to the provisions of *State Environmental Planning Policy No. 56 – Sydney Harbour Foreshores and Tributaries (SEPP 56).* In accordance with *SEPP 56*, Concord Council adopted the Breakfast Point Master Plan in 1999 as a guiding document for the ongoing development of the site, which proposed 1,650 residential dwellings and 18, 800 m^2 of commercial uses.

The Masterplan was limited to the land at Breakfast Point (including the area where car parking is proposed), and did **not** apply to or include provisions or controls for the waterway area (i.e. the area where the marina and ferry wharf are proposed).

7.2.8 Breakfast Point Masterplan 2002

The Breakfast Point Master Plan was amended in 2002 to allow for 1,865 dwellings and 12,300m2 of commercial uses on the site.

Like the 1999 Masterplan, the Breakfast Point Masterplan 2002 did not cover the waterway area (i.e. the area where the marina and ferry wharf are proposed).

Notwithstanding the above, the Breakfast Point Masterplan 2002 (D191/2002) was approved by the City of Canada Bay Council on 3 September 2002 and included approval of the "Silkstone Precinct", which proposed to accommodate a built element (of up to 5 storeys) and 100 public off-street car parking spaces associated with a *"future marina (subject to Waterways and Planning NSW Consent)."*

The Community Facilities projected in the 2002 plan included:

> ***Open Space and Recreation***
>
> *Formal constructed open spaces and meeting places and recreation facilities are projected to be located in the Intensive Waterfront Area eg. Amphitheatre, market square associated with other waterfront activities, cafes, shops, commercial and land-based marina facilities.*
>
> *Subject to Waterways concurrence, waterfront skiff sailing and/or rowing facility is being considered on the waterfront in association with the Community Recreation Centre and a marina in association with the pier. The water based uses are beyond the master plan area. The master plan makes provision for the necessary land based support facilities eg parking and access for these facilities.*

Therefore, whilst the water based uses were beyond the Masterplan area and subsequently the size and scale of any future marina was not detailed in the 2002 Masterplan, provision for the necessary land based support facilities was approved in the form of 100 car parking spaces expressly set aside for future marina car parking.

Australian Standards 3962 – 2002 (Guidelines for design of marinas) parking for marinas should be provided as follows:

- *0.3 to 0.6 spaces per wet berth; plus*
- *0.5 spaces per employee; plus*
- *One space per 30m2 for ancillary activities not directly related to berthing*

AS 3962-2002 indicates that the range of parking provision per wet berth depends on the type of facility. For commercial facilities, the lower number of parking spaces should be considered. For racing clubs, the larger number should be considered.

Taking into account AS 3962-2002, the provision for 100 car parking spaces indicates a marina of which the size and scale could be between 166- 333 berths.

7.2.9 Breakfast Point Concept Plan 2005

On 31 August 2005 the Minister for Planning determined that the remaining development of the Breakfast Point site was a major project and that future development should be subject to the provisions of **Part 3A** of the *EP&A Act*. In this regard, the Breakfast Point Concept Plan 2005 only applies to a limited portion of the larger Breakfast Point site. The Breakfast Point Master Plan 2002 remains the planning instrument for areas outside of the 2005 Concept Plan Area.

Of relevance to the Project, the proposed car parking area associated with the marina is subject to the Breakfast Point Concept Plan 2005. The proposed marina car parking use and its location within the Silkstone Precinct is consistent with the Breakfast Point Concept Plan 2005.

Like the 1999 and 2002 Masterplans before it, the Breakfast Point Concept Plan 2005 does not cover the waterway area (ie. the area where the marina and ferry wharf are proposed).

Whilst it is acknowledged that the strategic Masterplans and Concept Plan only applied to the redevelopment of the land at Breakfast Point, the documents contained provisions for a 100 space off-street car parking area to be associated with a future marina. Whilst the actual location, size and scale of the future marina is not detailed in any of the Masterplans/Concept Plan, the allowance for off street marina parking for 100 spaces was included in the strategic redevelopment and planning of the site.

7.2.10 Sydney Harbour Foreshores and Waterways Development Control Plan

The Sydney Harbour Foreshore and Waterways Development Control Plan provide detailed design guidelines for development and criteria for natural resource protection for the area identified as Foreshores and Waterways area. The site is located in the Foreshores and Waterways Area (refer **Figure 10**). Accordingly, the DCP guidelines have been addressed in the relevant technical reports having regard to:

- Ecological Assessment *(Aquatic Ecology Assessment* see **Appendix 4***)*;
- Landscape Assessment *(Visual Impact Assessment* see **Appendix 8***);* and
- Design Guidelines *(included in the EA).*

7.3 Protection of the Environment Operations Act, 1997

The *Protection of the Environment Operations Act 1997 (POEO Act)*, administered by the Department of Environment and Climate Change (DECC), exerts control over the activities of certain uses to ensure that likely environmental impacts are eliminated or reduced to harmless levels and monitored to prevent the degradation of the environment and human health. The *POEO Act* provides a single licensing arrangement to replace the different licences and approvals under existing separate Acts relating to air pollution, water pollution, noise pollution and waste management.

Pursuant to **Section 91** of the *EP&A Act,* the Project is a '**scheduled activity'**, and as such requires approval pursuant to **Clause 48** of the *(POEO Act).*

Under **Section 48** of the *POEO Act*, licences are required to carry out a 'scheduled activity' listed in **Schedule 1** to the Act. **Schedule 1** includes:

25 Marinas and Boat Repairs

1) This clause applies to the following activities:

***boat construction/maintenance (dry/floating docks)**, meaning the use of dry docks or floating docks for the construction, repair and maintenance of vessels.*

***boat construction/maintenance (general)**, meaning the use of facilities (whether water-based or land-based) for the construction, repair and maintenance of vessels (other than dry docks, floating docks and facilities not having frontage to a waterway).*

***boat mooring and storage**, meaning the use of pontoons, jetties, piers or other structures(whether water-based or land-based) designed or utilised to provide moorings or dry storage(other than swing moorings and facilities not having frontage to a waterway).*

2) Each activity referred to in Column 1 of the Table to this clause is declared to be a scheduled activity if it meets the criteria set out in Column 2 of that Table.

***3)** In this clause, **waterway** means any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea).*

Column 1 - Activity	Column 2 - Criteria
Boat construction/maintenance (dry/floating docks)	Capacity to handle vessels 25 metres or longer
Boat construction/maintenance (general)	Capacity to handle more than 5 vessels longer than 5 metres (excl rowing boats, dinghies and other small craft) at any time
Boat moorings and storage	Capacity to handle more than 80 vessels (excluding rowing boats, dinghies and other small craft) at any time

The *POEO Act* makes it an offence to pollute the environment without a valid Environment Protection Licence (EPL) to do so, granted by the DECCW (Environment Protection Authority) under **Section 55** of the *POEO Act.*

As the Project has the *"capacity to handle more than 80 vessels (excluding rowing boats, dinghies and other small craft) at any time",* an EPL is required for the Project.

7.4 Environment Protection and Biodiversity Act, 1999

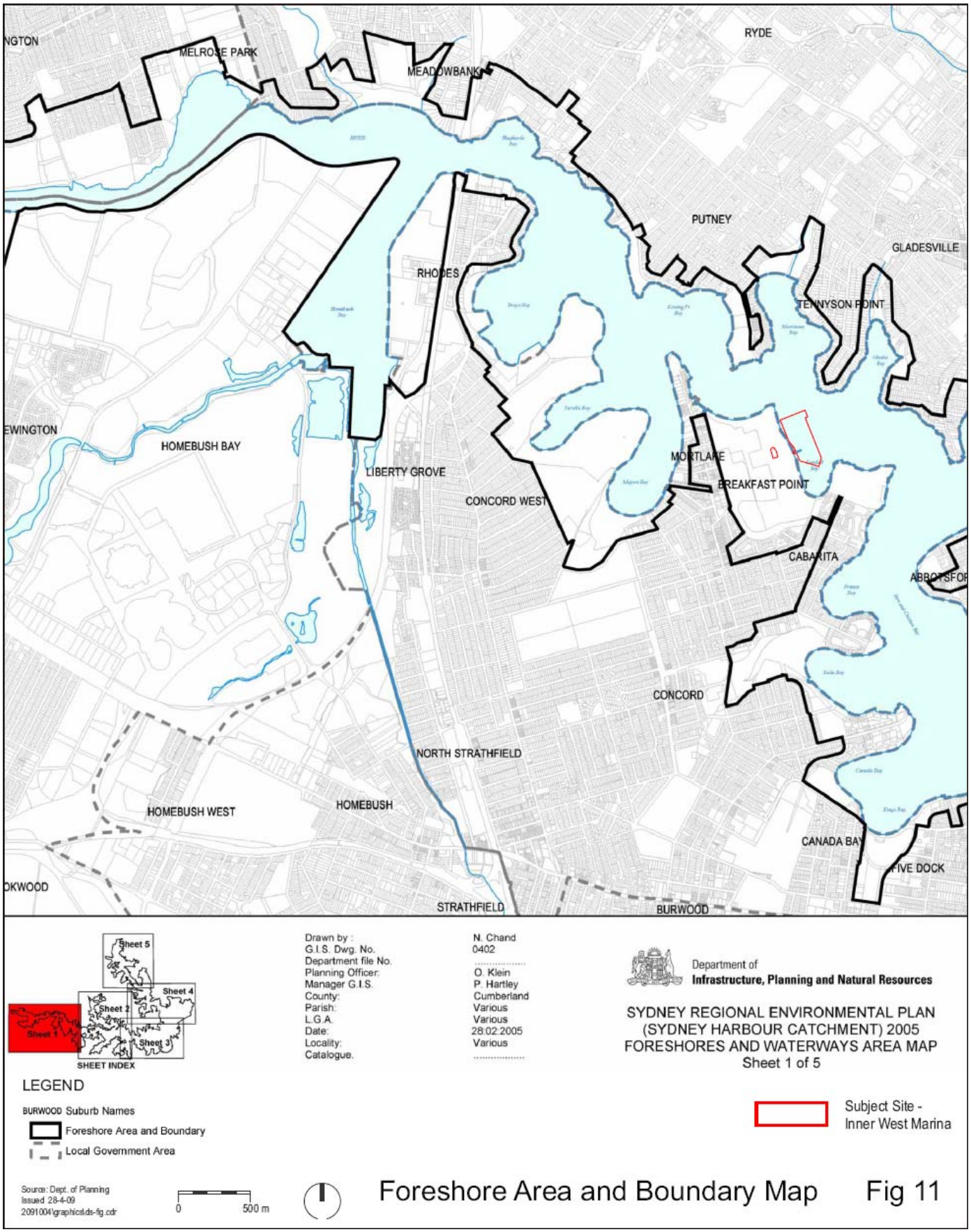
The *Environment Protection and Biodiversity Act, 1999 (EPBC Act)* requires approval from the Commonwealth Minister for the Environment for actions that will have a significant effect on matters of national environmental significance.

The seven matters of national environmental significance to which the EPBC Act applies are:

- world heritage sites;
- national heritage places;
- wetlands of international importance;
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- nuclear actions.

In addition, the Act confers jurisdiction over actions that have a significant environmental impact on Commonwealth land, or that are carried out by a Commonwealth agency (even if that significant impact is not on one of the seven matters of 'national environmental significance').

The proposal will not have a significant impact on matters of national environmental significance as listed in the EPBC Act or a significant environmental impact on Commonwealth land and, accordingly, a referral is not required to the Commonwealth Minister for the Environment.


NGTON
MELROSE PARK
MEADOWBANK
RYDE
PUTNEY
GLADESVILLE
RHODES
TENNYSON POINT
EWINGTON
HOMEBUSH BAY
LIBERTY GROVE
MORTLAKE
BREAKFAST POINT
CONCORD WEST
CABARITA
ABBOTSFOR
CONCORD
NORTH STRATHFIELD
HOMEBUSH WEST
HOMEBUSH
CANADA BAY
FIVE DOCK
OKWOOD
STRATHFIELD
BURWOOD
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
SHEET INDEX
Drawn by : N. Chand
G.I.S. Dwg. No. 0402
Department file No.
Planning Officer: O. Klein
Manager G.I.S. P. Hartley
County: Cumberland
Parish: Various
L.G.A. Various
Date: 28.02.2005
Locality: Various
Catalogue.
Department of
Infrastructure, Planning and Natural Resources
SYDNEY REGIONAL ENVIRONMENTAL PLAN
(SYDNEY HARBOUR CATCHMENT) 2005
FORESHORES AND WATERWAYS AREA MAP
Sheet 1 of 5
LEGEND
BURWOOD Suburb Names
Foreshore Area and Boundary
Local Government Area
Subject Site -
Inner West Marina
Source: Dept. of Planning
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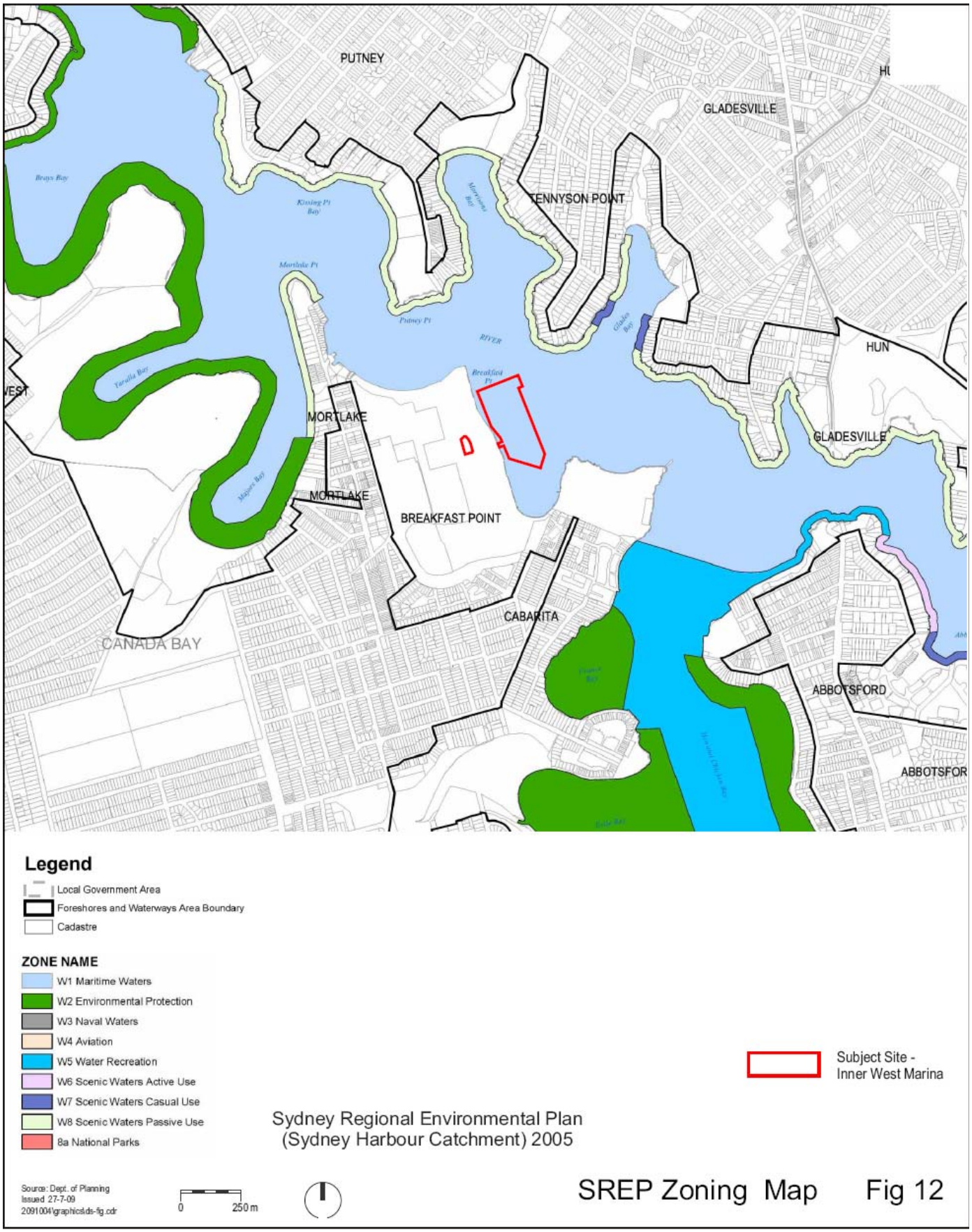
Foreshore Area and Boundary Map
Fig 11


PUTNEY
GLADESVILLE
TENNYSON POINT
MORTLAKE
MORTLAKE
BREAKFAST POINT
CABARITA
CANADA BAY
GLADESVILLE
ABBOTSFORD
Legend
Local Government Area
Foreshores and Waterways Area Boundary
Cadastre
ZONE NAME
W1 Maritime Waters
W2 Environmental Protection
W3 Naval Waters
W4 Aviation
W5 Water Recreation
W6 Scenic Waters Active Use
W7 Scenic Waters Casual Use
W8 Scenic Waters Passive Use
8a National Parks
Subject Site - Inner West Marina
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
Source: Dept. of Planning
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SREP Zoning Map Fig 12

8. REQUIREMENTS OF THE DIRECTOR GENERAL OF THE DEPARTMENT OF PLANNING

8. Requirements of The Director General of The NSW Government Department of Planning

Details of the Director General's Requirements (DGRs) were provided by letter from the Department of Planning, dated 31 May 2007. Following a review of the Project, the DGRs were amended and reissued by letter dated 14 January 2008, a copy of which is included at **Appendix 2**. **Table 8.1** outlines the DGRs and where they have been addressed in the EA.

Table 8.1 Director General's Requirements

Director General's Requirements (DGRs)	Section of EA where addressed
General Requirements -The Environmental Assessment (EA) must include an executive summary.	
A detailed written and graphical description, including engineering and/or architectural plans, of the project.	Executive Summary
Need for the Project	Section 5
Alternatives considered	Section 9
Various components and stages of the Project	Section 4.8
Consideration of any relevant statutory provisions including the consistency of the project with the objects of the Environmental Planning and Assessment Act 1979	Section 7
A general overview of the environmental impacts of the proposal, taking into consideration any issues raised during consultation	Section 10
A detailed assessment of the key issues specified below and any other significant issues identified in the general overview of the environmental impacts of the proposal	Section 11 and Appendices
A description of the existing environment	Section 3
An assessment of the potential impacts of the project, including any cumulative impacts from construction activities and from all water related craft that would utilise the marina	Section 11
A description of the measures that would be implemented to avoid, minimise, mitigate, offset, manage, and/or monitor the impacts of the project. A draft Statement of Commitments	Section 12
A conclusion justifying the project, taking into consideration the environmental impacts of the proposal ,suitability of the site, and the cost and benefits of the proposal	Section 13
A signed statement from the author of the EA certifying that that the information contained in the report is neither false nor misleading.	Introduction
<u>Key Issues</u> Strategic Planning Contamination Visual Amenity Navigation and Safety Public Access Soils, Sediment and Water Traffic Noise Flora and Fauna	 Section 7 Section 11.1 Section 11.2 Section 11.3 Section 11.4 Section 11.5 Section 11.6 Section 11.7 Section 11.8 and 11.9
The Environmental Assessment must take into account relevant State government technical and policy guidelines.	Section 11.1

9. ALTERNATIVES CONSIDERED

9. Alternatives Considered

The other options considered for the proposed development were as follows:

1. "Do nothing";
2. Locating the berths further south in Kendall Bay;
3. Using a fixed structure for all berths in lieu of a floating structure;
4. A marina without the fixed jetty;
5. Expansion of existing marina (River Quays) at Mortlake and
6. Swing moorings

9.1 "Do Nothing"

When compared with the proposed marina, the "Do Nothing" approach results in:

1. Demand for "wet berth" in Western Sydney remaining unsatisfied;
2. The bed of Kendall Bay is unprotected and the risk of contaminant disturbance is greater;
3. There would be a navigation hazard along the line of the original jetty, which poses a risk to navigation that is eliminated by the proposed marina.

9.2 Locating the Marina Further South

There is insufficient navigable water south of the proposed location of the Marina unless dredging is undertaken.

Dredging would disturb the contaminated sediments in the bed of the Bay to such an extent that a "least risk" approach has been adopted by locating the marina and the vessel berths in an area where no dredging is required.

The cost of dredging and the treatment of the contaminated bed material would result in the cost of the works making the Marina financially unviable.

9.3 Fixed Structure in Lieu of Floating

A fixed structure against which all vessels would berth, would be set at a level of at least RL +1.775 (AHD) compared with a floating structure which changes level with the changing water level, and will be at levels between RL -0.425 (AHD) and RL +1.575 (AHD). As a result the fixed structure would have a greater visual impact.

When compared with the proposed floating structure, the fixed structure would:

1. Take longer to construct;
2. Would be more difficult to remove;
3. Would required more piles;
4. Would cost more than the floating structure.

9.4 Marina without Fixed Jetty

The fixed jetty is on the same line and is the same length as the original jetty at the site. Without the fixed jetty:

1. The interpretive reminder of the heritage of the site would be lessened;

2. The kiosk would not be constructed and therefore the waterside experience for the general public would not be enhanced. An opportunity to increase the "feeling of community" would be lost by not having an area for informal get togethers on the foreshore.

9.5 Expansion of River Quays Marina at Mortlake

This existing marina known as "River Quays" at Mortlake has 100% occupancy.

There is insufficient waterway area to accommodate a marina with sufficient berths to satisfy the demand.

The expansion of the marina at Mortlake would reduce the open waterway space near the main channel along the Parramatta River, thereby having an effect on safe navigation along the Parramatta River. The proposed Marina will have little or no effect on navigation and is in a better location.

9.6 Swing Moorings

A swing mooring requires ten times the water space of a wet berth in a floating structure and therefore it is an inefficient use of water space to install swing moorings rather than the type of marina proposed.

The area required for swing moorings would result in only 20 vessels being accommodated in Kendall Bay compared with the 172 berths proposed. This will have little effect on satisfying the demand.

Swing moorings consist of riser chains attached to mooring blocks. As a vessel moves under the influence of wind and currents, the chains cause significant disturbance of the bed. Without a blanket to prevent bed disturbance, this will disturb contaminated sediment. This type of disturbance without the blanket is unacceptable; however, the blanket cost is sufficiently high that it is uneconomic to install one over the area required for swing moorings.

10. IDENTIFICATION OF ISSUES

10. Identification of Issues

The Methodology for identification of issues has involved:

- Reviewing previous investigations within Kendall Bay;
- Reviewing the Director General's Requirements;
- Reviewing relevant planning instruments and guidelines (including the EIS Guidelines for Marinas and Related Facilities) and government policies;
- Reviewing relevant standards for marinas including Australian Standard AS3962-2001-Guidelines for the Design of Marinas;
- Consultation with NSW Maritime (as Land Owner);
- Consultation with government agencies including the Department of Planning and the Department of Environment, Climate Change and Water;
- Consultation with the local community (including adjoining land owners);
- Consultation with users of the waterway;
- Review of vessel registration generally and in particular in the western part of Sydney.
- Engagement of specialist consultants to prepare and review marina designs, advise on potential issues and assess the environmental impacts of the Project.
- Preparation of photomontage images to assist in the assessment of visual effects.

The following issues were identified during the consultation process. The list is not in any priority order.

Aquatic Ecology	Noise	Heritage	Hours of Operation
Lighting	Native Title	Waste	Public Access
Visual Amenity	Water Quality	Soils, Sediment & Water	Traffic & parking
Navigation and Safety incl impact on Sydney Ferries	Contaminated sediments	Strategic Planning	Costs- maintenance of roads, footpaths etc
Alternative Sites	Public Transport	Remediation	Other Waterway Users
Layout and Design	Berth Demand	Private/Commercial Marina	Flora and Fauna

The issues have been addressed in the various sections on the EA report.

These key issues, along with other matters, are discussed in **Section 11** and the attached detailed reports.

11. ENVIRONMENTAL ASSESSMENT

11. Environmental Assessment

The EA has taken into account relevant State and Local Government planning instruments, technical policies and guidelines, including but not limited to the following:

- EIS Guidelines for Marinas and Related Facilities (DUAP, 1996);
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005;
- Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005;
- Control of Obtrusive Effects of Outdoor Lighting (AS 4282);
- Canada Bay Local Environmental Plan 2008;
- Breakfast Point Master Plan 2002;
- Breakfast Point Concept Plan 2005
- NSW Government Floodplain Development Manual - DPI;
- Traffic Co-ordination on the Parramatta River – NSW Maritime;
- Engineering Standards and Guidelines for Maritime Structures – NSW Maritime
- Engineering Assessment of applications involving marinas – NSW Maritime Guidance note 8.3.02
- Depths in Berths and Fairways – Maritime Guidance note 8.3.03;
- Statements of Heritage Impact – Heritage Office, Department of Urban Affairs and Planning 2002;
- Heritage Office Manual - Heritage Office, Department of Urban Affairs and Planning 1996;
- National Water Quality Management Strategy;
- ANZECC Guideline and Water Quality Objectives in NSW;
- Threatened Biodiversity Survey and Assessment;
- Aquatic Habitat Management and Fish Conservation Policy and Guidelines;
- Draft Guidelines for Threatened Species Assessment under Part 3A of the EP&A Act 1979;
- Australian Standard Guidelines for Design of Marinas AS 3962 -2001;
- Australian Standard for Parking Facilities (Part 1: Off street car parking) AS 2890.1:2004;
- Australian Standard Guidelines for Design of Maritime Structures;
- Marina Guidelines (PWD, 1987);
- Guidelines for Design and Construction of Flexible Revetments incorporating Geotextiles for Inland Waterways (PIANC, 1987);

- Guidelines for the Design of Armoured Slopes under Open Piled Quay Walls (PIANC, 1997);

- Guidelines for the Design of Waterside Works subject to Rivercat and Harbourcat Wash (NSW Maritime, 2001).

11.1 Contamination

An assessment of the contaminated sediments in the bed of Kendall Bay and how the construction and operation of the marina may impact on the contaminated sediments has been prepared by AECOM Pty Ltd. Its detailed site investigations and results are included under the *Sediment Management Report* at **Appendix 13.**

11.1.1 Background – Site History

The proposed marina is located immediately east of the former AGL Mortlake Gasworks site (refer **Figure 15**). From 1886 to the 1990s, coal gas was produced on the Gasworks site. During this period three wharves were located along the foreshore area and were used for coal and oil loading. One wharf was also used to load oil/tar. It is understood that the Gasworks and the coal ships discharged many of their pollutants into Parramatta River and into Kendall Bay.

Whilst all three wharves have been removed, the contaminated sediments within Kendall Bay are the subject of a Remediation Order by NSW EPA, discussed at Section 11.3.2 below.

The land-based former gas works site was remediated and now comprises the Breakfast Point residential development.

11.1.2 Remediation Order

On 25 May 2004, a **Declaration of Remediation Site** (Declaration Number 21055, Area number 3335) under **Section 21** of the *Contaminated Land Management Act 1997 (CLMA)* was issued by the Environment Protection Authority (EPA) for an area within Kendall Bay (refer **Appendix 13**).

Alinta LGA Ltd (previously the Australian Gas Light Company) entered into a voluntary remediation agreement (VRA) with the then Department of Environment and Climate Change (DECC) and, in August 2004, submitted a voluntary remediation proposal (VRP) supported by a conceptual site model and Workplan. Since 4 August 2008, Alinta LGA Ltd has been trading as Jemena Ltd.

Subsequent to the VRP, URS Australia Pty Ltd was engaged by Jemena Ltd to quantify the nature and extent of the contamination, to undertake an Environmental Risk Assessment (ERA) and a Human Health Risk Assessment (HHRA) for the site, and to develop a remediation strategy.

On 22 June 2007, the EPA issued a **Remediation Order (Order Number 23022; Declaration Number 21055; Area 3335)** under **Section 23** of the *CLMA* to the Maritime Authority of New South Wales (refer **Appendix 3**).

The Remediation Order states as follows:

REMEDIATION ORDER – Order Number 23022; Declaration Number 21055; Area 3335

Maritime Authority of NSW

A. On 25 May 2004, the Environment Protection Authority (EPA) declared the sediments of the bed of Kendall Bay and the Parramatta River which fall within 200 metres of the land based boundary of the former Mortlake gasworks site as a remediation site under Section 21 of the Contaminated Land Management Act 1997 ("the Act"). A map of the area is attached at Attachment 1.

B. The site has been found to be contaminated with polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (PHs) ("the contaminants").

C. The EPA has considered the matters in s.9 of the Act and found that, the contamination in the near-shore sediments adjoining the former Mortlake gas works site pose a significant risk of harm (SRoH) for the following reasons:

- Environmental harm has occurred in that there is a "lack of benthic biota" in the area. Although "cause and effect" has not been established it is reasonable to assume based on the scientific literature that the nature and degree of the contaminants results in the "lack of benthic biota".

- The concentration of total polycyclic aromatic hydrocarbons (both low and high molecular weight components) are significantly elevated above ANAECC 2000 sediment quality guideline levels. Although there is no criteria for TPHs, these are also present in the sediment in significant concentrations and separate phase product has been observed.

- Some PAHs are classifiable as human carcinogens;
- PAHs have the potential to biomagnify through the food chain;
- Benthic biota, and humans could be exposed to the contaminants;
- It is likely that further development of the area would increase the risk of harm
- Disturbance of the sediments would mobilise contaminants and hence increase the risk of harm.

D. The bed of Kendal Bay and the Parramatta River is owned by Maritime Authority of New South Wales (Maritime Authority of NSW).

E. The purpose of this Order is to ensure further disturbance of contaminated sediments a the site is minimised and that persons proposing to carry out activities, which may disturb these sediments, prepare and comply with EPA approved plans. EPA may review this strategy and require a more active remediation approach in light of future investigations and remediation actions and scientific knowledge on the impact caused by these sediments.

F. EPA has considered all submissions received in response to the remediation declaration as to whether an order should be made.

G. EPA has provided a copy of this order to Alinta LGA Ltd ACN 052 167 405 (formerly known as the Australian Gas light Company) PO Box R 1465 Royal Exchange NSW 1225, for the purposes of section 23(4)(b) of the Act, which requires the EPA to serve copies of the order on "those persons who the EPA has reason to believe contaminated the land in such a way as to present a significant risk of harm.

11.1.3 Major Project MP08_0020 (Preliminary Environmental Assessment – Remediation of Sediments in Kendall Bay, Mortlake)

In October 2008 Jemena Ltd submitted a **"Preliminary Environmental Assessment - Remediation of Sediments in Kendall Bay, Mortlake" (PEA)** to the NSW Department of Planning under Part 3A and requested the Director-General issue Environmental Assessment Requirements for the Project. The PEA proposed remediation over only a very small part of the southern end of Kendall Bay and a 800m2 area adjacent to the old wharf and did not address remediation of "*the sediments of the bed of Kendall Bay and the Parramatta River which fall within 200 metres of the land based boundary of the former Mortlake gasworks site"*

Director General's Requirements for the **Kendall Bay Sediment Remediation Project (MP 08_0020)** were issued on 28 December 2008. The DGRs address *"remediation of contaminated sediments from Kendall Bay, including the excavation of sediments, importation of clean fill; the transportation and offsite treatment of sediments; and disposal of treated sediments."* It is

understood that, the Environmental Assessment for MP 08_0020 has not yet been submitted to the Department of Planning.

11.1.4 Existing Environment

The *Sediment Management Report* prepared by AECOM (2009) (refer **Appendix 13**) states that sediments within the proposed marina site are generally comprised of sandy silty clay, considered typical of an estuarine environment. It was noted that sediments became coarser towards the north within the proposed marina site, likely due to increasing wave (including boat generated waves) and tidal influence associated with proximity to the Parramatta River.

The studies found that the sediments within Kendall Bay were generally dominated (> 75% of the total) by fine material with a particle size of less than 75 µm.

The AECOM (2009a) investigation indicated that PAHs were present at concentrations greater than the interim sediment quality guidelines (ISQG) published in ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* PAHs were found to exceed the ISQG High levels in approximately 35% of samples analysed, and PAHs concentrations were greater than the ISQG Low guidelines in approximately 60% of samples analysed. Elevated concentrations of TPH were also detected in the sediment samples, however, there are currently no available guideline levels for TPH to be assessed against.

The AECOM (2009a) investigation identified that the highest concentrations of PAHs were in the sub surface sediments (greater than 100 mm depth). Lower concentrations were detected in the surficial sediments (i.e. between 0.0-100 mm below the bed surface). The 95% upper confidence limit (UCL) on the mean for PAH concentrations the driving contaminant within the top 100 mm of the sediment profile across the footprint of the marina was 22.3 mg/kg.

Concentrations of heavy metals, including Mercury, Nickel and Zinc, were generally greater than their respective ISQG High guidelines, in the majority of surface grab samples analysed. Arsenic, Chromium and Copper concentrations were greater than the ISQG Low guidelines in the majority of surface grab samples analysed, but did not exceed the ISQG High guidelines.

Hydrocarbon odours and an oily sheen were observed within the sediments at a number of sampling locations. However, the AECOM (2009a) investigation did not identify any free product (oil) in sediments within the proposed marina site.

Water depth within Kendall Bay was described as up to 5 m in the central area, and less than 2 m in the southern portion of the bay and along a narrow fringe adjacent to the seawall to the north of the former coal loading wharf.

gbaCoastal Pty Ltd (GBAC) (2009) conducted studies of estuary hydrodynamics and physical sedimentary environment (refer **Appendix 9**). Based on the study findings, GBAC (2009) reported that under existing conditions, sediment within the proposed marina site is subject to disturbance mainly due to currents induced by wind waves, boat generated waves, boat propeller action and stormwater flows from outlets discharging into Kendall Bay.

GBAC (2009) reported that it would seem reasonable to adopt a disturbance (erosion) threshold velocity of 0.3 m/s for bed sediments at the marina site. While lower velocities could disturb unconsolidated muddy sediments, it is conservative to nominate this 0.3 m/s as a reasonable upper bound threshold.

The nearby passing of Rivercat and Harbourcat ferries alone were found to generate the greatest wave heights and wave velocities within Kendall Bay, with wave heights up to 0.5 m and velocities exceeding 1 m/s for water depth of 1 m, dropping to 0.4 m/s in 2 m of water and 0.3 m/s in 3 m of water (GBAC, 2009). GBAC has estimated that every time a fast ferry passes at water level of RL 0 m AHD, the median expected tidal level in Kendall Bay, approximately 8,300 m^2 of the footprint of the proposed marina would be stirred by wave induced currents (velocities at or greater than 0.3 m/s).

Currently some 25,000 fast ferries pass the site each year. Passing of recreational power craft are almost three times that of the fast ferries. Combined boat and wind wave action is assessed to disturb the bed in a water depth of 3 m some 70 times per day, controlled by the passing of fast ferries. Wind waves in 50 year average recurrence interval (ARI) storms would only disturb bed sediment in water depths up to 2 m (GBAC, 2009).

Based on the data provided in GBAC (2009), the following estimates have been made:

- Assuming a conservative lower bound thickness of 0.075 mm (equivalent to the dominant grainsize of 75 µm) is disturbed by every ferry crossing the total volume of sediment disturbed within the area of disturbance (8,300 m^2) is 0.62 m^3 for each fast ferry pass;

- If 25,000 fast ferries pass every year, this equates to approximately 15,500 m3 of sediment being disturbed per year (or 42.6 m3 per day). This equates to approximately 18,600 tonnes of sediment per year (if a sediment density of 1.2 tonnes/m3 is applied);

- Based on the AECOM (2009) investigation, the 95% UCL on the mean for PAH (the driving contaminant) concentrations within the top 100 mm of sediment in the area of ferry disturbance (at RL 0 AHD) is 120.5 mg/kg; and

- Therefore, conservatively the weight of PAH presently disturbed by fast ferry alone on a yearly basis would be about 2,200 kg (for a 95% UCL concentration of 120.5 mg/kg).

DEC's requirement for the proposal is that the marina must not cause any additional resuspension of contaminated sediments over and above that attributed to background processes (DEC letter to TLB, 7/8/07). GBAC (2009) provided findings of previous studies. These were presented in terms of propeller wash impacts at the unprotected bed (no SPS) for varying water depths, as follows:

- **Two metres** water depth was considered unlikely to satisfy DEC's requirements for any of the test vessels.

- **Three metres** water depth was unacceptable for the large (24m) vessel, with mixed compliance exhibited for the small (11 m) and medium length (14 m) vessels.

- In **four metres** of water, the small (11 m) and medium (14 m) vessels essentially met DEC's requirement, but the large (24 m) vessel did not.

- The small (11 m) and medium (14 m) vessels clearly satisfied DEC for all manoeuvring in **five metres**, but the large (24 m) vessel caused significant turbidity impacts for the case of full thrust starting astern.

GBAC (2009) also applied the available background and vessel test turbidity data to develop an analytical procedure to estimate the level of turbidity impact from proposed marina operations. This assessment indicated that, even without the proposed SPS, the daily average turbidity within the proposed marina area within Kendall Bay would be elevated by less than 1 NTU over and above an assessment of daily average turbidity equal to 10.2 NTU. The overall turbidity impact of the proposed marina in relation to propeller wash was thus predicted to be small.

However, GBAC (2009) concluded that based on the current local conditions, without the implementation of appropriate sediment protection and/or management measures, the proposed marina development would be likely to cause additional disturbance of the bed sediments.

The aquatic biota environment is described in detail in the Environmental Assessment (EA) prepared by TLB Engineers (TLB, 2009). In summary, Cardno Ecology Lab Pty Ltd (Cardno) (2009) report provided the following study findings:

- The proposed Marina location supports a diverse range of infauna, but generally not typical of that region of the estuary. Additionally, the infauna was less abundant generally than observed in a 1996 study;

- There are no wetlands along the western foreshore of Kendall Bay within the proposed Marina location;

- No protected or threatened fauna was found; and

- No sea grasses were found within the proposed marina footprint.

Given that the organisms found by Cardno (2009) were generally not typical of the area and that there are extensive areas of these habitats elsewhere in the estuary, these were not considered of significant ecological value.

11.1.5 Potential impacts

In relation to the potential impacts of the proposed development on the disturbance of contaminated sediments within Kendall Bay, the *Estuary Hydrodynamics and Physical Sedimentary Environment* report (July 2009), prepared by GBA Coastal (refer **Appendix 9**), reported that the turbidity impacts of the proposed marina due to propeller wash were *"found to be small."*

Notwithstanding the above, to address any additional re-suspension of contaminated sediments over and above that attributed to background processes, it is proposed to install a Sediment Protection System (SPS) across the entire development footprint of the proposed marina, including the floating structures, berths and access fairways and areas of potential bed disturbance in shallow water between the floating structure and the mean high water mark. The SPS will extend beyond the footprint of the floating structure by a minimum distance equal to an acceptable navigable fairway width of 1.5 times the maximum length of passing vessels. The SPS will cover an area of approximately 5.6 hectares.

At the ingress and egress points of the proposed marina, the SPS would be extended to the boundary of the Remediation Order specified remediation area, to provide 50 m wide protected navigation conditions.

The SPS will comprise a geotextile blanket, which will be laid in overlapping strips across the contaminated sediments within the footprint of the marina and to the boundary of the remediation site to allow for vessel access and vessel turning.

The geotextile blanket would then be stabilised with a layer of basalt rock armour, approximately 300 – 400 mm in thickness.

The installation of the SPS would be controlled by a *Construction Environmental Management Plan (CEMP)* (refer **Appendix 10**) to provide guidance on environmental control measures for the construction phase of the proposed Marina with regard to management of near shore sediments of Kendall Bay. The management and operation, once the SPS is installed, would be guided by the *Operational Environmental Management Plan (OEMP)* (refer **Appendix 15**).

Bed Disturbance during Construction

To minimise disturbance, the SPS construction works will be carried out progressively over small areas. It is proposed to install a silt curtain and floating boom at the limit of the SPS to trap disturbed sediment. In addition, a second, inner silt curtain will be employed around working areas and moved as construction works progress. The inner silt curtain and floating boom will be removed upon completion of SPS installation and the outer curtain and boom will remain during construction of marina infrastructure.

Notwithstanding the above, construction of the SPS is likely to result in localised temporary disturbance of the bed sediments during the period of installation. Douglas Partners (DP) (2009) estimated that the upper 100 mm of sediments are likely to be affected during the installation of the SPS, which was considered a reasonable upper bound average over the 56,000 m^2 area of the SPS by GBAC (2009). As discussed above, the AECOM (2009a) investigation found the upper 100 mm of sediments contained elevated concentrations of PAH, the driving contaminant at Kendall Bay. The 95% UCL on the mean was 22.3 mg/kg for PAH within the top 100 mm of the sediment profile across the footprint of the marina.

Based on GBAC (2009), the following estimates have been made:

- Placement of the SPS will affect the top 100 mm of the bed sediment;
- The placement of the SPS is expected to approximately feed between 1 and 20 mm of surface sediment up through the geotextile, with the sediment delivery being much closer to 1 mm (equating to the average of 0.7%) than 20 mm, of the top 100 mm passing through;

- However, a conservative value of 10 mm has been considered for the sediment that will re-settle within spaces in the basalt rock armour and generally at the top of the geotextile. This equates to approximately 560 m^3 of sediment.

GBAC (2009) has also reported that the disturbance of the sediment under the SPS during construction (expected to be a couple of minutes) would equate to the same disturbance as fast ferry movements over a period of no more than one month. The above estimates support GBAC when compared to the volume of sediment disturbed during fast ferry passes, which was estimated to be approximately 42.6 m^3 per day. Therefore, during construction, the volume of sediment disturbed would equate to only 13 fast ferry passess. This sediment would not be mobilised into the water column during construction (boating activity not sufficient), and therefore the impact on water quality from these sediments would be negligible in the context of present conditions. However, these sediments would remain within the rock armour.

In relation to potential construction impacts of the proposed SPS, the Report concludes:

> *"During marina construction there will be negligible sediment disturbance into the water column, with disturbed sediment likely to be held within the rock armour. Therefore, any impact on the environmental condition is also likely to be negligible.*

However, to minimise disturbance of sediment, the following approach will be used during the installation of the SPS:

- The works will commence from the northern portion of the proposed Marina area. The sheets will be laid continuously from west to east (perpendicular to the shore) by barge using a guide frame and nose board system to minimise sediment disturbance. The works on the western side will commence on the rising tide when the tidal level is at or above mid tide;

- A dive team would be utilised during construction of the SPS, to ensure positioning of the edges and sufficient overlap (2 m) of the geotextile blanket is achieved;

- The geotextile will be secured by placing ballast on top. This process will involve the use of an excavator (fitted with a GPS controlled bucket guidance system), situated at the stern, which will carefully unload ballast directly onto the newly laid geotextile as the barge passes over the geotextile;

- The barge will be slowly moved from west to east as the geotextile is fed from the roll over the bow and beneath the hull;

- Adjacent sheets will be overlapped and secured in a similar way ensuring that no areas of the bed within the footprint of the marina remain exposed;

- As discussed above, an inner boom/silt curtain will be progressively moved south over the SPS, as the SPS is laid; and

- The edges of the SPS will be sunk into the bed sediments and covered with a thicker layer of rock armour.

Given the size of basalt rock proposed, only a small amount of turbidity is expected from the fines of the associated material. However, settlement of these particles is expected within a short period of time and within the silt curtain, mitigating impact to the water quality.

Piles will be required to support the floating marina infrastructure. It is proposed that piles be driven following installation of the SPS. Areas for the piles will be cleared of ballast and the holes cut by divers to minimise sediment release. Once piles are driven to the appropriate depth a geotextile collar would be attached to each pile overlying the geotextile blanket. The ballast will then be replaced by divers and each pile penetration inspected.

Monitoring of water quality is proposed to be carried out prior to construction works commencing (to obtain baseline conditions), on a daily basis (for the first 2 weeks) and on a weekly basis there

on (with the monitoring requirements re-assessed on a monthly basis) throughout the construction works, and at the completion of construction but prior to removal of the silt curtains and floating boom. This monitoring program will be re-assessed regularly and modified, as required, through consultation with DECC. Furthermore, the silt curtains and floating boom will be inspected visually on a fortnightly basis during the construction works.

Bed Disturbance during Marina Operation

Immediately post construction, a quantity of sediment equivalent to up to 10 mm across the marina footprint would settle within the spaces in the rock armour. These sediments would not be mobilised into the water column to any significant extent during the construction period. However given the current velocities (≥ 3m/s) estimated by GBAC(2009) in the rock armour during operation, a significant proportion is expect to be displaced into the water column over the initial 12 months of operation of the marina.

It should be noted that due to the calming effect of the marina infrastructure and the SPS, the effect of fast ferries would be eliminated during operation of the marina.

During the first 12 months of operation of the marina:

- As noted in Section 5 the total volume of sediment from construction expected to be held within the rock armour and available for displacement would be 560 m3;
- Applying a sediment density of 1.200 Tonnes/m3, this equates to 672 Tonnes of sediment; and
- Applying the 95% UCL on the mean concentration of 22.3 mg/kg the weight of PAH within the rock armour available for mobilisation into the water column would equate to about 15 kg.

Therefore, during the first 12 months of operation up to 15 kg of PAH within sediment may be mobilised into the water column compared to the present yearly mobilisation conservatively estimated at 2,200 kg per year.

On this basis it is considered that the impact of the proposed marina on water quality and the local environment in general will be negligible and will, in fact, effect a significant contribution to improvement in water quality.

In terms of the long term ongoing operation, based on the GBAC (2009) report, the primary causes of potential bed sediment disturbance would be currents induced by wind waves, boat waves and propeller action.

As described previously, disturbance via these mechanisms is currently taking place across Kendall Bay. GBAC (2009) has also noted that waves generated by vessels navigating within, to and from the marina would be no more energetic than boat waves currently experienced in Kendall Bay due to ambient boat traffic, and would have small wash generating capacity compared to ambient wash in the bay, attributable to the passing of ferries during marina operation, as discussed previously. However, based on the GBAC (2009) report, following placement of the proposed SPS an improvement in conditions will be achieved as:

- The bed will be protected from disturbance by ferry wave action at water depths of between 2 m and 3 m; and
- The calming effect of the floating marina infrastructure and moored boats will reduce wind and boat wave disturbance of the bed sediments at shallow water depths (1 m or less) to the west and south of the proposed marina.

The greatest potential to generate turbidity and disturb bed sediments would therefore be caused from increased propeller action.

For the proposed marina berthing configuration, GBAC (2009) reported that, depending on boat size and water depth, current velocities at the sediment bed between 0.7 and 2 m/s would be expected during marina operation without implementation of the SPS. However, the implementation of the SPS, as discussed, would reduce these current velocities at the bed to 0.1 to 0.2 m/s, which is below the adopted nominal threshold value of 0.3 m/s. Therefore, the SPS design would account for the hydraulic gradients attributed to the propeller wash, thereby mitigating the disturbance of the underlying sediments. The predicted velocities at the bed with the SPS in place is comparable if not slightly lower than the existing tidal and wind induced water velocities at the bed of Kendall Bay and significantly lower than present conditions where ferry wave action is considered.

GBAC (2009) reported that once the blanket is in place and the marina operational, it is assessed that currents due to all boat waves, including ferry waves, tidal flows, wind action, freshwater flows, stormwater outlet flows, and propeller wash, would be insufficient to mobilise the bed under the SPS.

One of the other factors that requires consideration during operation is the movement of piles and subsequent creation of migration pathways for contaminants through the annulus created around the pile. Given that the piles will be protected by the geotextile collars, migration of contaminants associated with particulates is unlikely. However, contaminants as free phase from the underlying sediments need to be considered. Based on observations of the AECOM (2009a) report, and during pile removal works at the time of the former wharf removal, no free phase contamination has been identified in the sediments down to the underlying clays. Consequently, this type of contaminant migration is not considered an issue of significance during operation of the marina.

Therefore, based on the available data, when compared with present situation the environmental condition of the area of the proposed marina will be significantly improved. Also, requirements of the RO would be met as marina operations would not result in “further disturbance of the bed sediments” and any disturbance of the bed sediments would be negligible when compared to present levels.

The *Operational Environmental Management Plan (OEMP)* (refer **Appendix 10**)has been prepared to mitigate potential impacts on the environment from the proposed marina, with respect to water pollution, air pollution, land pollution, hazardous materials and waste, offensive noise and waste.

To protect the SPS and mitigate sediment disturbance, the OEMP includes the following key management procedures:

- The use of anchors, or other bottom anchoring devices, within the proposed marina is prohibited;

- All marina users would use the designated access and egress routes to and from the marina that would be evident through the use of appropriate navigational measures. The access route would be covered by the SPS, while the egress route would be covered by the SPS and is to be in water sufficiently deep so that disturbance of the bed sediment outside the remediation area is minimised;

- Marina operations staff will be trained in the location and purpose of the SPS and instructed that disturbance of the SPS is not permitted without prior consent from NSW EPA;

- Deep hulled vessels will have restricted access to the marina and will not be permitted in shallow water;

- Yearly inspections of the SPS will be undertaken by divers for at least the first five years of marina operation (frequency to be re-assessed after this period) to assess the conditions of the SPS, including, but not limited to, condition of the rock armour, condition of the geotextile including around piles, presence of any foreign objects that may damage the integrity of the SPS and evidence of potential contamination such as areas of reduced visibility;

- In the event that the integrity of the SPS is compromised a diver will be engaged to repair the subject area. Geotextile material will be available to use, as required; and

- Emergency procedures to address accidents that may impact the integrity of the SPS, including accidental loss overboard of large objects.

In summary and in relation to the potential impacts of the proposed SPS during the operation of the marina the Sediment Management Report concludes:

> *During marina operation, limited disturbance of sediment will occur in the first year, as the sediment disturbed during construction will be held within the spaces within the rock armour and is likely to be dispersed into the water column. However, this impact is expected to be orders of magnitude lower than current conditions, and therefore will effect on improvement in the environmental condition of the area within the first twelve months of operation, as current sources of disturbance will have been eliminated due to the presence of the marina and the SPS.*
>
> *Following the first twelve months of operation, there will be no disturbance of the sediments from the marina operations or the current sources, as these will be eliminated due to the presence of the marina and SPS. Consequently, the operation of the marina will effect on environmental improvement on the area."*

11.1.6 Adequacy of the SPS Design

Design development of the SPS has considered the following:

- Boat movement zones and controlling bed levels;

- Design water level in Kendall Bay;

- Screw race modelling and design bed velocities;

- Protective rock requirements: rock size, blanket thickness and footprint;

- Geotextile filter; and

- Construction aspects.

The proposed SPS comprises a geotextile blanket overlain by rock armour to minimise scour and hence disturbance of the bed sediments. The SPS is to be installed across the entire development footprint of the proposed marina, including the floating structures, berths and access fairways and areas of potential bed disturbance in shallow water between the floating structure and the mean high water mark. The SPS will cover an area of approximately 56,000 m^2.

The first element of the SPS is the geotextile blanket, Elcomax1200R, a non-woven, needle punched polyester geotextile. The geotextile blanket is proposed to be 5.7 mm thick with a pore size (equivalent opening size – EOS) of < 75 micron, which is the smallest EOS available. The GBAC (2009) study considered that this type of geotextile would meet the impact and tear strength requirements for the Kendall Bay environment and prevent turbulence of the sediment. The geotextile will also serve as a foundation or load distributor for the rock armour when placed over poorly consolidated material, typical of contaminated sediments within the Marina footprint.

The geotextile is supplied in rolls of approximately 40 m width and will be laid in panels of up to 150 m length. Each panel will overlap by approximately 2 m. The overlap is designed to be sufficient to withstand the load of rock armour and edge displacement during construction without exposing the underlying sediment.

The overlying rock armour has been designed to be of between 300 mm and 400 mm thickness, depending on anticipated water velocities at the bed (0.7 – 2.0 m/s), without the SPS, calculated based on a range of propeller sizes, boat lengths, water depths, etc. When applying the water

depth, the proposed thickness of rock armour of the SPS was taken into account. Overall, the SPS design requires the placement of approximately 29 000 tonnes of igneous rocks (basalt) in 2 – 5 layers where an end thickness of 300 mm is required (rock size between 70 – 160 mm) and in 2 – 3 layers where an end thickness of 400 mm is required (rock size between 140 – 235 mm), for areas with current water depth and used by boats of 16 to 25 m in length would result in bed velocities greater than 0.3 m/s if 300 mm of rock of 70 – 160 mm were to be used.

Table 11.1 provides a summary of the concept design:

Table 11.1: Concept Design for SPS

Item	300 mm Thick SPS	400 mm Thick SPS
Design axial velocity at top of SPS (m/s)	1.6 m/s	2.2 m/s
Location	Under full marina footprint extending an additional minimum fairway width and extending inshore nominally RL -1.9 bed contour, extending area where 400 mm thick SPS is provided	Protecting bed areas where design velocities assessed to exceed 1.6 m/s, located primarily between Arms 3 and 4, but also at the inshore end between Arms 1 and 2 extending north of Arm 1 and S of Arm 2 immediately under the main inshore walkway
Surface Area	47,000 m^2	9,000 m^2
Median rock diameter range	100 – 120 mm	190 – 220 mm

The ballast along the edge of the geotextile will consist of a thicker layer (about 500 mm thick) of ballast to minimise lifting by wave, propeller and current action. The edge design will comprise ballast placed on the edge and a 1:2 slope (away from the edge) to the desired 500 mm thickness. The ballast thickness will continue at 500 mm for 3000 mm from the edge, at which point the thickness will revert back to 300 mm to 400 mm thickness.

All rock in the SPS will comprise basalt, due to its durability and chemical stability is an ideal material for use as a scour reduction measure. Basalt's (igneous rock) use as rip-rap is a standard practice worldwide. No studies have been identified that indicate impact to marine water quality from the numerous projects where it has been used.

Based on the GBAC (2009) report downslope migration of the geotextile blanket is not considered relevant at the proposed marina site due to the relatively flat bed gradients.

Based on a literature review conducted by GBAC, this type of design has been used previously in similar applications and environments as follows:

- An in-situ cap with armouring layer was used at a Super-fund site in Sheboygan Falls, Wisconsin, USA. This project involved covering areas of PCB-contaminated sediments in river and floodways with a composite cap, comprising layers of gravel and geotextile. A total area of 4,000 m^2 was capped in water depths of 1.5 metres (Eleder, 1992).

- At Eitrheirn Bay in Norway, a composite cap of geotextile and gablions was used over heavy metal contaminated sediments. A total area of 100,000 m2 was capped in water depths of up to 10 metres (Instanes, 1994).

11.1.7 Geotextile Degradation, Durability and Chemical Impact

Geofabrics Australia Pty Ltd (Geofabrics), the manufacturers of the Elcomax 1200R geotextile have indicated that the Elcomax R range of polyester staple fibre geotextiles have a design life of greater than 100 years when submerged in saline water below a rock cover and is resistant to biological and hydrocarbon attack (Geofabrics). Mathur *et al* (1994) noted that polyester geotexiles underwent degradation only at elevated temperatures (70 – 95 degrees Celsius) and relatively high

and low pH (pH 3 and 13). These conditions are unlikely to be encountered at the proposed marina site.

Based on the chemical and physical properties of polyester geotextiles assessed in Davis (1986) (*Aging and Durability of Polyester Geotextiles*, Garald W. Davis, 2nd GRI Seminar of Durability and Ageing of Geosynthetics, 1986), the geotexile blanket has excellent strength, toughness and durability. Furthermore, Davis (1986) notes that polyester geotextiles, such as Elcomax R range have good resistance to permanent deformation under long-term loading and excellent chemical resistance to water, salts, organic acids, organic solvents and petroleum based chemicals such as those present in the bed sediments of Kendall Bay.

In relation to Geotextile Degradation, Durability and Chemical Impact the *Sediment Management Report* (refer **Appendix 13**) concludes:

> *"The information from Geofabrics Australia Pty Ltd (Geofabrics), the manufacturers of the Elcomax 1200R geotextile (refer to the EA) have indicated that the Elcomax R range of polyester staple fibre geotextiles have a design life of greater than 100 years when submerged in saline water below a rock cover and is resistant to biological and hydrocarbon attack (Geofabrics). Mathur et al (1994) noted that polyester geotexiles underwent degradation only at elevated temperatures (70 – 95 degrees Celsius) and relatively high and low pH (pH 3 and 13). These conditions are unlikely to be encountered at the proposed marina site.*
>
> *Based on the chemical and physical properties of polyester geotextiles assessed in Davis (1986) (Aging and Durability of Polyester Geotextiles, Garald W. Davis, 2nd GRI Seminar of Durability and Ageing of Geosynthetics, 1986), the geotexile blanket has excellent strength, toughness and durability. Furthermore, Davis (1986) notes that polyester geotextiles, such as Elcomax R range have good resistance to permanent deformation under long-term loading and excellent chemical resistance to water, salts, organic acids, organic solvents and petroleum based chemicals such as those present in the bed sediments of Kendall Bay."*

11.1.8 Permeability and Sediment Retention

As discussed above, the geotextile has an EOS of <75 micron, which indicates that finer grained sediments may be able to migrate through the geotextile blanket. Geosynthetic Testing Services conducted static and hydrodynamic testing of the Elcomax 1200R geotextile to assess the retention of sediments beneath the SPS. The tests comprised a hydrodynamic sieve test, in which a sample of sediments from north of the former coal loading wharf in a 100 mm piece of geotextile was subjected to a cycle of emersion and drainage over a 24 hour period to simulate intertidal conditions, and a static test, which involved emersion of a sample of the same sediment over a 48 hour period.

Hydrodynamic testing by GTS (presented in GBAC, 2009) involving repeated submersion of the geotextile through a water column resulted in an average of 19% of a 20 mm thick sediment sample passing through the geotextile. Static testing resulted in an average of 0.7% of sediment passing through. GBAC (2009) considered that given the extreme agitation used in the hydronynamic test, during the construction stage (including placement of the geotextile) the static submersion test (i.e. 0.7% pass through) provides a representative measure of the hydraulic loading environment.

GBAC (2009) reported that the application of the rock armour is expected to reduce current velocities at the surface of the geotextile blanket by approximately 80% (equivalent to 0.2 – 0.4 m/s) compared with current velocities at the surface of the rock armour (300 mm to 400 mm thickness). Beneath the geotextile blanket, a further reduction in current velocities of between 25 – 50% is considered likely, therefore resulting in an effective maximum current velocity beneath the geotextile blanket no more than 5 – 10% (equivalent to 0.1 – 0.2 m/s) of current velocities at the surface of the SPS. Given that these predicted velocities of 0.1 to 0.2 m/s are less than the nominal threshold velocity of 0.3 m/s adopted for the marina area, GBAC (2009) concluded that the filtration design would be expected to account for the hydraulic gradients attributed to the propeller wash and thereby contain the underlying sediments.

In considering hydraulic permeability during the SPS design, GBAC (2009) criteria was that the geotextile filter must maintain a higher permeability than the underlying sediments and head loss through the geotextile must not be excessive.

Based on published studies and expected permeability of the Kendall Bay sediments, GBAC (2009) concluded that a permeability of 0.0005 m/s is required for the geotextile. This is easily satisfied by the 0.0016 m/s permeability of the Elcomax 1200R geotextile. Also, given the high permeability of the geotextile it can be concluded that gas retention under the SPS is effectively mitigated.

11.1.9 Future Remediation

In relation to opportunities for future remediation the Report concludes:

> *"The type of construction of the proposed marina and the SPS, which have been designed so that the marina infrastructure and the SPS can easily be removed, in sections if required would facilitate future remediation.*
>
> *Therefore, any future requirement for active remediation of sediments at the proposed marina site would be easily addressed by a simple process. This will include the removal of the marina and associated SPS, as required. Further, to mitigate environmental impact the OEMP (AECOM, 2009c) requires an environmental management plan (EMP) to be prepared prior to the removal of the marina infrastructure and the SPS."*

11.1.10 Audit Report

An interim audit report has been received by GHD Australia and included in Appendix 13.

11.2 Visual Amenity

A *Visual Impact Assessment (July 2009)* has been prepared by **Richard Lamb and Associates**. The report considers the nature of the proposal- its height, width, length, siting, colour, reflectivity and function as well as the landscape setting in which it is proposed, the degree of change created by the Project, and its ability to integrate with the landscape character.

To assess the potential visual impacts which would be experienced by viewers, a view point analysis was conducted. This consisted of visiting the site and locality and assessing the likely impact on views from a selected series of locations. The key viewing locations ranged from a number of public domain locations, including those on:

- roads,
- recreational areas
- waterways.

The Visual Impact Assessment defines the intrinsic scenic quality of the site and its surrounding context as:

> *"…of a low to moderate rating."*

The Visual Impact Assessment defines three viewing ranges within the potential visual catchment based on the viewing distance from the site:

1. **close range viewing locations** are those which are located within 100m distance from any part of the site

2. **medium range viewing locations** are those which are located between 100m-1000m distance from the site; and

3. **distant viewing locations** are those which are located at a distance greater than 1km from the site.

The visual effects and impacts of the proposed development were assessed adopting a detailed visual impact methodology based on the methodology contained in the Sydney Harbour Foreshores and Waterways Development Control Plan. The potential effects of the proposed development on the visual character, scenic quality and view composition for individual viewing locations were analysed. The "view blocking effect" on each individual location was also analysed.

The visual impacts of the proposed development were assessed under three criteria;

1 The capacity of individual view compositions to physically absorb the proposed development,

2 Compatibility of the proposed development with the maritime elements present in individual views and

3 Compatibility of the proposed development with the urban and natural shoreline elements in individual views

The Assessment found that:

> *"There would be no significant visual exposure of the proposed development from roads with the exception of the southern terminus of Pellisier Road (Putney), Tennyson Road (Tennyson Point), Ross Street (Gladesville) and Wharf Road (Gladesville). The proposed development would be visible from the foreshore reserves located below the southern termini of these streets. It would be visible from the foreshore walkway adjacent to the western and southern shoreline of Kendall Bay, Cabarita Rivercat Ferry Wharf, foreshore to the southeast of the Wharf and Putney Point Vehicular Ferry Ramp. It would be visible from the townhouses and apartment buildings in Manors Precinct East and Wharf Precinct in the Breakfast Point residential development and some apartments in Kendall Inlet."*

In relation to the **high view sensitivity zone locations,** the Assessment found that:

> *"The overall effects and impacts rating for the high view sensitivity zone (close range zone within 100m distance from the site) in the public domain were assessed to be high. Highest individual levels of effects were found for close views from the waterway and the foreshore walkway along the western shoreline of Kendall Bay, including the intertidal beaches.*
>
> *The overall effects and impacts rating for the high view sensitivity zone in the private domain were also assessed to be high. Highest individual levels of effects and impacts were found for close views from the townhouses and apartments in Manors Precinct East and Wharf Precinct at ground level, decreasing for higher floor levels.*
>
> *The reasons of high rating impacts on high view sensitivity zones were mostly due to the potential presence of the proposed marina in the foreground of the views from these locations and the resultant change it would cause to the view compositions and visual character of those views.*
>
> *There would not be unreasonable view loss effects of the proposed marina on the potential visual catchment generally, but there would be potential loss of the views of parts of Parramatta River and the sense of the river sweeping towards Kissing Point Bay when seen from viewing locations along the southern shoreline of Kendall Bay and part of Cabarita Park.*
>
> *There would also be view loss effect of parts of Parramatta River and the far shoreline from the foreshore walkway and the ground floors of the residential development adjacent to it, to the west of the site of the proposed marina. The proposed wide fairways assist in maintaining some of the latter views in a view experience which, with the exception of static private views, is a dynamic experience for all viewers and one which is affected along only part of a continuous foreshore access way."*

In relation to **medium sensitivity zone locations,** the Assessment found that:

"The overall effects and impacts rating for the medium sensitivity zone (medium range locations within 100m and 1000m from the site), both in the public and private domains, were assessed to be low, low to medium or medium. A few exceptions to these ratings were the southern end of Tennyson Road and Pellisier Road and Putney Parade on which there would be higher visual effects and impacts.

There would be a potential view loss effect of the existing views of the constructed western shoreline of Kendall Bay when seen from medium range viewing locations to the southeast, east and northeast. This view loss effect is not considered to be significant due to the constructed nature of the shoreline and the medium and high density residential backdrop of the site when seen from these directions which overall has a low to moderate scenic quality"

In relation to **low sensitivity zone locations,** the Assessment found that:

"Low sensitivity zone locations (distant locations at greater than 1km distance from the site) included public domain views. The overall effects and impacts rating for the low visual sensitivity zone were assessed to be low."

In relation to the visual impacts of the proposed marina car parking, the Assessment found:

"The visual effects and impacts of the land based component of the proposed development would

be generally low on the whole potential visual catchment."

In relation to visual effects of the proposed construction and lighting the Assessment found:

"The visual effects of the proposed construction activity and lighting were assessed to be not significant, the first being transitory and water based and making no permanent change to the environment, and the second adding only similar light levels and sources to those that are found

in the existing setting."

The Visual Impact Assessment concludes that in relation to the **close range public and private domain viewing location**:

"..that there would be visual impacts in the range of medium, medium to high and high for close range public and private domain viewing locations which would be mostly due to the potential presence of the proposed marina in the foreground of the views from these viewing locations and the resultant change it would cause to the view compositions and visual character of those views. The close range public domain viewing locations are constituted by the waterway and foreshore walkway along the western and southern shoreline of the Bay. The close range private domain viewing locations include the townhouses and apartment in Manors East Precinct and Wharf Precinct. The southern shoreline of the Bay is of relatively higher scenic quality and the part of the proposed marina close to this part of the Bay in particular Arm 8 would have a higher impact on this scenic quality. That impact is not considered to be such that the application ought to be refused."

11.3 Navigation and Safety

This section should be read in conjunction with drawing N01- "Navigation", the Sydney Ferries time table for the Parramatta River service, and the Schedules of moored and registered vessels from NSW Maritime Authority. All of these documents are attached to this project application at Appendix 17 "Navigation Information".

11.3.1 Context – Recreational and Charter Vessels

Upstream of the Marina on the Parramatta River there are:

- Four existing plus one future public boat ramps for launching and retrieving trailable boats with 20,970 boats 4m to 8m in length, registered to owners who live in the catchment who could use these ramps; with an observed usage of up to at least 160 boats per weekend over the four ramps, averaging 80 boats plus on Saturdays and Sunday;
- A private marina at Hilly Street, Mortlake (25 vessels in wet berths);
- River Quays marina at Tennyson Road, Mortlake (23 vessels in wet berths);
- Marina at Waterview Road, Putney (10 vessels in wet berths);
- Numerous private mooring pens;
- 252 vessels on swing moorings in nearby bays:
    - Kissing Point Bay 57 vessels
    - Morrisons Bay 106 vessels
    - Glades Bay 53 vessels
    - Majors Bay 20 vessels
    - Mortlake foreshore 16 vessels;
- A small watercraft sailing club at Putney.

In Kendall Bay at the south eastern corner is a public boat ramp which is used primarily on weekends, with an observed usage of up to 6 boats per day (Saturday and Sunday).

Immediately downstream of the Marina on the Parramatta River there are:

- Numerous private mooring pens;
- 168 vessels on swing moorings:
    - Looking Glass Bay 27 vessels
    - Hen and Chicken Bay plus exile Bay 87 vessels
    - Abbotsford Foreshore 34 vessels
    - Gladesville Foreshore 20 vessels;
- A commercial marina at Cabarita (120 boats in wet berths);
- A private marina “Cape Cabarita” (23 vessels in wet berths)
- Two small watercraft sailing clubs, one at Putney and one at Gladesville;
- Newington College Rowing Facility at Abbotsford.

In the vicinity of the Inner West Marina there are in excess of 621 vessels (of similar sizes to the vessels proposed for the Marina), on swing moorings or in existing marina berths, plus numerous vessels moored in mooring pens along the foreshore. In addition there are 20,970 potential users of the public boat ramps upstream of the Marina, of which at least 80 boats per Saturday and Sunday use the boat ramps.

Based on the usage rates of the boats in Sydney on a summer weekend, 60 plus recreational boats moored in the vicinity of the proposed Marina would travel along the Parramatta River together with 80 vessels plus recreational trailable boats.

In addition to the recreational boats which pass along the Parramatta River in the vicinity of the Marina, charter vessels, operated from berths around the Sydney CBD, pass up and down the River past the location of the proposed Marina. The charter vessel movements are summarised in **Table 11.2.**

Table 11.2 Charter Vessel Movements

	Summer		Winter	
	Mid Week	Weekend	Mid Week	Weekend
No. of charter vessels on cruises up and down the river:				
(1) Vessels up to 35m – February to October	4	6	2	1
(2) Vessels up to 35m – November to January	20 per week		2	1
(3) 53m long Captain Cook vessel "Explorer"	Saturday a.m. and p.m.		Saturday a.m. and p.m.	

11.3.2 Ferry Services

Sydney Ferries operates scheduled services along the Parramatta River both upstream and downstream of the marina. Not all scheduled ferry services stop at Cabarita Wharf east of the marina.

Based on Sydney Ferries timetables (copy attached), there are:

- 38 vessel passings per weekday (Monday to Friday), and 35 passings on each Saturday and Sunday, which do not stop at Cabarita Marina, but which pass along the main Parramatta River channel;

- 38 vessel passings per day Monday to Friday and 31 passings on each of Saturday and Sunday, which do stop at Cabarita Wharf, and which would pass the Marina to the east.

The scheduled ferry services pass along the Parramatta River in the vicinity of the Marina between 6.30 am and 10.30 pm (a period of 16 hours) Monday to Friday, and between 7.30 am and 10.30 pm (a period of 15 hours) Saturday and Sunday.

On average there are scheduled ferry services which pass along the main Parramatta River channel north of the Marina every 25 minutes, and in the area east of the Marina, going to or from Cabarita Wharf, every 25 minutes.

Sydney Ferries Rivercat vessels have been observed approaching Cabarita Wharf from upstream and departing Cabarita Wharf heading upstream, on lines which take the vessels close to Breakfast Point. These vessel paths result in the vessels being within 200m of the Mean High Water Mark on the western side of Kendall Bay.

These sailing lines are not in accordance with the NSW Maritime Authority document entitled "Traffic Co-ordination on the Parramatta River" and 'cut across' the area proposed for the north eastern corner of the Marina.

Notwithstanding the non-compliance of Sydney Ferries vessels with the ferry usage zone for Cabarita Wharf as set out in the NSW Maritime document, the optimum ferry paths for travel west of Cabarita Wharf are shown on drawing N01.

Sydney Ferries vessels will have to modify their paths to and from Cabarita Wharf to comply with the NSW Maritime Traffic Co-ordination requirements on the Parramatta River. Nonetheless, with the marina in place, Sydney Ferries vessels will have to modify their travel paths west of Cabarita Wharf. There is ample navigable water way for this to occur. The navigable water way is discussed in the following sections.

The effect on the schedules for Sydney Ferries services is minimal.

The difference in travel distance when comparing the optimum path of the current situation, with the proposed path with the marina in place, has been calculated to be 45 metres. This extra distance is in the area where vessels used on the Parramatta River Service (Rivercat and Supercat) are able to travel at 20 knots. Accordingly, the travel time would be increased by only five seconds in either direction.

11.3.3 Proposed Marina – Boat Usage

Although the Inner West Marina will have berths for 172 boats, on any day the number of boats leaving their berth and returning is significantly fewer.

Based on the average boat usage rates from marinas in Sydney, the number of boats which would leave their berths and subsequently return is calculated to be as set out in **Table 11.3.**

Table 11.3 Daily Vessel Usage

	Summer		**Winter**	
	Mon-Fri	**Sat, Sun**	**Mon-Fri**	**Sat, Sun**
Number of Vessels	11	18	5	9
Average time between vessels' movements in peak arrival or departure periods [(1)]	15 minutes	10 minutes	35 minutes	20 minutes

(1) Based on 70% of the departures or arrivals over a two hour period in the morning and early evening.

On a few special event days each year such as Boxing Day (26 December) there is increased boat usage, as the boating public, like the general public has a great interest in the Sydney to Hobart Yacht Race, there will be greater boat usage.

At peak vessel usage periods (summer weekends), the Inner West Marina is calculated to contribute 18 boats out of 198 boats (9%) (158 recreational vessels plus 7 charter vessels plus Sydney Ferries Services equating to 33 vessels), which would use the Parramatta River.

There is ample navigable water space and time between boats, for the increase in boat traffic as a result of the marina, to not affect the safe navigation along the Parramatta River.

11.3.4 Vessel Clearances for Safe Navigation

The regulations governing navigation along the Parramatta River and set out in the NSW Maritime Authority Boating Handbook, require that:

- Vessels travelling at a speed of 10 knots or more must be:
  - 30m minimum from other power driven vessels, land and structures;
  - 60m from non powered vessels.
- Vessels travelling at a speed of 4 knots or more must be 100m from a working barge.

The north eastern corner of the marina is 140m from the centre of the main channel along the Parramatta River.

The eastern side of the marina is 135m from the Rivercat usage zone relating to Cabarita Wharf, as set out in the NSW Maritime Authority publication entitled "Traffic Co-ordination on the Parramatta River".

During construction of the SPS Blanket, the area required for barges will extend east of the marina by 65m (refer to drawing CMP00 of the *Construction Management Plan*).

Once the SPS Blanket construction has been completed, the zone required for construction barges would be no more than 30m east of the marina. Nonetheless, a silt curtain will be maintained around the construction site for the whole of the construction period and the silt curtain will be fixed to piles on a line 65m east of the marina.

11.3.5 During Marina Operation

Comparing the distances from the marina to the main channel along the Parramatta River and the Rivercat usage zone for Cabarita Wharf, there is sufficient water space to not cause vessels to restrict their speed to 10 knots or less.

For the vessels of lengths up to 25m (maximum length of vessel moored in the Marina) approaching or departing the Marina, the preferred clear waterway width for safe navigation is 40m in the line of the direction of travel of the vessels (refer AS 3962 – Guidelines for the Design of Marinas). This allows for two vessels to pass at less than 10 knots, and for vessels to turn without affecting vessels beyond the 40m wide navigation width.

Allowing for a 40m wide navigation zone around the marina for vessels arriving and departing from the marina, there is at least 100m beyond this zone to the centre of the main channel along the Parramatta River, and 95m beyond this zone to the Rivercat usage zone for Cabarita Wharf. This is well in excess of the distances required for safe navigation by all users of the Parramatta River and the marina.

In summary, there is sufficient safe navigable water around and beyond the marina to not affect all users of the Parramatta River and not require speed restrictions on Sydney Ferries Rivercat vessels during operation of the marina.

11.3.6 During Construction

The southern end of the marina is 380m from the main channel along the Parramatta River.

The western side of the marina is 230m from the Rivercat usage zone at Cabarita Wharf. Therefore while the southern and western sides of the development are being constructed, there should be no requirement to restrict the speed of vessels passing along the Parramatta River or Sydney Ferries vessels servicing Cabarita Wharf.

However as the construction proceeds east and west, Sydney Ferries vessels servicing Cabarita Wharf will be required to slow down in the vicinity of the Marina. This is not an uncommon occurrence on Sydney Harbour and the Parramatta River.

Construction vessel access to and from the marina site will be at the northern end (refer to drawing CMP00 in the Construction Management Plan). This is 300m away from Cabarita Wharf and 100m away from the centre of the main channel along the Parramatta River.

For the construction of the Blanket, barges of up to 55m long x 20m wide may be used. These barges would be brought to site by tug. They would be under the control of licensed commercial masters.

As these barges approach the entry to the site or on departing the site, there would be at least 45m of clear water to the centre of the main channel along the Parramatta River. This is sufficient clear water to not affect the safe navigation of vessels along the Parramatta River.

While these barges are entering or departing the site, Sydney Ferries Rivercat vessels would have to modify their routes to and from Cabarita Wharf on those occasions when the two activities coincided.

During construction, it is proposed that a line of temporary buoys is placed along the eastern side of the site to give vessel masters a good understanding of the western limit of the general use waterway while construction is being undertaken. These buoys would be yellow with yellow flashing lights.

11.3. 7 Water Depth for Safe Navigation around Marina

The minimum water depth for the safe navigation of vessels around the marina has been based on the requirements of Australian Standard AS 3962 – Guidelines for the Design of Marinas, and the requirements of the NSW Maritime Authority as set out in Guidance Note 8.3.03

The minimum water depths are summarised in **Table 11.4** for motor vessels.

Table 11.4 Minimum Water Depth for Safe Navigation

Length (cm)	Minimum Water Depth [1] (m)
≤ 8	1.5
10	1.6
12	1.7
14	1.8
16	1.8
18	2.1
20	2.3
25	2.8

[1] Includes an allowance of 300m for under keel clearance.

There is sufficient clear water depth to the north and east of the marina for these depths to be achieved in all conditions.

To the south and south east of the marina the water depth in Kendall Bay at low tide is less than the minimum depth required.

Also along the foreshore west of the marina the bed rises such that at low tides there is insufficient water landward the marina.

In order that vessel masters are aware of the lessening depths of water landward the marina, it is proposed that Special Buoys be installed. The buoys would be yellow with yellow flashing lights and located at the north west corner of the marina (CMB1 on drawing DA01) and south east of the marina (CMB3 and CMB4 on drawing DA01).

These buoys are located at a sufficient distance from the moored vessels and floating structure of the marina, as to permit safe navigation between the lines defined by the buoys and the marina.

11.3. 8 On Line of Original Wharf

The proposed new fixed jetty is on the line of the original wharf and of a similar length and width.

In this location there is limited water depth such that it is not safe today for vessels, other than shallow draft vessels, to navigate in the area of the original wharf.

Currently there is a warning buoy (marked CRP831 on drawing DA01) which marks the eastern extent of the limited water depth. Prior to installation of this buoy and after the original wharf was removed, a Sydney Ferries vessel ran aground in this area.

The new fixed jetty and marina will prevent vessels passing over this area.

11.4 Public Access

The Project does not have any impact on the number of existing accessible vantage points.

The Project enhances public access to vantage points on the waterway, by permitting public access along the main spine of the proposed marina to the kiosk at the eastern end of the jetty. This enables viewing of the Parramatta River, foreshores and surrounds from within Kendall Bay. The proposed marina will also provide access for people with a disability and the mobility impaired, generally, improving access to Sydney's waterways for all members of the public.

11.5 Soils, Sediment and Water

11.5.1 Hydrological

An assessment of *Estuary Hydrodynamics and Physical Sedimentary Environment* in Kendall Bay has been prepared by gbaCoastal Pty. Ltd (refer **Appendix 9**).

The assessment reviews the existing site conditions and considers future conditions (with the marina in place, including the blanket) and addresses:-

1. Bathymetry and Shoreline Morphology
2. Water level;
3. Wave climate;
4. Currents;
5. Physical Bed Sediment Characteristics and Transport Behaviour;

Bathymetry and Shoreline Morphology

In relation to the existing environment, the assessment states:-

> *"Kendall Bay forms a shallow embayment on the southern side of the Parramatta River, between Breakfast Point in the west and the NW tip of Cabarita Park at Cabarita Point in the east. The bay occupies a waterway area of slightly more than 10 ha.*
>
> *…Mean water depths within Kendall Bay range up to 5 m in the central area adjoining the former jetty. The southern half the bay is less than 2 m deep, as is a narrow fringe along the seawall north of the former jetty. The main river channel exhibits two deep holes between Breakfast Point and Glades Bay, where mean depths exceed 15 m. Morrisons Bay and Glades Bay exhibit similar depths to the southern half of Kendall Bay. It would appear that the deepened approach across Kendall Bay to the former jetty is artificial, probably a result of past dredging to allow larger carriers to access the jetty."*

In relation to impacts of the construction of the marina on bathymetry and shore morphology, the assessment concludes:-

> *"The construction of the marina would have no impact on the bathymetry and shore morphology of Kendall Bay."*

In relation to impacts of the operation of the marina on bathymetry and shore morphology, the assessment concludes:-

> *"The scour blanket would result in a small reduction in the water depths. This would vary between approximately 15% at the inshore edge of the blanket, to 6% at the deeper outer areas. These changes would be of no environmental consequence."*

Water Level

In relation to the existing environment, the assessment states:-

> *"Water level at Kendall Bay fluctuates primarily in response to astronomical tide. Storm surge, local wind and wave set up, and fresh water flooding may also slightly increase the water level. Sea level rise (SLR) as a consequence of climate change will affect water level in Kendall Bay."*

The marina contains floating structures and a fixed structure (new jetty).

The proposed floating structures will rise and fall with the changing tidal water levels. The floating structures are held in place by piles through guide brackets fixed to the floating structures. The tops of the piles restraining the floating structure have been set at RL +3.0 AHD. This is 1.2m

above the maximum water level (and 0.7m above the top of the floating structure) accounting for external wave conditions, storm surge and global warming effects.

The deck of the fixed jetty is set at RL +1.825, which is 0.125m above the maximum future still water level accounting for storm surge and global warming effects to 2050.

In relation to impacts of the construction of the marina on water level, the assessment concludes:-

> *"The construction of the marina would have no impact on water level."*

In relation to impacts of the operation of the marina on water level, the assessment concludes:-

> *"The operation of the marina would have no impact on water level."*

Wave Climate

In relation to the existing wave climate, the assessment states:-

> *"Wave climate at the site is contributed to by wind waves and boat generated waves."*

In relation to the impact of waves on the construction of the marina, the assessment states:-

> *"In maritime construction terms, the wave climate at the site is sedate. Plant and construction methods would be readily available to work under the ambient wave conditions. The existing wave climate would be advised to tenderers in the technical specification for the installation of the marina. The selected contractor would therefore take account of the existing wave climate in developing its final construction method."*

In relation to the impact of waves on the operation of the marina, the assessment finds that for a draft of a floating structure of 0.4m the wave climate at all berths on arms 1 to 6 satisfies the criteria set out in AS 3962.

For the berths on arms 7 and 8, it will be necessary to increase the draft of the 'T' head sections to at least 0.6m in order that the wave climate at the berths is acceptable.

In relation to potential impacts of the construction of the marina on waves, the assessment concludes:-

> *"The construction of the marina would have a negligible impact on the wave climate."*

In relation to potential impacts of the operation of the marina on waves, the assessment concludes:-

> *"The floating marina would cause the short period wind and boat wave energy to dissipate, but not the long period ferry waves which would be unaffected. While it follows that a component of the wave loading currently experienced at the seawall would be reduced, loading due to the higher energy ferry waves would be unchanged. No loads would be increased."*

Currents

In relation to the existing environment, the assessment states:-

> *"Currents at the site are driven by:*
> - *tide;*
> - *freshwater flows in the Parramatta River;*
> - *wind (unidirectional and oscillatory currents);*
> - *boat wash (wave induced water particle movements and propeller wash); and*
> - *stormwater."*

In relation to the potential impacts of currents on the marina, the assessment states:-

"The currents would potentially load the marina components, including the pontoon, piles and scour blanket.

Tidal currents, fresh water flows and unidirectional wind induced currents would impart loads which are significantly lower than the design wave and berthing loads.

The floating walkways are greater than 30 m from the closest stormwater outlets along the western shore. We estimate that a peak outlet discharge of say 3 m/s would have reduced to no more than 0.2 m/s at the walkways (Albertson, 1948). Uniform flows of 0.2 m/s on the 400 mm draft floating pontoons would not be expected to impart a load exceeding 0.01 kN/m. This is small and is readily accounted for by the design wave and berthing loads.

The 1650Ø outlet at the head of the bay discharges behind a dense stand of mangroves. Because it is over 250 m away, the outlet velocities from this large culvert would not exceed the design velocities at the floating marina attributed to the western outlets."

Bed Disturbance

The sediment on the bed of the Bay is disturbed each day with every Rivercat passing along the Parramatta River.

Studies of the propeller wash effects have identified that for:

1. Water depth of 2m or less, the vessels up to 14m in length are likely to cause bed disturbance in excess of current conditions.

2. Water depth 4m or more, vessels up to at least 14m in length will not cause bed disturbance in excess of current conditions, and that is it most likely for the manoeuvring required to moor and depart from the Marina, the engine power used by the vessels up to 25m will not cause bed disturbance in excess of existing conditions.

Accordingly, the SPS blanket is proposed to be placed over the bed to keep water particle velocities at the top of the sediment sufficiently low that the sediment is not disturbed as a result of the operation of the Marina.

Extending the SPS blanket landward of the floating structures as proposed, has the benefit of reducing and almost eliminating bed disturbance as a result of waves generated by the Rivercat and Harbourcat vessels.

11.5.1 Acid Sulphate Soils

An assessment of acid sulphate soils was undertaken by AECOM as part of the **Construction Environmental Management Plan** (see **Appendix 10**). **Section 5.4** of the CEMP provides that:

"The Acid Sulfate Sediment Soil Map (Edition 2) for Prospect/Parramatta River, published by the Department of Land and Water Conservation (1997) indicates that there is a 'High Probability' of occurrence of ASS within the 'Bottom Sediments', and that there is a potential for severe environmental risk if bottom sediments are disturbed by activities such as dredging.

Confirmation the presence of acid sulphate soils was determined through laboratory analysis for Suspension Peroxide Oxidation Combined Acidity and Sulfate (SPOCAS) as part of the Sediment Investigation conducted by AECOM in 2009.

Given that the works will not involve excavation of the sediments, an acid sulphate management plan will not be required. However, if future works require removal of sediments and expose to air a plan should be prepared in accordance with New South Wales Acid Sulphate."

11.5.2 Water Quality

The quality of the water at the site has been tested. The results of the testing are set out in the *Aquatic Environmental Assessment* and *Aquatic Ecology Technical Report* (refer **Appendix 4**).

The water quality at the site has the potential to be affected by bed disturbance during the construction and operation of the marina.

During construction the water quality will be monitored and sediment and erosion control measures implemented in accordance with the *Construction Management Plan* (refer **Appendix 12**) and the *Construction Environmental Management Plan* (refer **Appendix 10)**.

During operation of the marina, the water quality will be monitored in accordance with the *Operational Environmental Management Plan (*refer **Appendix 17**), and marina activities governed by the *Marina Management Plan* (refer **Appendix 15**).

The potential impacts of the Project on water quality are discussed in the following documents:

1. *Estuary Hydrodynamics Report* (refer **Appendix 9**);
2. *Turbidity Investigation* (refer **Appendix 9**);
3. *Aquatic Environmental Assessment* (refer **Appendix 4**);
4. *Sediment Management Report* (refer **Appendix 13**);
5. *Operational Environmental Management Plan* (refer **Appendix 17**);
6. *Construction Environmental Management Plan* (refer **Appendix 10**).

During construction there is some potential for the water quality to be affected by stormwater run-off over the carpark area, and temporary bed disturbance during the placement of the blanket. The short term turbidity and chemical effects on the water column will be contained within two silt curtains such that on completion of construction and prior to removal of the silt curtains, the quality of water over the construction area will satisfy the relevant Australian guidelines for chemical concentrations.

11.5.3 Erosion and Sediment Controls

The proposed erosion and sediment controls are detailed in the **Construction Environmental Management Plan** (CEMP) prepared by AECOM.

In summary the CEMP provides that:

- *Prior to commencement of any construction works, floating silt curtains and booms will be installed around the work area. The floating silt curtains and booms will be set up for each construction stage of the proposed Marina.*

- *Each Construction Stage will be enclosed and protected by a dual floating silt curtain / boom scheme. The aim of the silt curtains and booms is to ensure disturbances of potentially contaminated sediment and hydrocarbons leaks/spillages are contained within the work area during construction, thereby minimising impacts on the surrounding environment.*

- *The floating boom and silt curtain arrangements will be designed and constructed to accommodate the wave and current movements which arise at the Site.*

- *An inner (primary) floating boom will be installed along the full perimeter of the work area prior to commencement of any works. An outer (secondary) floating boom will be placed outside the inner floating boom (placed outside the blanket area), to minimise possible floating oil impact associated with pile or blanket installation.*

- *An inner (primary) silt curtain will be installed along the full perimeter of the work area prior to commencement of any works. An outer (secondary) silt curtain will be placed outside the inner silt curtain (surrounding the outside of the blanket area), to minimise possible floating oil impact associated with pile or blanket installation.*

11.6 Traffic

A *"Traffic and Parking Report for Proposed Inner West Marina, Sydney- July 2009" (Traffic and Parking Report)* has been prepared by **Colston Budd Hunt & Kafes Pty Ltd** and is included at **Appendix 7**.

The *Traffic and Parking Report* includes:

- A review of the existing traffic environment;
- An assessment of potential traffic and car parking impacts of the proposed development, including traffic generation during construction and operation of the marina;
- Public transport options;
- Consideration of the relevant car parking requirements;
- Consultation with the Roads and Traffic Authority.

In relation to traffic generated during the construction of the marina, all piles, beams, materials and equipment for the floating marina structure and timber decking will be brought to the site by water.

The site preparation for the car park will involve heavy vehicle movements (estimated at 50 movements over 3 days, with a peak of 3 movements per hour). Construction of the car park will involve concrete supply (20 trucks over 2 days with a peak of 2 trucks per hour) and asphalt supply (10 trucks over 2 days with a peak of 1 truck per hour).

In relation to construction traffic, **Sections 3.16 and 3.17** of the *Traffic and Parking Report* state:

> *"**3.16** - …Peak daily traffic flows during construction are estimated to be up to some 50 vehicles two-way.*
>
> ***3.17** – On a typical working day of eight hours, this is equivalent to an average of less than 10 vehicles per hour two-way. The surrounding road network will be able to cater for this low volume of traffic*

In relation to traffic generation during operation of the marina, **Sections 3.12 – 3.14** of the *Traffic and Parking Report* state:

> ***3.12**- Traffic generated by the proposed development will have its greatest effects on weekends when people travel to the marina to use their boats. The majority of vehicles would be inbound in the morning and outbound during the afternoon.*
>
> ***3.13** – The marina would generate up to some 20 vehicles per hour at these times. This is a low generation, equivalent to an average of one vehicle every three minutes during peak hours.*
>
> ***3.14** – Such a low traffic generation would not have significant effects on the operation of surrounding roads within Breakfast Point or the external road network. Intersections would continue to operate at their existing good levels of service A/B, with average delays of less than 5 seconds per vehicle.*

11.6.1 Site Access and internal roadways:-

The main roads within Breakfast Point have been designed and constructed to accommodate buses and pedestrian and cycle links. Vehicular access to the proposed marina car parking area is from the existing Rosewater Circuit. **Section 3.3** of the *Traffic and Parking Report* confirms that *"Good pedestrian access will therefore be provided between the surrounding area and the proposed marina, including to the proposed parking area for the marina."*

Sections 3.9 and 3.11 of the *Traffic and Parking Report* state:

> *"**3.9** -… The proposed driveway will be six metres wide which is in accordance with the Australian Standard for parking Facilities (Part 1: Off-street car parking) AS 2890.1:2004 to serve a car park of the size and type proposed.*

***3.11** – Parking spaces within the at-grade car park will be 2.5 metres wide and 5.4 metres long. The disabled space will be 3.2 metres wide and the four parallel spaces will be 6.6 metres long. Access aisles will be at least six metres wide. These dimensions are considered appropriate, being in accordance with AS 2890.1:2004.*

The site is within reasonable proximity to existing public transport infrastructure (refer **Figure 14**).

11.6.2 Parking:-

The proposal includes an at-grade car parking area for marina patrons and service vehicles. A total of 58 car parking spaces are proposed (including 1 disability car parking space), and entry to the car park will be via a swipe card.

Australian Standards 3962 – 2002 (Guidelines for design of marinas) indicates that parking for marinas should be provided as follows:

- *0.3 to 0.6 spaces per wet berth; plus*
- *0.5 spaces per employee; plus*
- *One space per 30m2 for ancillary activities not directly related to berthing*

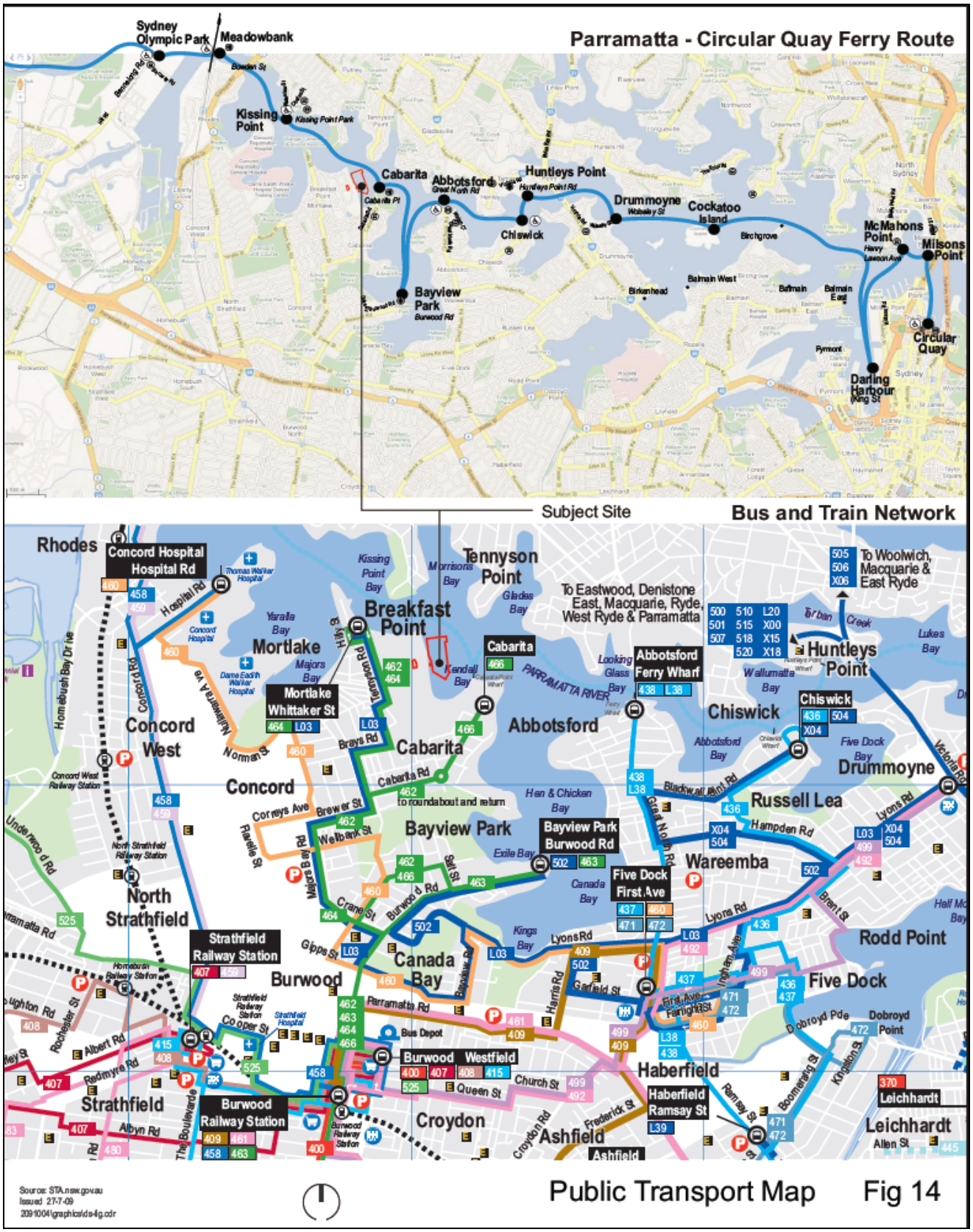
Sections 3.5 - 3.8 of the *Traffic and Parking Report* state;

*"**3.5** –AS 3962-2002 indicates that the range of parking provision per wet berth depends on the type of facility. For commercial facilities, the lower number of parking spaces should be considered. For racing clubs, the larger number should be considered.*

***3.6** – Based on 0.3 spaces per berth, one employee (the manager) and the kiosk of some 30m2, the proposed marina would require some 53 parking spaces.*

***3.7** – 58 spaces are proposed, including one disabled space, as shown in Figure 3. The proposed provision therefore satisfies this requirement, and is considered appropriate.*

***3.8** – We note that a proportion of the berths may be used by residents of the Breakfast Point development. This may reduce the parking demands at the proposed marina as some residents are likely to walk to and from the facility and would therefore not require parking."*


Parramatta - Circular Quay Ferry Route
Sydney Olympic Park
Meadowbank
Kissing Point
Cabarita
Abbotsford
Huntleys Point
Drummoyne
Cockatoo Island
Chiswick
McMahons Point
Milsons Point
Bayview Park
Circular Quay
Darling Harbour
Subject Site
Bus and Train Network
Rhodes
Concord Hospital
Hospital Rd
Tennyson Point
Breakfast Point
Mortlake
Concord West
Concord
Cabarita
Abbotsford
Huntleys Point
Chiswick
Drummoyne
Russell Lea
Wareemba
Rodd Point
Five Dock
Bayview Park
Bayview Park Burwood Rd
Five Dock First Ave
North Strathfield
Strathfield Railway Station
Burwood
Canada Bay
Burwood Westfield
Haberfield
Haberfield Ramsay St
Strathfield
Burwood Railway Station
Croydon
Ashfield
Leichhardt
To Woolwich, Macquarie & East Ryde
To Eastwood, Denistone East, Macquarie, Ryde, West Ryde & Parramatta
Public Transport Map
Fig 14

11.7 Noise

A **Construction and Operation Noise Assessment** has been prepared by **Heggies Pty Ltd (see Appendix 5).** The Assessment considers the construction, operation and traffic noise impacts of the Project (both the land and water components) on nearby sensitive receivers.

The Assessment identified that the existing sensitive receivers are located in:

> *"…Peninsula Drive and Kendall Inlet, Breakfast Point; in Delmar Parade and Shackel Avenue, Gladesville, in Tennyson Road and Champion Road, Tennyson Point, in Pellisier Road and in Putney Parade, Putney.*
>
> *All the sensitive receivers described above are best described as suburban, with an environment characterised by local traffic with intermittent flows or with some limited commerce or industry."*

In relation to Ambient Noise Survey, Section 4 of the Assessment states:

> *"Environmental noise monitoring was conducted at the potentially most affected (representative) noise-sensitive locations in order to:*
>
> - *Characterise the existing noise environment in the vicinity of the Marina.*
> - *Establish the noise levels upon which to base the construction and operation noise emission objectives*
>
> *The noise monitoring locations were selected after a detailed inspection of the area adjacent to the Marina, with consideration to other noise sources which may influence the recordings and security issues for the noise monitoring devices.*
>
> *The unattended noise loggers were programmed to continuously monitor the ambient noise levels, recording relevant environmental statistical noise descriptors at the end of each 15 minute period throughout the survey."*

The noise loggers were located at 31/53 Hunters Wharf Apartment, Breakfast Point (Location 1), 172 Tennyson Road, Tennyson Point (location 2) and 9 Delmar Parade, Gladesville (Location 3). The noise monitoring was conducted between Friday 22nd May 2009 and Friday 29th May 2009.

In relation to **Construction Noise**, the Assessment found:

> *"Predicted noise levels at the nearest residences from construction activities are expected to exceed the daytime period noise design goal. Significant exceedances of the design goals by more than 33 dBA may occur as a result of impact piling. It should be noted that it is common for noise from construction activities to exceed the daytime period construction noise goal, being a result of the nature of the activities and the often relative close proximity of sensitive receivers. Noise mitigation strategies have the potential to minimise impacts and should therefore be implemented wherever feasible and reasonable during construction works."*

Construction Noise Mitigation strategies are included in the draft Statement of Commitments.

In relation to **Operation Noise**, the Assessment states:

> *"The primary noise sources from the "on water" operation of the Marina are boat engines as boats arrive and leave. People talking with raised voices from and to the car park have also been considered."*

The Assessment concludes:

> *"Predicted noise levels at the nearest residences from operational activities are expected to comply with the noise design goals during the daytime, evening and night-time.*

…there is a potential for sleep disturbance at Breakfast Point if people are shouting close to the Marina and also from the use of bow thrusters close to the shore.

It is recommended that Marina noise management plan address the potential issue of patrons shouting during the 10pm to 7am night –time period. The location of vessels with bow thrusters at the outer marina arms will reduce the potential to exceed the sleep disturbance criteria at the surrounding residences. It is recommended that Marina users are not to operate "bow-thrusters" during the 10 pm to 7 am night-time period, except in emergency. However, the likelihood of their frequent use beyond 10 pm is probably small."

Operation Noise Mitigation strategies are included in the draft Statement of Commitments.

In relation to **Traffic Noise** the Assessment considers two situations:

- Case 1: The peak hourly traffic movements on the transport routes corresponds to the same peak hours use of the Marina.

- Case 2: The peak hourly traffic movements on the transport routes corresponds to a different peak hour use of the Marina

The **Construction and Operation Noise Assessment** concludes:

"Traffic noise impacts associated with the operation of the Marina are considered acceptable (based on the assumptions made) as the daytime, evening and night-time noise levels comply with the recommended criteria at offset distances of 14 m (and greater) respectively on the most impacted roads.

11.8 Aquatic Flora and Fauna

Cardno Ecology Lab prepared two reports as part of the EA, as follows:

- an ***Aquatic Ecology Technical Report*** which outlines the methodology and the results of field studies undertaken by Cardno Ecology Lab in May 2009 (refer **Appendix 4**); and

- an ***Aquatic Environmental Assessment*** based on the findings of the Aquatic Ecology Technical Report (refer **Appendix 4**).

11.8.1 Existing Environment

The Technical Report identified the following habitats present in Kendall Bay:

- *"Sandy shore adjacent to a seawall, with sand winnowed by wakes for River Cat ferries;*

- *Rocky shores, including:*

  - *areas of natural sandstone outcrops and*
  - *artificial "shores" consisting of a boat ramp near the head of Kendall Bay and extensive rock retaining walls;*

- *Existing ferry wharf with pylons;*

- *Mangroves;*

- *Subtidal soft sediments consisting of estuarine muds and sands; and*

- *A small, sparse patch of the seagrass Halophila ovalis off the rock platform just to the west of Cabarita Wharf."*

In May 2009, qualitative observations were made of the fauna and flora associated with artificial habitats adjacent to the Proposed Marina Location. Quantitative surveys were also undertaken of the infauna (animals living within sediments), epibenthic fauna (animals living on or in close proximity to the estuary bed), mobile fish and invertebrate fauna at the Proposed Marina Location and two nearby Reference Locations (Sydney Rowing Club in Hen and Chicken Bay and Kissing Point Bay).

In relation to **Aquatic Habitats, Flora and Fauna of Conservation Significance** the Aquatic Environmental Assessment found:

> *"None of the critical habitats listed on the NSW Register occur within Kendall Bay. None of the aquatic species, populations or communities of conservation significance listed under the Threatened Species Conservation Act 1995, Fisheries Management Act 1994 or Environment Protection and Biodiversity Conservation Act 1999 has been recorded within Canada Bay LGA. There are no protected wetlands along the western foreshore of Kendall Bay adjacent to the Proposed Marina Location, but there some at the southern end of Kendall Bay and to the east around Cabarita Wharf and Cabarita Point. In September 2007, a small, sparse patch of the seagrass Halophila ovalis was observed off the rock platform near Cabarita Wharf.*
>
> *A key threatening process listed under the FM Act 1994, "Introduction of non-indigenous fish and marine vegetation to the coastal waters of NSW", is relevant to the marina project, because these organisms can be spread through fouling of boats and boating equipment.*
>
> *No protected or threatened faunal taxa were found in May 2009."*

11.8.2 Potential Impacts

The *Aquatic Environmental Assessment* identified the following impacts associated with the construction and operation of the marina:

Construction Phase

- *Subtidal soft bottom habitats and their associated biota would be lost when the geotextile blanket is laid;*
- *The existing fines-dominated habitat would be replaced by a layer of basalt rocks into which fines would settle over time;*
- *The biota within the water column encircled by the silt curtains would be disturbed indirectly by the resuspension of sediment and concomitant increase in turbidity resulting from blanket laying and pile driving;*
- *Subtidal soft bottom habitats and their associated biota located immediately beyond the geotextile blanket would be disturbed indirectly by resuspension and subsequent settlement of sediment when the blanket is laid;*
- *The resuspension and subsequent settlement of sediment may alter the bioavailability of contaminants in the water column; and*
- *Aquatic biota would be disturbed by underwater noise and vibrations generated by pile driving operations and construction vessels.*

Physical Presence of the Marina

- *The pontoons, pilings and jetty comprising the marina would provide novel habitats for a variety of aquatic organisms to colonise and may attract organisms away from surrounding natural habitats;*

- *The floating pontoons, jetties and walkways associated with the marina would shade the water and reduce the amount of light available to photosynthetic organisms in the water column and that may settle on the bottom; and*

- *Subtidal soft bottom habitats and their associated biota would be disturbed indirectly by changes in the sedimentation patterns within the bay resulting from the marina structure reducing the effects of short period vessel and wind generated waves within Kendal Bay (TLB 2007).*

Operation of the Marina

- *Boats mooring at the marina could introduce non-indigenous species which may compete with local aquatic flora and fauna; and.*

- *The combustion of fuel in boat engines, accidental spills of sewage, fuel, motor and other oils and release of toxic components from anti-fouling paints applied to boat hulls would alter the bioavailability of contaminants in the aquatic environment.*

11.8.3 Management and Mitigation

The recommendations of the *Aquatic Environmental Assessment* are:

- *"As the concentrations of PAHs and some heavy metals within the sediment below the Proposed Marina Location exceed the ISQG-Low values and the ISQG-High values in some areas, it is recommended that elutriate tests be undertaken to determine the concentrations that might be released into the water column when the geotextile blanket is laid and the piles are inserted.*

- *As the total copper concentrations within the water column are already in excess of the ANZECC/ARMCANZ 95% trigger values, it is recommended that measures to encourage boat owners to use non-copper based anti-fouling compounds be incorporated into the environmental management plan for the marina. The concentration of copper within the sediment and water column should also be monitored regularly and screened against the appropriate ANZECC/ARMCANZ guidelines, once the marina commences operation."*

The impacts of contamination associated with boating activity could be mitigated by:

- Educating boat owners about the environmental problems associated with use of copper-based anti-fouling paints; discouraging them from in-situ cleaning of hulls that have been treated with copper paints and encouraging them to switch to non-toxic anti-fouling paints.

- Prohibiting boat owners from discharging sewage and bilge water directly into Kendall Bay and encouraging them to use the sewage pump-out facility proposed for the landward end of the jetty and to remove oil from bilge water by using bilge removing pads.

- Containing accidental spillages of fuels and oils within floating booms and cleaning them up as soon as possible; and

- Encouraging use of environmentally friendly cleaning agents for on board washing of boats.

11.9 Avian Fauna

A *Desktop Assessment on Avian Fauna* was prepared by **Aquenal Pty Ltd** to determine the likely occurrence of species of birds listed under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* and under the *New South Wales Threatened Species Conservation Act 1995 (NSW TSC Act),* and any potential impacts the proposal may have on avian species listed under these Acts. The Assessment is included at **Appendix 14.**

The Assessment concludes:

> *"Although the proposed development site does not appear to support important populations of listed species, it was considered worthwhile to assess the potential impact of the proposed development on listed birds in the area. Potential impacts could arise from direct impacts (habitat loss or modification), or indirect impacts (increase in vessel movements and noise, increase in collision risk with vessels, reduction in the quality of foraging habitat, increase in the risk of fuel spills or sewerage contamination). The proposed development is in an area which does not appear to have any significant habitat for birds, there is little infrastructure planned for the proposed development, and dredging is not required to construct the facility. Therefore, it is anticipated that there will not be any significant loss of bird habitat due to the proposed development. The Kendall Bay area has a substantial amount of existing vessel movements and infrastructure and the proposed development is very unlikely to contribute to a significant increase in noise or collision risk to birds in the area. It is recommended that the implementation of management prescriptions to lessen the likelihood of a fuel and/or sewerage spills and an action plan if one occurs, will minimise any potential impacts to avian species from such an event.*
>
> *The lack of data or information on bird species or habitat at Kendall Bay indicates that the immediate area of the proposed Inner West Marina development does not represent important bird habitat or support significant numbers of listed species. Therefore, there does not appear to be any grounds to justify dedicated avian surveys in this area.*
>
> *This desktop assessment found that there is unlikely to be a significant impact from the proposed development to any avian species listed under the EPBC Act or the NSW TSC Act."*

11.10 Air Quality

There will be no activities during the construction or operation of the proposed development which will affect the existing air quality.

11.11 Waste Management

Three types of waste will be generated from the proposed Project:

- Solid waste from office activities and kiosk activities.
- Waste water from kiosk and vessels.
- Sewage from vessels and toilets in kiosk and manager's office.

The solid waste will be placed in sealed bins and removed by a waste removal contractor for disposal in an approved site. The bins will be stored on the fixed jetty at the kiosk and marina Manager's office, then transferred by small vehicle to a location near the carpark for collection by the waste removal contractor.

The waste water from the kiosk will be discharged into a line connected to the Sydney Water Sewage Collection System. The treatment of the water will be in accordance with the requirements of Sydney Water and the Department of Environment, Climate Change and Water (DECCW).

Waste water (bilge water) and sewage from the vessels will be pumped out of the vessels at designated sewage pump out locations, from where it will pumped into the Sydney Water Sewage System, in accordance with the requirements of Sydney Water.

The procedures for undertaking sewage pumpout and containing and cleaning up accidental spills are set out in the *Marina Management Plan* (refer **Appendix 15**) and the *Operational Environmental Management Plan* (refer **Appendix 10**).

At the sewage extraction unit, a silt curtain with an attached boom will be stored to deploy in the event of an accidental spillage. Appropriate water surface skimming equipment and absorbent pads will be stored at the marina for removing any spilled waste. The procedures for monitoring, containing and removing waste, spillages and the like are set out in a *Marina Management Plan.*.

All oil and fridge gas waste will be collected and placed in sealed drums and removed by an approved contractor for disposal.

The following table sets out the estimated annual quantities of waste generated by the marina activities.

Waste Quantities	**Total Litres**
Waste from Vessel Maintenance	
Air conditioning gas from services	3
Fridge gas from fridge services	4
Bilge oil from boat cleaning (pump out)	50
Total Litres of Waste	**57**

Waste from Boat Cleaning	**Total Litres**
Soap suds from washing boats	130
Polish waste from cleaning boats	40
Teak oil waste from cleaning boats	30
Waste from toilets on boats holding tanks	3,500

11.12 Social

The proposed development will provide access to vessels for people with a disability. Ramps will comply with the requirements of the Disability Discrimination Act and relevant Australian Standards.

At several locations, brackets will be installed in the pontoons for the installation of specially designed lifting devices, to enable wheelchair bound and other people with disabilities to be transferred to sailing or motor vessels.

There is level access from the carpark to the Marina via designated pedestrian pathways.

The proposed development will increase employment in the area, thereby providing an on-going contribution to the social and economic welfare of the neighbourhood.

The marina and kiosk will provide a point of interest and meeting place for informal get togethers by locals, both from within the Breakfast Point community and the surrounding suburbs. As a result, it will contribute to a sense of “community” in the locality.

The provision of “day tripper/destination” berths will provide an improved amenity and enhanced waterway experience for the general boating public.

The provision of the propsed SPS blanket over the bed of Kendall Bay will reduce the general risk in Kendall Bay of contaminants being released and affecting human health.

Overall, the proposed development will provide a positive social contribution to the locality and Breakfast Point, generally.

11.13 Heritage

An assessment of the impact of the proposed marina on heritage items, including indigenous heritage, has been undertaken by AECOM, the detailed results of which are presented in its *Historical and Aboriginal Heritage Impact Statement* attached at **Appendix 6.**

The assessment determined that the proposed Marina will be visible from the three heritage items:

- The Former AGL Powerhouse (City of Canada Bay LEP No. 383).
- Cabarita Park – landscape, rotunda and swimming pool (City of Canada Bay LEP No.58).
- Scots College Boatshed (REP No.48).

The Statements of Historic Heritage Impacts have determined that while the proposed Marina will be visible from these three historic heritage items, there will be no impact on the significance of the items, as listed. The significance lies largely in non-tangible associations. Where the setting of the item is significant, e.g. for Cabarita Park, it is for views *towards* the heritage item. These views will be unaffected by the proposed Marina due to its siting within Kendall Bay, without major impact on sight lines along Parramatta River.

The *Historical and Aboriginal Heritage Impact Statement* concludes that the proposed development will have no impact on the heritage significance of the Former AGL Power House, Cabarita Park or Scots College Boatshed as:

- *The significance of the items lies largely in non-tangible historical and cultural associations.*
- *It does not physically impact on the heritage items.*
- *While there may be limited impediment to the viewing of Cabarita Park, there will be no impediment from existing public vantage points.*
- *The view from the items is not considered to be of historical significance. In the case of Cabarita Park and the Boatshed, the significance lies in views towards the item, which may be enhanced through increased visitation.*
- *The location of the development within Kendall Bay means the Marina does not impact on sight lines along Parramatta River.*

No Aboriginal sites were identified within the footprint of the proposed Marina. The proposed Marina is located on a highly modified landscape that is considered to have no Aboriginal archaeological potential. The REP requires full assessment if there is potential for the project to impact on Aboriginal heritage. As it is deemed unlikely that Aboriginal sites remain on the western shore of Kendall Bay, there is no requirement to proceed to a full Aboriginal heritage assessment or community consultation. There is not considered to be any need for further Aboriginal archaeological investigations in relation to the proposed Marina.

As the significance of the heritage items will not be affected and there is not considered to be any potential for Aboriginal sites to remain, there is no necessity to provide recommendations to mitigate impacts. However, the following are provided to guide the project more broadly:

- No further heritage assessment is required as no historic or Aboriginal heritage impacts have been identified.
- It is a requirement under the *Heritage Act 1977* that any relics discovered during works must be reported to the Heritage Branch, Department of Planning on 02 9873 8500. All works must cease until the relics have been assessed by the Heritage Branch or a qualified professional on their behalf.
- It is a requirement under the *National Parks and Wildlife Act 1974* that any Aboriginal objects discovered during works must be reported to the Department of Environment and

Climate Change on 131 555. All works must cease until the Aboriginal objects have been assessed by the DECC or a qualified professional on their behalf.

11.14 Hazard Assessment

In respect of *State Environmental Planning Policy No. 33– Hazardous and Offensive Development (SEPP 33)*:

1. No hazardous material will be stored on the marina or on the fixed jetty.

2. It will not be permissible for vessels moored or berthed at the Marina to be used to carry out hazardous activities.

3. No hazardous activities will be undertaken at the marina.

SEPP 33 does not apply to the proposed development.

The *Marina Management Plan* sets out the rules for vessels berthed at the marina and include rules for types of materials stored on the vessels.

11.14.1 Fire

The ,marina will have a mobile fire fighting pump unit, and all vessels are required by law to carry fire extinguishers. These will be checked as part of the management of the marina.

The risk of fire on the vessels is minimised through the Marina Rules and the containment of a fire event is set out in the *Marina Management Plan.*

11.14.2 Spillage

As set out in the *Marina Management Plan*, the marina will have a mobile floating boom and other materials and equipment for dealing with and preventing the spread of an accidental spill of bilge water, sewage or other waste water.

11.14.3 Chemical Hazards

The landside areas have been remediated, such that there are no contaminants in the area of the carpark.

Based on the site's history, previous environmental assessments, remediation work at the former Mortlake Gasworks property adjacent to the proposed marina development area and sediment testing over the area of the proposed marina, the following substances have been identified as potential contaminants derived from various gasworks activities, and comprise the sediments on the bed of Kendall Bay:

- Ammoniacal liquors.
- Waste coal and coke.
- Spent oxide.
- Heavy metal catalysts and corrosion inhibitors.
- Heavy metals;
- Cyanide;
- Sulphate;

- Tar;
- Polycyclic aromatic hydrocarbons (PAHs);
- Phenols; and
- Total petroleum hydrocarbons (TPHs).

Of particular concern during the proposed marina construction works are known contaminants in nearby sediments, including:

- Heavy metals;
- PAHs; and
- TPHs.

Although marina construction workers are unlikely to come into contact with the above contaminants given the nature of the proposed works (i.e. majority of work will occur water level), the management of exposure to the above contaminants will involve, but would not be limited to, the following safe operating procedures:

- All site personnel whose work tasks may expose them to contaminants or contaminated material during site works will be required to adopt appropriate personal protective equipment (PPE). The level of PPE will be determined onsite by the contractor in consultation with AECOM. A minimum level of PPE will be required at all times as described in Section 10.2;
- Ensure that any visitors or other site users are not exposed to any potential contaminants or airborne contaminant matter;
- All visitors or other site users personnel should be kept at a safe distance;
- Where dust is a concern, dust suppression measures will be employed to reduce the potential for exposure of personnel to inspirable dust. Dust suppression will as a minimum involve watering down of an area or covering of the source material;
- Any eating, drinking or smoking is prohibited in any working area;
- When handling any material (soil, solid, sediment, sludges etc.) personnel will wear disposable latex or nitrile gloves at a minimum and avoid any dermal contact.

11.14.4 Natural Occurrences

The potential hazards resulting from the accidental spillage of waste water, sewage and fuel will be managed through the *Marina Management Plan*.

The proposed marina is located in a section of the Parramatta River where the maximum water level is governed by tidal water levels and not flooding events.

The heights of the piles and height of the fixed jetty have been determined by accounting for the effects of global warming and the associated climate change effects.

Vessels moored at the marina will simply rise and float at whatever water level occurs.

The marina will not be affected by any natural hazardous events.

Overall, the marina would not be exposed to significant hazards. In the unlikely event of a fire on a vessel or the accidental spillage of fuel, sewage and waste water, management plans will be in

place to contain the hazard and minimise the risk of damage to other vessels, structures and the environment.

11.15 Economic

11.15.1 Effect on Neighbouring Marinas

In relation to the effect on neighbouring marinas, the commercial marinas in the vicinity (River Quays and Cabarita Marina), are at 100% and 94% occupancy (refer to the *Demand Study* at **Appendix 11**). Other commercial marinas near the Sydney CBD are between 88% and 100% occupancy. Having regard for the demand for berths and the current occupancy levels, the Project will have little if any effect on berth occupancy at the marinas nearby.

In addition, there is a refuelling facility at Cabarita Marina which will benefit from the additional vessels being moored at the Inner West Marina, as there will be no refuelling facilities at the proposed marina.

11.15.2 Employment

The marina will provide local financial benefits as it will:

1. Create employment directly for a manager and assistants.
2. Create work for local service suppliers for both cleaning and on board vessel maintenance.

11.15.3 Local Community

The marina will contribute to the cost of maintaining the local community area. The area designated for the marina carpark, being Lot 53 in DP270347, has a Unit of Entitlement of 42 allocated to the lot. Therefore, the operator of the marina will be paying levies to the Community Scheme via this Lot 53 in DP270347 for the upkeep of community assets such as roads and the like.

The cost for maintaining the marina will be paid by the marina management. The levies for vessels moored in the marina will be determined by taking into account the long term and short term cost for maintaining the marina. The local community will not be responsible for or required to contribute to the maintenance of the marina.

As discussed in the *Demand Study* (refer **Appendix 11**), there is a demand for the sizes proposed in this Project. The marina has specifically been designed to have a number of berths for smaller vessels 8-10m in length included to provide affordable berths for these smaller vessels.

11.16 Construction Impacts

11.16.1 Above Mean High Water Mark – Carpark

The proposed works above the Mean High Water Mark (MHWM) are associated with the construction of the marina carpark.

The land has already been significantly altered as part of the redevelopment of Breakfast Point and is surrounded by dwellings, roads and buildings, which have transformed the former industrial site into a residential area.

The works which have already been undertaken include the removal of contaminated soils down to the underlying rock, then the placement of clean fill suitable for construction of the various buildings and roads.

The construction works for the proposed carpark will simply require the removal of the top 300mm layer of material, creating the required falls by further localised removal of material and filling, using material from the site. Asphaltic concrete pavement will be laid to seal the sire and landscaping is proposed around the perimeter.

The removed material will be taken by truck to an approved landfill or other approved site.

The site is relatively level, stable and not subject to landslip. The ground will remain stable with no erosion from wind, or stormwater effects.

11.16.2 Below the Mean High Water Mark – Marina

Kendall Bay forms a shallow embayment on the southern side of the Parramatta River, between Breakfast Point in the west and the NW tip of Cabarita Park at Cabarita Point in the east. The bay occupies a waterway area of slightly more than 10 ha.

The eastern shore of the bay, adjacent to Cabarita Park, is rocky. The rock becomes covered with sediment towards the southern head of the bay where it sweeps around to the west and eventually joins the seawall along Breakfast Point. Mangroves occupy the intertidal areas at the head of the bay.

The shoreline morphology is punctuated by three prominent cultural features: the Cabarita Ferry Berth at the NW tip of Cabarita Park; the subaqueous mound comprising the remnant of the former loading jetty at Breakfast Point *(position of the proposed jetty within the marina)*; and the seawall-lined promontory of Breakfast Point itself.

Mean water depths within Kendall Bay range up to 5m in the central area adjoining the former jetty. The southern half of the bay is less than 2m deep, as is a narrow fringe along the seawall north of the former jetty. The main river channel exhibits two deep holes between Breakfast Point and Glades Bay, where mean depths exceed 15m. Morrisons Bay and Glades Bay exhibit similar depths as the southern half of Kendall Bay. It would appear that the deepened approach across Kendall Bay to the former jetty is artificial, probably a result of past dredging to allow larger carriers to access the original jetty.

Bathymetry is shown on drawings HS01 and HS02 **(Appendix 1)**

The foreshore adjacent to the proposed Marina location has been modified extensively and now consists of a vertical sandstone seawall and sloping sandstone revetment with a narrow fringe of rubble below some parts. There is also a small sandy beach in front of part of the revetment which is subject to winnowing by wave action, primarily from Rivercat ferries. There is a mudflat with mangrove trees and a sandy beach at the southern end of Kendall Bay and a rocky shore consisting of natural outcrops of sandstone extending along the western shore of Cabarita Park.

The subtidal sediments along the shallow inshore edge of the proposed Marina location are dominated by sand, but also contain small amounts of clay, silt and gravel. The subtidal sediments in deeper water and shallow subtidal sediments at the southern end of Kendall Bay are dominated by fines with a particle size of less than 75 µm. The proportion of fines increases southwards along the length of the proposed Marina location, probably due to a decrease in the strength of hydrodynamic processes (e.g. wave action from Rivercat ferries). The sediments in the nearshore area are more variable than those offshore, with respect to the proportion of fines. The sediment at the site closest to Breakfast Point is dominated by sand, reflecting its exposure to waves generated by vessels and tidal currents.

The sediments along the western foreshore contain various contaminants, many of which emanate from the former Mortlake gasworks. The concentrations of cyanide and BTEX compounds (benzene, toluene, ethylbenzene and xylene) were generally below the limit of laboratory reporting, but concentrations of total petroleum hydrocarbons (TPHs) and polycyclic aromatic hydrocarbons (PAHs) were measurable. TPH concentrations were an order of magnitude greater in some areas of the proposed Marina location. Total PAH concentrations in the sediments exceeded the Interim Sediment Quality Guidelines (ISQG) Low value for a large proportion of the proposed Marina location and the ISQG-High value in a few areas. Concentrations of arsenic, chromium and copper

in the sediment were generally in excess of their respective ISQG-Low values but not their ISQG-High values, whilst those of lead, mercury and zinc were above their respective ISQG-High values in at least half the sites. Potential acid sulphate soils occur at a depth of 0.2-0.4 m in the sub-surface sediment. These, however, will not be excavated, so an acid sulphate management plan will not be required.

The concentrations of heavy metals in water samples, however, were below the limits of detection, suggesting that there is little flux of dissolved metals from the sediment.

During the placement of the blanket, the surface sediments over the bed of Kendall Bay in the immediate area of the marina will be disturbed. Following placement of the blanket during construction of the piling, floating structure and fixed structure, there will be minimal disturbance of the bed.

A *Construction Environmental Management Plan* has been prepared (refer **Appendix 10**) which sets out the controls, monitoring and mitigation measures for containing and controlling the bed disturbance.

An assessment of the disturbance of the bed from vessel movements from the marina has been prepared by gbaCoastal. The detailed assessment report is at **Appendix 9.**

The assessment has found that during the operation of the marina with the blanket in place, the sediments of Kendall Bay in the vicinity of the marina, including vessel access paths and fairways, will not be disturbed.

Currently with no marina in place, vessels moor in Kendall Bay using anchors which disturb the contaminated sediment.

All vessels using the marina will be bound by the marina rules which will set out the navigation restrictions around the marina. Marker buoys will be positioned at the north western corner of the marina area, and at the southern side of the marina area, providing a warning and limit on the areas a vessel may travel.

With the marina in place there is a reduced risk of bed disturbance in Kendall Bay, particularly at the southern end and over the area of the blanket.

An *Operational Environmental Management Plan* has been prepared (refer **Appendix 10**), which together with the *Marina Management Plan* (refer **Appendix 15**), set out the controls, monitoring and mitigation measures to minimise the risk of bed disturbance as a result of the Marina operation, and how to deal with any accidental bed disturbance.

11.17 Cumulative Impacts

The cumulative impact of the proposed Marina would be positive, for the following reasons:

- The community will obtain a fixed jetty to enhance the water experience along the foreshore and an area for informal social gatherings,which,will enhance the sense of “community” in the locality.

- The general boating public will be provided with destination berths to enhance their enjoyment of the Parramatta River and Sydney Harbour waterway.

- The covering of the bed of Kendall Bay will reduce the risk of disturbance of contaminants.

- The proposed Marina will reduce the wave energy at the near shore areas where sediments containing contaminants could be disturbed.

- There will be a net commercial benefit to local service providers and Cabarita Marina (fuel supply).

- While there will be a small increase in vehicular traffic, the associated noise and maintenance costs will be nominal. The marina will be responsible for its required share of maintenance costs.

11.18 Approvals and Licences

The Project requires the following approvals and licences:

1. Approval from the Minister for Planning.

2. Consents and licences from the NSW Maritime Authority:

   - Land Owners' Consents (Permission to Lodge received, refer **Appendix 3**).

   - A construction consent under Clause 65 of the *Management of Waters and Waterside Lands Regulations, NSW.*

3. Licence from the Department of Environment, Climate Change and Water (DECCW):

   - The Marina would be a 'scheduled activity' within the meaning of Schedule 1 of the *Protection of the Environment Operations Act* and requires an Environment Protection Licence from the Department of Environment, Climate Change and Water.

4. Trade Waste Disposal licence from Sydney Water.

12. STATEMENT OF COMMITMENTS

12. Draft Statement of Commitments

12.1 Introduction

This **Draft Statement of Commitments** has been prepared on behalf of Breakfast Point Pty Ltd (the proponent) and forms part of the Environmental Assessment (EA) for the proposed Inner West Marina Project.

The Draft Statement of Commitments outlines the environmental management, mitigation and monitoring measures the Proponent is prepared to implement and specifies how the project will be managed to minimise potential impacts both during construction and operation.

A specific *Construction Environmental Management Plan (CEMP)* has been prepared by AECOM and a *Construction Management Plan (CMP)* has been prepared by TLB Engineers to address the environmental safeguards during the proposed marina construction works.

A specific *Operational Environmental Management Plan (OEMP)* has been prepared by AECOM to address the required environmental safeguards during the operation of the Marina.

A specific *Marina Management Plan (MMP)* has been prepared by TLB Engineers to assist in the day-to-day management of the Marina.

The CEMP, CMP, OEMP and MMP are not reproduced in this document but the Objectives and Scope are included for completeness.

These four documents, together with the draft Statement of Commitments, include commitments by the proponent in respect of the following:

- Construction Management (including noise, traffic, aquatic ecology and sediment and erosion control);
- Waste Management;
- Aquatic Ecology;
- Contamination;
- Public Benefits;
- Traffic and Parking;
- Heritage.
- Offensive Noise; and
- Complaints and Incidents.

12.2 The Site

The proposed Project is to be carried out on the “subject site”, as shown in **Figure 3**, below, comprising:

- part Lot 53 in DP 270347; and
- the area of water within Kendall Bay subject to a proposed NSW Maritime Lease


97
47 DP270347
101
69
5 DP285959
69 DP270347
14
53 DP270347
1 DP 945166
1 DP270347
35
42 DP270347
65 DP270347
72 DP270347
27
50 DP270347
1 DP126394
15 DP270282
14 DP270282
6 DP270282
7 DP270282
12 DP270282
1 DP270282
38 DP270282
SP71699
22 DP270282
20 DP270214
13 DP270547
Source: SIX.nsw.gov.au
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2091004\graphics\ds-fig.cdr
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100 m
Subject Site -
Inner West Marina
Lot and DP Fig 3

12.3 General

A The development will be undertaken generally in accordance with the EA report prepared by TLB Engineers, including accompanying Appendices 14.1 – 14.23 prepared by others.

B The development will be undertaken generally in accordance with the following drawings:

Plan No	Plan Name	Prepared By	Date	Plan Revision
DA01	General Arrangement	TLB Engineers	09.10.09	03
DA02	New Jetty	TLB Engineers	09.10.09	03
DA03	Marina Layout	TLB Engineers	09.10.09	03
DA04	Sections	TLB Engineers	09.10.09	03
DA05	Marina Services	TLB Engineers	09.10.09	03
DA06	Bed Treatment	TLB Engineers	09.10.09	03
DA07	Site Diagram	TLB Engineers	09.10.09	03
DA08	Signage	TLB Engineers	09.10.09	03
DA100	Kiosk Building	Rose Architectural Design	06.08.09	C
DA200	Manager's Office	Rose Architectural Design	06.08.09	C
AM-01	Marina Car Park	Giles Tribe Architects	June 2009	-
CMP00	Construction Staging	TLB Engineers	09.10.09	04
CMP01	Construction Staging	TLB Engineers	09.10.09	03
CMP02	Construction Staging	TLB Engineers	09.10.09	04
CMP03	Construction Staging	TLB Engineers	09.10.09	04
CMP04	Construction Staging	TLB Engineers	09.10.09	01

12.4 Construction

A *CMP* has been prepared by TLB Engineers and a *CEMP* has been prepared by AECOM to address the environmental safeguards during the proposed marina construction works and forms part of the EA.

The overall construction period is estimated as follows:

STAGE	WORKS	TIME
Stage 1	Car Park	8 weeks
	Blanket Construction	30 weeks
Stage 2	Fixed Jetty, Kiosk and Managers Office	24 weeks
Stage 3	Floating Structures including piles for Arms 4, 5, 6, 7 and 8	14 weeks
Stage 4	Floating Structures including piles for Arm 3	10 weeks
Stage 5	Floating Structures including piles for Arms 1 and 2	18 weeks
Stage 6	Pontoon	2 weeks

The purpose of the *CEMP* is to provide guidance on environmental control measures for the construction phase of the proposed Marina with regard to management of near shore sediments of Kendall Bay.

The objectives of the *CEMP* are to:

- Manage and mitigate the potential for disturbance of the contaminated bed sediments of Kendall Bay during construction of the Marina;
- Outline proposed control measures to be implemented in order to prevent sediment disturbance during construction; and
- Demonstrate that the proposed management strategy is acceptable and adequately addresses compliance issues set under the remediation order, allowing approval from the DECCW.

The scope of the *CEMP*:

- Identifies site specific environmental hazards and outlines proposed environmental control and mitigation measures;
- Develops a water quality monitoring plan (detailing monitoring frequency and criteria) appropriate for the nature of the construction activities and considers possible environmental impacts recognising the extent of existing contamination;
- Discusses safety measures for on-site construction workers performing works which may result in exposure to the contaminated bed sediments (i.e. details of appropriate Personal Protective Equipment (PPE) to be used during construction);
- Outlines Emergency response procedures related to environmental protection for the construction phase of the proposed Marina; and
- Outlines proposed contingency measures in the event of environmental control or equipment failure.

12.4.1 Noise Management

Construction for the entire project will be restricted to the following hours:

- Monday to Friday 7:00am to 6:00pm
- Saturday 8:00am to 1:00pm
- No work on Sundays or Public Holidays

Construction noise goals may be exceeded by up to 33 dBA at the closest dwellings in Breakfast Point; by up to 27 dBA at the closest dwellings in Tennyson Point, by up to 16 dBA at the closest dwellings in Gladesville; and by up to 20 dBA at the closest dwellings in Putney. Significant exceedances of the design goals, by more than 33 dBA, may occur as a result of Impact Piling. Feasible and reasonable noise mitigation strategies will therefore be implemented wherever possible during the construction works.

AS 2436-1981 "*Guide to Noise Control on Construction, Maintenance and Demolition Sites*" sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the Marina project are listed below, including the typical noise reduction achieved, where applicable.

Operational Strategies:

- Conducting piling only after 8.00 am, and include respite periods.
- Regular compliance checks on the noise emissions of all plant and machinery used for the project will indicate whether noise emissions from plant items were higher than normal.
- Ongoing noise monitoring during construction at sensitive receivers during critical periods (ie times when noise emissions are expected to be at their highest - eg piling) will assist in identifying and controlling high risk noise events.

Source Noise Control Strategies:

- Engines and exhausts are typically the dominant noise sources on mobile plant such as graders, excavators, trucks, etc. In order to minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Regular maintenance of all plant and machinery used for the project will assist in minimising noise emissions.
- Installation of acoustic enclosures on plant items, where required.

Community Consultation:

Active community consultation and the maintenance of positive relations with local residents and building owners will assist in alleviating concerns and thereby minimise complaints.

12.5 Aquatic Ecology

The following mitigation measures are proposed to address **Indirect Disturbance Associated with Re-suspension of Sediment:**

- During Stage 1, two silt curtains attached to floating booms would be deployed from the shoreline to a distance 2 m beyond the area encompassing the blanket (see CMP01). The outer curtain will remain in the same position during Stages 2-5, but the inner curtain will be moved so that it encircles the area encompassing Floating Arms 4-8 during Stages 2-3 of the development (see CMP02) and the area encompassing Floating Arms 1-3 during Stages 4 and 5 (see CMP03). The deployment of these curtains would minimise the spread of resuspended sediment into nearby protected wetlands, other areas of Kendall Bay and the estuary, provided that they are properly maintained and inspected regularly.

- The twice daily opening of panels in the silt curtains to allow passage of construction vessels would mitigate this impact by allowing fish out of the curtained area, and replenishing supplies of plankton and nekton.

The following mitigation measures are proposed to address **Changes in the Bioavailability of Contaminants:**

- The threat to organisms resulting from a potential increase in the concentration of contaminants on suspended particulate matter will be minimised by using silt curtains to confine and prevent the spread of sediment and turbidity plumes. As pile driving has the potential to disturb and resuspend both surface and deeper sediments it is proposed that small turbidity curtains be installed around the areas in which the individual piles are to be inserted prior to them being driven into the estuary bed. This will reduce the likelihood of mobile organisms being exposed to contaminants. The exposure of benthic organisms to an increase in the bioavailability of contaminants will not be an issue within the Proposed Marina Location, because these organisms would have perished shortly after the geotextile blanket was laid. The dispersion of soluble contaminants through the silt curtains could pose a threat to organisms outside the Proposed Marina Location, if concentrations exceed the ANZECC/ARMCANZ guidelines (2000).

The following mitigation measures are proposed to address **Generation of Underwater Noise and Vibrations:**

- Limitations on the times that construction activities can take place and restriction of pile driving to 2 per day will assist in limiting impacts resulting from the generation of underwater noise and vibrations. Consideration will also be given to additional ways of reducing the level and frequency of noises emitted during such operations. Pile driving activities could, for example, be managed so that the underwater noise generated increases incrementally. This will enable mobile fauna to move away before maximum noise levels are achieved. The level of underwater noise generated during pile driving could also be reduced by creating a bubble curtain or screen around the area in which piles are being driven (Würsig et al. 2000). The fine bubbles of air produced by such devices attenuate the peak underwater sound pressure levels that have the potential to adversely affect sensitive fauna in the vicinity. If a hydraulic impact hammer is to be used to insert piles, an additional mitigation measure in the form of a hammer cushions could be used.

The following mitigation measures are proposed to address **Indirect Disturbance Associated with Sediment Resuspension:**

- The potential impacts of boat wash on sediment and turbidity will be mitigated by limiting the size of berths situated over shallower areas of the Proposed Marina Location. Potential impacts will also be minimised by implementing and enforcing no wash zones and speed restrictions in

and around the marina and indicating the maximum wave height and wave period that boats are permitted to generate on signage. The exposure of benthic organisms to boat wash will not be an issue within the Proposed Marina Location, because these organisms will be lost when the geotextile blanket is laid.

The following mitigation measures are proposed to address **Changes in the Bioavailability of Contaminants** and to reduce potential threats to aquatic biota:

- The provision of a sewage pump-out facility will help mitigate any impacts arising from the disposal of sewage. Boat owners will also be prohibited from discharging sewage and bilge water directly into Kendall Bay and encouraged to remove oil from bilge water by using bilge removing pads.

- Boat owners will be educated about the environmental problems associated with use of copper-based anti-fouling paints; discouraged from in-situ cleaning of boat hulls that have been treated with copper paints and encouraged to switch to non-toxic anti-fouling paints.

- Accidental spillages of fuels and oils will be contained within floating booms and cleaned up as soon as possible to prevent weathering and subsequent deposition of heavy fractions.

- The potential for introduction of contaminants during on board washing of boats will be reduced by encouraging the use of environmentally friendly cleaning agents (i.e. those that do not contain chlorine or phosphate-based ingredients).

The following mitigation measures are proposed to address the **Introduction of Non-Indigenous Species:**

- The risk of inadvertent introduction of non-indigenous species will be reduced by prohibiting the cleaning of hulls and discharge of bilge water from boats moored at the marina. Boat owners would also be encouraged to inspect their hulls, anchors, fishing gear and general boating equipment for non-indigenous species, such as Caulerpa taxifolia which occurs in Sydney Harbour, and dispose of them in an appropriate manner.

- The biota on the piles and jetty comprising the marina and in the underlying soft sediments will be inspected periodically to determine whether non-indigenous species are present. The origin of vessels arriving at the marina will be determined so that a list of potential introduced species can be drawn up. A targeted marine pest survey and literature review will also be undertaken prior to the marina commencing operations to determine whether any known marine pests are present. This will provide a baseline for comparison during the operational life of the marina.

The following mitigation measures are proposed to address **Underwater Noise** impacts:

- The impact of the noise generated by the additional boating could be reduced by implementing and enforcing speed restrictions in and around the marina.

12.6 Operational Environmental Management Plan

A specific *OEMP* has been prepared by AECOM to address the required environmental safeguards during the operation of the Marina including the Sediment Protection System.

This *OEMP* provides an environmental manual for use by management and users of the Marina.

The objectives of the *OEMP* are to:

- Detail environmental management responsibilities;
- Improve environmental performance;
- Prevent pollution and reduce environmental risks;
- Manage and mitigate the potential for disturbance of the contaminated bed sediments of Kendall Bay;
- Detail auditing requirements; and

- Provide a mechanism to track environmental management activities.

The scope of the *OEMP*:

- Summarises background environmental information and Site conditions;
- Outlines operational measures that will mitigate sediment disturbance and adverse effects on the environment and human health;
- Outlines emergency response procedures related to environmental protection for the operation of the Marina;
- Outlines the Marina decommissioning process that will mitigate sediment disturbance;
- Outlines roles and responsibilities; and
- Outlines training requirements.

The *OEMP* provides management controls for:

- Water pollution;
- Air pollution;
- Land pollution;
- Hazardous materials and waste;
- Offensive noise; and
- Waste management, including reuse, recycling and disposal;
- Disturbance of contaminated sediments or damage to the SPS

Environmental Policy

"The Inner West Marina Environmental Policy" has been developed to provide a commitment to protect the environment, comply with regulations and improve practices.

Complaints Register

The marina operator will maintain a Complaints Register which will include a record of each complaint associated with the operation of the proposed marina from local residents, or other parties and the action taken in response to each complaint.

Incident Reports

Records will be kept of any environmental incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. A representative of the marina operator will investigate the cause of any emergency so that necessary changes in work practices can be made to prevent the incident from recurring. Copies of incident and complaint reports will be provided to the NSW Maritime Authority.

OEMP Audit and Review

The marina operator or a representative of the marina operator will conduct regular audits of the *OEMP* and operation activities to ensure that the *OEMP* is being properly implemented and followed. Additionally, the NSW Maritime Authority may require independent audits of the marina and associated activities.

Audits outside of the regular audit program may be conducted where:

- Major amendments occur to applicable legislation, policy or standards;
- Environmental feedback or complaints identify a major system non-conformance; and
- Significant risk to due diligence is identified.

The marina operator will review the *OEMP* to ensure its continuing suitability, adequacy and effectiveness. Copies of all Audits will be forwarded to NSW Maritime Authority.

12.7 Marina Management

The *Marina Management Plan (MMP)* sets out the rules for vessels berthed at the marina and contains the relevant management, mitigation and monitoring measures for the day-to-day use of the marina with regard to:

- Noise;
- Lighting;
- Parking and loading;
- Emergency and essential services;
- Vessel management and navigation;
- Security and CCTV; and
- Waste and Rubbish.

12.8 Traffic

The marina Project will include the provision of 58 dedicated marina car parking spaces, including 1 disability car parking space.

The lot upon which the Marina car park will be located currently has Units of Entitlement allocated and contributes to Community levies for the upkeep of Breakfast Point Community roads.

12.9 Sediment Protection System

The Project includes installation of a Sediment Protection System (SPS) comprised of a, consisting of a geotextile blanket and rock ballast, over the area covered by the marina to ensure sediments are not disturbed by propeller wash effects.

The management of the SPS is contained in the *OEMP*.

12.10 Heritage

As the heritage significance of the heritage items in the vicinity of the subject site will not be affected there is no requirement to provide commitments to mitigate impacts. However, the following are provided to guide the Project more broadly:

- No further heritage assessment will be undertaken as no heritage impacts have been identified.

- In accordance with the requirements of the *Heritage Act 1977,* any relic discovered during works will be reported to the Heritage Branch, Department of Planning. Upon discovery of a relic, all works will cease until the relics have been assessed by the Heritage Branch or a qualified professional on its behalf;

- In accordance with the National Parks and Wildlife Act 1974, any Aboriginal relic discovered during works will be reported to the Department of Environment and Climate Change and Water. Upon discovery of a relic, all works will cease until the relics have been assessed by the DECCW or a qualified professional on its behalf.

12.11 Public Benefits

Public Access

Public access along the fixed jetty is unrestricted and will be allowed 24 hours / 7 days a week.

Public access to the floating structures will be allowed during business hours of operation, viz:

7:00am – 6pm, 7 days a week

Public entry and exit to the floating structures will be provided through the access gates on the western side of the jetty and will be subject to the public adhering to safe and sensible behaviour as seen fit by the management.

A level foreshore path to the marina and ramps down to the floating structure will ensure access for the mobility impaired. “Destination berths” will have a facility for transferring people, by special personal davit crane to the vessel.

Toilets

Four toilets will be available for users of the Marina and Kiosk:

- three in the Kiosk building; and
- one in the Manager’s Office.

One of the toilets will be Disability Discrimination Act complaint.

Sewage Pumpout

The project will include sewage pumpout, available during marina business hours.

Destination Berths

Public day berthing will be provided during marina business hours including berthing for water taxis to pick-up and drop-off passengers.

Jetty

The Project will include a fixed jetty designed to incorporate a ferry stop for the general public.

Kiosk

The Project will include a kiosk with seating for 50 people, located on the jetty, to encourage the public to actively use and enjoy the Breakfast Point foreshore.

Sediment Protection System

The installation of the Sediment Protection System (SPS) will result in the availability of a marina facility to the general public in an area which would otherwise not be available to them.

The provision of the SPS is in the public interest because it will achieve the land use planning principles and policy considerations that underpin Section 5(a)(ii) of the EP&A Act, by *“promoting and coordinating the orderly and economic use and development of the land.”*

13. CONCLUSION

13. Conclusion

It is considered appropriate to meet the demands for water based berth storage in locations which can accommodate facilities, where the environmental, social and economic impacts are minimised.

The Environmental Assessment concludes that:

- The proposed Inner West Marina is a timely response to the much sought after on-water vessel storage within Sydney Harbour.
- The Project Application demonstrates current and future demand for the proposed marina.
- The Project is a positive contribution to the revitalisation of Kendall Bay, part of a former waterfront industrial precinct, the foreshores of which over the past decade have been transformed into a waterfront residential estate.
- On statutory planning grounds, the Project is consistent with the Objectives of the W1 Maritime Waters zone in that the Project has demonstrated that "*…it is compatible with, and will not adversely affect the effective and efficient movement of, commercial shipping, public water transport and maritime industry operations."*
- In addressing the environmental impacts of the Project and the suitability of the site, the specialist reports have demonstrated that any environmental impacts of the Project are minimal and can be suitably managed and mitigated.
- In relation to the key issue of contaminated sediments, the proposed remediation approach ("geotextile blanket" over the bed of the proposed marina lease area) will ensure a significantly reduced level of contaminants will be disturbed.
- The construction of the proposed marina will also reduce the wave energy reaching shallow water and consequently reduce the disturbance of contaminated sediment, a situation which is not managed at present.
- The site is easily accessible, has sufficient area and dimensions, and is suitable to accommodate the Project.
- The Project does not restrict the navigation channel for other waterway users or impact on the existing and future opportunities for public recreation.