Site Audit Report

0503-1410

Bank Street
Pyrmont, NSW

28 April 2015
50429-100373
JBS&G Australia Pty Ltd

www.jbsg.com.au

NSW Site Auditor Scheme
SITE AUDIT STATEMENT

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the Contaminated Land Management Act 1997 on 31st October 2012. For more information about completing this form, go to Part IV.

PART I: Site audit identification

Site audit statement no. **0503-1410**

This site audit is a **statutory audit/~~non-statutory audit~~*** within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details (as accredited under the *Contaminated Land Management Act 1997*)

Name **Andrew Lau** Company **JBS&G**

Address **Level 1, 50 Margaret Street**

SYDNEY **NSW** Postcode **2000**

Phone **02 8245 0300** Fax **02 8245 0399**

Site Details

Address **Bank Street**

Pyrmont **NSW** Postcode **2009**

Property description *(attach a list if several properties are included in the site audit)*

Part Lot 19 DP 803159, Part Lot 20 DP 803159 and Part Lot 33 DP 1151746

Local Government Area **City of Sydney Council**

Area of Site (eg. hectares) **3850 m^2** Current zoning **RE1 Public Recreation**

To the best of my knowledge, the site ~~is~~**/is not*** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

Declaration/Order/Agreement/Proposal/Notice* no(s) **N/A**

** Select as appropriate*

Site audit commissioned by

Name	**Alan Edenborough**	Company	**Sydney Maritime Museum Ltd t/a Sydney Heritage Fleet**
Address	**Wharf 7, 58 Pirrama Road**		
	Pyrmont NSW	Postcode	**2009**
Phone	**0403 892 701**	Fax	**NA**

Name and phone number of contact person (if different from above)

John Crawford, Crawford Architects, (02) 9660 3644

Purpose of site audit

☐ ~~A. To determine land use suitability (please specify intended use[s])~~

OR

☐ ~~B(i) To determine the nature and extent of contamination, and/or~~

☐ ~~B(ii) To determine the appropriateness of an **investigation/remedial action/management plan***, and/or~~

☑ B(iii) To determine if the land can be made suitable for a particular use or uses by implementation of a specified **remedial action plan/~~management plan~~*** (*please specify intended use[s]*)

Maritime Facility including boat storage, exhibition space, community work space and maintenance workshop, publicly accessible foreshore walk, fixed wharf, floating pontoons and timber walkway.

Information sources for site audit

Consultancy(ies) which conducted the site investigation(s) and/or remediation:

Noel Arnold & Associates Pty Ltd

SLR Consulting Pty Ltd

Title(s) of report(s) reviewed

- *Soil Contamination Investigation, Bank Street, Pyrmont NSW,* Noel Arnold & Associates Pty Ltd, June 2010 (NA 2010).
- *Preliminary Contaminated Land Assessment, Sydney Heritage Fleet Base, Pyrmont NSW 2009 (Draft 1),* SLR Consulting Pty Ltd, 9 November 2011 (SLR 2011).
- *Sampling, Analytical and Quality Plan for Limited Contamination Assessment, Sydney Heritage Fleet Base, Pyrmont NSW,* SLR Consulting Pty Ltd, 2 February 2015 (SLR 2015a).
- *Preliminary Contamination Assessment, Sydney Heritage Fleet Base, Bank Street, Pyrmont NSW,* SLR Consulting Pty Ltd, 23 April 2015 (SLR 2015b).
- *Remedial Action Plan, Sydney Heritage Fleet Base, Bank Street, Pyrmont, NSW,* SLR Consulting Pty Ltd, 23 April 2015 (SLR 2015c).

Other information reviewed (including previous site audit reports and statements relating to the site)

- *Report on Marine Sediment Contamination Assessment, Hymix Wharf Blackwattle Bay, Pyrmont*, Douglas Partners, June 2008 (DP 2008)

** Select as appropriate*

Site audit report

Title **Site Audit Report 0503-1410, Bank Street, Pyrmont, NSW**

Report no. **JBS&G 50429-100373** Date **28 April 2015**

** Select as appropriate*

PART II: Auditor's findings

Please complete either Section A or Section B, **not** both. *(Strike out the irrelevant section.)*

Use Section A where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land use(s).

Use Section B where the audit is to determine the nature and extent of contamination and/or the appropriateness of an investigation or remedial action or management plan and/or whether the site can be made suitable for a specified land use or uses subject to the successful implementation of a remediation action or management plan.

Section A

☐ **I certify that, in my opinion, the site is SUITABLE for the following use(s)** *(tick all appropriate uses and strike out those not applicable)*:

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry
- ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ☐ Day care centre, preschool, primary school
- ☐ Residential with minimal opportunity for soil access, including units
- ☐ Secondary school
- ☐ Park, recreational open space, playing field
- ☐ Commercial/industrial
- ☐ Other (please specify)

subject to compliance with the following environmental management plan *(insert title, date and author of plan)* **in light of contamination remaining on the site:**

OR

☐ I certify that, in my opinion, the site is NOT SUITABLE for any use due to the risk of harm from contamination.

Overall comments

** Select as appropriate*

Section B

~~Purpose of the plan[1] which is the subject of the audit~~

I certify that, in my opinion:

- ☐ ~~**the nature and extent of the contamination HAS/HAS NOT* been appropriately determined**~~

AND/OR

- ☐ ~~**the investigation/remedial action plan/management plan* IS/IS NOT* appropriate for the purpose stated above**~~

AND/OR

- ☑ **the site CAN BE MADE SUITABLE for the following uses** *(tick all appropriate uses and strike out those not applicable)***:**
  - ☐ ~~Residential, including substantial vegetable garden and poultry~~
  - ☐ ~~Residential, including substantial vegetable garden, excluding poultry~~
  - ☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
  - ☐ ~~Day care centre, preschool, primary school~~
  - ☐ ~~Residential with minimal opportunity for soil access, including units~~
  - ☐ ~~Secondary school~~
  - ☐ ~~Park, recreational open space, playing field~~
  - ☑ Commercial/industrial
  - ☑ Other (please specify): Maritime Facility including boat storage, exhibition space, community work space and maintenance workshop, publicly accessible foreshore walk, fixed wharf, floating pontoons and timber walkway.

  if the site is remediated/~~managed~~* in accordance with the following remedial action plan/~~management plan~~* *(insert title, date and author of plan)*

  Remedial Action Plan, Sydney Heritage Fleet Base, Bank Street, Pyrmont, NSW, SLR Consulting Pty Ltd, 23 April 2015 (SLR 2015c).

  subject to compliance with the following condition(s):

- Preparation of a Validation Sampling, Analysis and Quality Plan (VSAQP) addressing the limited data gaps. The VSAQP must be reviewed by a Site Auditor prior to commencement of site remediation works.
- The RAP be updated to incorporate the findings of the additional contamination assessment required to address the identified data gaps. The updated RAP must be reviewed by a Site Auditor prior to commencement of site remediation works.
- An Acid Sulfate Soils Management Plan and a Construction Environment Management Plan be prepared for the site work, and both plans must be reviewed and accepted by a Site Auditor prior to commencement of site remediation works.
- An appropriate Sediment Management Plan be prepared and implemented as part of the site construction works.
- An ongoing Environmental Management Plan (EMP), along with the final Validation Report, must be prepared upon completion of the remedial works and submitted to the

[1] For simplicity, this statement uses the term ‘plan’ to refer to both plans and reports.

* *Select as appropriate*

Site Auditor for review. In accordance with relevant NSW EPA requirements, the EMP must reasonably be able to be made legally enforceable and there must be an appropriate public notification mechanism to inform interested parties as to the requirements relating to the management of contamination at the site.

- Completion of a Site Audit Statement supported by Site Audit Report, certifying suitability of the site for the proposed uses, following the successful completion of the remediation and validation activities.

** Select as appropriate*

Overall comments

- The site assessment activities are considered to have generally met the requirements of the *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (2nd Edition) (DEC 2006), however, additional assessment works are required to adequately assess all areas of the site and COPCs before site remediation works can commence.
- The levels of some contaminants of potential concern (i.e., PAHs) in fill soils are considered to require remediation/management under the proposed site use.
- A RAP (SLR 2015c) has been prepared for the site to address the identified contamination issues. The RAP proposed containment of the identified impacts on-site under a suitable cap and long-term management. The remediation approach documented in the RAP was checked by the auditor and found to be: technically feasible; environmentally justifiable given the nature and extent of the identified contamination; and consistent with relevant laws, policies and guidelines.
- The remedial strategy proposed for the site is appropriate given the identified contamination issues, and is able to make the site suitable for the proposed use as a maritime facility (commercial/industrial landuse), subject to the conditions listed on the previous page.

PART III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority under the *Contaminated Land Management Act 1997* (**Accreditation No. 0503**).

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Andrew Lau
28 April 2015

** Select as appropriate*

PART IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remedial action or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use(s) of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A or Section B of Part II, **not** both.

In **Section A** the auditor may conclude that the land is *suitable* for a specified use(s) OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further remediation or investigation of the site was needed to render the site fit for the specified use(s). Any **condition** imposed should be limited to implementation of an environmental management plan to help ensure the site remains safe for the specified use(s). The plan should be legally enforceable: for example a requirement of a notice under the *Contaminated Land Management Act 1997* (CLM Act) or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of the *Environmental Planning and Assessment Act 1979.*

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

In **Section B** the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or whether land can be made suitable for a particular land use or uses upon implementation of a remedial action or management plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

In **Part III** the auditor certifies his/her standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to:

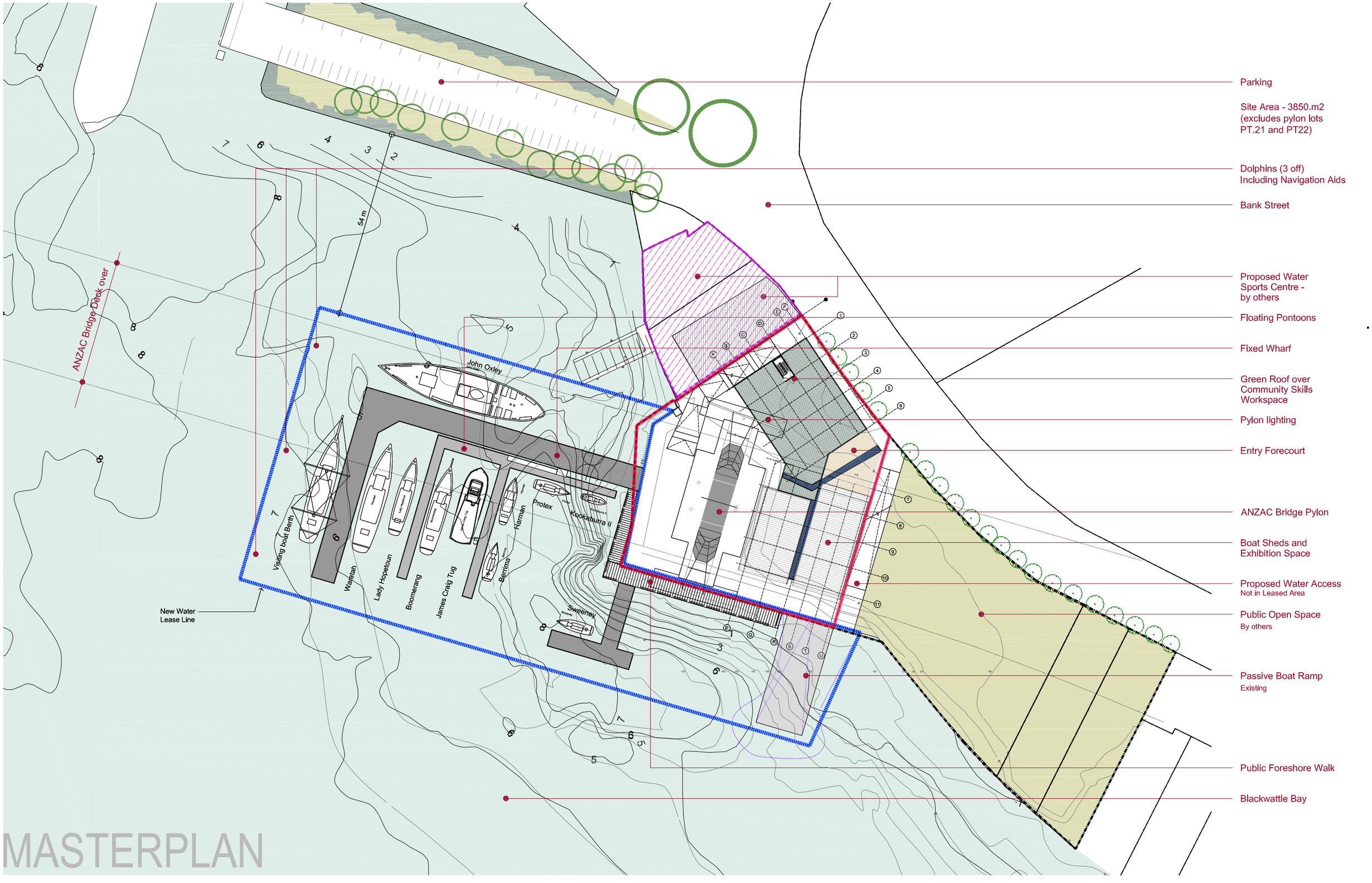
EPA (NSW)
Contaminated Sites Section
PO Box A290, SYDNEY SOUTH NSW 1232
nswauditors@epa.nsw.gov.au

AND

the **local council** for the land which is the subject of the audit.

.

** Select as appropriate*



SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

MASTERPLAN
SK10 - F 2014.10.03
Scale 1:500 @ A1

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106

Date Nov 2012

Project No 0811

Site Audit Report

0503-1410

Bank Street
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28 April 2015
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JBS&G Australia Pty Ltd

Table of Contents

Tables

Appendices

List of Abbreviations

A list of common abbreviations used throughout this report is provided below.

As	Arsenic
AST	Aboveground Storage Tank
Cd	Cadmium
Cr	Chromium
Cu	Copper
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
B(a)P	Benzo (a) pyrene
EPA	NSW Environment Protection Authority
DO	Dissolved oxygen
DPI	NSW Department of Planning and Infrastructure
DQO	Data Quality Objectives
DP	Deposited Plan
EIL	Ecological Investigation Levels
ESL	Ecological Screening Levels
Hg	Mercury
HIL	Health Based Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
MAH	Monocyclic Aromatic Hydrocarbon
Ni	Nickel
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyls
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percentage Difference
SAR	Site Audit Report
SAS	Site Audit Statement
TPH	Total Petroleum Hydrocarbons (C_6-C_9 and C_{10}-C_{36})
UST	Underground Storage Tank
Zn	Zinc

1. Introduction

1.1 Introduction and Background

Andrew Lau, of JBS&G Australia Pty Ltd (JBS&G), was engaged by Sydney Maritime Museum Ltd t/a Sydney Heritage Fleet (the client) c/o Crawford Architects Pty Ltd (representative for the client) on 2 December 2014 to conduct a site audit at a property located at Bank Street, Pyrmont, NSW (`the site'). The site is legally described as Part Lot 19 DP 803159 and Part Lot 20 DP 803159, and also includes a portion of the adjoining Blackwattle Bay (part Lot 33 DP 1151746) (**Appendix C**).

Andrew Lau is a Site Auditor accredited by the NSW Environment Protection Authority (EPA) under the Contaminated Land Management Act 1997 (CLM Act 1997) (Accreditation Number 0503). The audit was completed with the assistance of Ken Henderson and Joanne Rosner, JBS&G's senior consultants trained and experienced in contaminated land assessment and auditing. The audit reference number is 0503-1410.

The site was historically used for a number of different uses including a timber merchant, miscellaneous materials storage (building materials including gypsum) and vacant land. Between 1989 and 2003 the site was owned by the NSW Roads and Traffic Authority (currently the Roads & Maritime Services, RMS) relating to the eastern pylon of the Anzac Bridge. The audit relates to the proposed development of the site as a maritime facility (i.e., commercial/industrial landuse scenario) including boat storage, exhibition space, community work space and maintenance workshop, publicly accessible foreshore walk, fixed wharf, floating pontoons and timber walkway.

No previous Site Audit Statements (SAS) or Site Audit Reports (SAR) are known to exist for the site.

1.2 Objectives of Audit

The objective of this site audit was to independently review environmental assessment reports, a Remedial Action Plan (RAP) and associated documentation prepared by the consultants, Noel Arnold & Associates (NA) and SLR Consulting Pty Ltd (SLR), to determine the appropriateness of the investigations and ultimately determine if the land can be made suitable for the intended site uses by implementation of the processes outlined in the RAP.

In reviewing the reports as part of this site audit, consideration was given to:

- The provisions of the CLM Act, Regulations and subsequent amendments;
- The provisions of any environmental planning instruments applying to the site; and
- Relevant guidelines made or approved by the EPA (**Appendix A**).

1.3 Type of Audit

This site audit is being undertaken in response to development consent requirement by a consent authority (Minister for Planning and Infrastructure, Application No. MP11_0001, 26 March 2014), and as such, the site audit has been conducted as a statutory audit. Site Audit Notification (SAN) number 0503-1410 was sent to EPA on 2 December 2014, with receipt confirmation provided by EPA on 3 December 2014 (EPA Reference DOC14/297595).

1.4 Documents Reviewed

The following documents were reviewed as part of this site audit:

- *Soil Contamination Investigation, Bank Street, Pyrmont NSW,* Noel Arnold & Associates Pty Ltd, June 2010 (NA 2010). It is noted that this report refers to a larger parcel of land,

incorporating the current site and land adjoining the site to the east. The total site area of the NA 2010 investigation was reported to be approximately 10 500 m^2.

- *Preliminary Contaminated Land Assessment, Sydney Heritage Fleet Base, Pyrmont NSW 2009 (Draft 1),* SLR Consulting Pty Ltd, 9 November 2011 (SLR 2011).
- *Sampling, Analytical and Quality Plan for Limited Contamination Assessment, Sydney Heritage Fleet Base, Pyrmont NSW,* SLR Consulting Pty Ltd, 2 February 2015 (SLR 2015a).
- *Preliminary Contamination Assessment, Sydney Heritage Fleet Base, Bank Street, Pyrmont NSW,* SLR Consulting Pty Ltd, 23 April 2015 (SLR 2015b).
- *Remedial Action Plan, Sydney Heritage Fleet Base, Bank Street, Pyrmont, NSW,* SLR Consulting Pty Ltd, 23 April 2015 (SLR 2015c).

An additional document was also considered during the site audit, comprising the *Report on Marine Sediment Contamination Assessment, Hymix Wharf Blackwattle Bay, Pyrmont*, Douglas Partners, June 2008 (DP 2008). The assessment involved the investigation of sediments at the footprint of the former Hymix Australia wharf approximately 250 m east of the site and at additional locations within Blackwattle Bay (all sample locations are noted to be outside of the current site area).

Additional correspondence relating to the site audit is provided in **Appendix B**.

The site was inspected on the date shown in **Table 1.1**.

Table 1.1: Summary of Audit Inspections

Date	Attendance	Purpose
10 March 2015	Joanne Rosner – Site Auditor Assistant (JBS&G)	Site inspection to verify site condition/ surrounding environment.

1.5 Chronology of Site Activities

The process of the site assessment, reporting and auditor review undertaken at the site has been summarised in **Table 1.2**.

Table 1.2: Summary of Assessment and Audit Works Undertaken at the Site

Date	Action
April 2011	Preparation of the Soil Contamination Investigation (NA 2010), which included completion of soil sampling in June 2010 from eight test pit locations excavated to a maximum depth of 1.3 m below ground surface (bgs). Results indicated that the investigated areas do not comply with the adopted soil criteria (parks, recreation & open space) for the (then) proposed site use as a public boat ramp. As such, the soils were not considered suitable for use in construction of the boat ramp.
June 2011	Completion of a Preliminary Contaminated Land Assessment (SLR 2011) which included a site history review (land titles, historical maps, EPA records and aerial photographs), a site inspection, review of previous environmental assessment reports and an appraisal of potential acid sulfate soils (ASS). Based on the findings, the consultant recommended a Stage 2 Detailed Site Investigation be conducted.
December 2014	Commencement of Site Audit (audit #0503-1410), with notification to the NSW EPA of the commencement of the site audit.
February 2015	Preparation of a sampling analysis and quality plan (SAQP) (SLR 2015a), which included a scope of work necessary to conduct the Limited Contamination Assessment (SLR 2015b).
April 2015	Completion of a Limited Contamination Assessment (SLR 2015b) for works conducted in February 2015 in which 18 soil samples were collected from five tests, with sediment sampling conducted at four locations within 3 m of the site waterfront boundary. Consultant concluded the site is unsuitable in its current condition for the proposed commercial land use, but could be made suitable for the proposed land use subject to the remediation/management of potentially contaminated soils. The consultant recommended the following be conducted prior to commencing remediation: • An additional contamination assessment for some identified data gap. • Preparation of a Sediment Management Plan and an Acid Sulfate Management Plan. • Conduct an asbestos investigation that meets the requirements of the WA DOH (2009) guidelines.

	• Prepare a RAP outlining the proposed remediation/management strategy.
April 2015	Preparation of the RAP (SLR 2015c). The RAP specified the preferred remedial strategy (in-situ capping) to be achieved through building footprints and paved surfaces that are proposed to be constructed, and a long term Environmental Management Plan (EMP) would be prepared and implemented to minimise the risk of exposure to impacted soils.
April 2015	Preparation of a Site Audit Statement 0503-1410 and Site Audit Report (JBS&G 2015), in which the reported remediation goals were identified to include management of the identified PAH impacted soils at the site in a manner that will not present an unacceptable risk of exposure to human health and the environment for the proposed landuse as a maritime facility (i.e., commercial/industrial landuse scenario).

2. Site Description

2.1 Site Identification

The site details provided by the consultant (SLR 2011 and SLR 2015b) have been summarised in **Table 2.1** and described in further detail in the following sections. Plans identifying the subject site have been presented in **Appendix C**. The site location and layout is shown in **Appendix D**.

Table 2.1: Summary Site Details

Street Address:	Bank Street, Pyrmont, NSW 2009
Lot & DP	Part Lot 19 DP 803159, Part Lot 20 DP 803159 and part Lot 33 DP 1151746.
Local Government Area:	City of Sydney Council
Property Size:	3850 m^2 (approx.)
Zoning:	RE1 Public Recreation
Previous Use	Commercial/Industrial
Current Use	Vacant
Anticipated Future Use	Maritime Facility including boat storage, exhibition space, community work space and maintenance workshop, publicly accessible foreshore walk, fixed wharf, floating pontoons and timber walkway (commercial/industrial landuse)

2.2 Site Condition

The consultant (SLR 2015b) reported the site is pentagonal in shape and consists of a portion of two lots (Lot 19 and Lot 20 of DP 803159) located beneath Anzac Bridge on Bank Street. In addition, the proposed development will comprise additional features (a fixed wharf, floating pontoons and a boardwalk) which will extend into a portion of Blackwattle Bay (part Lot 33 DP 1151746) adjoining the western boundary of the site. The auditor also notes that the eastern pylon of the Anzac Bridge occupies a large portion of the southwest area of the site, with the remaining areas of the site currently vacant. Additional site details are presented below.

2.3 Topography

The consultant (SLR 2015b) reported that the site is split with an upper northern portion and a lower southern portion, as follows:

- The upper portion is adjacent to Bank Street with an elevation of 3.9 m AHD at the Bank Street entrance, and an elevation of 4.4 m AHD at the eastern entrance gate adjacent to the car park.
- The lower southern portion is approximately 2 m lower than the northern portion. The majority of the area in the lower portion forms the area around the Anzac Bridge pylon.

2.4 Geology

The consultant (SLR 2011) reported that a review of the Soil Landscapes of the Sydney 1:100,000 sheet 1989 (Soil Conservation Service of NSW, Sydney), indicates that a combination of 'Gymea' and 'disturbed terrain' soil landscapes are present across the site, and the disturbed terrain is likely to have been partially created through the emplacement of artificial fill over swamp and estuarine shore areas to create reclaimed areas during early development of the site.

The consultant (SLR 2015b) reported that a review of the Geological Survey of NSW Sydney 1:100,000 Geological Series Sheet 9130 Edition II (1983) indicates that the site is located within the Triassic period Wianamatta group lithology comprising medium to coarse grained sandstone, very minor shale and laminite lenses.

2.5 Hydrology

The consultant (SLR 2015b) did not describe the hydrogeology of the site, however, the auditor's representative (as per **Table 1.1**) conducted a site investigation on 10 March 2015 and noted the

site is predominantly crushed aggregate with some asphalt and paved areas. As such, some stormwater infiltration would be expected in the non-paved areas of the site, and surface stormwater runoff would be anticipated towards Blackwattle Bay to the west and south.

2.6 Hydrogeology

The consultant (SLR 2015b) reported that there are no registered groundwater bores on-site or down gradient of the site, however, no additional detail (such as references for this information) was provided. For completeness, the auditor conducted a review of the NSW Natural Resource Atlas website (http://www.nratlas.nsw.gov.au) on 24 April 2015 and identified no registered groundwater bores for any purpose at the site.

During the test pitting investigation undertaken by the consultant (SLR 2015b), water was observed at one location (TP01) at 1.3 m bgs in sandstone fill, and possible groundwater was observed at another location (TP03) in sandstone fill at 3 m bgs.

2.7 Surrounding Environment

The consultant (SLR 2015b) reported that the site is surrounded by the following:

- North and northwest: Bank Street, with multi-storey mixed use (residential/commercial) developments beyond.
- Northeast: Bank Street, with commercial and residential buildings beyond. Companies located within these buildings include Macquarie Radio Network, Network Ten and Sydney Cruises.
- East: vacant land used as a car park for rowing and boating clubs located further east, with Poulos Bros Seafoods Pty Ltd beyond.
- West and South: Blackwattle Bay, with Anzac Bridge spaning over the site and crossing the bay to the west. A brick building of unknown use (noted by the consultant to likely be commercial land use) is located to the west, and a public walkway is to the south.

2.8 Acid Sulfate Soils

The consultant (SLR 2015b) conducted review of available documentation regarding acid sulfate soils at the site, as follows:

- The Australian Soil Resource Information System (www.asris.csiro.au), which indicated the following:
  - The higher portion of the site is located within low probability for the occurrence of acid sulfate soil.
  - The lower portion is located within the high probability for the occurrence of acid sulfate soils.
- The Department of Land and Water Conservation (DLWC) Prospect/Parramatta River Acid Sulfate Soil Risk Map (Edition Two), which indicated that the site is located in an area known as 'Disturbed Terrain'. These areas may include:
  - Filled areas, which often occur during reclamation of low lying swamps for urban development.
  - Areas which have been mined or dredged, or have been undergone heavy ground disturbance through general urban development or construction of dams or levees.
- The Sydney City Council, Sydney Local Environmental Plan 2012 – Acid Sulfate Soils Map – Sheet ASS_007, which indicates that the site lies within Class 1 and Class 2 lands.

2.9 Audit Findings

The information provided by the consultants (SLR 2011, SLR 2015b) in regards to the site condition and surrounding environment has been checked against and generally meets the requirements of OEH 2011. The information provided was also consistent with the observations made by the site auditor's assistant during the site audit inspection.

The consultants (SLR 2011 and SLR 2015b) provided relevant information pertaining to topographical features for the site. The auditor has reviewed the title plan (**Appendix C**) and confirms that site boundaries in the site plans provided by the consultant are accurate. It is noted the consultant (SLR 2015b) referenced the site area as 3500 m^2 (rather than 3850 m^2 as provided in the site survey plan in **Appendix C**), however, this is not considered to materially affect the outcome of the site audit.

Overall, the information provided by the consultant (SLR 2011 and SLR 2015b) in relation to site condition and the surrounding environment is considered adequate for the purposes of the investigations.

3. Site History

3.1 Site History Information Sources

The consultant (SLR 2011) used a combination of sources to provide a site history, including the following:

- Council records, in which the consultant reported, *'…there are no council records for this site which indicate any significant environmental issues*.'
- Aerial photographs (1930, 1951, 1961, 1972, 1982, 1991 and 2009).
- Historical maps (1865, 1903, 1938-1950 and 1956).
- Historical land titles.
- NSW EPA records.

A summary of relevant historical information for the site was provided in the consultant (SLR 2015b) and is summarised as follows:

- Lots 19 and 20 of DP 803159 both comprise reclaimed land, although associated with different periods of reclamation work, with Lot 20 reclaimed during the late 1800s. Since the time when the land was first reclaimed there has not been a substantial change in the shoreline.
- No exact details of the reclamation works at the site could be located. It was, however, common practice at the time to utilise dredged estuarine sediments and excess fill from industrial and residential development sites.
- Lot 19 was reclaimed between 1989 and 1991 to facilitate the construction of the eastern support pylon for the Anzac Bridge. It is anticipated that the nature of the works would have required the imported fill to meet certain geotechnical parameters to allow placement to the required engineering specification. Documents relating to the reclamation of this lot could not be identified and therefore, it is unknown whether there is a potential for contaminated fill to have been used to complete this work. The site had probably received further imported fill material between the time of the initial reclamation and present day, due to the postulated changes in operational ground level.
- Between 1989 and 2003 the NSW RTA owned both Lots 19 and 20. During this time, Lot 19 has been used only to accommodate the eastern pylon of the Anzac Bridge and Lot 20 had been left mostly untouched and empty.

3.2 Aerial Photographs

The consultant (SLR 2011) undertook an aerial photograph review of the site, with the following information provided:

- 1930: No detailed interpretation of the subject site was possible due to resolution, however, it was reported that the approximate line of the Pyrmont peninsula is similar to that in more recent images. Surrounding properties showed a high number of buildings and maritime traffic.
- 1951: The northwestern end of the site shows an 'L' shaped building, and the southeastern end shows a large wharf attached and potentially a small white building at the rear of the site. Surrounding properties showed more factories and large buildings.

- 1961: The large wharf had been removed and the southwest end of the site possibly contained boxes/pallets (assumed to be raw materials or finished goods). Surrounding properties appeared unchanged since the previous photograph.
- 1972: The 'L' shaped building had been removed, with a smaller rectangular building visible at the rear of the site, with what appears to be cars occupying the front (water side) of the site.
- 1982: The site is completely vacant with exposed dirt and concrete visible.
- 1991: Footing for the eastern pylon of the Anzac Bridge is visible.
- 2009: The eastern pylon of the Anzac Bridge dominates the Lot 19 parcel, however, the bridge obscures most of Lot 20.

3.3 Historical Maps

The reviewed historical maps (SLR 2011) generally did not show site-specific details, with the following exceptions:

- The 1938-1950 maps showed the large wharf referenced in the 1951 aerial photograph.
- The 1956 map shows Lot 20 as comprising two parts:
  - The western half is occupied by the Potato Marketing Board of Tasmania.
  - The eastern half is vacant with the large wharf attached, plus a smaller wharf towards the edge of the site.

3.4 Historical Land Titles

The consultant reviewed historical land titles from Service First Registrations for Lots 19 and 20 in DP803159, with the following summary:

Lot 20

- 1899 to 1955 - Ownership was generally individual owners or companies of unknown nature (such as 'Cam and Sons Limited').
- 1948 (for a portion of Lot 20) to 1989 – Colonial Sugar Refining Company Limited.
- 1989 to 2003 – RTA of NSW.
- 2003 to date – Waterways Authority.

Lot 19

- To 1989 – Maritime Services Board.
- 1989 to 2003 – RTA of NSW.
- 2003 to date – Waterways Authority.

In addition, three easements were identified for both Lots 19 and 20 in March 2003 comprising:

- Easement for Electricity Purposes - 3 and 4.625 m wide;
- Easement for Drain Water – 3 m wide; and
- Easement for Maintenance - variable width.

The consultant also noted during the 1970s to 1980s previous elongated lots which fronted Blackwattle Bay were amalgamated to provide the current larger blocks/lots which are now present.

3.5 EPA Records

The consultant reported the following:

- A search of the Office of Environment and Heritage Contaminated Land Record website (7 October 2011) indicated no notices issued for the site.
- A search of the EPA licences, applications and notices register for the Pyrmont area under the Protection of the Environment Operations (POEO) Act 1997 (7 October 2011) indicated no active licences pertaining to the site or the surrounding areas.

3.6 Previous Reports and Reference Documents Review

The consultant (SLR 2011) noted additional reports and documentation were prepared and/or reviewed for the site/surrounding site area:

- NA 2010, which refers to a larger parcel of land, incorporating the current site under investigation and land adjoining the site to the east. Additional detail of the findings of this report is outlined below in **Section 7**.
- DP 2008, which involved the investigation of sediments at the footprint of the former Hymix Australia wharf approximately 250 m east of the site and at additional locations within Blackwattle Bay (the auditor notes that all sample locations are outside of the current site area, including the area of the proposed wharf portion of the site that will extend into Blackwattle Bay). However, the consultant (DP 2008) reported that some PAHs and heavy metals were reported in sediment samples collected during the investigation, and presented the following conclusions:
  - Contamination present is not necessarily caused by the wharf and associated activities and more likely due to discharge of contaminant-loaded effluent from various sources (e.g. storm water runoff) into Blackwattle Bay.
  - Given the high levels of contamination (PAHs) in sediments, care should be taken during removal of the wharf to ensure minimal disturbance of sediments.
- The consultant also conducted an internet search for a number of reference documents which provided details on the site and site history/background information of the Pyrmont area. In particular, it was noted that the former Pyrmont incinerator was located directly east and above the Lot 20 portion of the site. The primary use was a garbage incinerator for commercial and residential waste, and was in use until 1971 when the incinerator was abandoned until it was demolished in 1992.

3.7 Audit Findings

A generally comprehensive historical review was undertaken by SLR 2011 and included a review of aerial photographs, historical maps, land titles and NSW EPA records. A summary of relevant findings was provided, however, the auditor notes the following deficiencies:

- Section 149 planning certificates were not researched.
- The consultant reported that, '…there are no council records for this site which indicate any significant environmental issues.' Copies of council records were not provided in the SLR 2011 report, and as such, the auditor cannot verify the validity of this statement.
- WorkCover NSW records were not reviewed.
- Limited NSW EPA records were provided with the report, however, EPA records were not researched in follow-up documentation (SLR 2015b).

- The consultant did not undertake searches of relevant heritage databases.

For completeness, on 24 April 2015 the auditor conducted an updated search of available NSW EPA online information databases including updated searches of the CLM register, the POEO register, and the List of NSW Contaminated Sites Notified to EPA, with the following findings (search records are provided in **Appendix E**):

- A search of the CLM register did not discover any notices related to the site.
- A search of the POEO register did not identify any licences referring to the site.
- A search of the List of NSW Contaminated Sites Notified to EPA did not identify any locations related to the site.

In addition, on 24 April 2015 the auditor had undertaken searches of the NSW Heritage and Australian Heritage databases, with the following information provided (records are provided in **Appendix E**):

- The site was not listed on the Australian Heritage Register.
- The site was not listed on the NSW Heritage Register, with the exception that the Anzac Bridge was listed as significant at a State level because of its technical qualities. It is noted that the proposed site development considers the presence of the eastern pylon of the Anzac Bridge, and the auditor understands that development is not expected to have an impact on the bridge structure.

Notwithstanding the above referenced deficiencies, the extent of site history information presented by the consultant (SLR 2011) is considered generally sufficient and comprehensive in identifying contamination issues at the site. In addition, the auditor considers that based on the systematic intrusive works undertaken across the site (SLR 2015b), supplemental NSW EPA searches undertaken by the auditor (above), the requirement for additional investigations at the site (refer to **Section 7**) and the proposed remedial strategy for the site (refer to **Section 8**), it is considered that the referenced deficiencies are unlikely to materially affect the outcome of the site audit.

4. Conceptual Site Model

The National Environment Protection (Assessment of Site Contamination) Measure (NEPC) 1999 (as amended 2013, NEPC 2013) identifies a conceptual site model (CSM) as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments and remediation activities.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

4.1 Sources of Contamination

Based on a review of the available site historical information, the consultant (SLR 2015b) identified the following potential sources of contamination at the site:

- Site soils/potential uncontrolled filling.
- Sediment within 3 m from the site's waterfront boundaries.

Based on the identified sources of contamination, the consultant (SLR 2015a and SLR 2015b) identified the following contaminants of potential concern (COPCs), including:

- Metals.
- Total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX).
- Polycyclic aromatic hydrocarbons (PAHs).
- Phenolic compounds.
- Organochlorine pesticides (OCPs).
- Polychlorinated biphenyls (PCBs).
- Asbestos.
- Dioxins (due to the nearby former Pyrmont incinerator).

In addition, the consultant reported that if soils containing sulfidic ore are present on-site in an undisturbed state, these soils may pose risk when disturbed or exposed to oxygen. Based on this, the consultant considered that further assessment of acid sulfate soil is warranted.

4.2 Potentially Affected Media

The consultant (SLR 2015b) identified that the identified COPCs are potentially likely to occur in the fill materials and sediments within 3 m of the site's waterfront boundaries.

4.3 Potential Receptors and Exposure Pathways

4.3.1 Human Receptors

The consultant (SLR 2015b) reported that the key human receptors for the potential contaminants sourced from the site include:

- If contamination is present in the site soils and sediments within 3 m from site's water front, it is possible that site users, visitors and construction workers may be exposed to such contamination via direct contact with the contamination.
- If volatile contamination is present in the site soils, it is possible that site users, visitors and construction workers may be exposed to such contamination via vapour inhalation or vapour intrusion.
- If asbestos is present in the fill material, it is possible that construction workers may be exposed to such contamination via inhalation.

4.3.2 Ecological Receptors (Terrestrial, Aquatic and Benthic Ecosystems)

The consultant (SLR 2015b) reported the following ecological considerations:

- If contamination is present in the soil, terrestrial and aquatic ecosystems could be exposed to such contamination.
- The proposed development will include site improvements, including construction of slab, paving or landscaping across the entire site. It is considered that this limits the environmental values that require consideration (i.e., support of plant growth) and further assessment of unacceptable risk to terrestrial ecosystems through contaminants that may be present in site soils is not warranted.
- The consultant identified that a preliminary assessment of sediment quality will be conducted that will provide consideration of risks to aquatic and benthic ecosystems.

4.4 Audit Findings

The consultant (SLR 2015b) has identified a number of potential contamination issues at the site, and based on the site history review, the auditor considers that list of COPCs was adequate in assessing the nature and extent of contamination across the site. The consultant also considered both human and ecological receptors subsequent potential exposure pathways.

It is noted that the consultant (SLR 2015b) identified that a preliminary assessment of sediment quality will be conducted that will provide consideration of risks to aquatic and benthic ecosystems. Additional detail on the findings and potential sediment management requirements is discussed below in **Section 7** and **Section 8**.

The consultant did not report on groundwater as a potentially impacted medium, and the auditor considers this a deficiency as impacted fill materials, if present, could be in contact with (and/or leach to) groundwater. Overall, however, the auditor considers that the identified potential contamination issues and potentially contaminated media were appropriate for assessing the suitability of the site for the intended use, noting additional assessment is required to fully understand the site conditions (refer also to **Section 7** and **Section 8**).

5. Sampling Analytical and Quality Program

5.1 Sampling / Analytical Regime

The sampling/analytical regimes adopted as part of the soil and sediment investigation works (NA 2010 and SLR 2015b) are summarised in **Table 5.1**.

The sample locations are shown on the consultants' sample location diagrams provided in **Appendix D**.

Table 5.1: Summary of Soil and Sediment Sampling / Analytical Schedule

Media	Area	No. Sampling Locations	General Depth Intervals	Sampling Regime	No. Analyses (not incl. QA/QC)
NA 2010					
Fill/Soil	10 500 m^2*	8 test pits**	0.1 0.2 0.3 0.4 0.5 0.6	Systematic	Heavy metals – 8 TPH/BTEX – 8 PAHs – 8 VOCs – 8 Asbestos - 4
SLR 2015b					
Fill/Soil	3850 m^2 (not including the area of the site extending into the adjoining Blackwattle Bay).	5 test pits	0.05-0.2 0.1-0.3 0.4-0.5 0.4-0.6 0.6-0.8 0.8-1.0 1.0-1.2 1.1-1.3 1.5-1.7 1.6-1.7 1.6-1.8 1.8-2.0 2.4-2.6 2.6-2.8 2.8-3.0	Systematic	Metals – 15 PAHs – 15 Asbestos - 10 BTEX/TPH – 7 OCPs - 5 PCBs - 5
Sediment	Within 3 m of the site's waterfront boundary	4	Grab sample	Targeted-within 3 m of the site's waterfront boundary during low tide	Metals – 4 PAHs – 4 BTEX/TPH – 4 OCPs - 4 PCBs - 4

*The NA 2010 investigation included a larger parcel of land, incorporating the current site and land adjoining the site to the east.
**The consultant (SLR 2015b) reported that two sample locations from the NA 2010 investigation are at off-site locations (test pits TP04 and TP05).

5.2 Sampling Methodology

5.2.1 Soil Investigation

Sampling undertaken by the consultants as part of the investigation works (NA 2010 and SLR 2015b) were undertaken using similar and consistent methodologies, briefly discussed as follows:

- Soil samples were collected from test pits advanced by an excavator.
- Samples were collected directly from the excavator bucket, taking care to avoid collecting soils in direct contact with the bucket.
- NA 2010 reported that subsequent to the recovery of soil from the excavator, a hand trowel was used to transfer the soil sample to the glass jar. All sampling equipment was cleaned

(wash and brush scrubbing with laboratory grade detergent, rinsed with tap water and de-ionised water) prior to sampling and between sampling events to prevent cross contamination.

- Care was taken not to homogenise sediments prior to sampling.
- Sediments were lightly compacted into each sample jar and sealed with a Teflon lined lid to minimise headspace.
- Samples were stored and transported to the laboratory under chain of custody (COC) conditions in insulated containers with ice.
- Soil samples were collected (in zip lock bags) for headspace screening using a calibrated photo-ionisation detector (PID).
- Field logs were completed during all sampling undertaken as part of the investigation works.

5.2.2 Sediment Investigation

The consultant (SLR 2015b) reported that sediment samples were collected during low tide using a shovel as follows:

- Samples were collected directly from the centre of the shovel, taking care to avoid collecting sediments in direct contact with the shovel.
- Care was taken not to homogenise sediments prior to sampling.
- Sediments were lightly compacted into each sample jar and sealed with a Teflon lined lid to minimise headspace
- Samples were stored and transported to the laboratory under COC conditions in insulated containers with ice.

5.3 Laboratory Methods

The consultants (NA 2010 and SLR 2015b) used laboratories which were NATA accredited for the chemical analyses undertaken. Envirolab Services at Chatswood NSW (NA 2010) and SGS Australia Pty Ltd at Alexandria NSW (SLR 2015b) were the primary analytical laboratories.

Eurofins/MGT of Lane Cove West, NSW was the secondary (check) laboratory (SLR 2015b only). No secondary (check) laboratory were used for the soil investigation works undertaken by NA 2010.

The methods used by the laboratories as part of the investigation programs are consistent and are shown in **Table 5.2**.

Table 5.2: Laboratory Methods Used

	Limit of Reporting			Laboratory Method
	SGS Soil* (mg/kg)	Envirolab Soil (mg/kg)	Eurofins/MGT Soil (mg/kg)	
Metals				
Arsenic	3	4	2	ICP-AES/ICPMS
Cadmium	0.3	0.5	0.4	ICP-AES/ICPMS
Chromium	0.3	1	5	ICP-AES/ICPMS
Copper	0.5	1	5	ICP-AES/ICPMS
Lead	1	1	5	ICP-AES/ICPMS
Mercury	0.01	0.1	0.1	ICP-FIMS
Nickel	0.5	1	5	ICP-AES/ICPMS
Zinc	0.5	1	5	ICP-AES/ICPMS
Total Petroleum Hydrocarbons				
C_6-C_9 Fraction	20	25	20	Purge Trap-GC/MS, PT/GC/FID/MSD

	Limit of Reporting			Laboratory Method
	SGS Soil* (mg/kg)	Envirolab Soil (mg/kg)	Eurofins/MGT Soil (mg/kg)	
C_6-C_{10} Fraction	25	-	20	Purge Trap-GC/MS, PT/GC/FID/MSD
C_{10}-C_{14} Fraction	20	50	20	GC/FID
C_{15}-C_{28} Fraction	45	100	50	GC/FID
C_{29}-C_{36} Fraction	45	100	50	GC/FID
>C_{10}-C_{16} Fraction	25	-	50	GC/FID
>C_{16}-C_{34} Fraction	90	-	100	GC/FID
>C_{34}-C_{40} Fraction	120	-	100	GC/FID
>C_{10}-C_{16} (F2)	25	-	-	GC/FID
C_{10}-C_{36} Fraction	110	-	-	GC/FID
Monocyclic Aromatic Hydrocarbons				
Benzene	0.1	0.5	0.1	Purge Trap-GC/MS, PT/GC/FID/MSD
Toluene	0.1	0.5	0.1	Purge Trap-GC/MS, PT/GC/FID/MSD
Ethylbenzene	0.1	1	0.1	Purge Trap-GC/MS, PT/GC/FID/MSD
Xylenes	0.1-0.2	1-2	0.3	Purge Trap-GC/MS, PT/GC/FID/MSD
PAHs				
B(a)P	0.1	0.05	0.5	GC/MS
Naphthalene	0.1	0.1	0.5	GC/MS
PAHs (Indiv.)	0.1	0.05-0.2	0.5	GC/MS
Volatile Organic Compounds (VOCs)				
Individual	-	1-2	-	Purge Trap-GC/MS
PCBs				
Individual	0.2	-	0.1	GC-ECDs
OCPs				
Aldrin	0.1	-	0.05	GC with dual ECDs
Dieldrin	0.2	-	0.05	GC with dual ECDs
Chlordane	0.1	-	0.1	GC with dual ECDs
DDT+DDD+DDE	0.1	-	0.05	GC with dual ECDs
Heptachlor	0.1	-	0.05	GC with dual ECDs
Other				
Asbestos	0.01 %w/w	0.1 g/kg	Lab report not provided	PLM/Dispersion Staining

Note:
* Sediment samples considered as soil samples as per provided laboratory report.
'-' Not analysed by laboratory.

5.4 Quality Assurance / Quality Control (QA/QC)

The consultants (NA 2010 and SLR 2015b) developed pre-determined data quality indicators broadly based on the seven step process referred to in DEC 2006. Both a field and laboratory quality assurance/quality control (QA/QC) program was conducted during the site investigation works. Field QA/QC consisted of the following procedures:

- Where sampling equipment was re-used, decontamination was conducted between sampling locations using phosphate free detergent and water (NA 2010), otherwise care was taken to avoid collecting sediments in direct contact with the shovel or excavator bucket.
- Collection and analysis of 'blind duplicate' soil samples for a suite of potential chemicals of concern (intra or 'within' laboratory duplicates).
- Collection and analysis of 'split duplicate' (inter-laboratory) soil samples for a suite of potential chemicals of concern (SLR 2015b only).
- Inclusion of trip blank and trip spike samples collected during the soil/sediment sampling (SLR 2015b only).
- Transporting samples in ice-cooled chests, under chain of custody conditions, to laboratories that were NATA accredited for the analysis performed.

Laboratory QA/QC consisted of the following procedures:

- Analysis and reporting of laboratory duplicate samples.
- Analysis and reporting of laboratory method blank samples.
- Analysis and reporting of laboratory control samples.
- Analysis and reporting of laboratory control spikes, matrix and surrogate spikes.

The QA/QC undertaken by the consultant(s) has been reviewed and summarised in **Table 5.3** against the PARCC parameters (precision, accuracy, representativeness, comparability and completeness), with a discussion of any significant deficiencies provided below in **Section 5.5**.

Table 5.3: Investigation QA/QC summary

DATA USABILITY ASSESSMENT			
Aspect	**DQI**	**Requirement**	**Auditor Assessment**
Precision	Intra-Laboratory Duplicates (blind)	Collected at a rate of 1/20 primary samples for each sampling batch. Analysed for primary contaminants of concern at a minimum, with analysis for secondary contaminants of concern to be based on professional judgement. RPDs less than 30% should be considered as indicative of acceptable precision. RPDs above 30% should be discussed (i.e. likely cause, consequences for data interpretation).	NA 2010 - Frequency appropriate (1/8 primary samples). RPDs generally acceptable with some exceedances for metals and acenaphthene, no discussion provided by consultant. SLR 2015b - Frequency appropriate (2/15 primary samples). RPDs generally acceptable, with some exceedances for metals attributed by the consultant due to sample heterogeneity.
	Inter-laboratory duplicates (split)	Collected at a rate of 1/20 primary samples for each sampling batch. Analysed for primary contaminants of concern at a minimum, with analysis for secondary contaminants of concern to be based on professional judgement. RPDs less than 30% should be considered as indicative of acceptable precision. RPDs above 30% should be discussed (i.e. likely cause, consequences for interpretation).	Not conducted (NA 2010). SLR 2015b Frequency appropriate (2/15 primary samples). RPDs generally acceptable, with some exceedances for metals attributed by the consultant due to sample heterogeneity.
	Laboratory duplicates	Laboratory duplicates performed as required by NATA accreditation. RPDs to be <30%. RPDs above 30% should be discussed (i.e. likely cause, consequences for data interpretation).	Meets requirement (NA 2010). Generally meets requirement (SLR 2015b) with the exception of some outliers for metals and PAHs.
Accuracy	Field rinsate blanks	Collected at a rate of 1/piece of decontaminated sampling equipment/day of sampling. Analysed for primary COPC at a minimum, with analysis for secondary COPC to be based on professional judgement. Laboratory results below laboratory LOR should be considered indicative of adequate decontamination procedures. Detections above laboratory reporting limits should be discussed (likely cause, consequences for data interpretation).	No rinsates collected (NA 2010), laboratory results do not show sustained pattern of elevated impact. No rinsates collected (SLR 2015b) or considered necessary due to sampling methodology.

DATA USABILITY ASSESSMENT			
Aspect	**DQI**	**Requirement**	**Auditor Assessment**
	Field blanks and/or Field trip blanks	Collected at a rate of 1/day of sampling where primary contaminants of concern include volatiles. Analysed for volatiles of concern. Laboratory results below laboratory reporting limits should be considered to be indicative of no significant cross contamination in the field. Detections above laboratory reporting limits should be discussed (likely cause, consequences for data interpretation).	Not collected (NA 2010). One collected (SLR 2015b).
	Field trip spikes	Collected at a rate of 1/batch where primary contaminants of concern include volatiles. Analysed for volatiles of concern. Laboratory results within =/-30% of the spike concentration should be considered to be indicative of no significant volatile loss during sample transport. Recoveries outside =/-30% should be discussed (likely cause, consequences for data interpretation).	Not collected (NA 2010). One collected (SLR 2015b) with acceptable recoveries (99% to 101%).
	Laboratory surrogate spikes	Surrogate spikes performed as required by NATA accreditation. Recoveries to be within 70-130%, or 30%-130% (phenols only). Recoveries outside these ranges should be discussed (i.e. likely cause, consequences for data interpretation).	Meets requirement (NA 2010 and SLR 2015b).
	Laboratory method blanks	Laboratory method blanks performed as required by NATA accreditation. Method blank results to be below laboratory reporting limits. Detections above laboratory reporting limits should be discussed i.e. likely cause, consequences for data interpretation).	Meets requirement (NA 2010 and SLR 2015b).
	Laboratory control samples	Laboratory control samples performed as required by NATA accreditation. Recoveries within 70-130% or 30%-130% (phenols only). Recoveries outside these ranges should be discussed (likely cause, consequences for data interpretation).	Meets requirement (NA 2010 and SLR 2015b).
	Laboratory matrix spikes	Matrix spikes performed as required by NATA accreditation. Recoveries to be within 70-130%, or 30%-130% (phenols only). Recoveries outside these ranges should be discussed (i.e. likely cause, consequences for data interpretation).	Meets requirement (NA 2010). Generally meets requirement (SLR 2015b) with the exception of one outlier for mercury.
	Data transcription	ESdat system to be used in order to minimise risk of data transcription errors.	In general results accurately summarised in tables.
Represent-ativeness	Soil sampling locations	Probability based: Where appropriate, samples to be collected using a square grid for the detection of circular hotspots in accordance with AS4482.1. Judgement based: Where appropriate, samples to be collected at targeted locations based upon the findings of the PSI.	Does not meet requirement (NA 2010 and SLR 2015b). For SLR 2015b, all soil sample locations conducted on a general grid, however, the number of locations less than the required for site area of 3850 m^2 (5 locations sampled, less than recommended in EPA 1995 of 9 to 11). Sediment sample locations targeted within 3 m of site waterfront. Phenols and dioxins not analysed.

DATA USABILITY ASSESSMENT			
Aspect	**DQI**	**Requirement**	**Auditor Assessment**
	Soil sampling depths	Soil sampling locations extended to depths which are sufficient to delineate vertical extent of fill material, delineate the vertical extent of potentially contaminated material (based on field observations) and extent beneath any known buried contamination sources.	NA 2010 only targeted shallow fill, with fill in only one location delineated. SLR 2015b sampled natural soils at 3 locations. Natural soils not encountered at 2 locations at west/southwest portion of site due to test pit collapse.
	Soil sampling methodology	Soil samples collected using a methodology which is appropriate for the primary contaminants of concern.	Meets requirement (excavator bucket or shovel) with exception that samples analysed for asbestos were subsampled by the laboratory.
	Soil sampling containers	Soil samples collected into laboratory supplied, clean and unpreserved jars.	Meets requirement.
	Soil sample headspace	Soil samples collected with zero headspace, unless volatiles are of no concern.	Meets requirement.
	Soil sampling equipment decontaminat ion	Soil sampling equipment decontaminated between sampling locations, or between different sampling depths where significant contamination is encountered.	Meets requirement (where reusable equipment was used).
	Soil sample collection intervals	Soil samples collected at regular intervals based upon stratigraphy and field evidence of contamination.	Meets requirement.
	Soil sample contaminatio n screening	Soil samples screened for contamination via visual/olfactory observations and PID measurement.	Not conducted (NA 2010). Meets requirement (SLR 2015b).
	Groundwater sampling locations	Groundwater sampling locations to assess areas of concern, allow for lateral delineation of contamination and assess the groundwater flow direction.	Not conducted.
	Soil vapour locations	Soil vapour locations to target likely sources of soil vapour contamination and preferential flow pathways for soil vapour contamination.	Not conducted nor considered applicable.
	Sample storage	Samples placed in an insulated container and chilled using ice bricks (relevant for soil and waters only).	Meets requirement.
	Sample transport from field to laboratory	Samples transported to laboratory under chain of custody conditions.	Meets requirement (SLR 2015b). No COC provided in NA 2010.
	Laboratory sample receipt advice	No damaged containers. No samples with inappropriate headspaces (soil samples only). No samples submitted without sufficient time to comply with recommended holding times. No samples submitted in containers which have not been chilled.	Meets requirement (SLR 2015b). No lab receipt provided in NA 2010.
	Holding times	Samples extracted and analysed within recommended holding times.	Meets requirement with the exception of ASLP PAHs (SLR 2015b).
	Analytical method	Samples analysed using a NATA accredited methodology.	Meets requirement.
Completeness	Sampling, analysis and quality plan	100% of sampling, analysis and quality plan implemented.	Not all COPCs analysed (dioxins, phenols).

DATA USABILITY ASSESSMENT			
Aspect	**DQI**	**Requirement**	**Auditor Assessment**
	completeness		
	Field document-ation	All relevant field documentation collated, including sampling logs and calibration records.	Meets requirement.
	Laboratory document-ation	All relevant laboratory documentation collated, including chain of custody records, sample receipt advice and analytical reports.	Meets requirement (SLR 2015b). No COC or lab receipt provided in NA 2010.
	Critical sample validity	All critical sample data valid.	Meets requirement.
Comparability	Sampling, analysis & quality approach	Adequately comparable sampling, analysis and quality approach used throughout project.	Meets requirement.
	Sampler	Samplers used throughout project have sufficient experience.	Meets requirement.
	Climatic conditions	Samples collected during similar climatic conditions. Where this is not possible, consideration to be given to significance of climatic variation.	Meets requirement.

5.5 Data Usability Discussion

Based on the data usability assessment provided above in **Table 5.3**, the auditor provides the following comments on the noted deficiencies:

- The auditor considers that the higher than expected RPDs for some soil results (metals, PAHs) are attributed to the heterogeneity of the fill. Based on this, the auditor is of the opinion that the elevated RPD results do not affect the overall reliability of the analytical data.
- The consultants (NA 2010 and SLR 205b) completed a series of environmental investigations across the site, however, the auditor notes that fill materials have not yet been adequately delineated, and the number of sampling locations did not conform to EPA 1995. As such, additional assessment is required to better understand the site conditions and potential risks to site users (refer to **Section 5.6** for additional detail).
- Samples were generally analysed using NATA accepted and standard analytical methods, with the exception of asbestos samples collected and analysed during the investigation (NA 2011 and GHD 2014b). A review of the laboratory reports indicates that a the laboratory subsampled the supplied sample jars for asbestos, however, WA DoH 2009 guidelines recommend 500 mL samples. In addition, the number of samples collected and analysed for asbestos did not meet WA DoH 2009 guidelines. As such, the auditor considers that additional asbestos assessment will be required at the site prior to the start of site remediation work to better understand the remedial and/or OHS requirements during site development.
- The internal laboratory duplicates analysed by the primary laboratory were generally within the control limits. However, some elevated RPDs for PAH and metals were reported in SLR 2015b. Overall, however, the internal laboratory duplicates do not indicate a sustained pattern of reduced precision by the testing laboratory and are considered by the auditor not to affect the overall reliability of the analytical data.
- All laboratory control samples, matrix spike recoveries and surrogate spike recoveries reported by the primary laboratories were within the control limits, with the exception of one matrix spike result (mercury) from SLR 2015b. Overall, however, the matrix spike recoveries

do not indicate a sustained pattern of reduced precision by the testing laboratory and are considered by the auditor not to affect the overall reliability of the analytical data.

- Holding time compliance reports provided by both laboratories confirmed that all samples were analysed within their holding times for all analyses undertaken, with the exception of ASLP PAH results (SLR 2015b). The consultant noted that ASLP results were utilised to identify if the reported PAH impacts in two sample locations were likely to leach into groundwater (refer also to **Section 7**). The impact of the holding time non-compliance on this data is currently unclear, and the auditor considers these results indicative, and the consultant (**Section 7**) reported that, given fill material has not been adequately characterised and groundwater quality has not been assessed to date, the risk posed by contaminants in soil to groundwater should be appropriately assessed in a future contamination assessment.

5.6 Audit Findings

The QA/QC measures employed by NA 2010 were checked and, overall, were found to be insufficient. In particular, no trip blanks, trip spikes, rinsate samples or inter-laboratory duplicate samples were collected during sampling works, and some laboratory documentation (COCs, SRN) were not included. In addition, the consultant only targeted shallow fill (with fill in only one location delineated) and the number of sampling locations did not meet the requirements of EPA 1995. As such, the auditor considers the results of the NA 2010 investigation are indicative only.

The QA/QC measures employed by SLR 2015b were checked and generally found to adequately comply with the requirements outlined in OEH 2011, DEC 2006 and NEPC 2013. The laboratory QA/QC results have been reviewed and the results indicate that the analytical laboratories were achieving adequate levels of precision and accuracy. However, the auditor notes some deficiencies in the sampling and analytical protocols undertaken by the consultant as follows:

- Not all COPCs were analysed, with analyses for dioxins and phenols not conducted.
- The depths of fill materials at the southwest portion of the site were not delineated.
- The number of sampling locations does not meet the requirements of EPA 1995.
- Asbestos sampling (sample size and number of locations) did not meet the requirements of WA DOH 2009.

Based on the above deficiencies, the consultant (SLR 2015b) reported that additional assessment will be required at the site (refer to **Section 7** for additional detail). The auditor agrees with this assessment, and additional assessment and analytical data will be required during the remediation/validation works.

6. Assessment Criteria

6.1 Soil Criteria

The consultant (SLR 2015b) reported that the intended future use of the site is for a maritime facility (i.e., commercial/industrial landuse). Based on this, the consultant assessed the analytical results against the following adopted soil criteria:

- Health Investigation Levels (HILs) for commercial and industrial landuse (HILs-D) listed in Table 1A (1) of NEPC 2013.
- Health Screening Levels (HSL) for direct for contact commercial and industrial landuse listed in Table B4 of Friebel & Nadebaum (2011).
- HSLs for vapour intrusion listed in Table 1A (3) in NEPC (2013).
- HSLs for asbestos contamination in soil from NEPC 2013, which are based on specific land use exposure scenarios for three forms of asbestos: bonded asbestos containing material (ACM), friable asbestos (FA) and asbestos fines (AF).

The consultant (SLR 2015b) also referenced Ecological Screening Levels (ESLs) for commercial/industrial (course/fine) from NEPC 2013, and Ecological Investigation Levels (EILs) for commercial/ industrial.

A summary of the above referenced criteria is listed below in **Tables 6.1, 6.2, 6.3, 6.4** and **6.5**.

The previous consultant (NA 2010) reported that analytical results were assessed against the adopted soil assessment criteria for the (then) proposed site use as a public boat ramp, consisting of the following:

- Health Investigation Levels (HILs) 'E' (Parks, recreational open spaces and playing fields, including secondary schools) from National Environment Protection Measure (NEPM) for the Assessment of Site Contamination (NEPC 1999)
- The Guidelines for Assessing Service Station Sites (NSW EPA, December 1994).

The auditor notes the guidelines referenced in NA 2010 have either been superseded (NEPC 1999, superseded by NEPC 2013) or rescinded by the NSW EPA (EPA 1994).

Table 6.1: Health-Based Investigation Levels and Ecological Investigation Levels – Commercial/Industrial (mg/kg)

Substance	Health-Based Investigation Levels (commercial/industrial)	Ecological Investigation Levels (commercial/industrial)
Metals		
Arsenic	3000	160
Cadmium	900	-
Chromium	-	310-660*
Chromium (VI)	3600	-
Copper	240 000	85-1200*
Lead	1500	1800
Mercury (inorganic)	730	-
Nickel	6000	55-960*
Zinc	400 000	110-2000*
PAHs		
Benzo(a)pyrene TEQ	40	-
Naphthalene	-	370
Total PAHs	4000	-
PCBs		
Total PCBs	7	-

Substance	Health-Based Investigation Levels (commercial/industrial)	Ecological Investigation Levels (commercial/industrial)
OCPs		
DDT+DDD+DDE	3600	640 (DDT)
Aldrin+Dieldrin	45	-
Chlordane	530	-
Endosulfan	2000	-
Endrin	100	-
Heptachlor	50	-
HCB	80	-
Methoxychlor	2500	-
Mirex	100	-
Toxaphene	160	-
Other		
Phenols	240 000	-
Pentachlorophenol	660	-
Cresols	25 000	-

*Requires calculation depending on soil properties (i.e. pH, cation exchange capacity).

Table 6.2 Soil Health Screening Levels for Vapour Intrusion – HSL-D Commercial/ Industrial (mg/kg), Sand

Substance	0 m to <1 m	1 m to <2 m	2 m to <4 m
Benzene	3	3	3
Toluene	NL	NL	NL
Ethylbenzene	NL	NL	NL
Xylenes	230	NL	NL
Naphthalene	NL	NL	NL
F1 (TRH C_6-C_{10} – BTEX)	260	370	630
F2 (TRH >C_{10}-C_{16} – naphthalene)	NL	NL	NL

Table 6.3 Soil Health Screening Levels for Direct Contact (mg/kg)

Substance	HSL-D Commercial/Industrial
Benzene	430
Toluene	99 000
Ethyl benzene	27 000
Xylenes	81 000
Naphthalene	11 000
TRH C_6-C_{10}	26 000
TRH >C_{10}-C_{16}	20 000
TRH >C_{16}-C_{34}	27 000
TRH >C_{34}-C_{40}	38 000

Table 6.4 Ecological Screening Limits – Commercial/Industrial (Course/Fine)

Substance	Commercial and Industrial
F1 C_6-C_{10}	215 (Coarse/Fine)
F2 >C_{10}-C_{16}	170 (Coarse/Fine)
F3 >C_{16}-C_{34}	1700 (Coarse)/2500 (Fine)
F4 >C_{34}-C_{40}	3300 (Coarse)/6600 (Fine)
Benzene	75 (Coarse)/95 (Fine)
Toluene	135 (Coarse/Fine)
Ethylbenzene	165 (Coarse)/185 (Fine)
Xylenes	180 (Coarse)/95 (Fine)
Benzo(a)pyrene	0.7* (Coarse/Fine)

*1.4 mg/kg as noted in the NEPM 1999 Technical Working Group Errata Update 6 February 2014

Table 6.5: Health Screening Levels – Asbestos (w/w)

Asbestos	Commercial/Industrial D – Health Screening Level
Bonded ACM	0.05 %
FA and AFa (friable asbestos)	0.001%
All forms asbestos	No visible asbestos for surface soil

Note 1: Bonded ACM – bonded asbestos; fibrous asbestos (FA); asbestos fines (FA) – free fibres of asbestos, small fibre bundles and ACM fragments that pass through 7 mm x 7mm sieve. .
Note 2: The screening level of 0.001 % w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.

The consultant (SLR 2015b) noted that for the purposes of the Limited Contamination Assessment (SLR 2015b), criteria of 'no visible asbestos containing materials on the surface' and 'no asbestos fibres detected in samples' had been adopted as an initial screening criteria.

In addition to the above criteria, the auditor notes that the consultant did not reference the Management Limits from NEPC 2013, however, for completeness these levels are presented below in **Table 6.6**.

Table 6.6 Management Limits (mg/kg dry soil)

TPH Fraction	Commercial and Industrial
F1 TRH C_6-C_{10}	700 (Coarse)/800 (Fine)
F2 >C_{10}-C_{16}	1000
F3 >C_{16}-C_{34}	3500 (Coarse)/5000 (Fine)
F4 >C_{34}-C_{40}	10 000

6.2 Sediment Criteria

The consultant (SLR 2015b) assessed the analytical results against the following guidelines, which form the adopted sediment criteria for the site:

- The Interim Sediment Quality Guideline (ISQG) – Low Criteria presented in Table 3.5.1 of ANZECC/ARMCANZ (2000), summarised below in **Table 6.7**.
- Human health direct contact criteria for soil comprising HSLs for commercial/industrial landuse (Table B4 of Friebel, E & Nadebaum, P 2011) and HILs for commercial/industrial landuse (HILs-D - Table 1A (1) of NEPC 2013) presented above in **Tables 6.1 and 6.2**.

Table 6.7 Interim Sediment Quality Guideline (mg/kg)

Substance	ISQG – ANZECC 2000 (mg/kg)*
Metals	
Arsenic	20
Cadmium	1.5
Chromium	80
Copper	65
Lead	50
Mercury (inorganic)	0.15
Nickel	21
Zinc	200
PAHs	
Naphthalene	160
Acenaphthylene	44
Acenaphthene	16
Fluorene	19
Benzo(a)pyrene	430
Phenanthrene	240
Anthracene	85
Fluoranthene	600
Pyrene	665
Benzo(a)anthracene	261
Chrysene	384
Dibenzo(a,h)anthracene	63
Total PAHs	4000
PCBs	
PCBs (total)	23
OPPs	
Total DDT	1.6
DDE	2.2
DDD	2.2
Chlordane	0.5
Dieldrin	0.02
Endrin	0.02
Lindane	0.32

*Normalised to 1% TOC for organic constituents.

6.3 Audit Findings

In consideration of the proposed future landuse for a maritime facility (commercial/industrial landuse), the investigation works undertaken by the consultant (SLR 2015b) assessed soil and sediment conditions to commercial/industrial criteria in accordance with the guidelines approved by the NSW EPA, namely, NEPC 2013 (soils) and the ISQG (sediments).

The criteria are appropriate for commercial/industrial landuse, which is considered by the auditor to be broadly consistent with the proposed site use as a maritime facility (noting the site survey plan (**Appendix C**) indicates the proposed activities/uses of the land portion of the site to include a community skills workspace, boat sheds and exhibition space).

The adopted soil and sediment criteria were checked against, and were consistent with, EPA endorsed criteria, and the auditor considers the adopted criteria were suitable for broadly assessing the contamination status of the site for proposed commercial/industrial landuse. In addition, as part of the SLR 2015b investigation, previous soil data from NA 2010 was reassessed in accordance with the adopted criteria from NEPC 2013.

The consultant (SLR 2015b) noted that, should evidence of petroleum hydrocarbon contamination be identified in site soils or groundwater (significant odours, elevated PID readings, sheen/LNAPL in groundwater), then assessment of soil vapour intrusion risk should be

considered (soil vapour HSLs for vapour intrusion in Table 1A(5) in NEPC 2013). No such observations were reported by the consultant (**Section 7**), and as such, these additional criteria were not considered.

As part of the investigation and in consideration of the proposed development, the consultant (SLR 2015b) undertook a review of the applicability of ESLs and EILs. Based on the design of the proposed development comprising permanent hardstand across the site (i.e., buildings and pavements), the consultant considered there to be limited sensitive ecological receptors at the site and did not consider ESLs or EILs as part of the assessment. The auditor considers that, based on the proposed future use of the site for commercial/industrial landuse comprising a permanent paved/building surface, the consultant's justification of not applying ESLs and EILs is appropriate.

The consultant did not report assessment criteria for dioxins. The auditor notes that appropriate screening criteria for dioxins will need to be selected as part of the proposed additional investigations (refer also to **Section 8**).

The consultant (SLR 2015b) referenced relevant criteria from NEPC 2013/WA DoH 2009 for the asbestos criteria, with criteria of 'no visible asbestos containing materials on the surface' and 'no asbestos fibres detected in samples' adopted as initial screening criteria. The asbestos criteria adopted by the consultant are considered appropriate, however, as noted below in **Section 7**, additional assessment for asbestos is required at the site.

Overall, the auditor considers that the soil and sediment criteria adopted by the consultant (SLR 2015b) were appropriate for assessing the contamination status across the site for the proposed landuse.

7. Site Investigation Results

7.1 Field Observations

7.1.1 NA 2010

Relevant findings noted during the field investigation undertaken by Noel Arnold are summarised as follows:

- No obvious surface contamination or stressed vegetation was noted or observed.
- The subsurface profile generally comprised:
  - Rubble/sand, overlying
  - Bitumen or roadbase (at some locations), overlying
  - Sandstone/sandy fill.
- Natural materials (such as sand and/or sandstone) were reported at some test pit locations from 0.2 – 0.5 m bgs.

7.1.2 SLR 2015b

Relevant findings noted during the field investigation undertaken by SLR are summarised as follows:

- The subsurface profile generally comprised:
  - Gravelly sand and crushed sandstone fill, with a layer of ash observed in two test pit locations at the northern upper level (TP01 and TP04). Fill material also comprised occasional bricks, concrete, charcoal, timber, bitumen and glass.
  - Natural materials were observed underlying the fill, comprising had grey/orange/brown sandstone.
- Slight to moderate petroleum hydrocarbon odour was observed in test pit TP02 between 1m and 2m depth. No other odours were observed.
- Staining was observed at two test pit locations as follows:
  - Minor black staining in TP02, observed sporadically between 3 m and 4 m bgs.
  - Black staining in TP05 at 1.5 m bgs.
- No potential asbestos containing materials were observed in the test pits excavated.

7.2 Soil Investigation Results

The consultants (NA 2010 and SLR 2015b) provided summary results tables (**Appendix F**) in addition to detailed laboratory reports and chain of custody documentation. A summary of the investigation results is provided as follows.

7.2.1 NA 2010

All analytical results from the NA 2010 investigation were either below the laboratory limits of reporting (LORs) and/or the adopted soil assessment criteria (**Section 6.1**) with the exception of the following:

- TPH C_{10}-C_{36} in samples TP05-0.4m (1110 mg/kg) and TP07-0.3m (1040 mg/kg), which exceeded the adopted soil assessment criterion (EPA 1994) of 1000 mg/kg.

- Benzo(a)pyrene in samples TP03-0.6m, TP05-0.4m, TP06-0.5m, TP07-0.3m and TP08-0.3m exceeded the adopted soil assessment criterion of 2 mg/kg, with results ranging from 7.5 mg/kg to 41 mg/kg.
- Total PAHs in samples TP03-0.6m, TP05-0.4m, TP06-0.5m, TP07-0.3m and TP08-0.3m exceeded the adopted soil assessment criterion of 40 mg/kg, with results ranging from 79 mg/kg to 363 mg/kg.

7.2.2 SLR 2015b

All analytical results from the SLR 2015b investigation were either below the laboratory LORs and/or below the adopted soil criteria (**Section 6.1**), with the exception of the following:

- Carcinogenic PAHs (benzo(a)pyrene TEQ) in soil samples TP04/02/0.4-0.5 (150 mg/kg) and TP05/04/1.5-1.7 (320 mg/kg) exceeding the HIL-D of 40 mg/kg.
- TRH >C_{16}-C_{34} in sample TP05/04/1.5-1.7 (4000 mg/kg) exceeding the Management Limit criterion of 3500 mg/kg.

Asbestos was not detected in any of the analysed samples.

Results of the ALSP PAH analyses (pH 5 extract) indicated some low leachability for sample TP05/04/1.5-1.7 as follows:

- Naphthalene reported at 0.4 μg/L;
- 1-methylnaphthalene reported at 0.1 μg/L;
- Acenaphthene reported at 1.0 μg/L;
- Fluorene reported at 0.4 μg/L; and
- Total PAHs reported at 2 μg/L.

7.3 Sediment Investigation Results

The consultant (SLR 2015b) provided summary results tables (**Appendix F**) in addition to detailed laboratory reports and chain of custody documentation. In comparison to the adopted sediment criteria (**Section 6.2**), the following results were reported.

All results were either below the laboratory LOR or below the adopted soil criteria with the exception of the following:

- Copper (69 mg/kg) in sediment sample S03, which exceeded the adopted ISQG Low trigger value for copper of 50 mg/kg.
- Lead (84 mg/kg) in sediment sample S03, which exceeded the adopted ISQG Low trigger value for lead of 65 mg/kg.

7.4 Consultants Interpretation and Conclusions

The consultant's interpretation and conclusions (NA 2010 and SLR 2015b) are presented as follows:

7.4.1 NA 2010

Based on a review of the initial investigation results, consultant (NA 2010) reported that soil sample results indicated the targeted soil sampling areas do not comply with the adopted site investigation levels for the proposed use as a public boat ramp and were not considered suitable for use in construction of the boat ramp.

The consultant recommended the following as part of the redevelopment of the site:

- Soil should be excavated and stockpiled according to visual similarities.
- As part of the excavation works, building/demolition rubble should be removed to the extent practical and separately stockpiled. Each stockpile should then be visually inspected and/or sampled according to the NSW EPA Waste Classification Guidelines and given a waste classification.
- If suspected clean stockpiles are developed, this material should be sampled and compared to the NSW EPA ENM Exemption criteria for potential beneficial reuse on-site.
- Material not able to be beneficially reused on the site should be disposed off-site to a suitably licensed facility.

7.4.2 SLR 2015b

Based on a review of the initial investigation results (NA 2010) and the recent assessment (SLR 2015b), the consultant (SLR 2015b) concluded the following:

- Insufficient data is available to ascertain the extent of the PAH impact identified at TP04 and TP05, and as such it would be prudent to assume that the fill material at the site as a whole is potentially contaminated.
- Presence of dioxins has not been assessed and will require assessment during a future assessment prior to commencing construction works.
- Potentially contaminated fill material is unlikely to pose a health risk to future site users, but may do so to construction workers and future maintenance workers.
- It would prudent to assume (perhaps conservatively) that the sediments within the proposed development area of the bay are likely to be contaminated with metals and PAH, though the consultant considered that such contaminated sediments are unlikely to pose a health risk to construction workers or future site users or maintenance workers.
- Potentially contaminated fill material is considered unlikely to pose a risk to the environment, though potential risks to groundwater quality should be evaluated through a future additional assessment.
- A sediment management plan should be prepared and implemented to minimise impacts to the benthic and aquatic ecosystems that may be caused through the disturbance of potentially contaminated sediments.
- The site is unsuitable in its current condition, for the proposed commercial land use.
- The site could be made suitable for the proposed land use scenario, subject to the remediation or management of the potentially contaminated soils.

The consultant recommended the following:

- Additional contamination assessment should be conducted prior to commencing construction or significant earth works in order to:
    - Assess the potential presence of dioxin and phenolic compounds within the fill material across the site.
    - Characterise the fill material across the site with a sufficient level of confidence (i.e. appropriate sample density), including the leachability of identified contaminants.
    - Assess the groundwater quality, depending on the findings of the above assessments.

- A Sediment Management Plan should be prepared to minimise potential harm to the aquatic and benthic ecosystems, and to minimise potential of construction workers for exposure to contaminated sediments.
- An acid sulfate management plan should be prepared and implemented during the proposed development works.
- An asbestos investigation that meets the requirements of the WA DOH (2009) guidelines should be conducted prior to commencing construction or significant earth works.
- All data available at this stage should be incorporated in to a RAP, which should outline a remediation or management strategy to enable the site to be rendered suitable for the proposed land use. The RAP should be updated as required, following the completion of the above recommended further assessment.

7.5 Audit Findings

The consultants (NA 2010 and SLR 2015b) provided tables that adequately summarised the laboratory results. The concentrations of contaminants reported by the consultants were checked against, and found to be consistent with, those reported by the laboratory and were considered to be generally accurate and complete.

The site plans provided by the consultants (NA 2010 and SLR 2015b) were to scale and adequately identified the sampling locations relevant to the main site features such as boundaries and street frontages.

NA 2010

The site investigation completed by NA 2010 was not comprehensive as fill materials were not delineated at most sampling locations, and the investigation was conducted at only a portion of the current site (i.e., the central and eastern portion of the site). In addition, asbestos sampling was not considered sufficient, with only three on-site locations sampled for asbestos (which was sub-sampled by the laboratory). As such, the NA sampling can be considered indicative only, with the relevant information factored into the SLR investigation/discussion (SLR 2015b) and remedial/ management strategy (SLR 2015c).

SLR 2015b

The extent of site history information presented by the consultant (as reported in SLR 2011 and summarised in SLR 2015b) is considered adequately complete for the purposes of identifying a range of potential contamination issues at the site as part of the site investigation process.

The sample intervals at each of the sampling locations were appropriate given the identified potential contamination sources at the site and the site geology.

The number of soil sampling locations conducted during SLR 2015b (five locations) did not meet EPA 1995 minimum sampling requirements of nine to eleven locations for a site with an area of 3850 m^2. As such, the auditor considers that that the sampling density undertaken by the consultant (SLR 2015b) did not meet EPA 1995 minimum sampling requirements, which is also based on the following considerations:

- Fill materials do not appear consistent across the site, in which the materials at the north half of the site (TP1 and TP4) appear to contain a mix of gravelly and silty sand with distinct ash layers, whereas the remaining test pits (TP2, TP3 and TP5) predominantly contained crushed sandstone (and other miscellaneous fill materials) with no ash layers observed.

- Analytical results of the ash layer samples from TP1 and TP4 indicate different results (<LORs and 0.4 mg/kg benzo(a)pyrene TEQ in the two ash layer samples from TP1, with 150 mg/kg benzo(a)pyrene TEQ in the ash layer sample from TP4).
- Depth of fill was not delineated in two of the five test pits due to test pit collapse at 4.3 m bgs (TP2) and 3.5 m bgs (TP3), which provides a data gap for the approximate western half of the site.

Dioxins and phenolic compounds in soil were not assessed during the SLR 2015b investigation, which is also considered a deficiency.

Asbestos analysis was limited to ten samples comprising 40 g sample size. This does not conform to NEPC 2013 requirements, and as such the asbestos analysis conducted by the consultant (SLR 2015b) is considered to provide a preliminary indication only.

With regards to the sediment sampling and results, the consultant reported the following:

- One sediment sample result contained concentrations of copper and lead marginally exceeding the adopted assessment criteria.
- The sediment sample locations were limited to near shore locations and considered unlikely to be reflective of the sediment quality within the footprint of the proposed wharf. As such, the consultant considered that it would prudent to assume that the sediments within the proposed development area of Blackwattle Bay are likely to be contaminated (metals and PAHs).
- It is considered unlikely that future site users will be subjected to risks that may be posed by sediments through the use of the proposed wharf or the boardwalk, as potential for direct contact with sediment based on the proposed land use is unlikely. The consultant and the client confirmed in follow-up correspondence (**Appendix B**) that, based on the proposed design of the wharf and site's foreshore, there is no potential for site users to come in contact with any sediments on the sea wall/water junction.
- The proposed development will likely cause minor disturbance to the sediment in areas where the wharf and the boardwalk is proposed, and as such, a sediment management plan should be prepared and implemented to minimise impacts to the benthic and aquatic ecosystems that may be caused through disturbance of contaminated sediments.

Based on the above considerations, the auditor agrees with the client's conclusions relating to sediments, and notes an appropriate sediment management plan will need to be prepared and implemented prior to commencement of site development works.

The consultant noted that the proposed development will include site improvements, including construction of slab, paving or landscaping across the entire site, and this limits the environmental values that require consideration (i.e., support of plant growth). Based on this, the consultant considered that further assessment of unacceptable risk to terrestrial ecosystems through contaminants that may be present in site soils is not warranted. Based on available site plans and the proposed remedial strategy (**Section 8**), the auditor considers this appropriate.

In general, the consultant (SLR 2015b) provided an assessment and consideration to contaminant odours emanating from the site and soil discolouration during the investigation process, however, as noted above, the extent of investigation conducted at the site during the SLR 2015b investigation is considered insufficient.

A groundwater investigation was not conducted. The consultant reported that potentially contaminated fill material is considered unlikely to pose a risk to the environment, though potential risks to groundwater quality should be evaluated through a future additional

assessment. The auditor notes a groundwater investigation will be required in the event fill materials are encountered that may pose a risk to groundwater. The existing data do not indicate the potential for gross or widespread impact of groundwater.

Overall, the conclusions reached by the consultants in relation to soil and sediment contamination issues are considered appropriate, and the consultant is considered to have obtained and reported results in a manner that enables conclusions to be drawn regarding the need for remediation. However, additional sampling is required to adequately conduct a waste classification for materials requiring off-site disposal, in addition to additional assessment(s) required to adequately assess the site in accordance with NSW EPA requirements (refer to **Section 8** for additional detail).

8. Proposed Remediation and Validation Plan

8.1 Remediation Objectives

The consultant (SLR 2015c) reported that the site is to be developed for commercial and industrial land use (maritime facility), comprising a two story building with a two storage areas, exhibition spaces, meeting rooms, amenities, an entrance lobby and reception areas.

The consultant reported that the remediation goals are to manage the identified PAH impacted soils at the site in a manner that will not present an unacceptable risk of exposure to human health for the proposed landuse scenario (commercial/industrial).

8.2 Remediation Options and Preferred Approach

The consultant (SLR 2015c) reported the preferred remedial strategy at the site is in-situ capping to provide a suitable physical barrier that would separate future site users from the identified and assumed contamination. This would be achieved through the building footprints and the paved surfaces that are proposed to be constructed. This strategy was selected based on the nature of the proposed development, and the ease of which this remediation strategy could be incorporated in to the proposed construction works.

8.3 Remediation Details

The consultant (SLR 2015c) provided details of the proposed remediation works including the following:

Excavation of impacted material and waste disposal

The consultant noted that, although it is intended that the identified and assumed impacted soils will be capped in-situ, it is likely that a minor quantity of potentially impacted soils will require excavation or drilling, which may require off-site disposal. Details were presented as follows:

- If excavated or drilled spoil requires off-site disposal, the material should be stockpiled for waste classification by the environmental consultant, and be disposed to a disposal facility that is licensed to receive that classification of waste.
- The movement of waste material will be tracked using a material tracking system, to be implemented by the construction contractor and checked by the environmental consultant.
- All disposal dockets will be retained for reconciliation against the material tracking records, and for inclusion in the validation report, to demonstrate that the waste was appropriately disposed to licensed facilities.
- Random checks will be employed by the environmental consultant to track the truck movements from the site to the nominated disposal facility and back.

Creation of capping layer

The consultant reported that the capping layer to provide a suitable physical barrier that would separate future site users from the identified and assumed contamination will be achieved through building footprints and the paved surfaces that are proposed to be constructed, together with a suitable marker layer on top of the soil beneath the building footprint and pavements. The consultant considered that the combination of the proposed building footprint and pavement, together with an appropriate management strategy, will provide a satisfactory physical barrier to minimise potential contact that future site users may have with the identified and assumed impacted soils.

Details of the proposed marker layer nominated by the consultant included non-woven, Bidum-type geo-fabric that is of a colour that would be easy to identify when stained with soil (i.e., bright orange or white) and the layers of geo-fabric should be overlapped by at least 20 cm and joined together appropriately.

The consultant reported other capping requirements and considerations as follows:

- Any paving is likely to be underlain by a well-compacted subgrade layer, which would be difficult to breach inadvertently and without significant effort by site users.
- Given the commercial nature of the proposed land use, it is unlikely that there will be an appreciable potential for the site users to attempt to remove unfixed pavers and the compacted subgrade to access the underlying impacted and assumed impacted soil.
- The implementation of an appropriate environmental management plan will further minimise potential for the pavement to degrade to a point where potentially contaminated soil will become accessible to future site users.
- If landscaping areas or garden beds are proposed, the RAP would need to be amended to include provisions for the consideration of such unsealed areas. Given that the site is proposed to be used for commercial purposes, any potential garden beds (though none is shown on the proposed plans) will likely be professionally maintained, and as such is unlikely to result in the erosion of more than 300 mm of placed landscaping medium, and site users are unlikely to dig the landscape medium, it is anticipated that minimum 300 mm thick layer of imported, clean landscape medium over the assumed and known impacted soils will likely be sufficient to provide a barrier between the future site users and the identified and potentially impacted soils.
- Any excavations or services trenches that may require to be excavated to facilitate the proposed development should be lined appropriately with the marker layer to minimise potential for construction workers to contact the identified and potentially impacted soils.

8.4 Additional Assessments

The consultant (SLR 2015c) recommended that the following additional assessments be conducted (and the RAP be updated to reflect the results obtained) prior to the commencement of construction works or any significant earth works:

- Additional contamination assessment should be conducted to:
  - Assess the potential presence of dioxin and phenolic compounds within the fill material across the site; and
  - Characterise the fill material across the site with a sufficient level of confidence (i.e. appropriate sample density), including the leachability of identified contaminants.
- Assess the groundwater quality, depending on the findings of the above assessments.
- Conduct an asbestos investigation that meets the requirements of the WA DOH (2009) guidelines prior to commencing construction or significant earth works.
- A SAQP should be prepared by the environmental consultant and provided to the site auditor to review and endorsement prior to conducting the additional assessment works. The SAQP will present the sample densities, sampling methods, assessment criteria and applicable decisions with regards to remediation requirements.
- The results of the proposed additional investigations will need to be reported appropriately in a contamination assessment report, which should be presented to the site auditor for review

and endorsement. This RAP will need to be updated (and reviewed and endorsed by the site auditor) as appropriate following the completion of the proposed additional assessments.

8.5 Validation Program

8.5.1 Validation Assessment

The consultant (SLR 2015c) reported the following requirements of the validation assessment:

- The validation assessment will need to confirm that the marker layer has been placed appropriately across the entire land portion of the site, including within any excavations and services trenches that may be excavated.
- Following the completion of the works on the site surface, the environmental consultant will undertake a detailed visual assessment of the site to assess if all parts of the site have been capped with either a building footprint or pavement.
- The thickness of the cap is not a consideration for successful validation, unless the area considered is unsealed (such as a grassed area or a landscaped area, which do not currently appear on the proposed development plans). Should such unsealed areas be introduced by the proponent through design alterations, the thickness of the cap in any such unsealed areas will need to be greater than 300 mm. An intrusive assessment or survey records will need to be used to validate the cap thickness in such areas.
- The environmental consultant will compile a detailed photographic record of the finished site surface.

8.5.2 Imported Fill Assessment

The consultant (SLR 2015c) reported that acceptance of any imported fill material will consider:

- VENM (as per the definition specified in the POEO ACT 1997) and is based on anticipated background levels for inorganics, laboratory detection limits for organics and no asbestos (visually and laboratory).
- ENM (as per the Excavated Natural Materials exemption under the POEO (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A) and is based on concentrations of contaminants assessed in the material that do not exceed the ENM assessment criteria, and the material does not contain asbestos.

8.5.3 Waste Classification

The consultant (SLR 2015c) reported that wastes to be removed from the site will be classified in accordance with NSW EPA (2014), and disposed to appropriately licensed facilities. The consultant also reported the additional following requirements:

- Waste disposal dockets should be provided to the environmental consultant within two days of the disposal event.
- Disposed waste material should be documented by the contractor in a comprehensive material tracking worksheet, which must account for all material imported, disposed off-site and moved within the site.
- The environmental consultant should verify the material tracking worksheet on a weekly basis, and should include reconciliation of the disposal dockets provided to the environmental consultant.

- The environmental consultant should also undertake random tracking of the contractor's truck movements to the waste disposal facility at an appropriate frequency, to assess if the waste is being transported to the proposed disposal facility appropriately.

8.5.4 Unexpected Finds

The consultant (SLR 2015c) provided a contingency plan that outlines procedures if yet unidentified contamination is present within the fill material, and may be encountered during the proposed construction works. Potentially hazardous substances could include, but are not limited to the following:

- Asbestos containing materials;
- Underground storage tanks;
- Buried containers and drums;
- Phase separated hydrocarbons;
- Powders and other suspicious buried material; and
- Evidence of contamination including significant staining, odours and discolouration.

8.5.5 Validation Report

Following the completion of all remediation and validation activities, a validation report will be prepared by the environmental consultant in accordance with NSW OEH 2011 *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*.

The validation report will include the following:

- Executive summary;
- Scope of work;
- Site identification;
- Summary of site history;
- Summary of site condition and surrounding environment;
- Summary of geology and hydrogeology;
- Information on remediation works, including site activities, monitoring results (hygiene), waste documentation correlation and validation;
- Results of field work;
- Field quality assurance/control information and evaluation;
- Site validation discussion;
- Ongoing site monitoring requirements (if any); and
- Conclusions and recommendations.

8.6 Site Management

The consultant (SLR 2015c) provided a summary of relevant site management and occupational health and safety controls that require implementation during remedial works, and provided a guide to the minimum site management requirements that should be implemented during the remedial works, including:

- Health and safety requirements including preparation of a project-specific safe work method statement (SWMS) or job safety analysis (JSA).
- Soil and water management requirements, including the preparation of a detailed soil and water management plan by the earthworks contractor prior to the commencement of site works, in accordance with the Landcom (2004) *Managing Urban Stormwater – Soil and Construction.* The soil and water management plan should also take into consideration the following:
    - Stockpiles will not be placed on footpaths or nature strips (unless approved by the planning consent authority/Council), and will be placed away from drainage lines, gutters, stormwater pits or inlets, and will be stored in a secure area.
    - Covering of the stockpiles will be considered by the contractor, subject to site conditions, during expected inclement weather and the duration the stockpile is expected to remain on-site, and will be placed on a level area as a low elongated mound.
- Should dewatering of the site be required, any discharge of surface water to surrounding water bodies or storm water or sewer needs to be conducted with specific approvals from the applicable regulatory authority (i.e. trade waste license, council approvals etc.).
- Noise requirements, including noise levels from the site during the project will not exceed the limits indicated in AS2436-1981, and no 'offensive noise' as defined under the Protection of the Environment Operations Act 1997 will be created during construction works/activities.
- Dust management measures, which may include:
    - Erection of dust screens around the perimeter of the site.
    - Securely covering all loads entering or exiting the site.
    - Use of water sprays across the site to suppress dust.
    - Keeping excavation surfaces moist, where practical and deemed necessary.
    - Wetting down of placed fill material during spreading.
    - Good housekeeping practices including sweeping of hardstand surfaces.
    - Minimising soil disturbance works during windy days.
    - Maintaining stabilised site access/egress points for vehicles.
- Odour management, including consideration given to:
    - Use of appropriate covering techniques such as the use of plastic sheeting to cover excavation faces or stockpiles in severe conditions.
    - Use of fine mist sprays or foaming agents (which may incorporate deodorizing agents).
    - Use of hydrocarbon mitigating agents on impacted areas/materials.
    - Adequate maintenance of equipment and machinery to minimise exhaust emissions.
- Waste disposal requirements, including materials removed from the site for recycling/disposal shall have regard to the provisions of the POEO Act (1997) and NSW EPA (2014.

8.7 Regulatory Compliance

The consultant (WSP 2015c) reported that the remediation works are likely to classify as Category 1 Remediation work, which will require development consent. The consultant also reported that

the Development Application for the proposed development, which will include a proposal to remediate the site, will be assessed by the Department of Planning and Environment (DPE), and that approval will include provisions for the remediation of identified contamination. The approval authority will require appropriate notification of the remediation works, in accordance with the requirements of the State Environmental Protection Policy SEPP55.

8.8 Long Term Site Management

Based on the preferred remediation option outlined by the consultant (SLR 2015c) in which the identified and assumed impacted soil is proposed to be capped and retained, a long term Environmental Management Plan (EMP) will be prepared and implemented to minimise the risk of exposure to impacted soils.

The consultant reported that the EMP should be legally enforceable, may be incorporated into a lease contract for the site, and should also be noted in the property title and Section 149 Certificate. The EMP will also need to address the following:

- Describe the contained contamination including nature, location and depth of the contamination.
- Describe measures required to maintain integrity of the containment, and the physical separation that is required between end site users and the contamination.
- Describe the frequency of checks and observations required to assess the integrity of the containment.
- Assign responsibilities for the implementation of the EMP.
- Procedure for ensuring appropriate restoration of the capping layer, and protection of the health and safety of the workers, in the event that the containment cap needs to be breached.
- Specify a timeframe for the review of the EMP.

8.9 Audit Findings

The consultant's (SLR 2015c) nominated remediation objectives were generally appropriate and consistent with the proposed future use of the site as a maritime facility (including boat storage, exhibition space, community work space and maintenance workshop, publicly accessible foreshore walk, fixed wharf, floating pontoons and timber walkway), broadly consistent with commercial/industrial landuse. The auditor accepts the adopted approach to be appropriate and consistent with relevant guidance.

The proposed validation assessment provided by the consultant is considered appropriate and in accordance with relevant guidelines.

The site management provisions appear to broadly control the potential impacts associated with the proposed remediation works, and appear adequately protective of both the remediation workforce and the surrounding environment (including the neighbouring community). The auditor also notes that an appropriate Sediment Management Plan will need to be prepared and implemented as part of the site construction works to:

- Minimise impacts to the benthic and aquatic ecosystems that may be caused through disturbance of contaminated sediments; and
- Minimise the exposure of construction workers to potentially contaminated sediment.

Based on the information contained in the consultant's Remedial Action Plan (SLR 2015c), it is considered that the proposed remediation:

- is technically feasible;
- is environmentally justifiable given the nature and extent of contamination at the site; and
- is consistent with relevant laws, policies and guidelines.

Upon successful completion of the remediation and validation activities, the consultant (SLR 2015c) stated that a validation report will be prepared in accordance with the requirements of OEH 2011. The auditor notes that the validation report must also be prepared in accordance with DEC 2006 and be provided to the Site Auditor for review and endorsement, with the Site Audit Report and Site Audit Statement issued outlining the suitability of the site for the intended use.

The auditor notes the proposed remedial strategy is subject to the following:

- Preparation of a Validation SAQP addressing the limited data gaps. The VSAQP must be reviewed by a Site Auditor prior to commencement of remediation works.
- The RAP be updated to incorporate the findings of the additional contamination assessment required to address the identified data gaps. The updated RAP must be reviewed by a Site Auditor prior to commencing site remediation works.
- An Acid Sulfate Soils Management Plan and a Construction Environment Management Plan be prepared for the site work, and both plans must be reviewed and accepted by a Site Auditor prior to commencement of site remediation works.
- An appropriate Sediment Management Plan be prepared and implemented as part of the site construction works.
- An ongoing Environmental Management Plan (EMP), along with the final Validation Report, must be prepared upon completion of the remedial works and submitted to the Site Auditor for review. In accordance with relevant NSW EPA requirements, the EMP must reasonably be able to be made legally enforceable and there must be an appropriate public notification mechanism to inform interested parties as to the requirements relating to the management of contamination at the site.
- Completion of a Site Audit Statement supported by Site Audit Report, certifying suitability of the site for the proposed uses, following the successful completion of the remediation and validation activities.

9. Evaluation of Landuse Suitability

In assessing the suitability of a site for an existing or proposed landuse in an urban context, the decision process for assessing urban redevelopment sites should be followed (Page 50 and 51, DEC 2006), as discussed in the following sections. For the purposes of this assessment, the proposed future landuse of the site is for maritime facility consistent with a commercial/industrial exposure scenario outlined in Section 3 of Schedule B7 NEPC 2013.

9.1 Reporting in accordance with EPA requirements

The documents provided by the assessment consultants have been checked against, and meet the requirements of, OEH 2011. As such, the reporting of the site investigation and the proposed remediation/validation process is considered to be appropriate.

9.2 Contaminant odours have been addressed

The consultant (SLR 2015b) completed an assessment of contaminant odours and soil discolouration in the screening process associated with the investigation works, in which slight to moderate hydrocarbon odours and some minor sporadic black staining was observed. The consultant reported that the identified odours are unlikely to represent potentially significant contamination within the fill material. In addition, the consultant (SLR 2015c) has proposed a remediation and management strategy that takes into consideration the site observations and analytical results obtained to date, and as such contaminant odours are considered to have been adequately addressed. It is noted that additional investigations are required at the site, and should additional odours be encountered during the proposed investigations, they will need to be appropriately addressed within an updated RAP prior remediation works.

9.3 Soils have been assessed against the appropriate investigation levels

The criteria adopted by the consultant for the site investigations have been checked against, and are consistent with, appropriate criteria endorsed by the EPA. The criteria are appropriate for commercial/industrial landuse, which is considered by the auditor to be broadly consistent with the proposed site use as a maritime facility (noting the site survey plan (**Appendix C**) indicates the proposed activities/uses of the land portion of the site to include a community skills workspace, boat sheds and exhibition space).

The auditor notes that the NA 2010 investigation was complete prior to the revisions to NEPC 1999 came into force in June 2013. However, the consultant (SLR 2015b) reviewed the NA 2010 results to NEPC 2013 criteria, and has incorporated these results into the additional remedial strategy. As such, the auditor is satisfied that the transitional requirements outlined by the EPA apply to the investigations undertaken, and the soils are considered to have been assessed against appropriate investigation levels.

9.4 Background soil concentrations have been adequately addressed

During the site investigation the consultants sampled in natural formations, providing a clear indication and representation of local natural soil profiles. The chemical concentrations in soil for the natural soil profile were below the appropriate soil criteria. However, natural materials were not delineated at all areas of the site (in particular, at the southwestern portion of the site) and additional site investigation(s) are proposed (as noted in SLR 2015c), with the findings to be considered into the proposed remedial strategy (and included into an updated RAP) prior to remediation works.

9.5 The human health impacts of chemical mixtures have been assessed

No issues relating to chemical mixtures in relation to the identified contaminants of concern were identified. Hence, there was no requirement to give any further consideration to the impact of chemical mixtures.

9.6 The site management strategy is appropriate

The previously identified PAH impacts and potential source (fill materials) require remediation/ management, as outlined in the RAP (SLR 2015c). The proposed remedial strategy includes capping of the identified impacts under building slab and pavements, with appropriate management required (a long-term EMP).

In accordance with the requirements of DEC 2006, the site management strategy outlined in the RAP (SLR 2015c) is considered to be:

- technically feasible;
- environmentally justifiable given the nature and extent of contamination; and
- consistent with relevant laws, policies and guidelines.

In addition, the auditor considers that identified data gaps can be readily addressed as part of the proposed remediation/validation works.

On this basis, the auditor accepts that the proposed remediation, validation and long-term management strategy is appropriate and, if implemented appropriately, can make the site suitable for the proposed landuse as a maritime facility (commercial/industrial landuse).

9.7 Contaminant migration (actual or potential) has been addressed

The consultant (SLR 2015b) addressed the potential for migration of the identified contaminants of concern through an assessment of soil. There were no reported concentrations of contaminants identified that were considered to pose unacceptable risks to any off-site human or ecological receptors (i.e., through the migration of potential contaminants off-site via groundwater). However, additional assessment is required at the site (as noted in SLR 2015c), which may require assessment of groundwater (depending on the findings of the additional assessment). The additional assessment will need to be conducted during the remediation/validation works, noting the proposed remedial strategy outlined in the RAP (SLR 2015c) will require reassessment should the potential for contamination migration be reported.

10. Audit Summary Opinion

On the basis of the findings of the site audit, and subject to the limitations in **Section 11**, the following summary audit opinions are provided:

- The site assessment activities are considered to have generally met the requirements of the *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (2nd Edition) (DEC 2006), however, additional assessment works are required to adequately assess all areas of the site and COPCs before site remediation works can commence.
- The levels of some contaminants of potential concern (i.e., PAHs) in fill soils are considered to require remediation/management under the proposed site use.
- A RAP (SLR 2015c) has been prepared for the site to address the identified contamination issues. The RAP proposed containment of the identified impacts on-site under a suitable cap and long-term management. The remediation approach documented in the RAP was checked by the auditor and found to be: technically feasible; environmentally justifiable given the nature and extent of the identified contamination; and consistent with relevant laws, policies and guidelines.
- The remedial strategy proposed for the site is appropriate given the identified contamination issues, and is able to make the site suitable for the proposed use as a maritime facility (commercial/industrial landuse), subject to the following:
    - Preparation of a Validation SAQP addressing the limited data gaps. The VSAQP must be reviewed by a Site Auditor prior to commencement of site remediation works.
    - The RAP be updated to incorporate the findings of the additional contamination assessment required to address the identified data gaps. The updated RAP must be reviewed by a Site Auditor prior to commencement of site remediation works.
    - An Acid Sulfate Soils Management Plan and a Construction Environment Management Plan be prepared for the site work, and both plans must be reviewed and accepted by a Site Auditor prior to commencement of site remediation works.
    - An appropriate Sediment Management Plan be prepared and implemented as part of the site construction works.
    - An ongoing Environmental Management Plan (EMP), along with the final Validation Report, must be prepared upon completion of the remedial works and submitted to the Site Auditor for review. In accordance with relevant NSW EPA requirements, the EMP must reasonably be able to be made legally enforceable and there must be an appropriate public notification mechanism to inform interested parties as to the requirements relating to the management of contamination at the site.
    - Completion of a Site Audit Statement supported by Site Audit Report, certifying suitability of the site for the proposed uses, following the successful completion of the remediation and validation activities.

11. Limitations

This audit was conducted with a reasonable level of scrutiny, care and diligence on behalf of the client for the purposes outlined in s.47(1) of the *Contaminated Land Management Act 1997.* The data used to support the conclusions reached in this audit were obtained by other consultants and the limitations which apply to the consultant's report(s) apply equally to this audit report.

Every reasonable effort has been made to identify and obtain all relevant data, reports and other information that provide evidence about the condition of the site, and those that were held by the client and the client's consultants, or that were readily available. No liability can be accepted for unreported omissions, alterations or errors in the data collected and presented by other consultants. Accordingly, the data and information presented by others are taken and interpreted in good faith.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this audit are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G and the Site Auditor reserve the right to review the report in the context of the additional information.

Appendix A: Guidelines made or approved by the EPA

Guidelines made or approved by the EPA (s.105 CLM Act 1997)

Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, 2000 (ANZECC/ARMCANZ 2000)

Australian Drinking Water Guidelines, National Health and Medical Research Council and Agriculture and Resource Management Council of Australia and New Zealand, 2011 (NHMRC/NRMMC 2011)

Composite Sampling, Lock, W. H., National Environmental Health Forum Monographs, Soil Series No.3, 1996, SA Health Commission, (NEHF 1996)

Contaminated Sites: Sampling Design Guidelines, NSW EPA, 1995 (EPA 1995)

Contaminated Sites: Guidelines for the Vertical Mixing of Soil on Former Broad-Acre Agricultural Land, NSW EPA, 1995 (EPA 1995b)

Contaminated Sites: Guidelines for the Assessment and Clean Up of Cattle Tick Dip Sites for Residential Purposes, NSW Agriculture and CMPS&F Environmental, February 1996 (NSW Agr. 1996)

Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, NSW EPA, 1997 (EPA 1997, reprinted and updated 2011)

Contaminated Sites: Guidelines for Assessing Banana Plantation Sites, NSW EPA, 1997 (EPA 1997b)

Contaminated Sites: Guidelines for Assessing Former Orchards and Market Gardens, NSW EPA, 2005 (EPA 2005)

Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd Edition), NSW DEC, 2006 (DEC 2006)

Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination, NSW DEC, March 2007 (DEC 2007)

Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, NSW DECC, June 2009 (DECC 2009)

Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards, Department of Health and Ageing and EnHealth Council, Commonwealth of Australia, June 2002 (EnHealth 2002)

National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013, National Environment Protection Council (NEPC 2013)

National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999 (NEPC 1999)

Appendix B: Audit Correspondence

Ken Henderson

From: Andrew Lau
Sent: Wednesday, 4 February 2015 9:17 AM
To: John Crawford
Cc: Alan Edenborough; Nalin De Silva; Ken Henderson; Andrew Lau
Subject: Audit comments on SAQP - Sydney Heritage Fleet Base

John/Alan/Nalin,

I've reviewed the SAQP and have the following comments:

- The proposed scope of work won't enable site suitability conclusions to be drawn which is what is needed for the DA process. This is because the amount of sampling and the amount of analyses falls significantly short of relevant EPA guideline requirements and also doesn't address all of the potential contamination issues already identified at the site as part of the previous investigations. Whilst I accept that there is a need/desire to proceed with the minimum scope at this stage and do more later when funds become available, please be aware that if you proceed down the proposed path outlined in the SAQP, the further investigations will (not may) be required. Furthermore, it's my view that the proposed initial stage of work will be insufficient to address the requirements of SEPP55 as part of the DA process. When we discussed the idea of a staged investigation program at our meeting, i was referring to (potentially) conducting the soil investigations in the first stage of intrusive investigations and holding off to see whether groundwater investigations were required as part of the second stage of works, if required. Please reconsider the approach to investigating the site in stages noting the need to obtain sufficient information to enable site suitability conclusions to be drawn in order to satisfy the planning process.

- The definition of the site appears to refer to only the land-based elements and not the water based elements.

- The conceptual model doesn't substantially meet the requirements of the relevant guidelines (NEPC 2013) and exposure to sediments and potential plants on the site need to be included in the consideration of issues.

- Gasworks waste was a common source of fill materials in harbour side locations throughout Sydney. As such, please include cyanide in the analytical suite for appropriate target samples. In addition, please include TBT in sediment samples and nominate criteria for all identified contaminants of potential concern (e.g., dioxins). TOC will also need to be included in the sediment analyses to enable normalisation of organic contaminant concentrations to 1% TOC in accordance with the relevant guidelines.

Happy to discuss if you have any queries.

Regards,
Andrew

Andrew Lau | Managing Director, Accredited Auditor | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
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Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

From: John Crawford [mailto:John.Crawford@crawford.com.au]
Sent: Friday, 30 January 2015 9:08 AM
To: Andrew Lau
Cc: Alan Edenborough; John Crawford; Nalin De Silva
Subject: Fwd: 610.10676.00100 SAQP for auditor review

Andrew, Ken,

Please find attached the draft SAQP received from Nalin De Silva of SLR last evening.

Can you please review this draft at your earliest opportunity as we are keen to commission the investigative work as soon as possible.

Please call or email me if you have any queries.

Regards,
John Crawford
Crawford Architects Pty Ltd

Suite 94 Jones Bay Wharf
Pirrama Road PYRMONT NSW 2009

Begin forwarded message:

Ken Henderson

From: Andrew Lau
Sent: Thursday, 5 February 2015 2:16 PM
To: Nalin De Silva
Cc: Alan Edenborough; Ken Henderson; John Crawford; Abanish Nepal; Andrew Lau
Subject: RE: Audit comments on SAQP - Sydney Heritage Fleet Base

Hi Nalin,

As discussed, you will need to justify the proposed sampling density as it departs from the guidance in EPA 1995. In doing so, please consider the requirements of NEPC 2013 and also the number of samples you are proposing to analyse relative to the total volume of fill across the site. It appears that the revised site area combined with the number of samples being analysed per borehole will let you get to a point that is defensible and, therefore, acceptable to me for the purposes of the audit. When you receive the analytical data, you will also need to confirm that the variability in the results is appropriate for the number of samples you end up analysing.

Regards,
Andrew

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From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Thursday, 5 February 2015 1:29 PM
To: Andrew Lau
Cc: Alan Edenborough; Ken Henderson; John Crawford; Abanish Nepal
Subject: RE: Audit comments on SAQP - Sydney Heritage Fleet Base
Importance: High

Andrew,

I tried calling you. Please call me back ASAP on 0407 117 562 to discuss the following.

Your comments 2, 3 and 4 below are noted, accepted and will be reflected in the SAQP and the scope of work proposed to be conducted tomorrow.

In relation to Comment 1 below, I note that our SAQP stated the site area incorrectly, and thus reported the minimum number of sampling points required incorrectly. Please refer to the attached plan provided by Crawford Architects. The site area that will be the subject of the proposed investigation is in fact 3,700m2 (excluding the easement around the pylon which we are not going to excavate within) – NOT the 7200m2 stated in the SAQP. As you know, for a site area of 3,700m2, the minimum number of sample points required to characterise contamination is 11.

SLR considers that the excavation of 5 test pits to the base of fill (where possible) across the site will provide sufficient information to comment on the site suitability, given that capping of any identified contamination (by virtue of the proposed development) will be adopted as a remediation strategy to manage identified contamination.

We have allowed for the analysis of up to 3 samples from each test pit for the range of analytes indicated in the SAQP. SLR proposes to increase the number of samples to up to four samples from each test pit, and also increase the analytical suite to include volatile chlorinated hydrocarbons and semi-volatile chlorinated hydrocarbons.

As discussed previously, we consider that if the data obtained indicates that additional investigations are required (groundwater assessment for example), such additional investigation be conducted following development approval on the basis of a Section B Site Audit Statement.

Can you please provide comment at your earliest convenience?

Regards,

Nalin De Silva
Principal Consultant
SLR Consulting Australia Pty Ltd

SLR
global environmental solutions

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100
Direct: +61 2 9424 2238
2 Lincoln Street, Lane Cove NSW 2066, Australia

From: Andrew Lau [mailto:ALau@jbsg.com.au]
Sent: Wednesday, 4 February 2015 9:17 AM
To: John Crawford
Cc: Alan Edenborough; Nalin De Silva; Ken Henderson; Andrew Lau
Subject: Audit comments on SAQP - Sydney Heritage Fleet Base

John/Alan/Nalin,

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- Gasworks waste was a common source of fill materials in harbour side locations throughout Sydney. As such, please include cyanide in the analytical suite for appropriate target samples. In addition, please include TBT in sediment samples and nominate criteria for all identified contaminants of potential concern (e.g., dioxins). TOC will also need to be included in the sediment analyses to enable normalisation of organic contaminant concentrations to 1% TOC in accordance with the relevant guidelines.

Happy to discuss if you have any queries.

Regards,
Andrew

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Subject: Fwd: 610.10676.00100 SAQP for auditor review

Andrew, Ken,

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Can you please review this draft at your earliest opportunity as we are keen to commission the investigative work as soon as possible.

Ken Henderson

From: Ken Henderson
Sent: Wednesday, 4 March 2015 10:58 AM
To: Nalin De Silva
Cc: John Crawford; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: Review of Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has reviewed the Limited Contamination Assessment for the Bank St, Pyrmont site and has the following comments that need to be suitably addressed by revision to the report.

Section 1 – For completeness, the Lot and DP should also include the Part Lot & DP that includes the water portion of the site (Blackwattle Bay).

Section 4.1 – Previous reports were discussed, however additional detail is required. Are there any sampling locations from the previous reports that pertain to the site (in particular, the NAA report)? All historic sample results pertaining to the site will need to be tabulated with locations provided on a figure as an appendix to the report (for example) and considered in the results discussion/recommendations.

Section 5 – The CSM will need to include additional discussion on the potential for asbestos at the site as per the requirements of WAH DOH 2009, noting that asbestos (if found) would require management during the construction works.

Section 6 – A statement should be provided regarding the applicability or otherwise of ecological criteria at the site (noting also the related comments that were provided in Section 5.2.4).

Section 7 – Fieldwork sampling comments:

- Asbestos sampling – the SAQP mentions 500 mL samples were to be collected, however, the provided laboratory reports from the assessment report indicates asbestos was sub-sampled from the sample jars. Please provide comment on the reliability or otherwise of the asbestos in soil data.
- Dioxin and phenolic compound analyses was not undertaken, and will be required.

Section 8 - Sediment data doesn't appear to have been normalised using TOC, and as such, comparison to ANZECC criteria may not be appropriate and therefore conclusions (Section 10.3.2) invalid.

Section 10 – Please revise to add a discussion referencing to the DQOs and decisions that need to be made (as referenced in the SAQP).

Section 10.1 – The sampling density was limited (which was accepted for the purposes of the investigation), however, this means that it is inappropriate to conclude that the apparent PAH impact is confined to a particular part of the site, seeing as the sampling density was less than a conventional phase 2 assessment. As such, the number of test pit locations is considered insufficient. This is based on the following considerations:

- Fill materials do not appear consistent across the site, in which the materials at the north half of the site (TP1 and TP4) appear to contain a mix of gravelly and silty sand with distinct ash layers, whereas the remaining test pits (TP2, TP3 and TP5) predominantly contained crushed sandstone (and other miscellaneous fill materials) with no ash layers observed.
- Analytical results of the ash layer samples from TP1 and TP4 indicate different results (<LORs and 0.4 mg/kg BaP TEQ in the two ash layer samples from TP1, with 150 mg/kg BaP TEQ in the ash layer sample from TP4).
- Depth of fill was not delineated in two of the five test pits (TP2 and TP3), which provides a data gap for the approximate western half of the site.
- The lack of dioxin and phenolic compound results represents a current data gap.
- As referenced above, consideration of further asbestos analysis is required.

- Results from previous investigations (including soil boring logs/observations) will need to be considered and discussed.

Section 10.3.2 - Risk to construction workers posed by sediments doesn't appear to be supported by the data (refer also to the comment above for Section 8).

Section 10.4 – Additional discussion is required on the potential risk to groundwater, noting that water was observed at 1.3 m in TP1 within fill materials.

Section 10.5 and 11 - Recommendations must include the preparation and implementation of an ASSMP.

Appendix D – PID calibration certificates were not provided, please include with the revised report.

Please also provide copies of the historic reports referenced in Section 4 for review.

Thank you. Please ring if any questions.

Regards,
Ken

Ken Henderson | Associate Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0409 582 845 | www.jbsg.com.au
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Ken Henderson

From: Ken Henderson
Sent: Monday, 30 March 2015 1:16 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: Review of Revised Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has conducted the review of the revised Limited Contamination Assessment. Overall there remain a few outstanding items that will require addressing.

Sediment results – the summary table and discussion indicates that the results were normalised to 1% TOC, however, the TOC values upon which these calculations depend do not appear to have been provided.

Section 8.1.1 – The depth of fill (and groundwater, if encountered) at TP02 and TP03 is currently unknown and remains a current data gap. This is important as these locations currently represent approximately half of the site. Adequate characterisation of the fill materials at the western/southwestern portion of the site is required.

Section 8.2 – there is an incomplete sentence at the end of the second last paragraph.

Section 10.5.1 - the provided details relating to groundwater risk are not considered sufficient considering the site has not yet been fully investigated, and considering fill has not been delineated at the western/southwestern portion of the site.

Section 11 - Recommendations:

- Phenolic compounds, which were listed as a COPC in Section 5, have also not been assessed at the site. This will also require assessment.
- Asbestos investigation will be required to meet the requirements of WA DOH 2009.
- Groundwater investigation may be required based on the findings of the additional assessment.
- The final recommendations should also reiterate that preparation and implementation of an ASSMP will be required.

Appendix D – Calibration records were not provided in the revised report. Please include with the final version.

Please ring if any questions.

Regards,
Ken

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From: Ken Henderson
Sent: Wednesday, 4 March 2015 10:58 AM
To: Nalin De Silva
Cc: 'John Crawford'; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: Review of Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has reviewed the Limited Contamination Assessment for the Bank St, Pyrmont site and has the following comments that need to be suitably addressed by revision to the report.

Section 1 – For completeness, the Lot and DP should also include the Part Lot & DP that includes the water portion of the site (Blackwattle Bay).

Section 4.1 – Previous reports were discussed, however additional detail is required. Are there any sampling locations from the previous reports that pertain to the site (in particular, the NAA report)? All historic sample results pertaining to the site will need to be tabulated with locations provided on a figure as an appendix to the report (for example) and considered in the results discussion/recommendations.

Section 5 – The CSM will need to include additional discussion on the potential for asbestos at the site as per the requirements of WAH DOH 2009, noting that asbestos (if found) would require management during the construction works.

Section 6 – A statement should be provided regarding the applicability or otherwise of ecological criteria at the site (noting also the related comments that were provided in Section 5.2.4).

Section 7 – Fieldwork sampling comments:

- Asbestos sampling – the SAQP mentions 500 mL samples were to be collected, however, the provided laboratory reports from the assessment report indicates asbestos was sub-sampled from the sample jars. Please provide comment on the reliability or otherwise of the asbestos in soil data.
- Dioxin and phenolic compound analyses was not undertaken, and will be required.

Section 8 - Sediment data doesn't appear to have been normalised using TOC, and as such, comparison to ANZECC criteria may not be appropriate and therefore conclusions (Section 10.3.2) invalid.

Section 10 – Please revise to add a discussion referencing to the DQOs and decisions that need to be made (as referenced in the SAQP).

Section 10.1 – The sampling density was limited (which was accepted for the purposes of the investigation), however, this means that it is inappropriate to conclude that the apparent PAH impact is confined to a particular part of the site, seeing as the sampling density was less than a conventional phase 2 assessment. As such, the number of test pit locations is considered insufficient. This is based on the following considerations:

- Fill materials do not appear consistent across the site, in which the materials at the north half of the site (TP1 and TP4) appear to contain a mix of gravelly and silty sand with distinct ash layers, whereas the remaining test pits (TP2, TP3 and TP5) predominantly contained crushed sandstone (and other miscellaneous fill materials) with no ash layers observed.
- Analytical results of the ash layer samples from TP1 and TP4 indicate different results (<LORs and 0.4 mg/kg BaP TEQ in the two ash layer samples from TP1, with 150 mg/kg BaP TEQ in the ash layer sample from TP4).
- Depth of fill was not delineated in two of the five test pits (TP2 and TP3), which provides a data gap for the approximate western half of the site.
- The lack of dioxin and phenolic compound results represents a current data gap.
- As referenced above, consideration of further asbestos analysis is required.
- Results from previous investigations (including soil boring logs/observations) will need to be considered and discussed.

Section 10.3.2 - Risk to construction workers posed by sediments doesn't appear to be supported by the data (refer also to the comment above for Section 8).

Section 10.4 – Additional discussion is required on the potential risk to groundwater, noting that water was observed at 1.3 m in TP1 within fill materials.

Section 10.5 and 11 - Recommendations must include the preparation and implementation of an ASSMP.

Appendix D – PID calibration certificates were not provided, please include with the revised report.

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Thank you. Please ring if any questions.

Regards,
Ken

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Ken Henderson

From: Ken Henderson
Sent: Friday, 10 April 2015 1:07 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: RE: Review of Revised Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has reviewed the revised report and has no further comment, with the exception that TOC normalisation appears to have been incorrectly calculated. Whilst this does not appear to have an impact on the results, the summary table will require correction.

Also, we would appreciate if you can please forward to us a copy of the SLR 2011 Phase 1 for our records.

The comments on the RAP will follow separately.

Thank you. Please ring if any questions.

Regards,
Ken

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From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Wednesday, 8 April 2015 2:44 PM
To: Ken Henderson
Cc: John.Crawford@crawford.com.au; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: RE: Review of Revised Limited Contamination Assessment - Bank St Pyrmont

Hi Ken,
I have revised the report addressing your comments below. The revised RAP that incorporates relevant comments you made on the contamination assessment will follow shortly.
Cheers.

Nalin De Silva
Principal Consultant
SLR Consulting Australia Pty Ltd

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100
Direct: +61 2 9424 2238
2 Lincoln Street, Lane Cove NSW 2066, Australia

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Monday, 30 March 2015 1:16 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: Review of Revised Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has conducted the review of the revised Limited Contamination Assessment. Overall there remain a few outstanding items that will require addressing.

Sediment results – the summary table and discussion indicates that the results were normalised to 1% TOC, however, the TOC values upon which these calculations depend do not appear to have been provided.

Section 8.1.1 – The depth of fill (and groundwater, if encountered) at TP02 and TP03 is currently unknown and remains a current data gap. This is important as these locations currently represent approximately half of the site. Adequate characterisation of the fill materials at the western/southwestern portion of the site is required.

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- Asbestos investigation will be required to meet the requirements of WA DOH 2009.
- Groundwater investigation may be required based on the findings of the additional assessment.
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Ken

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From: Ken Henderson
Sent: Wednesday, 4 March 2015 10:58 AM
To: Nalin De Silva
Cc: 'John Crawford'; Andrew Lau; Alan Edenborough; Abanish Nepal
Subject: Review of Limited Contamination Assessment - Bank St Pyrmont

Hi Nalin,

Andrew has reviewed the Limited Contamination Assessment for the Bank St, Pyrmont site and has the following comments that need to be suitably addressed by revision to the report.

Section 1 – For completeness, the Lot and DP should also include the Part Lot & DP that includes the water portion of the site (Blackwattle Bay).

Section 4.1 – Previous reports were discussed, however additional detail is required. Are there any sampling locations from the previous reports that pertain to the site (in particular, the NAA report)? All historic sample results pertaining to the site will need to be tabulated with locations provided on a figure as an appendix to the report (for example) and considered in the results discussion/recommendations.

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Thank you. Please ring if any questions.

Regards,
Ken

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Ken Henderson

From: Ken Henderson
Sent: Friday, 10 April 2015 1:09 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Abanish Nepal; Alan Edenborough
Subject: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

Andrew has reviewed the draft RAP (2 March 2015). Generally the RAP is appropriate, however additional detail is required for consideration of results of the additional data gap investigation and contingencies for issues that may arise. Comments are as follows:

General – please remove references to Section A/B Site Audit reporting & statements as these details are not required for RAP reporting.

Sections 3 and 4.1 – the site identification should also reference the water lot and DP.

Section 6.1 – the last paragraph will need to be updated to include analysis for total phenols (as per the comments relating to the Limited Contamination Assessment).

Section 7.4, Table 2 – the first two bullet points for the Advantages of In-situ Capping are incorrect, as further investigation is required to assess current data gaps before all remedial options can be fully considered.

Section 7.5 – As with the previous comment, the last sentence of the first paragraph ('this option does not require additional investigations') is not correct.

Section 7.6.1 – Regulatory Compliance & Approvals

- Additional detail is also required for the regulatory approvals/licensing, including the notification requirements of SEPP 55.
- Reference should also be made to Item G22 of the Instrument of Approval, which states that notification of completion of remediation works to council (as per SEPP 55) will also be required.

Section 7.6.6 – Capping Layer details

- Reference to the requirements of the ANZECC *Guidelines of the Assessment of On-site Containment of Contaminated Soil*, September 1999 should be made.
- The apparent omission of a marker layer is considered unsatisfactory and will need to be addressed.
- The RAP will also need to provide justification for capping thicknesses (including marker layer requirements) at any unpaved areas (garden beds/unsealed areas). This also includes other potential excavations that may be required for site development, such as service trenches.

Section 7.9 – Remediation contingencies. Noting that the further investigations are required, and detail of contingencies for additional issues that may arise are required, such as:

- If impacted groundwater is encountered that requires remediation.
- If asbestos in fill is encountered.
- If dioxins are identified. It is noted that dioxin-contaminated waste are subject to the chemical control order, and an appropriate contingency will need to be considered in the event dioxin contaminated wastes are generated.
- If impacted sediments (beyond what has already been reported) are encountered.

Section 8 – Validation:

- This section will require revision to include decisions relating to the additional data gap investigation that needs to be conducted at the site (including sediments), including reference to appropriate assessment criteria.
- Reference will also need to be made with consideration to contaminant odours emanating from site soils, and that odours (if any) will be adequately addressed.
- Regarding imported VENM assessment, please specify no asbestos is to be present in the imported materials.
- Section 8.4 – this section will require revision to clarify the boundaries of the land portion of the site and the water (sediments) portion.
- Section 8.7.1, last sentence – as referenced above in the comments for Section 7.6.6, the thickness of the cap will require justification (i.e. at garden beds/unsealed areas, service trenches), and the omission of a marker layer is considered unsatisfactory.

Section 12 – The conclusions should also include the requirement for:

- The preparation of a Validation SAQP which outlines additional soil & sediment validation required to provide more confidence of the collected data (and confirm appropriateness of the selected remedial/management strategy), and outlines the validation requirements of the proposed remedial strategy during remediation/site development. The VSAQP is to be reviewed and approved by a site auditor prior to commencing works.
- The preparation of a Sediment Management Plan for proposed construction works.

Please ring if any questions.

Regards,
Ken

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---

From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Friday, 27 March 2015 7:55 AM
To: Ken Henderson
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: RE: 610.10676.00100 Finalised Limited Contamination Assessment Report

Hi Ken,
Please find attached the Draft RAP. You will note that some of the comments you made for the assessment (dioxin testing for example) will be applicable to the RAP as well, and the RAP will be amended to include such further testing.
Regards,

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Friday, 27 March 2015 7:42 AM
To: Nalin De Silva
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: RE: 610.10676.00100 Finalised Limited Contamination Assessment Report

Thanks Nalin. We will take a look.

We have not yet received the RAP. Can you please send for review?

Regards,
Ken

Ken Henderson | Associate Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
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From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Friday, 27 March 2015 7:35 AM
To: Ken Henderson
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: FW: 610.10676.00100 Finalised Limited Contamination Assessment Report

Dear Ken,
Please find attached the assessment report addressing your comments. Can you please send through the RAP comments?
Regards,

Nalin De Silva
Principal Consultant
SLR Consulting Australia Pty Ltd

global environmental solutions

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100
Direct: +61 2 9424 2238
2 Lincoln Street, Lane Cove NSW 2066, Australia

Ken Henderson

From: Ken Henderson
Sent: Wednesday, 22 April 2015 5:03 PM
To: Nalin De Silva
Cc: Abanish Nepal; Andrew Lau; Alan Edenborough; John.Crawford@crawford.com.au
Subject: Re: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

Thank you for the clarification. Andrew and I have discussed your email, and what you have outlined sufficiently addresses the comment.

Regards,
Ken

From: Nalin De Silva <NDeSilva@slrconsulting.com>
Sent: Wednesday, 22 April 2015 4:52 PM
To: Ken Henderson
Cc: Abanish Nepal; Andrew Lau; Alan Edenborough; John.Crawford@crawford.com.au
Subject: RE: Audit comments on RAP - Bank Street Pyrmont

Hi Ken,

I appreciate that Ken, but the basis of validation is not dependent on chemical concentrations, but rather the capping of the site surface. So the validation assessment criteria will be limited to demonstrating that the necessary cap has been established across the site. The acceptance criteria in that context has already been specified in the RAP, with respect to capping extent and cap thickness in unsealed areas.

The assessment criteria will only play a role in characterising the contamination, in the proposed additional contamination assessments. The RAP presented will be implemented regardless of the contamination concentrations (with the exceptions identified in the remediation contingency section). I don't consider that such assessment criteria will need to be specified in the RAP. If the remediation strategy changes and chemical validation is required, of course, the relevant assessment criteria for validation (or remediation Acceptance Criteria) will be specified in the revised RAP.

I will call to discuss tomorrow, if you are still not satisfied.

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Wednesday, 22 April 2015 4:25 PM
To: Nalin De Silva
Cc: Abanish Nepal; Andrew Lau; Alan Edenborough; John.Crawford@crawford.com.au
Subject: Re: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

The comment relates to a requirement of the EPA Guidelines for Consultants Reporting on Contaminated Sites which references that the basis for assessment criteria (including tables listing all selected assessment criteria and references) should be included in the RAP.

Regards,
Ken

From: Nalin De Silva <NDeSilva@slrconsulting.com>
Sent: Wednesday, 22 April 2015 4:11 PM
To: Ken Henderson
Cc: Abanish Nepal; Andrew Lau; Alan Edenborough; John.Crawford@crawford.com.au
Subject: RE: Audit comments on RAP - Bank Street Pyrmont

Hi Ken,
I proposed to include this detail in the following two documents:

- SAQP for additional assessments; and
- Validation SAQP

Wouldn't that be satisfactory for you to endorse the RAP?

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Wednesday, 22 April 2015 4:09 PM
To: Nalin De Silva
Cc: Abanish Nepal; Andrew Lau; Alan Edenborough; John.Crawford@crawford.com.au
Subject: Fw: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

Andrew has reviewed the revised RAP for Bank St Pyrmont (21 April 2015). His previous audit comments have generally been addressed, however, reference to the remediation and assessment criteria has not been provided and will need to be included.

Thank you. Please ring with any questions.

Regards,
Ken Henderson
JBS&G

From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Tuesday, 21 April 2015 1:48 PM
To: Ken Henderson
Cc: John.Crawford@crawford.com.au; Andrew Lau; Abanish Nepal; Alan Edenborough
Subject: RE: Audit comments on RAP - Bank Street Pyrmont

Hi Ken,
Please find attached the revised (Draft 3) of the RAP, which incorporates your comments below.
Regards,

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Friday, 10 April 2015 1:09 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Abanish Nepal; Alan Edenborough
Subject: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

Andrew has reviewed the draft RAP (2 March 2015). Generally the RAP is appropriate, however additional detail is required for consideration of results of the additional data gap investigation and contingencies for issues that may arise. Comments are as follows:

General – please remove references to Section A/B Site Audit reporting & statements as these details are not required for RAP reporting.

Sections 3 and 4.1 – the site identification should also reference the water lot and DP.

Section 6.1 – the last paragraph will need to be updated to include analysis for total phenols (as per the comments relating to the Limited Contamination Assessment).

Section 7.4, Table 2 – the first two bullet points for the Advantages of In-situ Capping are incorrect, as further investigation is required to assess current data gaps before all remedial options can be fully considered.

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Section 7.6.1 – Regulatory Compliance & Approvals

- Additional detail is also required for the regulatory approvals/licensing, including the notification requirements of SEPP 55.
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- The RAP will also need to provide justification for capping thicknesses (including marker layer requirements) at any unpaved areas (garden beds/unsealed areas). This also includes other potential excavations that may be required for site development, such as service trenches.

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- If impacted sediments (beyond what has already been reported) are encountered.

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- This section will require revision to include decisions relating to the additional data gap investigation that needs to be conducted at the site (including sediments), including reference to appropriate assessment criteria.
- Reference will also need to be made with consideration to contaminant odours emanating from site soils, and that odours (if any) will be adequately addressed.
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Hi Ken,
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From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Friday, 27 March 2015 7:42 AM
To: Nalin De Silva
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: RE: 610.10676.00100 Finalised Limited Contamination Assessment Report

Thanks Nalin. We will take a look.

We have not yet received the RAP. Can you please send for review?

Regards,
Ken

Ken Henderson | Associate Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0409 582 845 | www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Friday, 27 March 2015 7:35 AM
To: Ken Henderson
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: FW: 610.10676.00100 Finalised Limited Contamination Assessment Report

Dear Ken,

Please find attached the assessment report addressing your comments. Can you please send through the RAP comments?
Regards,

Nalin De Silva
Principal Consultant
SLR Consulting Australia Pty Ltd

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100
Direct: +61 2 9424 2238
2 Lincoln Street, Lane Cove NSW 2066, Australia

From: Nalin De Silva
Sent: Wednesday, 18 March 2015 1:28 AM
To: John.Crawford@crawford.com.au
Cc: Alan Edenborough; Paul Godsell (Paul.Godsell@crawford.com.au); anepal@slrconsulting.com
Subject: 610.10676.00100 Finalised Limited Contamination Assessment Report

Dear John,
Please find attached the finalised Limited Contamination Assessment report for the Sydney Heritage Fleet site at Banks Street. I have addressed all of the auditor's comments and believe this would suffice the auditor.
I will amend the RAP as suggested in your email dated 17 March, on Thursday 19 March.
Regards,

Ken Henderson

From: Nalin De Silva <NDeSilva@slrconsulting.com>
Sent: Wednesday, 22 April 2015 5:02 PM
To: John Crawford
Cc: Ken Henderson; Andrew Lau; Alan Edenborough
Subject: RE: Audit comments on RAP - Bank Street Pyrmont

Thank you John.

Ken, Confirmed.

Nalin De Silva
Principal Consultant
SLR Consulting Australia Pty Ltd

SLR
global environmental solutions

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100
Direct: +61 2 9424 2238
2 Lincoln Street, Lane Cove NSW 2066, Australia

From: John Crawford [mailto:John.Crawford@crawford.com.au]
Sent: Wednesday, 22 April 2015 5:01 PM
To: Nalin De Silva
Cc: Ken Henderson; Andrew Lau; Alan Edenborough
Subject: Re: Audit comments on RAP - Bank Street Pyrmont

Nalin,

I can confirm that there is no potential for site users to come in contact with any sediments on the sea wall/water junction. No provision has been made for access to the littoral zone and it would in fact be difficult to reach from the existing sea wall.
Should you require further information please call me.
Regards,
John Crawford
CRAWFORD ARCHITECTS PTY LTD

Sent from my iPhone

On 22 Apr 2015, at 3:45 pm, Nalin De Silva <NDeSilva@slrconsulting.com> wrote:

> Hi Ken,
> That has always been my understanding, but I will get John to confirm.
> John, can you please review the emails below and confirm?
> Cheers.
>
> ---
>
> **From:** Ken Henderson [mailto:Khenderson@jbsg.com.au]
> **Sent:** Wednesday, 22 April 2015 3:35 PM
> **To:** Nalin De Silva
> **Cc:** 'John.Crawford@crawford.com.au'; Andrew Lau
> **Subject:** Re: Audit comments on RAP - Bank Street Pyrmont
>
> Hi Nalin,
>
> Thank you for your revision, which I have discussed with Andrew.
>
> Can you please confirm that as part of the proposed site design/layout there will be no potential for direct contact to sediments for future site users (such as to sediments along the foreshore/seawall, no beach launch area, etc.)?
>
> Please ring if any questions.
>
> Regards,
> Ken Henderson
> JBS&G
> 0409 582 845
>
> ---
>
> **From:** Nalin De Silva <NDeSilva@slrconsulting.com>
> **Sent:** Wednesday, 22 April 2015 2:31 PM
> **To:** Ken Henderson
> **Cc:** 'John.Crawford@crawford.com.au'; Andrew Lau
> **Subject:** RE: Audit comments on RAP - Bank Street Pyrmont
>
> Hi Ken,
> As discussed (regarding the email below), I have updated the contamination assessment report. Can you please check and comment if this is acceptable to the auditor with regards to sediment quality?
> I have tracked the changes for your convenience.
> Cheers.
>
> ---
>
> **From:** Nalin De Silva
> **Sent:** Tuesday, 21 April 2015 12:38 PM
> **To:** Ken Henderson
> **Cc:** John.Crawford@crawford.com.au; Andrew Lau

Subject: RE: Audit comments on RAP - Bank Street Pyrmont
Importance: High

Hi Ken,
Can you please provide clarification regarding the requirement to conduct additional assessment of sediment quality? The points highlighted below suggest further sediment assessment is required, but I am not aware of such a requirement from your comments for the contamination assessment.
Please clarify.
Cheers.

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Friday, 10 April 2015 1:09 PM
To: Nalin De Silva
Cc: John.Crawford@crawford.com.au; Andrew Lau; Abanish Nepal; Alan Edenborough
Subject: Audit comments on RAP - Bank Street Pyrmont

Hi Nalin,

Andrew has reviewed the draft RAP (2 March 2015). Generally the RAP is appropriate, however additional detail is required for consideration of results of the additional data gap investigation and contingencies for issues that may arise. Comments are as follows:

General – please remove references to Section A/B Site Audit reporting & statements as these details are not required for RAP reporting.

Sections 3 and 4.1 – the site identification should also reference the water lot and DP.

Section 6.1 – the last paragraph will need to be updated to include analysis for total phenols (as per the comments relating to the Limited Contamination Assessment).

Section 7.4, Table 2 – the first two bullet points for the Advantages of In-situ Capping are incorrect, as further investigation is required to assess current data gaps before all remedial options can be fully considered.

Section 7.5 – As with the previous comment, the last sentence of the first paragraph ('this option does not require additional investigations') is not correct.

Section 7.6.1 – Regulatory Compliance & Approvals

- Additional detail is also required for the regulatory approvals/licensing, including the notification requirements of SEPP 55.
- Reference should also be made to Item G22 of the Instrument of Approval, which states that notification of completion of remediation works to council (as per SEPP 55) will also be required.

Section 7.6.6 – Capping Layer details

- Reference to the requirements of the ANZECC *Guidelines of the Assessment of On-site Containment of Contaminated Soil*, September 1999 should be made.
- The apparent omission of a marker layer is considered unsatisfactory and will need to be addressed.
- The RAP will also need to provide justification for capping thicknesses (including marker layer requirements) at any unpaved areas (garden beds/unsealed areas). This also includes other potential excavations that may be required for site development, such as service trenches.

Section 7.9 – Remediation contingencies. Noting that the further investigations are required, and detail of contingencies for additional issues that may arise are required, such as:

- If impacted groundwater is encountered that requires remediation.
- If asbestos in fill is encountered.
- If dioxins are identified. It is noted that dioxin-contaminated waste are subject to the chemical control order, and an appropriate contingency will need to be considered in the event dioxin contaminated wastes are generated.
- If impacted sediments (beyond what has already been reported) are encountered.

Section 8 – Validation:

- This section will require revision to include decisions relating to the additional data gap investigation that needs to be conducted at the site (including sediments), including reference to appropriate assessment criteria.
- Reference will also need to be made with consideration to contaminant odours emanating from site soils, and that odours (if any) will be adequately addressed.
- Regarding imported VENM assessment, please specify no asbestos is to be present in the imported materials.
- Section 8.4 – this section will require revision to clarify the boundaries of the land portion of the site and the water (sediments) portion.
- Section 8.7.1, last sentence – as referenced above in the comments for Section 7.6.6, the thickness of the cap will require justification (i.e. at garden beds/unsealed areas, service trenches), and the omission of a marker layer is considered unsatisfactory.

Section 12 – The conclusions should also include the requirement for:

- The preparation of a Validation SAQP which outlines additional soil & sediment validation required to provide more confidence of the collected data (and confirm appropriateness of the selected remedial/management strategy), and outlines the validation requirements of the proposed remedial strategy during remediation/site development. The VSAQP is to be reviewed and approved by a site auditor prior to commencing works.
- The preparation of a Sediment Management Plan for proposed construction works.

Please ring if any questions.

Regards,
Ken

<image001.jpg>Ken Henderson | Associate Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0409 582 845 | www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

---

From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Friday, 27 March 2015 7:55 AM
To: Ken Henderson
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: RE: 610.10676.00100 Finalised Limited Contamination Assessment Report

Hi Ken,

Please find attached the Draft RAP. You will note that some of the comments you made for the assessment (dioxin testing for example) will be applicable to the RAP as well, and the RAP will be amended to include such further testing.
Regards,

From: Ken Henderson [mailto:Khenderson@jbsg.com.au]
Sent: Friday, 27 March 2015 7:42 AM
To: Nalin De Silva
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: RE: 610.10676.00100 Finalised Limited Contamination Assessment Report

Thanks Nalin. We will take a look.

We have not yet received the RAP. Can you please send for review?

Regards,
Ken

<image001.jpg>Ken Henderson | Associate Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0409 582 845 | www.jbsg.com.au
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From: Nalin De Silva [mailto:NDeSilva@slrconsulting.com]
Sent: Friday, 27 March 2015 7:35 AM
To: Ken Henderson
Cc: Andrew Lau; John.Crawford@crawford.com.au; Alan Edenborough
Subject: FW: 610.10676.00100 Finalised Limited Contamination Assessment Report

Dear Ken,
Please find attached the assessment report addressing your comments. Can you please send through the RAP comments?
Regards,

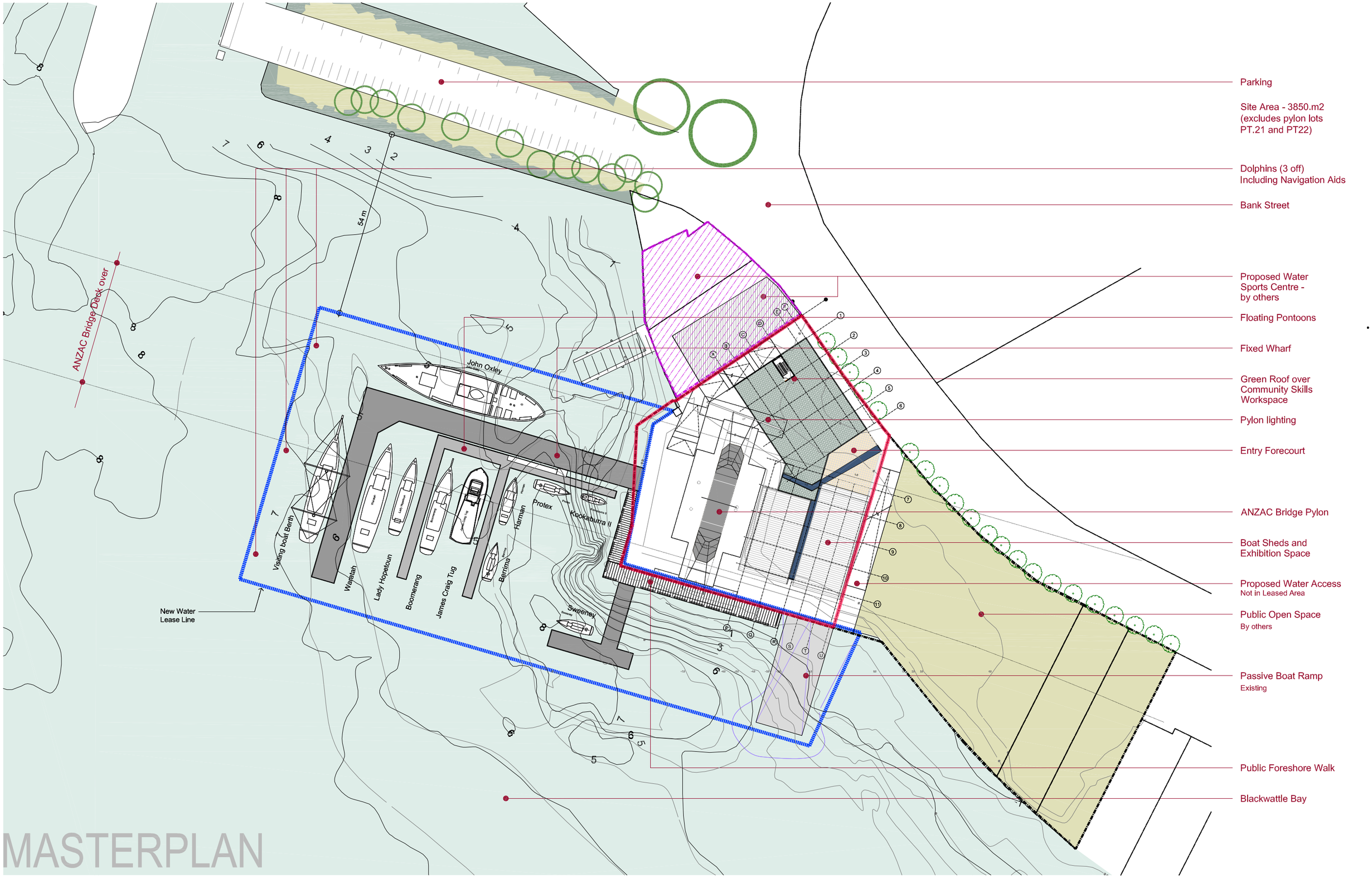
Nalin De Silva

Principal Consultant
SLR Consulting Australia Pty Ltd

SLR
global environmental solutions

Email: NDeSilva@slrconsulting.com
Mobile: +61 407 117 562
Office: +61 2 9427 8100

Appendix C: Site Plan



SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

MASTERPLAN
SK10 - F 2014.10.03
Scale 1:500 @ A1

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106

Date Nov 2012

Project No 0811

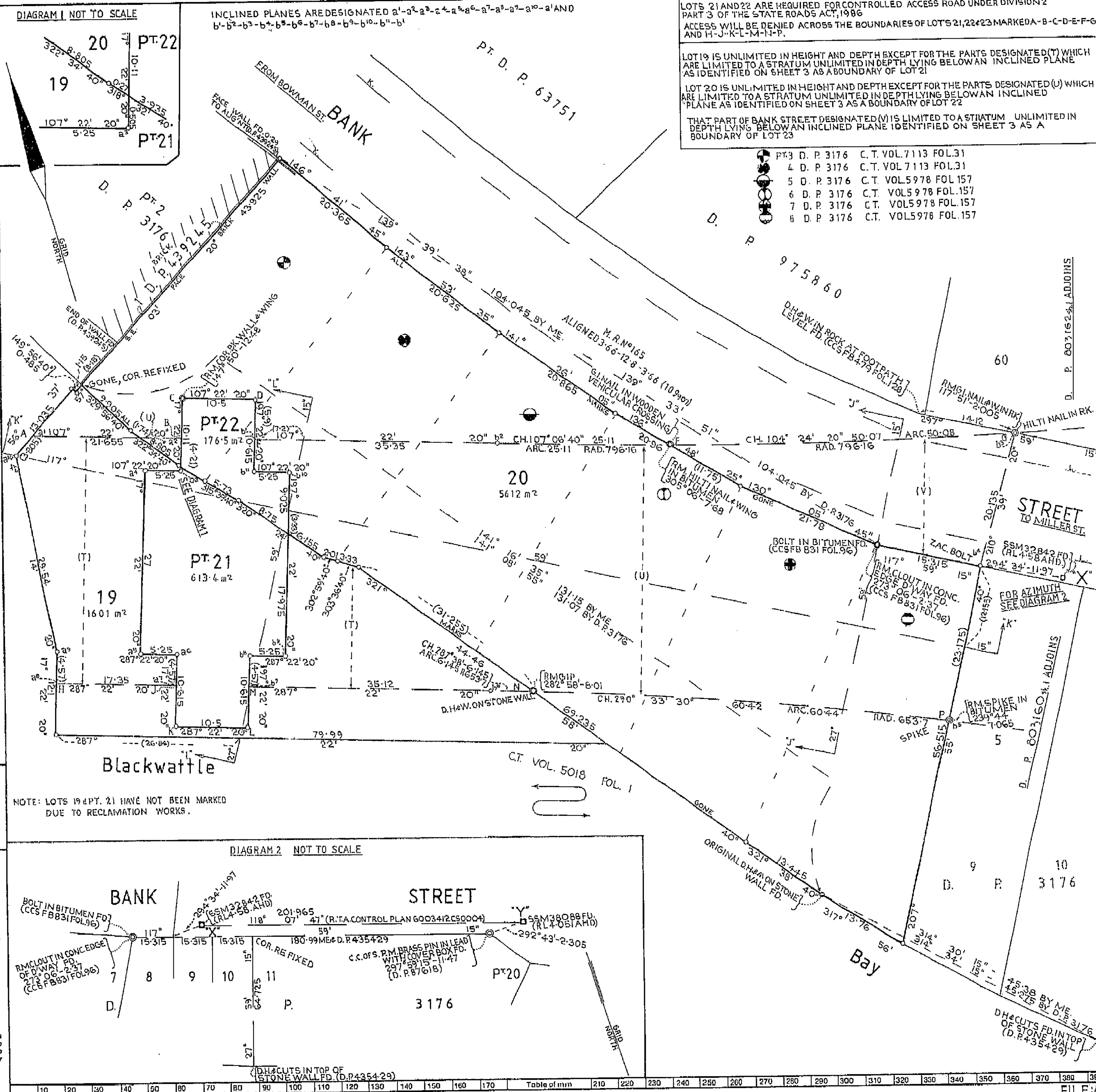
PLAN FORM 2

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

THE CONSENT OF THE CITY OF SOUTH SYDNEY TO THE DEFINITION OF BANK STREET FURNISHED

THE CONSENT OF THE MARITIME SERVICES BOARD TO THE DEFINITION OF BLACKWATTLE BAY FURNISHED

Plan Drawing only to appear in this space



LOTS 21 AND 22 ARE REQUIRED FOR CONTROLLED ACCESS ROAD UNDER DIVISION 2 PART 3 OF THE STATE ROADS ACT, 1986
ACCESS WILL BE DENIED ACROSS THE BOUNDARIES OF LOTS 21, 22 & 23 MARKED A-B-C-D-E-F-G AND H-J-K-L-M-N-P.

LOT 19 IS UNLIMITED IN HEIGHT AND DEPTH EXCEPT FOR THE PARTS DESIGNATED (T) WHICH ARE LIMITED TO A STRATUM UNLIMITED IN DEPTH LYING BELOW AN INCLINED PLANE AS IDENTIFIED ON SHEET 3 AS A BOUNDARY OF LOT 21

LOT 20 IS UNLIMITED IN HEIGHT AND DEPTH EXCEPT FOR THE PARTS DESIGNATED (U) WHICH ARE LIMITED TO A STRATUM UNLIMITED IN DEPTH LYING BELOW AN INCLINED PLANE AS IDENTIFIED ON SHEET 3 AS A BOUNDARY OF LOT 22

THAT PART OF BANK STREET DESIGNATED (V) IS LIMITED TO A STRATUM UNLIMITED IN DEPTH LYING BELOW AN INCLINED PLANE IDENTIFIED ON SHEET 3 AS A BOUNDARY OF LOT 23

PT 3 D. P. 3176	C.T. VOL. 7113 FOL. 31
4 D. P. 3176	C.T. VOL 7113 FOL. 31
5 D. P. 3176	C.T. VOL 5978 FOL 157
6 D. P. 3176	C.T. VOL 5978 FOL. 157
7 D. P. 3176	C.T. VOL 5978 FOL. 157
8 D. P. 3176	C.T. VOL 5978 FOL. 157

*OFFICE USE ONLY

DP 803159

Registered: 6 286 1990

C.A:

Title System: TORRENS & OLD SYSTEM

Purpose: ACQUISITION (NOT A CURRENT PLAN AT REGN. SEE SEC. 327 AA L.G.A.)

Ref. Map: SYDNEY SH. 101 #

Last Plan: D. P. 3176 #

PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE STATE ROADS ACT, 1986

Lengths are in metres. Reduction Ratio 1:400

City: SYDNEY

Locality: PYRMONT

Parish: ST. ANDREW

County: CUMBERLAND

This is sheet 1 of my plan in 3 sheets. (Delete if inapplicable).

I, STEPHEN BENNETT of ROADS AND TRAFFIC AUTHORITY, N.S.W. a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made in accordance with the Survey Practice Regulations, 1933 and any special requirements of the Department of Lands, and was completed on 22·2·1990

Signature 2-3-90

Surveyor registered under Surveyors Act, 1929, as amended. Datum Line of Azimuth: X"-Y", 6003 (412 CS 0004, distant date of survey

FB 97000 412 FP0016, 18, 20 - fol0019 to 197

Plans used in preparation of survey/compilation. D. P. 3176, D. P. 87618, D. P. 435429, D. P. 439245, D. P. 975860, S109-907, C.C OF S. FBKS 479, 4831, C.C. OF S. SURVEY PLOT 2-48

PANEL FOR USE ONLY for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements or restrictions as to user.

LOTS 21, 22 AND 23 ARE REQUIRED FOR CONTROLLED ACCESS ROAD UNDER DIVISION 2 PART 3 OF THE STATE ROADS ACT, 1986

ACCESS WILL BE DENIED ACROSS THE BOUNDARIES OF LOTS 21, 22 AND 23 MARKED A-B-C-D-E-F-G AND H-J-K-L-M-N-P.

APPROVED

D. Eccleston
CHIEF SURVEYOR
ROADS AND TRAFFIC AUTHORITY, N.S.W.

Crown Lands Office Approval

PLAN APPROVED .... Authorised Officer

Land District ....

Paper No. ....

Field Book .... pages ....

Council Clerk's Certificate

I hereby certify that —

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of Part 3 Division 2 of the † Water Board Act 1987 and † Water Supply Authorities Act 1987

have been complied with by the applicant in relation to the proposed .... (Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. ....

Date ....

(Signature) .... Council Clerk

Council File No. ....

* This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.
† Delete if inapplicable.

SURVEYOR'S REFERENCE: M.P.D.

10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	Table of mm	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

FILE: 412·12036 R.T.A. PLAN 5101·412SS0011

10	20	30	40	50	60	70 Table of mm	110	120	130	140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 3rd July, 1990

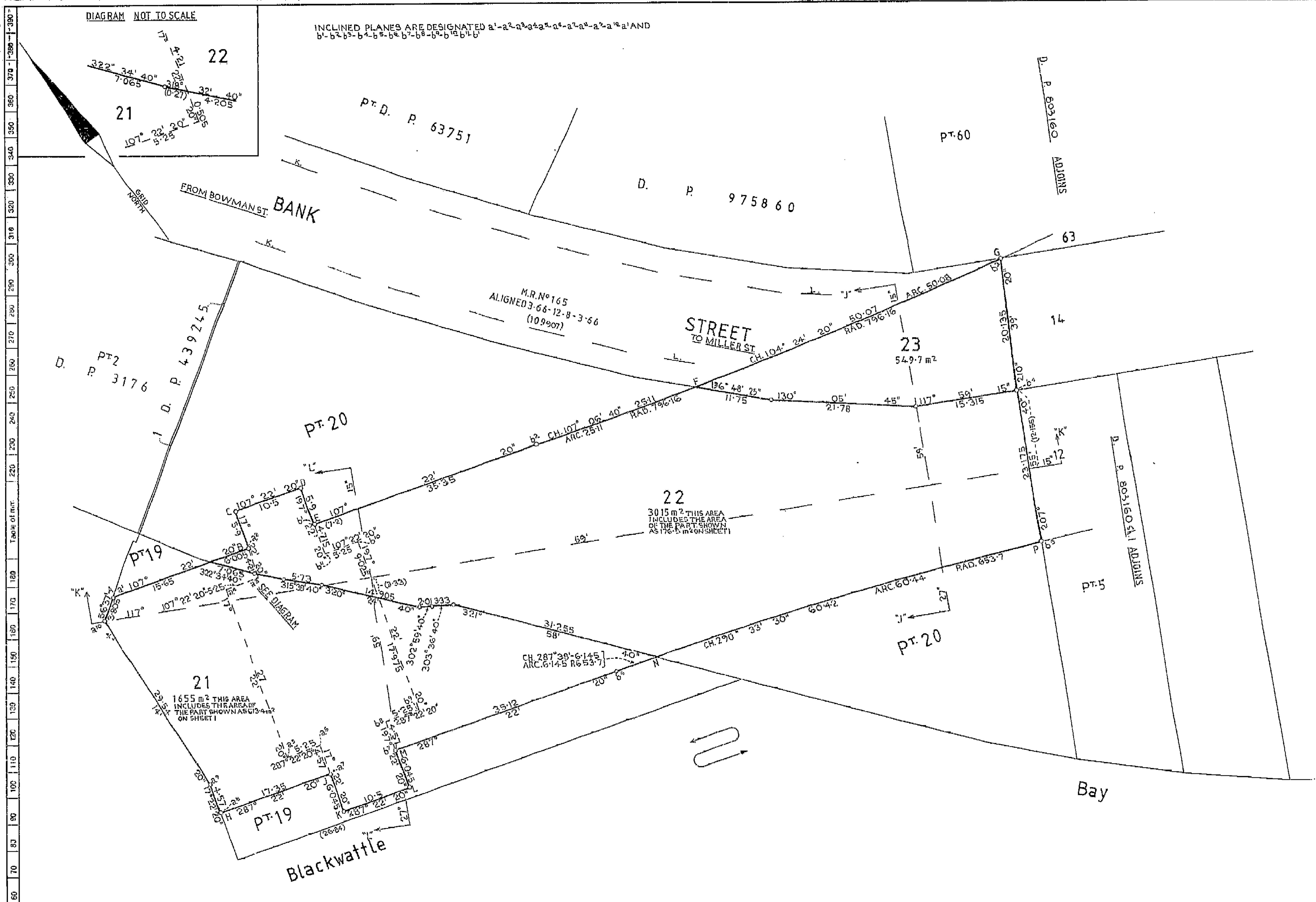
2

PLAN FORM 3 — To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION.

*OFFICE USE ONLY

INCLINED PLANES ARE DESIGNATED a¹-a²-a³-a⁴-a⁵-a⁶-a⁷-a⁸-a⁹-a¹⁰-a¹ AND b¹-b²-b³-b⁴-b⁵-b⁶-b⁷-b⁸-b⁹-b¹⁰-b¹¹-b¹



LOTS 21, 22 AND 23 ARE REQUIRED FOR CONTROLLED ACCESS ROAD UNDER DIVISION 2 PART 3 OF THE STATE ROADS ACT, 1986
ACCESS WILL BE DENIED ACROSS THE BOUNDARIES OF LOTS 21, 22 & 23 MARKED A-B-C-D-E-F-G AND H-J-K-L-M-N-P.

LOT 21 IS A STRATUM LIMITED IN DEPTH TO AN INCLINED PLANE AS IDENTIFIED ON SHEET 3 IS UNLIMITED IN HEIGHT AND INCLUSIVE OF THAT PART CONTAINING AN AREA OF 613·4 m² SHOWN ON SHEET 1 WHICH IS UNLIMITED IN HEIGHT AND DEPTH.

LOT 22 IS A STRATUM LIMITED IN DEPTH TO AN INCLINED PLANE AS IDENTIFIED ON SHEET 3 IS UNLIMITED IN HEIGHT AND INCLUSIVE OF THAT PART CONTAINING AN AREA OF 176·5 m² SHOWN ON SHEET 1 WHICH IS UNLIMITED IN HEIGHT AND DEPTH

LOT 23 IS A STRATUM LIMITED IN DEPTH TO AN INCLINED PLANE INDENTIFIED ON SHEET 3 AND IS UNLIMITED IN HEIGHT.

DP 803159

Registered: CB 28·6·1990

This is sheet 2 of my plan in 3 sheets dated 22·2·1990

S Bennett 2-3-90

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

For use where space is insufficient in any panel on Plan Form 2.

City: SYDNEY
Locality: PYRMONT
Parish: ST. ANDREW
County: CUMBERLAND

Reduction Ratio 1:400

Plan Drawing only to appear in this space

FILE: 412.12036 RTA.PLAN5101412SS0011.

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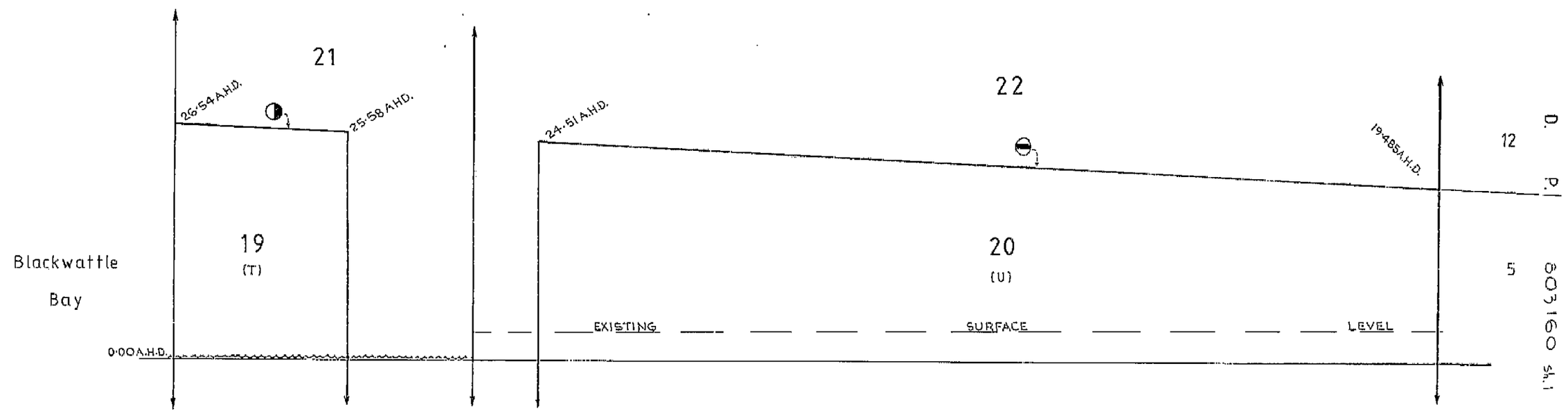
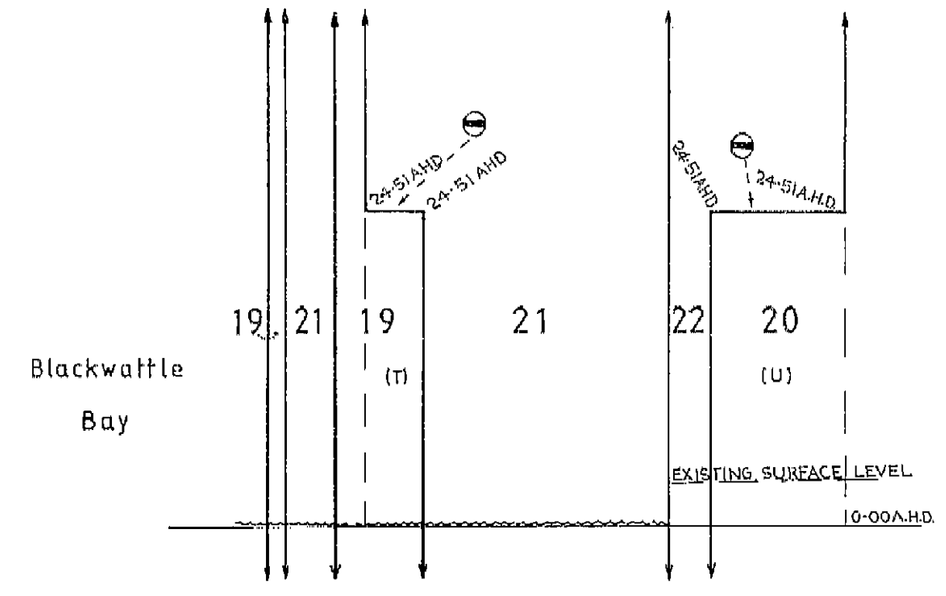


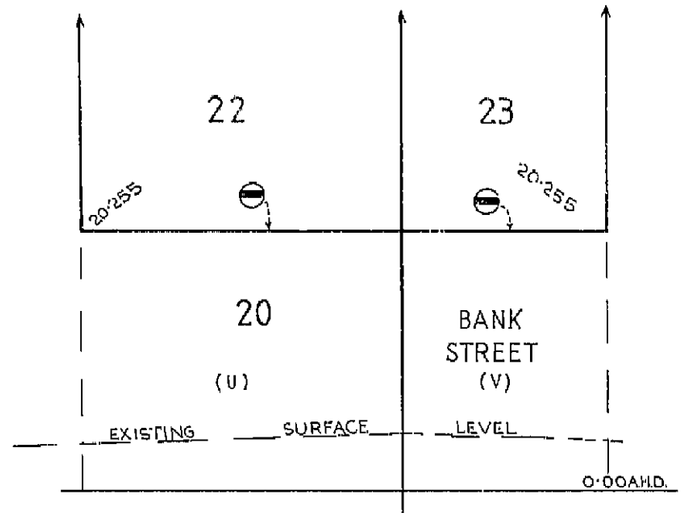
SECTION "K"-"K"

INCLINED PLANE DESIGNATED a^1-a^2-a^3-a^4-a^5-a^6-a^7-a^8-a^9-a^{10}-a^{11}-a^1 ON SHEETS 1 & 2 IS HORIZONTAL ALONG LINES AT RIGHT ANGLES TO SECTION LINE "K"-"K".

INCLINED PLANE DESIGNATED b^1-b^2-b^3-b^4-b^5-b^6-b^7-b^8-b^9-b^{10}-b^{11}-b^1 ON SHEETS 1 & 2 IS HORIZONTAL ALONG LINES AT RIGHT ANGLES TO SECTION LINE "K"-"K".



SECTION "L"-"L"



SECTION "J"-"J"

DP 803159

Registered: 28·6·1990

This is sheet 3 of my plan in 3 sheets dated 22·2·1990

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

For use where space is insufficient in any panel on Plan Form 2.

City: SYDNEY
Locality: PYRMONT
Parish: ST. ANDREW
County: CUMBERLAND

Reduction Ratio 1: 400

Plan Drawing only to appear in this space

FILE: 4-12-12036 R.T.A. PLAN 5101 4 12SS0011

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 3rd July, 1990

10 20 30 40 50 60 70 Table of mm 110 120 130 140

3

PLAN FORM 2 (A2)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

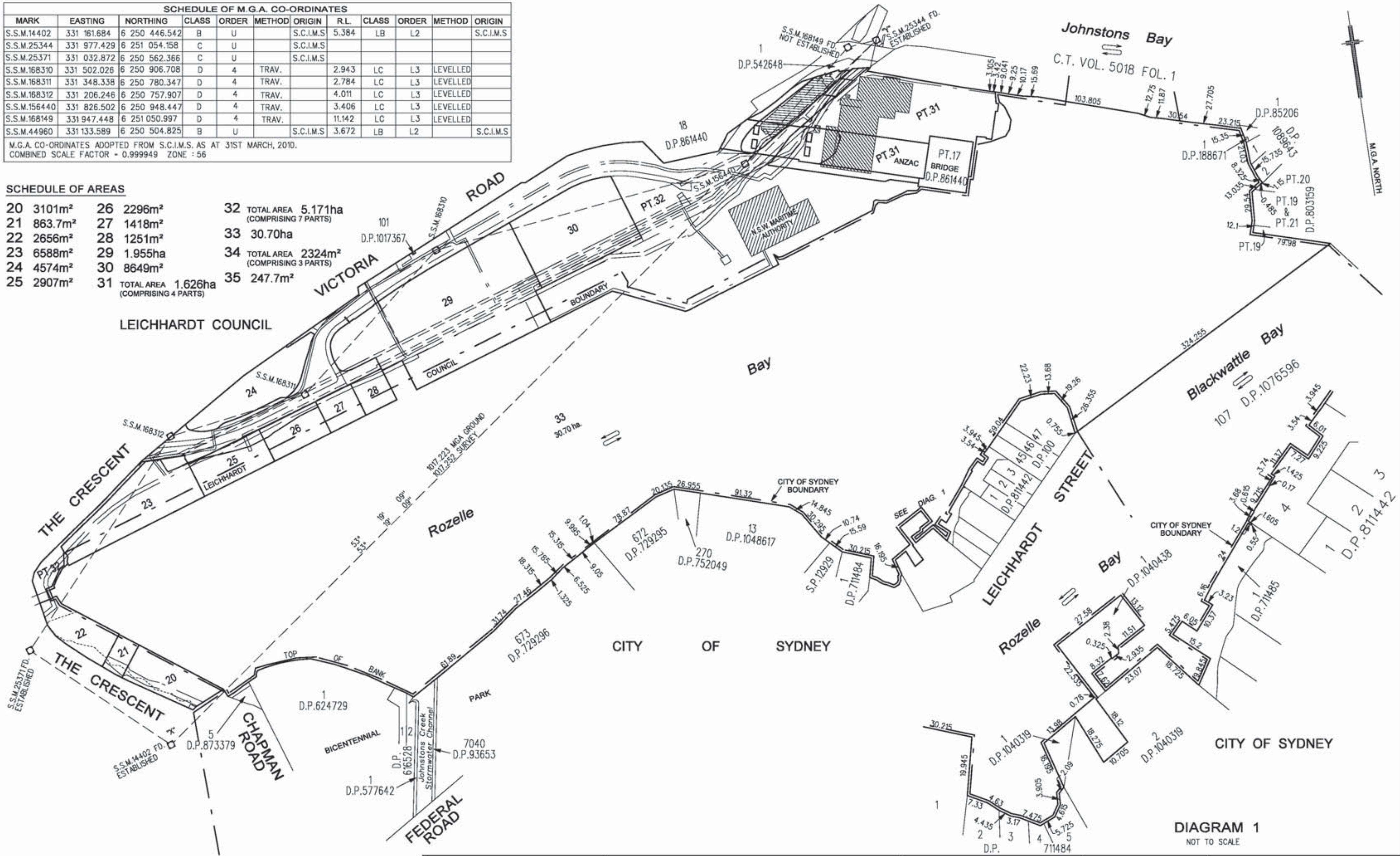
ePlan This is sheet 1 of my plan in 35 sheets

SCHEDULE OF M.G.A. CO-ORDINATES											
MARK	EASTING	NORTHING	CLASS	ORDER	METHOD	ORIGIN	R.L.	CLASS	ORDER	METHOD	ORIGIN
S.S.M.14402	331 161.684	6 250 446.542	B	U		S.C.I.M.S	5.384	LB	L2		S.C.I.M.S
S.S.M.25344	331 977.429	6 251 054.158	C	U		S.C.I.M.S					
S.S.M.25371	331 032.872	6 250 562.366	C	U		S.C.I.M.S					
S.S.M.168310	331 502.026	6 250 906.708	D	4	TRAV.		2.943	LC	L3	LEVELLED	
S.S.M.168311	331 348.338	6 250 780.347	D	4	TRAV.		2.784	LC	L3	LEVELLED	
S.S.M.168312	331 206.246	6 250 757.907	D	4	TRAV.		4.011	LC	L3	LEVELLED	
S.S.M.156440	331 826.502	6 250 948.447	D	4	TRAV.		3.406	LC	L3	LEVELLED	
S.S.M.168149	331 947.448	6 251 050.997	D	4	TRAV.		11.142	LC	L3	LEVELLED	
S.S.M.44960	331 133.589	6 250 504.825	B	U		S.C.I.M.S	3.672	LB	L2		S.C.I.M.S

M.G.A. CO-ORDINATES ADOPTED FROM S.C.I.M.S. AS AT 31ST MARCH, 2010.
COMBINED SCALE FACTOR = 0.999949 ZONE : 56

SCHEDULE OF AREAS

20	3101m²	26	2296m²	32	TOTAL AREA 5.171ha (COMPRISING 7 PARTS)
21	863.7m²	27	1418m²	33	30.70ha
22	2656m²	28	1251m²	34	TOTAL AREA 2324m² (COMPRISING 3 PARTS)
23	6588m²	29	1.955ha	35	247.7m²
24	4574m²	30	8649m²		
25	2907m²	31	TOTAL AREA 1.626ha (COMPRISING 4 PARTS)		



LEVELS ON AUSTRALIAN HEIGHT DATUM
ORIGIN OF LEVELS : S.S.M.14402
R.L.5.384 A.H.D.

Table of mm

Surveyor : ALAN CHARLES DOYLE
Date of Survey : 20th AUGUST, 2010
Surveyor's Ref : 70954 CHECKLIST

PLAN OF SUBDIVISION OF LOTS 2, 3 & 4 D.P.873379, LOT 100 D.P.1017367 AND LOT 1 D.P.1049334

LGA: LEICHHARDT, UNINCORPORATED AND CITY OF SYDNEY
Locality : ROZELLE BAY
Subdivision No: 12/11
Lengths are in metres. Reduction Ratio 1:2500

Registered
29.3.2012

DP1151746

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 3 sheet(s)

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

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 IT IS INTENDED TO CREATE :-

1. RIGHT OF ACCESS 6 WIDE AND VARIABLE WIDTH (A)
2. EASEMENT FOR SERVICES 6 WIDE AND VARIABLE WIDTH (B)
3. RIGHT OF CARRIAGEWAY VARIABLE WIDTH (C)
4. EASEMENT FOR SEWER OVER EXISTING LINE OF PIPES APPROXIMATE POSITION (D)
5. EASEMENT FOR PUMPING STATION AND SEWER RISING MAIN 3 WIDE (E)
6. EASEMENT FOR SERVICES VARIABLE WIDTH (F)
7. EASEMENT FOR ELECTRICITY SERVICES 0.5 WIDE AND VARIABLE WIDTH (G)
8. EASEMENT FOR SEWERAGE PURPOSES 3 WIDE (H)
9. EASEMENT FOR SEWER SERVICES 3 WIDE (I)
10. EASEMENT FOR ELECTRICITY PURPOSES 2.5, 4 AND 5 WIDE AND VARIABLE WIDTH (J)
11. EASEMENT FOR COMMUNICATIONS SERVICES 2 AND 4 WIDE AND VARIABLE WIDTH (K)
12. EASEMENT FOR SERVICES VARIABLE WIDTH (L)

CONTINUED ON SHEET 2
Use PLAN FORM 6A
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

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

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

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

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

AR Gordon
*Authorised Person/~~General Manager~~/~~Accredited Certifier~~

Consent Authority... MARITIME AUTHORITY OF NSW
Date of Endorsement... 31/10/2011
Accreditation No. .....
Subdivision Certificate No. ... 12/11
File No. ... 03/19/11 V 8

*Delete whichever is inapplicable.

* OFFICE USE ONLY

DP1151746

Registered: 29.3.2012

Title System: TORRENS

Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF LOTS 2, 3 & 4 D.P.873379, LOT 100 D.P.1017367 AND LOT 1 D.P.1049334

LGA: LEICHHARDT, UNINCORPORATED AND CITY OF SYDNEY

Locality: ROZELLE BAY

Parish: PETERSHAM

County: CUMBERLAND

Surveying and Spatial Information Regulation, 2006

I, ALAN CHARLES DOYLE
of RYGATE & COMPANY PTY. LTD., SYDNEY
a surveyor registered under the Surveying and Spatial Information Act, 2002, certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying and Spatial Information Regulation, 2006 and was completed on 20th AUGUST, 2010

The survey relates to
LOTS 20-32 & 34 & 35 SURVEYED
LOT 33 COMPILED
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

(Signature) ..... Dated: 15/08/2011
Surveyor registered under the Surveying and Spatial Informaton Act, 2002

Datum Line: "X" - "Y"
Type: Urban /~~Rural~~

Plans used in preparation of survey/~~compilation~~

D.P.873379, D.P.1017367, D.P.1049334
D.P.861440, D.P.542648, D.P.613409
D.P.261985, D.P.626033, D.P.1065973
D.P.1029351

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE: 70954 CHECKLIST

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN OF SUBDIVISION OF LOTS 2, 3 & 4 D.P.873379, LOT 100 D.P.1017367 AND LOT 1 D.P.1049334

* DP1151746

Registered: 29.3.2012

* OFFICE USE ONLY

Subdivision Certificate No: 12/11 Date of Endorsement: 31/10/2011

CONTINUED FROM SHEET 1

13. RIGHT OF ACCESS VARIABLE WIDTH (M)
14. EASEMENT FOR SERVICES VARIABLE WIDTH (N)
15. RIGHT OF ACCESS VARIABLE WIDTH (O)
16. EASEMENT FOR SERVICES VARIABLE WIDTH (P)
17. RIGHT OF ACCESS AND EASEMENT FOR SERVICES VARIABLE WIDTH (Q)
18. RIGHT OF ACCESS 5.04 WIDE (R)
19. RIGHT OF ACCESS 4.2 WIDE (S)
20. EASEMENT FOR WATER SUPPLY PURPOSES 3 WIDE (T)
21. EASEMENT FOR TRAFFIC SIGNAL SERVICES 2 WIDE (U)
22. EASEMENT FOR ENCROACHMENT AND SUPPORT VARIABLE WIDTH (V)
23. RIGHT OF FOOTWAY VARIABLE WIDTH (W)
24. RIGHT OF ACCESS (Z) WHOLE OF LOT
25. RESTRICTION ON USE OF LAND WHOLE OF LOT
26. EASEMENT FOR SERVICES (AA) WHOLE OF LOT
27. EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2, 2.5, AND 4 WIDE AND VARIABLE WIDTH (BB)
28. EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 4 WIDE AND VARIABLE WIDTH (CC)
29. EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 7.5 AND 5 WIDE AND VARIABLE WIDTH (DD)
30. EASEMENT FOR SIGNAGE 1 WIDE (EE)
31. EASEMENT FOR WATER SUPPLY PURPOSES 3 WIDE (FF)
32. EASEMENT FOR ENCROACHMENT AND SUPPORT WHOLE OF LOT (LL)
33. RESTRICTION ON USE OF LAND WHOLE OF LOT
34. RIGHT OF ACCESS VARIABLE WIDTH (GG)
35. POSITIVE COVENANT - POST CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN WHOLE OF LOT
36. RIGHT OF ACCESS 14 WIDE (HH)
37. EASEMENT FOR SERVICES VARIABLE WIDTH (JJ)
38. EASEMENT FOR SERVICES VARIABLE WIDTH (KK)
39. RESTRICTION ON USE OF LAND FENCING - WHOLE OF LOT

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 IT IS INTENDED TO RELEASE :-

1. RIGHT OF WAY (A) CREATED BY DEALING A625609
2. EASEMENT FOR WATER SUPPLY AND SEWERAGE (K) CREATED BY DEALING C446886
3. RIGHT OF WAY VARIABLE WIDTH CREATED BY D.P.873379
4. EASEMENT FOR SERVICES VARIABLE WIDTH CREATED BY D.P.873379
5. RIGHT OF WAY VARIABLE WIDTH CREATED BY D.P.873379
6. EASEMENT FOR SERVICES VARIABLE WIDTH CREATED BY D.P.873379
7. RIGHT OF WAY VARIABLE WIDTH CREATED BY D.P.873379
8. EASEMENT FOR SERVICES VARIABLE WIDTH CREATED BY D.P.873379

SURVEYOR'S REFERENCE: 70954 CHECKLIST

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN OF SUBDIVISION OF LOTS 2, 3 & 4 D.P.873379, LOT 100 D.P.1017367 AND LOT 1 D.P.1049334

* DP1151746

Registered: 29.3.2012

* OFFICE USE ONLY

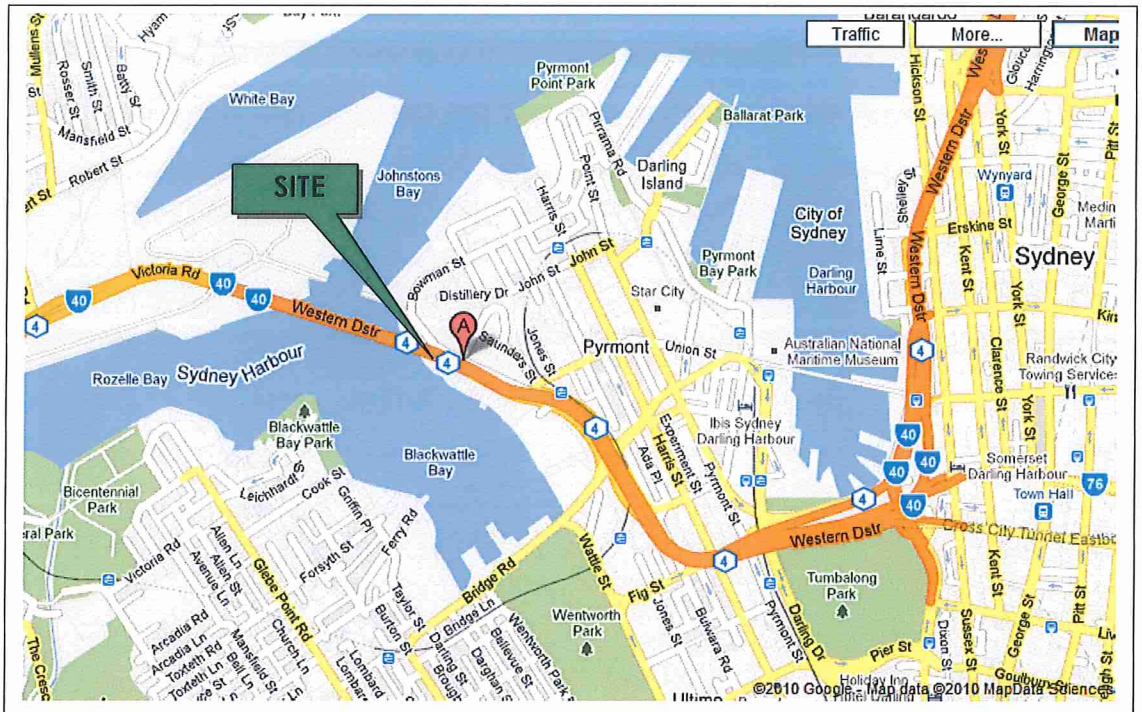
Subdivision Certificate No: 12/11 Date of Endorsement: 31/10/2011

AR Gordon

ALLAN GORDON
SURVEY MANAGER
MARITIME AUTHORITY OF NSW

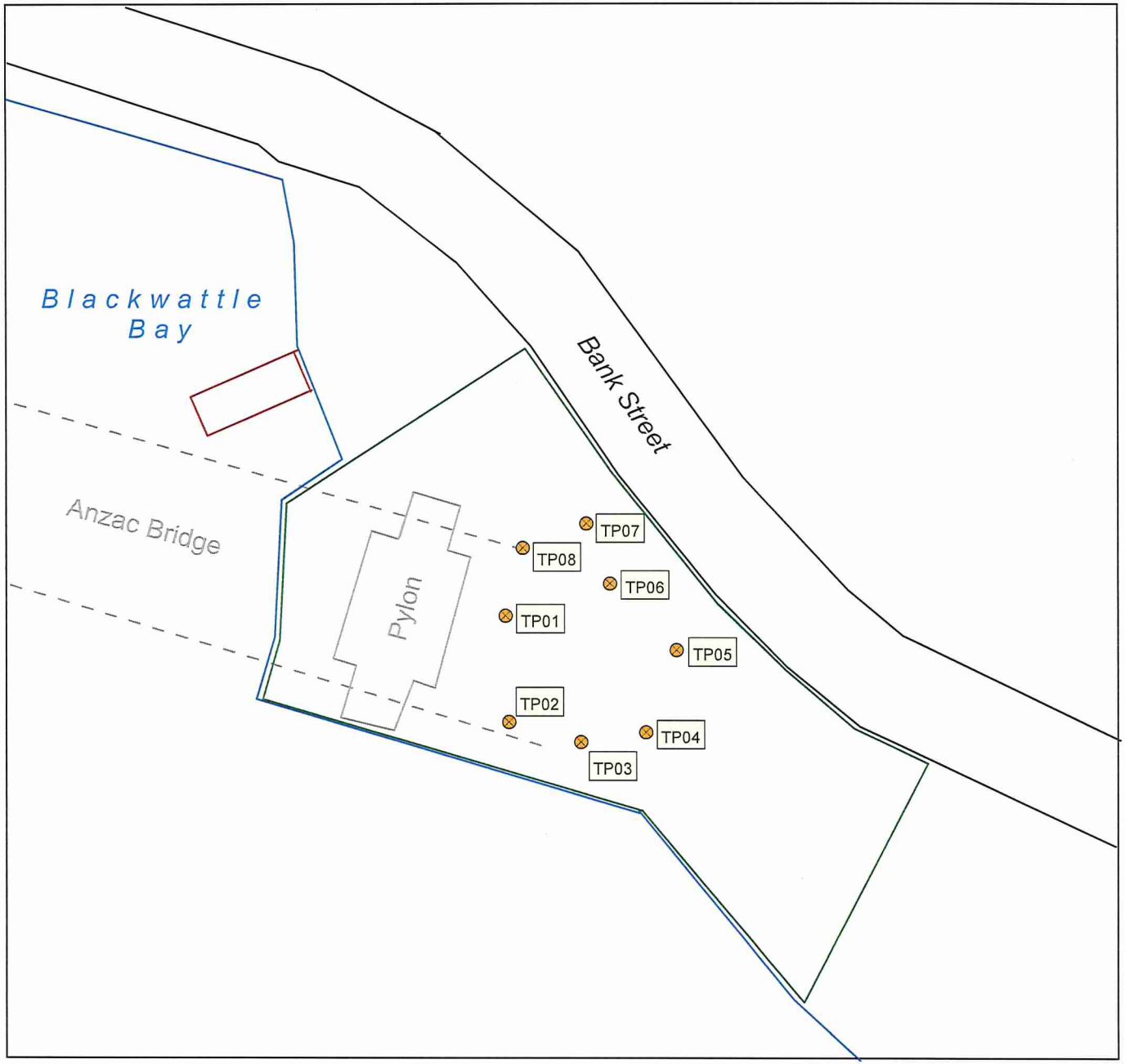
SURVEYOR'S REFERENCE: 70954 CHECKLIST

Appendix D: Consultant's Figures



Images courtesy of www.googlemaps.com, 2010

Date: June 2010	Client: SP0062	Job: 82962
Site: Bank Street, Pyrmont NSW	Appendix A: Site Locality Map	



Noel Arnold & Associates
RISK MANAGEMENT SERVICES

Level 2, 11 Khartoum Road
North Ryde NSW 2113
Ph: (02) 9889 1800
Fax: (02) 9889 1811

Legend

- Test Pit Location
- Road
- Water Boundary
- Property Boundary
- Boat Shed

N

0 10 20 30 40 50 Meters

Approximate scale

Client Name:	Department of Public Works		
Client No:	SP0062	Job No:	82962
Project:	Soil Contamination Investigation		
Site:	Vacant land adjacent Bank St, Pyrmont		
Figure Name:	Test Pit Locations		
Figure No:	01	Date:	25/06/2010
Drafted By:	HG	Reviewed By:	NP
Coord System:	N/A		

2 SITE IDENTIFICATION

The site is pentagonal in shape, consists of a portion of Lots 19 and 20 of DP 803159 and occupies an area of approximately 3,500m^2. The locality of the site is presented in **Figure 1**. A site layout plan is presented in **Figure 2**.

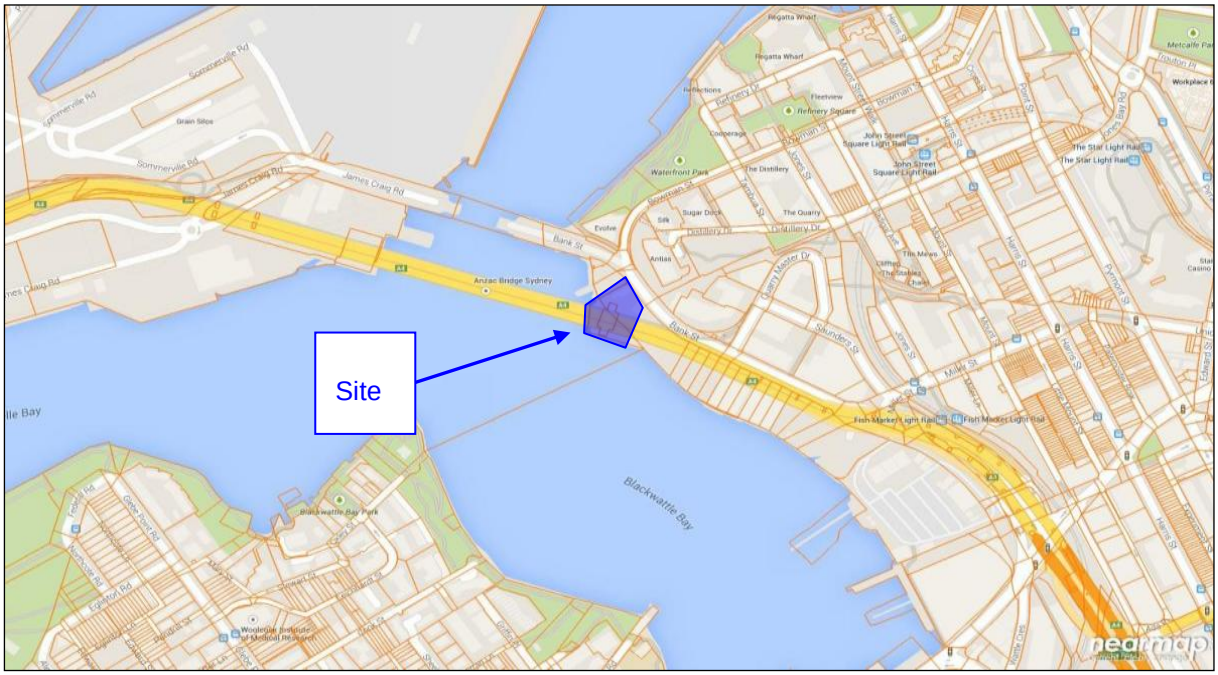
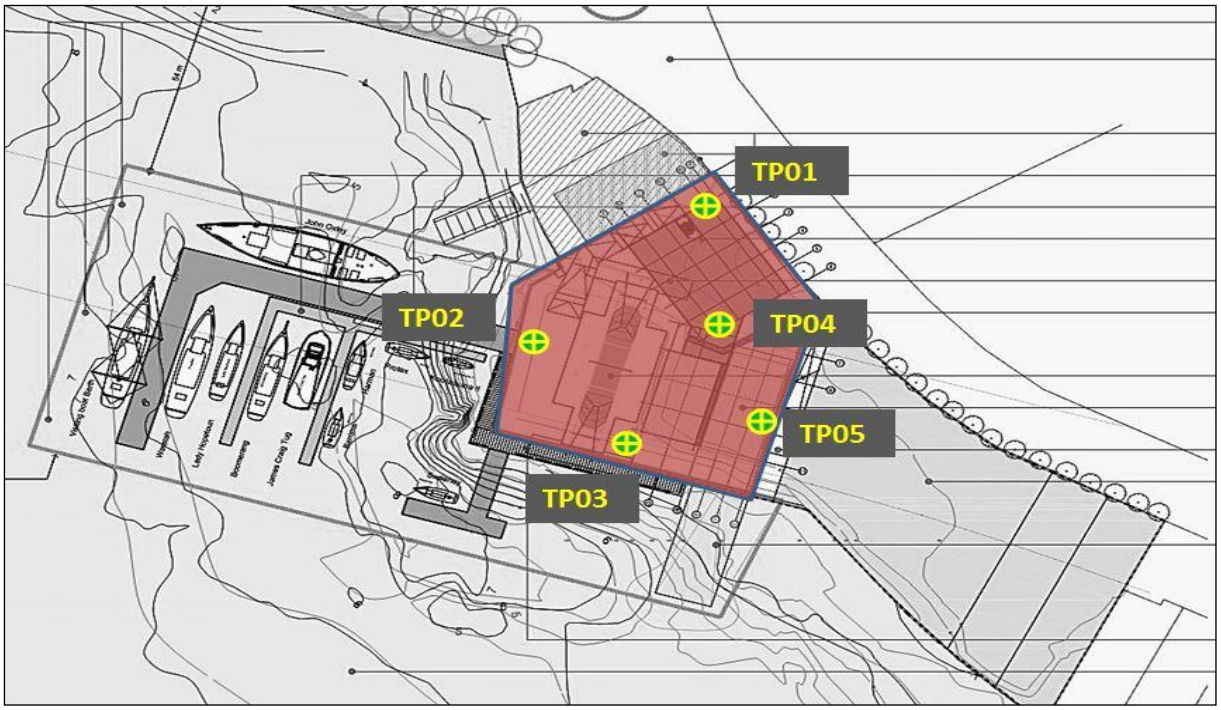


Figure 1 Site Locality



Modified from Crawford Architects Drawing SK10-F Master plan

Figure 2 Site Layout and Test Pit Locations

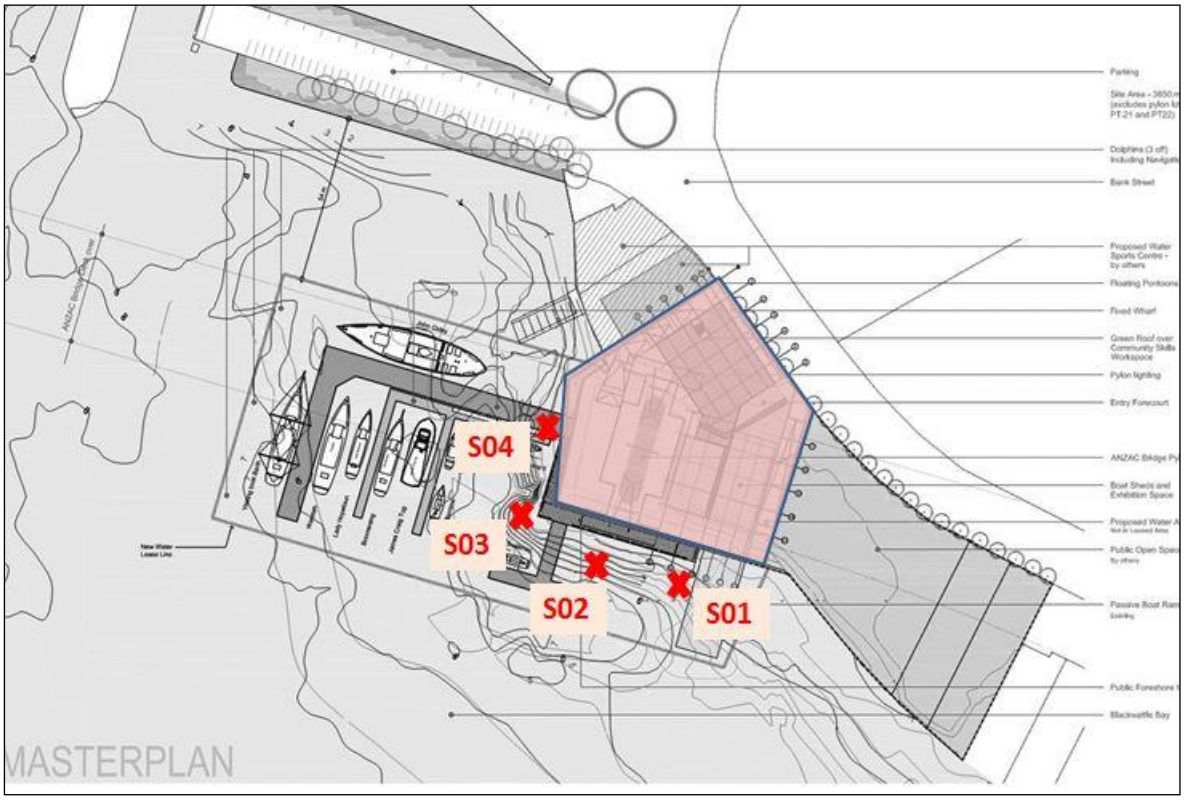


Figure 3 Sediment Sampling Locations

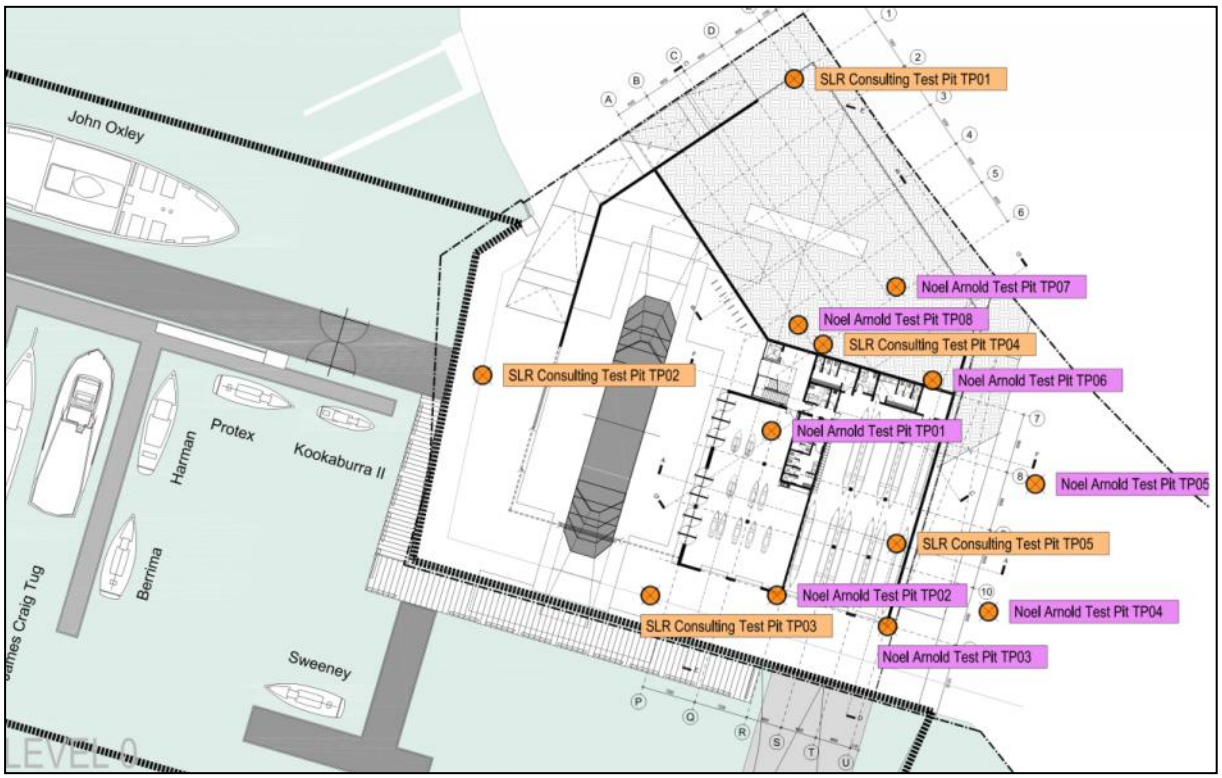


Figure 4 NAA Test Pit Locations Superimposed on the Proposed Development

4.2 Douglas Partners – 2008

SLR (2011) summarised the findings of the DP (2008) report as follows:

"Douglas Partners Pty Ltd conducted a Marine Sediment Contamination Assessment at the Hymix wharf, located on Blackwattle Bay NSW. The NSW Maritime Authority required the owner (Hymix) to remove the wharf structure and address the environmental requirements associated with the management of sediments during the removal. The scope of the work for this assessment included a review of the site history and the collection of 10 sediment samples.

"The soil sampling undertaken at the Site comprised collection of surface sediments from five on-site (i.e. within the footprint of the wharf) and five off-site locations. Off-site samples were collected by SCUBA divers and comprised surface sediments (i.e. 0 – 0.3m interval). Sediments were analysed for heavy metals, cyanide, PAHs, TRHs, BTEX, MAHs, PCBs, OCPs, Phenols, TBT and VCHs.

"The Sediment Quality Guidelines specified in Table 3.5.1 of the ANZECC Guidelines for Fresh and Marine Water Quality (2000) was adopted by Douglas Partners as the Site Assessment Criteria for the investigation.

"Concentrations of Cyanide, TRHs, BTEX, Phenols, PCBs and VHCs were below laboratory detection limits in all samples. Concentration of total PAHs in all samples exceeded the ISQG-Low criteria. Total PAHs was measured in one sample (onsite sample S3) at a significantly elevated level (71.29 mg/kg) compared with concentrations in other samples.

"Among the heavy metals:

- Cadmium and Chromium were within the ISQG-Low levels for all samples;
- Arsenic and Nickel both recorded one exceedance of the ISQG-Low levels but were below the ISQG-high levels;

3 SITE IDENTIFICATION

The site is pentagonal in shape, consists of a portion of Lots 19 and 20 of DP 803159 and occupies an area of approximately 3,500m^2. The fixed wharf, floating pontoons and a boardwalk are proposed to be constructed within Blackwattle Bay (Lot 33 DP 1151746), adjoining the western boundary of the site.

The locality of the site is presented in **Figure 1**. A site layout plan is presented in **Figure 2**.

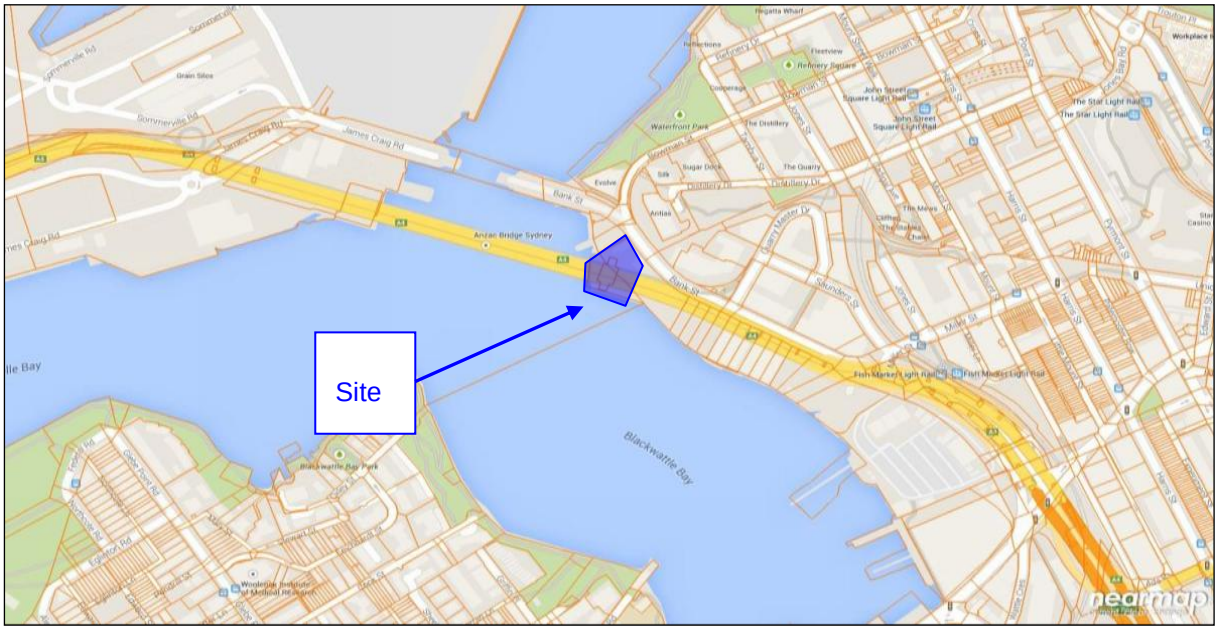
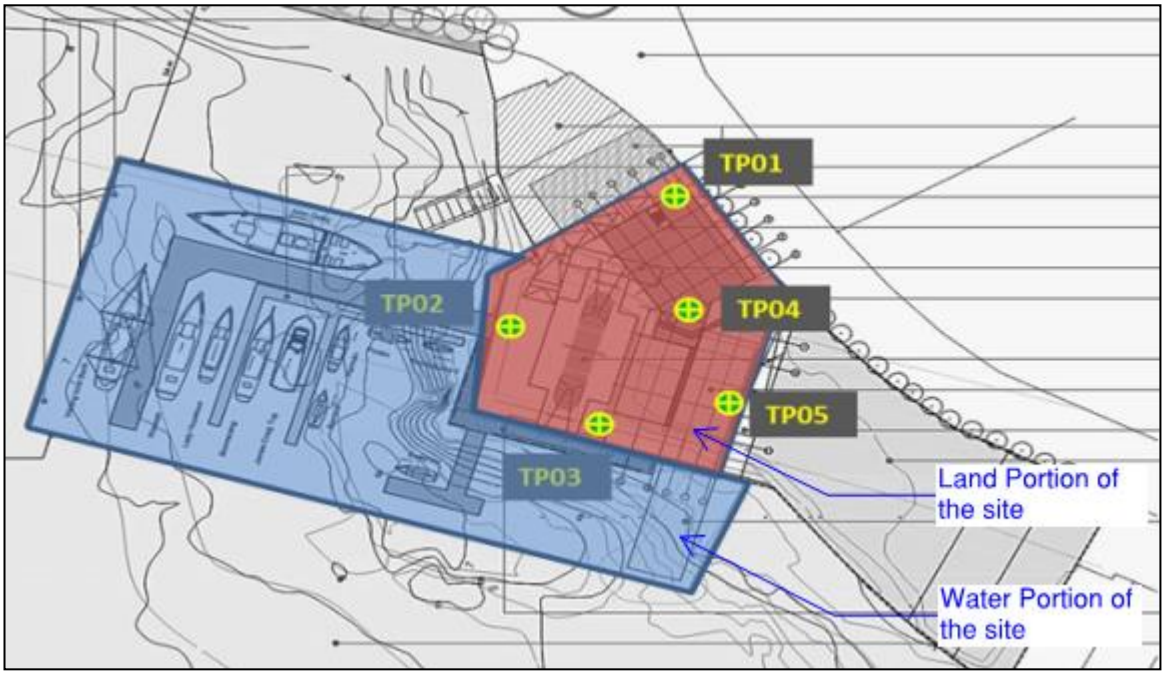
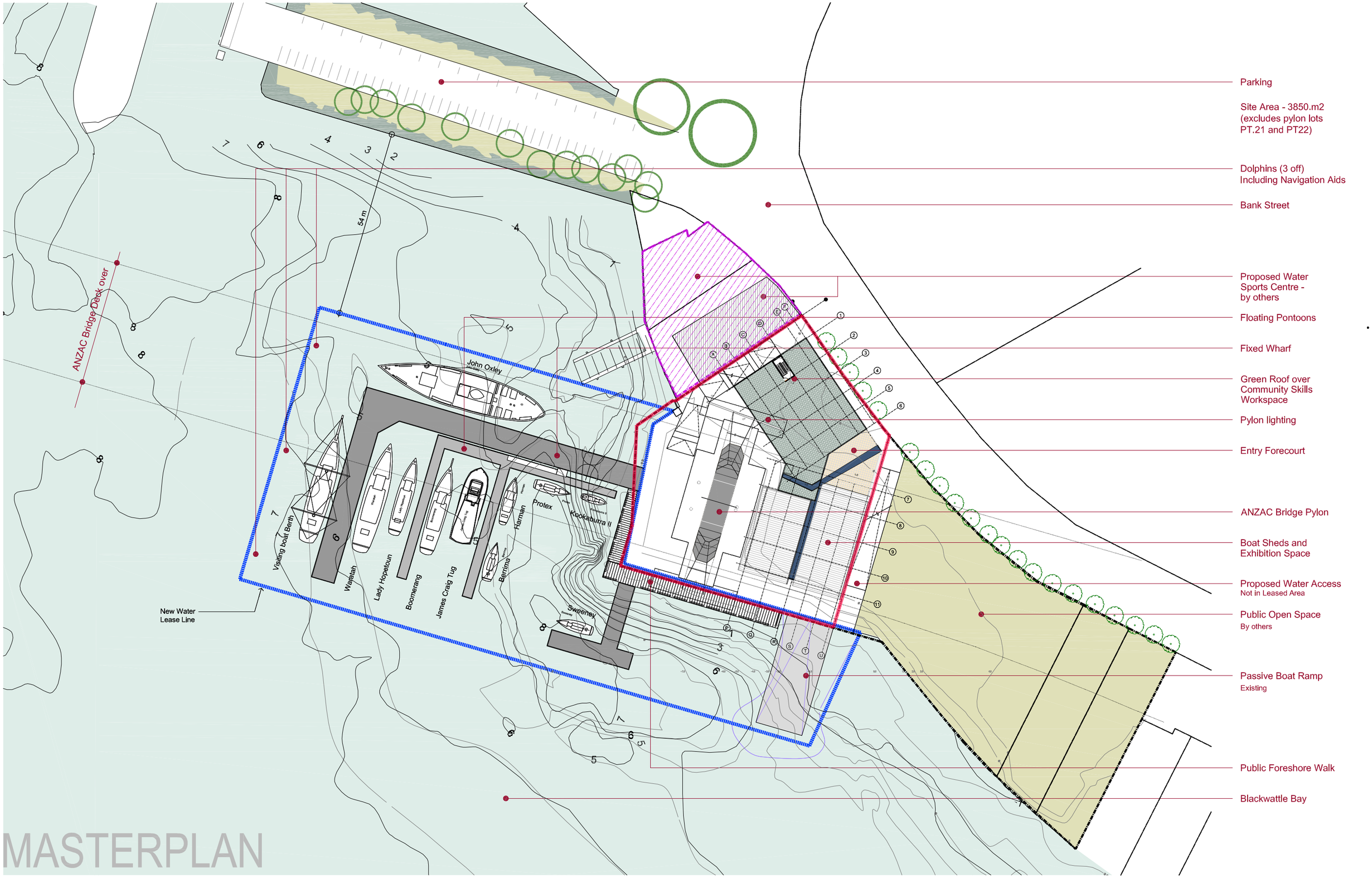


Figure 1 Site Locality



Modified from Crawford Architects Drawing SK10-F Master plan

Figure 2 Site Layout and Test Pit Locations



SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

MASTERPLAN
SK10 - F 2014.10.03
Scale 1:500 @ A1

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106

Date Nov 2012

Project No 0811

Proposed Water Sports Centre - by others

Foreshore Vehicle and Pedestrian Access
1:14 accessible ramp

Community Skills Workspace above

Energy Australia cable
Approximate position

Energy Australia Joint Bay (access required)

Fixed Wharf

Bicycle Parking

Lobby - Level 0

Boat Store Amenities

ANZAC Bridge Pylon

Workshop and Boat Store

Boat Store

Public Open Space
By others

Vehicle Access Ramp
Not in Leased Area

1.s

Pylon Security fencing & Gates

Floating Pontoons

Public Foreshore Walk

Passive Boat Ramp
Existing

SYDNEY HERITAGE FLEET BASE - Environmental Assessment

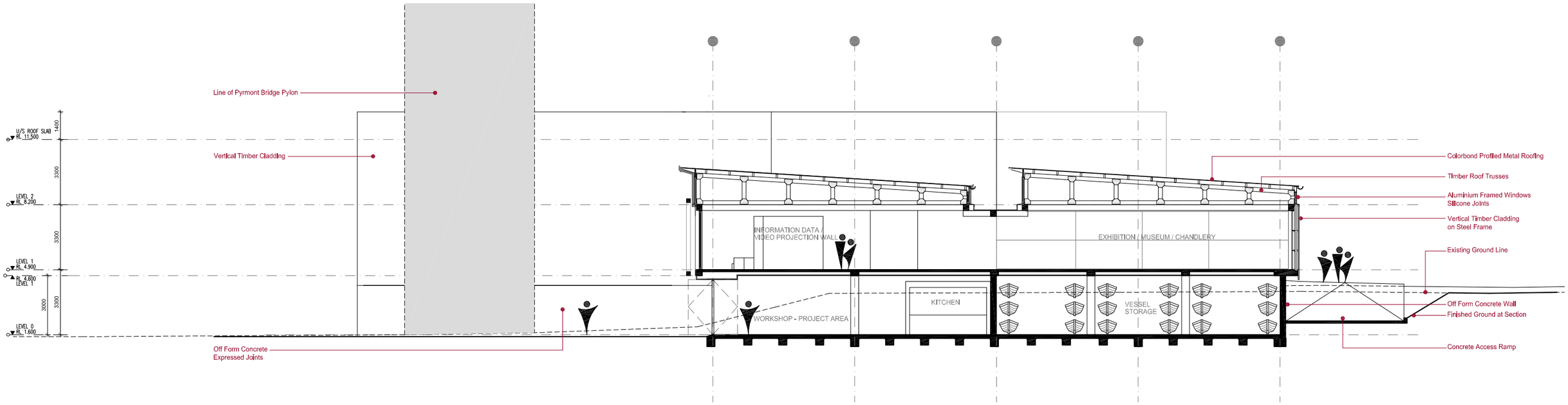
BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

LEVEL 0 PLAN
SK40 - D 2014.10.03
Scale 1:200 @ A1

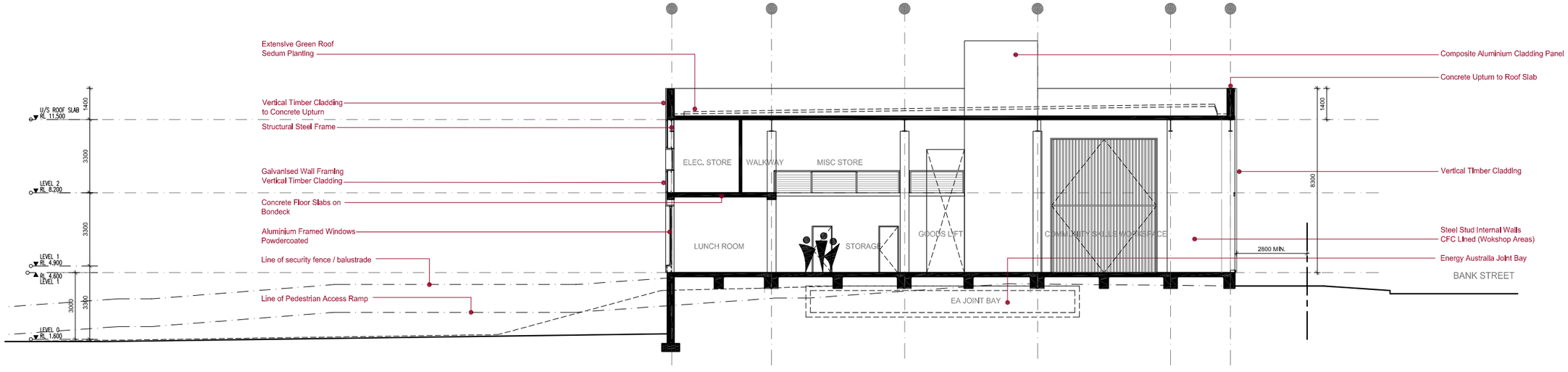
Date Nov 2012

Project No 0811

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106



SECTION AA



SECTION BB

SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

SECTIONS - SHEET 01

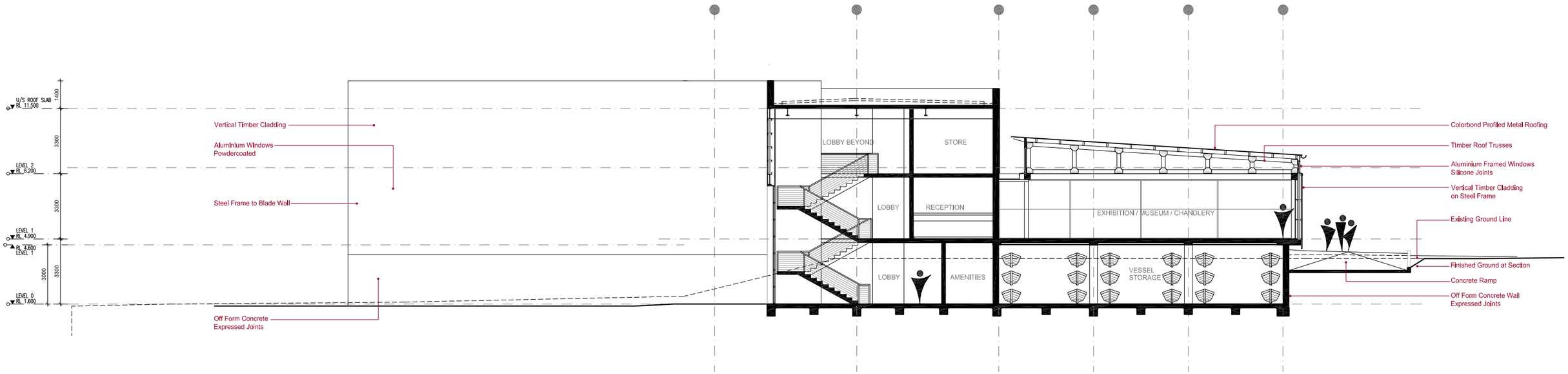
SK 50 - B 2014.10.03

Scale 1:100 @ A1

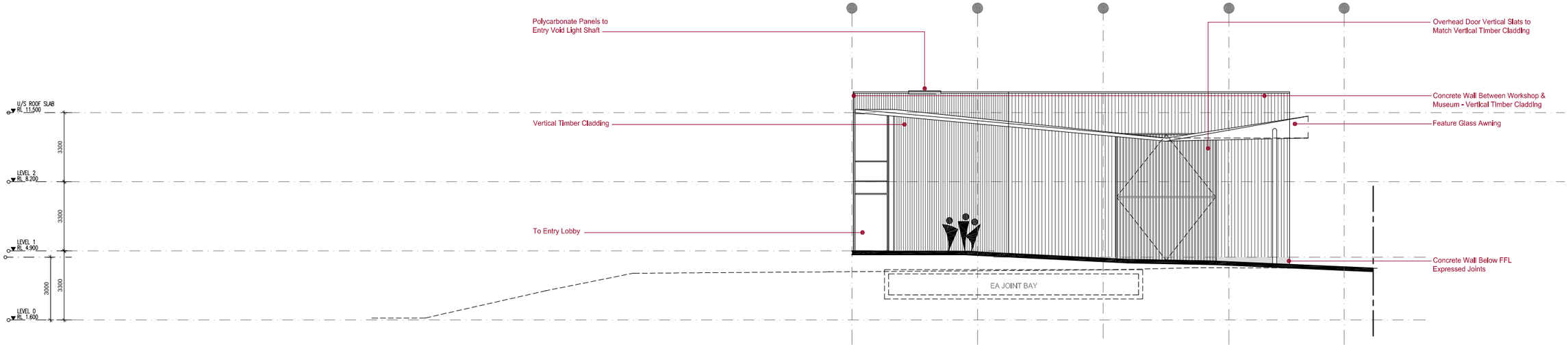
Date Nov 2012

Project No 0811

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106



SECTION FF



SECTION GG

SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

SECTIONS - SHEET 04

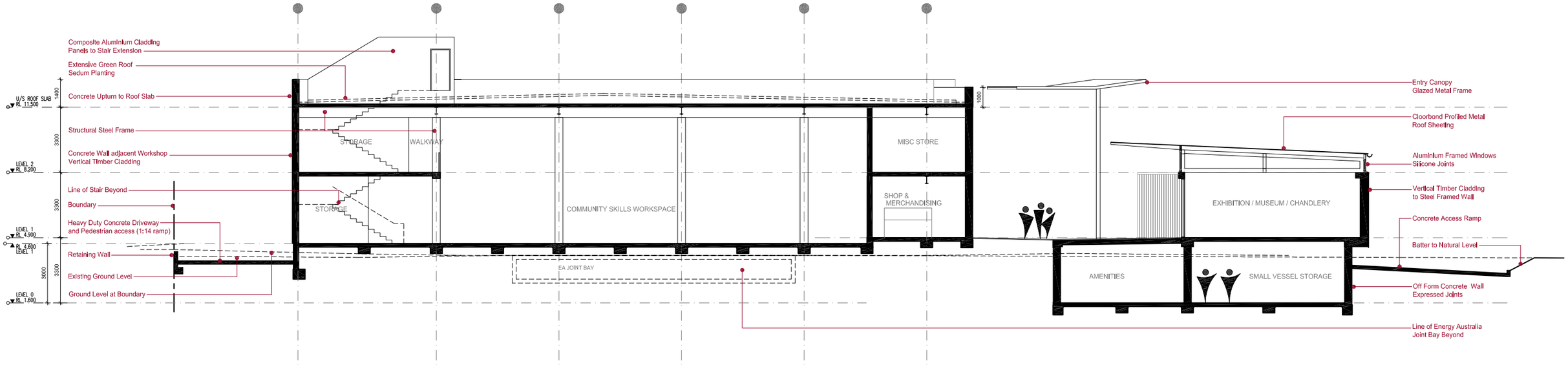
SK 53 - B 2014.10.03

Scale 1:100 @ A1

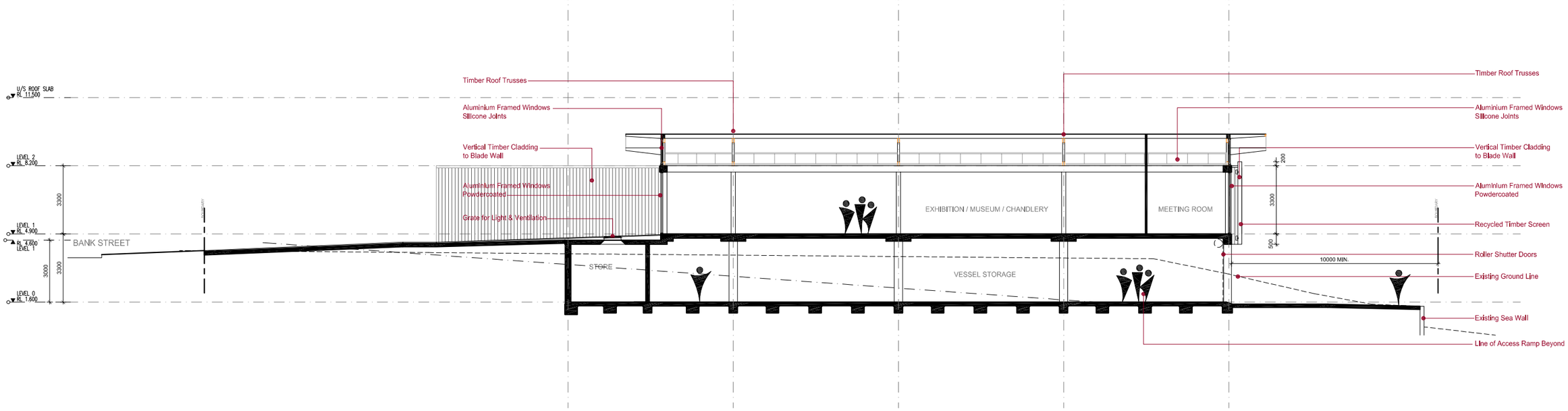
Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106

Date Nov 2012

Project No 0811



SECTION CC



SECTION DD

SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

SECTIONS - SHEET 02

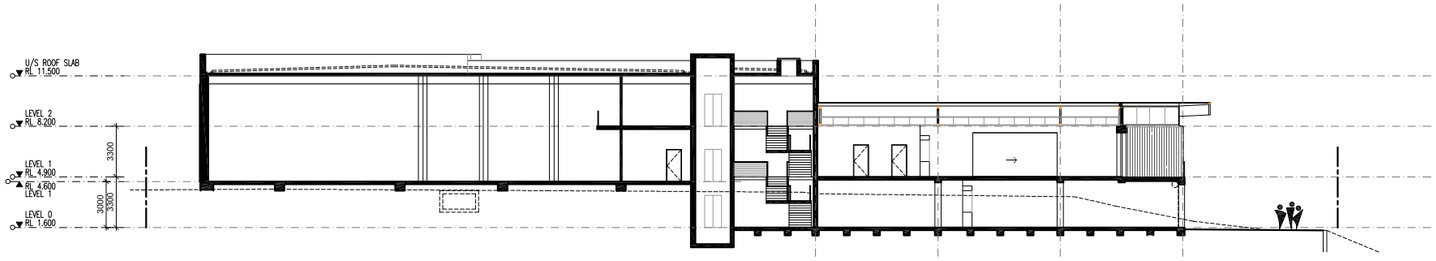
SK 51 - B 2014.10.03

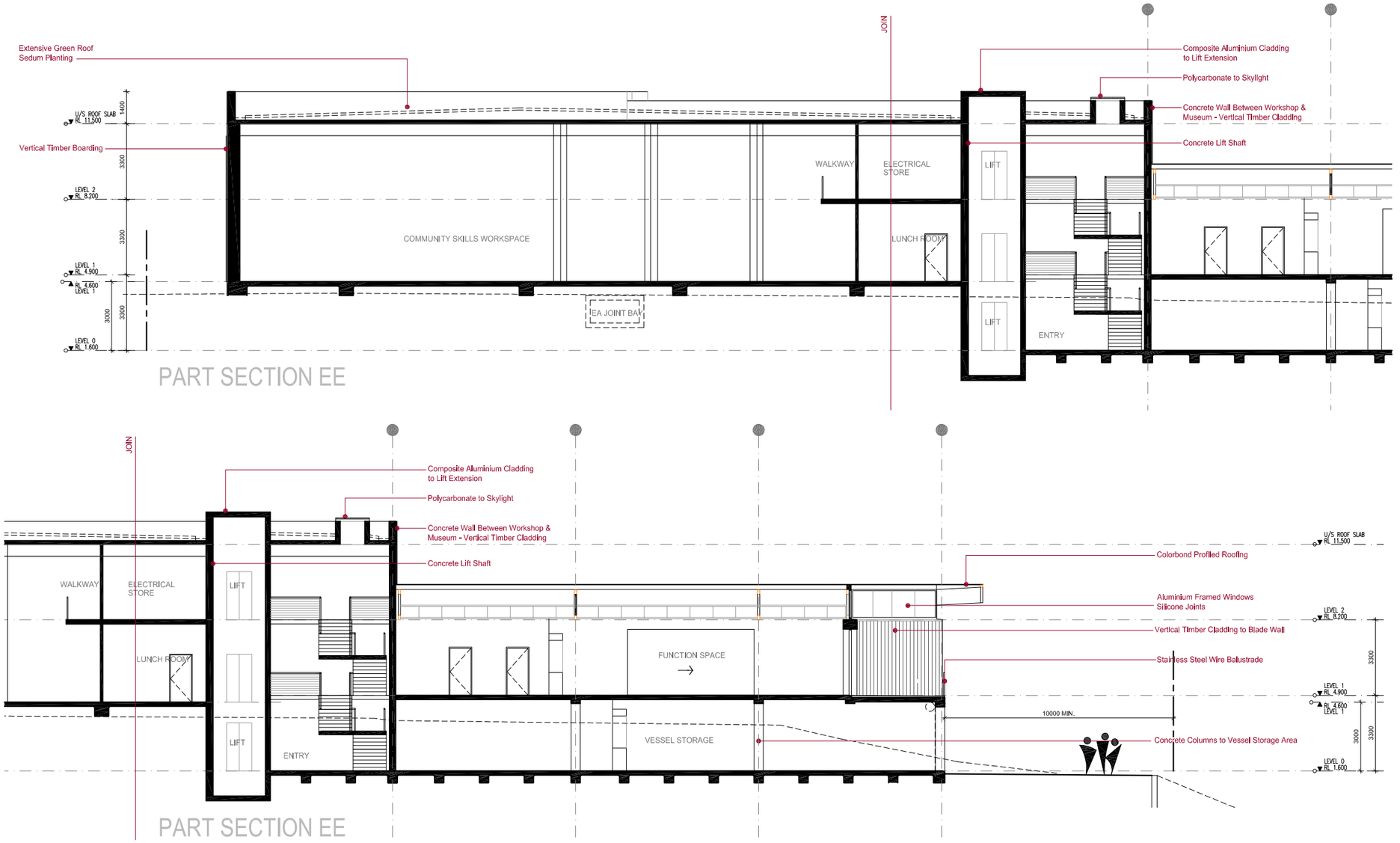
Scale 1:100 @ A1

Date Nov 2012

Project No 0811

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106





PART SECTION EE

PART SECTION EE

SECTION EE

SYDNEY HERITAGE FLEET BASE - Environmental Assessment

BANK STREET - PYRMONT - LOT 19 and LOT 20 - D.P.803159

SECTIONS - SHEET 03

SK 52 - B 2014.10.03

Scale 1:100 @ A1

Date Nov 2012

Project No 0811

Suite 100, Jones Bay Wharf, Pirrama Road, Pyrmont NSW 2009 T 02 9660 3644 F 02 9660 3622 ABN 56 120 779 106

Appendix E: Regulatory Search Results

Healthy Environment, Healthy

Home > Contaminated land > Record of notices

Search results

Your search for:Suburb: Pyrmont

Matched 7 notices relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
Pyrmont	Pyrmont Road	Pyrmont Power Station	7 former

Page 1 of 1

24 April 2

Healthy Environment, Healthy Community, Healthy Business

Search results

Your search for: **General Search** with the following criteria

Suburb - PYRMONT

returned 4 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
1253	HYMIX AUSTRALIA PTY LIMITED	41-45 BANK STREET, PYRMONT, NSW 2009	POEO licence	No longer in force	25 May 2000
1009061	HYMIX AUSTRALIA PTY LIMITED	41-45 BANK STREET, PYRMONT, NSW 2009	s.58 Licence Variation	Issued	21 Jun 2001
11718	LEND LEASE BUILDING PTY LTD	BOWMAN STREET, PYRMONT, NSW 2009	POEO licence	Surrendered	23 Aug 2002
5949	SYDNEY HARBOUR CASINO PROPERTIES PTY LIMITED	80 PYRMONT STREET, PYRMONT, NSW 2009	POEO licence	Surrendered	13 Jun 2000

24 April 2015

List of NSW Contaminated Sites Notified to EPA as of 6 March 2015

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Suburb	Site Description	Site Address	Activity that caused contamination	Site Status
Punchbowl	Former BP Service Station	1375 Corner Canterbury & Victoria Roads	Service Station	Under assessment
Punchbowl	Punchbowl Laundry	42-44 Belmore Road	Chemical Industry	Under assessment
Putney	Putney Marina	20 Waterview Street	Other Industry	Under assessment
Pymble	Caltex Service Station	1117 Pacific Hwy	Service Station	Regulation under the CLM Act not required
Pymble	Shell Coles Express Service Station	21 Ryde Road	Service Station	Under assessment
Pymble	Former 3M site	950 Pacific Highway	Gasworks	Regulation under the CLM Act not required
Pyrmont	Fig and Wattle Depot Site	14-26 Wattle Street	Unclassified	Under assessment
Quakers Hill	Caltex Service Station	450 Quakers Hill Parkway	Service Station	Under assessment
Quakers Hill	Mobil Service Station	83 Lalor Road	Service Station	Under assessment
Queanbeyan	Mobil Depot	109 High Street	Other Petroleum	Under assessment
Queanbeyan	Former Mobil Service Station	151-153 Uriarra Street	Service Station	Under assessment
Queanbeyan	Bill Lilley Automotive	169 Crawford Street	Service Station	Under assessment
Queanbeyan	Woolworths Petrol	196 Crawford Street Cnr Morisset Street	Service Station	Under assessment
Queanbeyan	Caltex Depot	5 Stephens Road	Service Station	Under assessment
Queanbeyan	BP Queanbeyan	50 Yass Road	Service Station	Regulation under the CLM Act not required
Queanbeyan	Caltex Service Station	Bungendore Rd	Service Station	Under assessment
Queanbeyan	Caltex Service Station	Lanyon Dr Cnr Mccrae St	Service Station	Under assessment
Quirindi	Caltex Service Station, Quirindi	199-201 George St	Service Station	Under assessment
Quirindi	Mobil Depot, Quirindi	4-6 Cross Street	Other Petroleum	Under assessment
Quirindi	Tamarang Service Centre	Lot 1 Station street	Service Station	Under assessment
Ramsgate	Shell Coles Express Service Station	Grand Parade cnr Ramsgate Road	Service Station	Under assessment
Randwick	7 Eleven Service Station	128 Barker Street	Service Station	Contamination currently regulated under the CLM Act
Randwick	Caltex Service Station	2 Alison Rd	Service Station	Regulation under the CLM Act not required
Randwick	United Service Station Clovelly	33-37 Carrington Road cnr Albion Street	Service Station	Regulation being finalised
Randwick	Metro Petroleum	345 Avoca Street	Service Station	Regulation under the CLM Act not required
Ravensworth	Ravensworth Operations Narama Mine	Lemington Road	Other Industry	Under assessment
Ravensworth	Cumnock Colliery	Old New England Highway	Other Industry	Under assessment
Raymond Terrace	Shell Coles Express Service Station	105 Pacific Highway	Service Station	Under assessment
Raymond Terrace	Former Motor Registry	53 William Street	Other Petroleum	Under assessment
Raymond Terrace	Caltex Service Station	Cnr Adelaide & Glenelg Streets	Service Station	Under assessment
Redfern	Former Printing Works	101a Marriott St	Other Industry	Regulation under the CLM Act not required
Redfern	BP Service Station	116 Regent Street	Service Station	Under assessment
Revesby	Caltex Service Station	181 The River Rd	Service Station	Under assessment

Search Results

94 results found.

Australian Financial Press Building 179 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Australian Joint Stock Bank (former) 1 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Bakery (former) 82 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Cooperage Building (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Gate House (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Laboratory B Building (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Main Office Building (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Managers House (former) 85 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Store House (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
CSR Tablet House (former) Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Commercial Terrace 117-125 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Commercial Terrace 135-141 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Commercial Terrace 304-308 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Commercial Terrace 74-80 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Commonwealth Bank 2 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Commonwealth Naval Stores Building (former) Darling Island Rd	Pyrmont, NSW, Australia	(Place removed from CHL) Commonwealth Heritage List
Corner Shop 35 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cottage 18 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cottage 6 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Council Terrace Houses 286-318 Jones St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Duke of Edinburgh Hotel 152-154 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Dunkirk Hotel 205-207 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Edwin Davey & Sons Flour MIll 2A Allen St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Elder Smith Goldsbrough Mort No 1 Woolstore 350-384 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Festival Records Building 63-79 Miller St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Georgian Cottage 4 Ways Tce	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Georgian Terrace 101-103 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Georgian Terrace 105-115 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Glebe Island Bridge Bank St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Harbour Queen Bank St	Pyrmont, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
House 20 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
House 4 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Houses 2-8 Scott St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Houses 75-77 John St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Interim Park Point St	Pyrmont, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
J H Geddes Woolstore (former) 139 Murray St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
John Street Terrace Group 54-66 John St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Low Level Sewage Pumping Station No 2 2-4 Wattle St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
MMI Building 47-49 Murray St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Maybanke Kindergarten 99 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
McCafferys Building 17 Mount St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
McComas and Price Williams Wool Press 137 Prymont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Memorial to World War One Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

New York Hotel 50 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pitt Son and Badgery Wool Store 320-348 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Arms Hotel (former) 42-44 Harris St	Pyrmont, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
Pyrmont Bridge Hotel 94-96 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Bridge Road Hotel 11 Pyrmont Bridge Rd	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Conservation Area	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Fire Station 145-147 Pyrmont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Incinerator Saunders St	Pyrmont, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Pyrmont Point	Pyrmont, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Pyrmont Point Carriageway Dividing Fence Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Point Escarpment Face Pirrama Rd	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Pyrmont Point Escarpment Palisade Fence and Stone Gateposts Pirrama Rd	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Point Railway Cutting & Tunnel	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Post Office 148 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Post Office 148 Harris St	Pyrmont, NSW, Australia	(Listed place) Commonwealth Heritage List
Pyrmont Power Station Building A 42 Pyrmont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Public School (former) John St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont Square Group Pyrmont Sq	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pyrmont and Murray Streets Residential Group	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Quarrymans Hotel 214-216 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Railway Viaduct Wattle St	Glebe, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Royal Edward Victualling Yard Group Darling Island Rd	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Royal Pacific Hotel 59 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Schute, Bell, Badgery & Lumby Store 94-136 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Bedes Church, School & Presbytery 37-43 Pyrmont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Sydney Harbour Landscape Area	Sydney, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Terminus Hotel 61 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace 3-21 Paternoster Row	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace 8-16 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace House 1 Paternoster Row	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace House 22 Union St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace House 67 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 1-5 Cross St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Terrace Houses 120-138 Bowman St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 143-155 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 189-203 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 224-302 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 27-29 Pyrmont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 31-41 Mount St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 46-48 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 5-15 Mount St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 63-65 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Terrace Houses 83 Point St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Ultimo Conservation Area	Ultimo, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Waite and Bull Building 137 Pyrmont St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Ways Terrace 12-20 Point St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Ways Terrace Group 2A & 2B Ways Tce	Pyrmont, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Westpac Bank Archives (former) 17-21 Pyrmont Bridge Rd	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wharf 19, 20 & 21 Bayview St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Woolbrokers Arms Hotel 22 Allen St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Woolstores No 1 Group 320-384 Harris St	Pyrmont, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Fri Apr 24 10:09:21 2015

Office of Environment & Heritage

Search for NSW heritage

Return to search page where you can refine/broaden your search. ItemName 0

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into two sections.

- **Section 1**. contains items listed by the **heritage council** under the NSW Heritage Act. This includes listing on the state heritage register, an interim heritage order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Branch.
- **Section 2**. contains items listed by **local councils & shires and state government agencies**. This section may also contain additional information on some of the items listed in the first section.

Section 1. Items listed under the NSW Heritage Act.

Your search returned 5 records.

Item name	Address	Suburb	LGA	SHR
Glebe Island Bridge	Bank Street, Victoria Road	Pyrmont	Sydney	01914
Pyrmont and Glebe Railway Tunnels	Metropolitan goods railway	Pyrmont	Sydney	01225
Pyrmont Post Office	148 Harris Street	Pyrmont	Sydney	01440
Royal Edward Victualling Yard	38-42 Pirrama Road	Pyrmont	Sydney	01855
Sewage Pumping Station 1	William Henry Street	Ultimo	Sydney	01336

ItemName 0

Section 2. Items listed by Local Government and State Agencies.

Your search returned 99 records.

Item name	Address	Suburb	LGA	Information source
Anzac Bridge	Victoria Road	Pyrmont	Sydney	SGOV
Arrow Marine Building	17a Pirrama Road	Pyrmont	Sydney	SGOV
Blackwattle Bay Stormwater Channel No 17	Pyrmont Bridge Road	Pyrmont / Glebe	Sydney	SGOV
Blackwattle Bay Stormwater Channel No 17	Pyrmont Bridge Road	Pyrmont / Glebe	Leichhardt	SGOV
Cast Iron Palisade Fence Fronting Bowman and Cross Streets		Pyrmont	Sydney	LGOV
Commercial and Residential Terrace Group Inc Interiors And Rear Yards	304-308 Harris Street	Pyrmont	Sydney	LGOV
Commonwealth Bank of Australia Building and Terrace Group Inc Interiors	2-22 Union Street	Pyrmont	Sydney	LGOV
Corner Shop and Residence "Charmelu" (35 Union St) Including Interiors	63-67 Edward Street	Pyrmont	Sydney	LGOV
Corner Shop and Terrace Group Inc Interiors, Front Gardens, Fences & Ret. Walls	224-302 Harris Street	Pyrmont	Sydney	LGOV
Corner Shop and Terrace Group Including Interiors	74-80 Harris Street	Pyrmont	Sydney	LGOV
Cottage (4 Ways Terrace) Including Interior and Grounds	1 Mill Street	Pyrmont	Sydney	LGOV
Cottage Group Including Interiors	27-29 Pyrmont Street	Pyrmont	Sydney	LGOV

Cross & Scott Street Terraces	1-5 Cross Street	Pyrmont	Sydney	SGOV
Darling Harbour Rail Corridor	West Side of Darling Harbour To Pyrmont	Darling Harbour & Pyrmont	Sydney	SGOV
Dunkirk Hotel Including Interior and Courtyard	205-207 Harris Street	Pyrmont	Sydney	LGOV
Eastern Escarpment and Palisade Fence, Above Pirrama Rd		Pyrmont	Sydney	LGOV
Escarpment Face From Former "Saunders' Quarry"		Pyrmont	Sydney	LGOV
Former Australian Joint Stock Bank Including Interiors	1 Union Street	Pyrmont	Sydney	LGOV
Former Bakery Including Interiors. Cartway and Courtyard	82 Harris Street	Pyrmont	Sydney	LGOV
Former Caledonian Hotel and Terrace Group Including Interiors	120-140 Bowman Street (And 83 Point Street)	Pyrmont	Sydney	LGOV
Former Csr Boiler House	3A Harris Street	Pyrmont	Sydney	LGOV
Former Csr Cooperage Building Including Interiors and Industrial Archaeology	56 Bowman Street	Pyrmont	Sydney	LGOV
Former Csr Engineers' Store Including Interiors	5-11 Harris Street	Pyrmont	Sydney	LGOV
Former Csr Gate House Including Interiors	58B Bowman Street	Pyrmont	Sydney	LGOV
Former Csr Main Office Including Interiros	58 Bowman Street	Pyrmont	Sydney	LGOV
Former Csr Manager's House	30-52 Mount Street	Pyrmont	Sydney	LGOV

(79-85 Harris St) Inc Interiors and Grounds				
Former Csr McCaffery's Building Including Interiors	21 Cadigal Avenue	Pyrmont	Sydney	LGOV
Former Csr Rum Store Including Interiors	6-8 Mount Street Walk	Pyrmont	Sydney	LGOV
Former Csr Tablet House Ncluding Interiors	29 Refinery Drive	Pyrmont	Sydney	LGOV
Former Garage Inc Interiors, Yard, Wharf and Seawall (Formerly 17A Pirrama Rd)	34 Pirrama Road	Pyrmont	Sydney	LGOV
Former Industrial Building Elements "Edwin Davey & Sons Flour Millers"	2A Allen Street	Pyrmont	Sydney	LGOV
Former John Taylor Wool Stores Inc Interiors & Industrial Archaeo (Wool Press)	137 Pyrmont Street	Pyrmont	Sydney	LGOV
Former Mws&db Sewage Pumping Station No 2 Including Interior	103 Pyrmont Bridge Road	Pyrmont	Sydney	LGOV
Former New York Hotel Including Interiors	50 Union Street	Pyrmont	Sydney	LGOV
Former Public Hall Including Interiors	179 Harris Street	Pyrmont	Sydney	LGOV
Former Pyrmont Arms Hotel Including Interiors	42-44 Harris Street	Pyrmont	Sydney	LGOV
Former Pyrmont Baths Inc Sandst Outcrop, Hewn Steps & Piles Visble Low Tide.	22-24 Pirrama Road	Pyrmont	Sydney	LGOV
Former Pyrmont Post Office Including	146-148 Harris Street	Pyrmont	Sydney	LGOV

Interiors, Side Passage and Yard				
Former Pyrmont Power Station Admin Building (42 Pyrmont Street) Incl Interiors	20-80 Pyrmont Street	Pyrmont	Sydney	LGOV
Former Pyrmont Power Station Administration Building	20 Pyrmont St	Pyrmont	Sydney	LGOV
Former Pyrmont Public School Inc Interiors, Grounds and Fences	79A John Street	Pyrmont	Sydney	LGOV
Former Quarryman's Arms Hotel Including Interiors and Courtyard	75-77 John Street	Pyrmont	Sydney	LGOV
Former Revy A & B Inc Interiors, Yard, Wharf & Industrial Archaeology	38-42 Pirrama Road	Pyrmont	Sydney	LGOV
Former Revy C Inc Interiors, Yard, Wharf & Industrial Archaeology	38-42 Pirrama Road	Pyrmont	Sydney	LGOV
Former Warehouse "Bank of NSW Stores" Including Interiors	17-21 Pyrmont Bridge Road	Pyrmont	Sydney	LGOV
Former Warehouse "Festival Records" Including Interiors	1-3 Bulwara Road (And 63-79 Miller Street)	Pyrmont	Sydney	LGOV
Former Warehouse "Harry Lesnie Pty Ltd" Including Interiors	47-49 Murray Street	Pyrmont	Sydney	LGOV
Former Warehouse "Hs Bird & Co" Including Interiors	51-53 Murray Street	Pyrmont	Sydney	LGOV
Former Woolstore "Clarence Bonded and Free Stores" Including Interiors	139 Murray St	Pyrmont	Sydney	LGOV

Former Woolstore "Schute, Bell, Badgery and Lumby" Including Interiors	94-136 Harris St	Pyrmont	Sydney	LGOV
Group of Three Cottages Including Shop, Interiors & Courtyard (93)	91-93 Pyrmont Street	Pyrmont	Sydney	LGOV
Harris Street (Harris At Union and Miller Streets)	Harris Street (Corner)	Pyrmont	Sydney	LGOV
Jones Bay Wharf (Wharf 60, Berths 19-21) Inc Wharf, Sheds & Interiors, Elev Road	26-32 Pirrama Road	Pyrmont	Sydney	LGOV
Maybanke Kindergarten and Playground Including Interiors And Fence	87-99 Harris Street	Pyrmont	Sydney	LGOV
Murray Street (Bunn Street To The Pyrmont Hotel)	43-69 Murray Street	Pyrmont	Sydney	LGOV
NCA Entry Tower, Wentworth Park	Wentworth Park	Pyrmont	Leichhardt	GAZ
NCA Steward's Building, Wentworth Park	Wentworth Park	Pyrmont	Leichhardt	GAZ
Point Hotel Including Interior and Courtyard	59 Harris Street	Pyrmont	Sydney	LGOV
Pyrmont & Murray Streets Residential Group	142-170 Pyrmont Street & 131-135 Murray Street	Pyrmont	Sydney	LGOV
Pyrmont Bridge Hotel Including Interior	94 - 96 Union Street	Pyrmont	Sydney	LGOV
Pyrmont Bridge Road Hotel Including Interior and Courtyard	11 Pyrmont Bridge Road	Pyrmont	Sydney	LGOV
Pyrmont Fire Station	145-147 Pyrmont Street	Pyrmont	Sydney	SGOV

Pyrmont Fire Station Including Interior	147 Pyrmont Street	Pyrmont	Sydney	LGOV
Pyrmont Heritage Conservation Area	Bulwara, Union, Pyrmont Streets	Pyrmont	Sydney	LGOV
Pyrmont Railway Cuttings, Tunnel & Weighbridge	Quarry Master Drive/Harris Street	Pyrmont	Sydney	SGOV
Quarryman's Hotel Including Interior	214-216 Harris Street	Pyrmont	Sydney	LGOV
Railway Cutting		Pyrmont	Sydney	LGOV
Railway Cutting and Bridge		Pyrmont	Sydney	LGOV
Remnants of Former Csr Laboratory B Building	25 Refinery Drive	Pyrmont	Sydney	LGOV
Residential Flat Building "Ways Terrace" Inc Interiors, Grds, Sandstone Ret Wall	12-20 Point Street	Pyrmont	Sydney	LGOV
Retail Premises - Harris Street Group	304-308 Harris Street	Pyrmont	Sydney	LGOV
Samuel Hordern Fountain Including Base and Setting	Pyrmont Street, Cnr Pyrmont Bridge Road	Pyrmont	Sydney	LGOV
Semi-detached House Group Including Interiors and Grounds	2-8 Scott Street	Pyrmont	Sydney	LGOV
St Bede's School Church Group Incl Church, Prebystery, School and Their Interior	33-43 Pyrmont Street	Pyrmont	Sydney	LGOV
Store Building, Wentworth Park	Wentworth Park	Pyrmont	Leichhardt	GAZ
Terminus Hotel Including Interior and Courtyard	61 Harris Street	Pyrmont	Sydney	LGOV
		Pyrmont	Sydney	LGOV

Terrace Group (1-5 Cross Street) Including Interiors and Grounds	6-8 Scott Street			
Terrace Group (286-318 Jones Street) Inc Interiors	282-318 Jones Street	Pyrmont	Sydney	LGOV
Terrace Group (2A-2b Mill Street) Including Interiors	10 Point Street	Pyrmont	Sydney	LGOV
Terrace Group (31-41 Mount Street) Including Interiors	31-45 Mount Street	Pyrmont	Sydney	LGOV
Terrace Group Inc Interiors, Front Gardens and Fences	54-66 John Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interior	1-21 Paternoster Row	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	189-203 Harris Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	46-52 Harris Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	142 - 168 Pyrmont Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	86-92 Union Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	101-125 Harris Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	135-155 Harris Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	63-65 Harris Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	5-15 Mount Street	Pyrmont	Sydney	LGOV
Terrace Group Including Interiors	31-33 Union Street	Pyrmont	Sydney	LGOV
Terrace House Including Interior	67 Harris Street	Pyrmont	Sydney	LGOV
Union Square War Memorial Including Platform and Setting	Union Street	Pyrmont	Sydney	LGOV

Warehouse "Slades Building" and Terrace Group Including Interiors	12-18 Pyrmont Street	Pyrmont	Sydney	LGOV
Wattle Street Railway Viaduct	Wattle Street	Pyrmont	Sydney	LGOV
Wentworth Park	Wentworth Park	Pyrmont	Leichhardt	GAZ
Wentworth Park Rail Viaduct	Wentworth Park	Pyrmont	Leichhardt	GAZ
Western and Northern Escarpment Face, Sandstone Walls, Palisade Fence & Steps		Pyrmont	Sydney	LGOV
Woolbrokers Arms Hotel Including Interior and Courtyard	22 Allen Street	Pyrmont	Sydney	LGOV

There was a total of 104 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: The Heritage Branch seeks to keep the State Heritage Inventory (SHI) up to date, however the latest listings in Local and Regional Evironmental Plans (LEPs and REPs) may not yet be included. Always check with the relevant local council or shire for the most recent listings.

Appendix F: Consultant's Summary Results Tables

Report:	Soil Contamination Investigation		
Site Name:	Vacant land		
Site Address:	Bank Street, Pyrmont		
Client Name:	Department of Public Works		
Client Number:	SP0062	Job Number:	82962

Soil Contamination Investigation	Heavy Metals (mg/kg)							
	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)
Column 3: Parks, recreational, open space	200	40	200	2000	600	30	600	14000
Soil Sample ID								
TP01-0.2m	<4	<0.5	8	9	23	<0.1	5	45
TP02-0.5m	6	<0.5	7	54	96	0.2	9	91
TP03-0.6m	8	<0.5	8	45	89	1.2	7	130
TP04-0.1m	<4	<0.5	23	13	110	<0.1	6	96
TP05-0.4m	<4	<0.5	3	39	21	<0.1	8	51
TP06-0.5m	13	<0.5	4	46	97	<0.1	11	92
TP07-0.3m	<4	<0.5	11	27	61	<0.1	11	100
TP08-0.3m	<4	<0.5	3	16	39	<0.1	5	170
BR01	6	<0.5	4	24	80	<0.1	7	55

Soil Contamination Investigation	PAH (mg/kg)		VOCs (mg/kg)
	Benzo (a) Pyrene	Total PAH	Total VOCs
Column 4: Commercial or Industrial	2	40	
Soil Sample ID			
TP01-0.2m	0.2	2.7	<PQL
TP02-0.5m	1.3	13.3	<PQL
TP03-0.6m	7.5	77	<PQL
TP04-0.1m	0.3	3.1	<PQL
TP05-0.4m	81	852	<PQL
TP06-0.5m	22	218	<PQL
TP07-0.3m	34	333	<PQL
TP08-0.3m	19	187	<PQL
BR01	21	216	<PQL

Asbestos
-
NA
NAD
NA
NAD
NA
NAD
NA
NAD
NA

Soil Contamination Investigation	TPH (mg/kg)					BTEX (mg/kg)			
	C10-C14	C15-C28	C29-C36	Total (C10-C36)	C6-C9	Benzene	Toluene	Ethyl Benzene	Xylene
Service Station Guidelines		-		1000	65	1	130	50	25
Soil Sample ID									
TP01-0.2m	<50	<100	<100	<100	<25	<0.5	<0.5	<1.0	<1.0
TP02-0.5m	<50	<100	<100	<100	<25	<0.5	<0.5	<1.0	<1.0
TP03-0.6m	<50	140	100	290	<25	<0.5	<0.5	<1.0	<1.0
TP04-0.1m	<50	<100	<100	<100	<25	<0.5	<0.5	<1.0	<1.0
TP05-0.4m	<50	480	580	1110	<25	<0.5	<0.5	<1.0	<1.0
TP06-0.5m	<50	330	260	640	<25	<0.5	<0.5	<1.0	<1.0
TP07-0.3m	<50	520	470	1050	<25	<0.5	<0.5	<1.0	<1.0
TP08-0.3m	<50	300	280	630	<25	<0.5	<0.5	<1.0	<1.0
BR01	<50	330	280	660	<25	<0.5	<0.5	<1.0	<1.0

"Column 4: Commercial or Industrial" Criteria adopted from NSW DECC Guidelines for the NSW Site Auditor Scheme 2nd Edition, 2006
Note: "PQL" = Practical Quantitation Limit

	Indicates "Complies With Site Criteria"
	Indicates "Exceeds Site Criteria"

								NAA 2010 Test Pits					
							Sample Name	NAA TP01_0.2m	NAA TP02_0.5m	NAA TP03_0.6m	NAA TP06_0.5m	NAA TP07_0.3m	NAA TP08_0.3m
							Sample Date	Jun-10	Jun-10	Jun-10	Jun-10	Jun-10	Jun-10
			Vapour Intrusion HSL - Commercial and Industrial				Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Analyte Name	**Units**	**Direct Contact HIL - Commercial and Industrial D (mg/kg)**	**0m to <1m (mg/kg)**	**1m to <2m (mg/kg)**	**2m to <4m (mg/kg)**	**EIL / ESL Commercial and Industrial - Coarse (mg/kg)**	**Reporting Limit**	Result	Result	Result	Result	Result	Result
BTEX													
Benzene	mg/kg	430	3	3	3	75	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	99000	NL	NL	NL	135	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	27000	NL	NL	NL	165	0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m/p-xylene	mg/kg						0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-xylene	mg/kg						0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	mg/kg	81000	230	NL	NL	180	0.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	mg/kg	11000	NL	NL	NL	370	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
TRH													
Benzene (F0)	mg/kg						0.1						
TRH C6-C9	mg/kg						20	<25	<25	<25	<25	<25	<25
TRH C6-C10	mg/kg						25						
TRH C6-C10 minus BTEX (F1)	mg/kg	26000	260	370	630	215	25	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D
TRH >C10-C16 (F2)	mg/kg	20000	NL	NL	NL	170	25	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D
TRH >C10-C16 (F2) minus Naphthalene	mg/kg						25	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D
TRH >C16-C34 (F3)	mg/kg	27000				1700	90	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D
TRH >C34-C40 (F4)	mg/kg	38000				3300	120	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D	< HIL D
PAH													
Benzo(a)pyrene	mg/kg					0.7	0.1	0.2	1.3	7.5	22	34	19
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	40					0.3	NT	NT	NT	NT	NT	NT
Total PAH	mg/kg	4000					0.8	**2.7**	**13.3**	**79.0**	**216.8**	**333.3**	**189.3**
OCP								N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
PCB													
Total PCBs (Arochlors)	mg/kg	7					1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Metals													
Arsenic, As	mg/kg	3000				160	3	<4	6	8	13	<4	6
Cadmium, Cd	mg/kg	900					0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, Cr	mg/kg	3600					0.3	8	7	8	11	3	4
Copper, Cu	mg/kg	240000					0.5	9	54	45	27	16	24
Lead, Pb	mg/kg	1500				1800	1	23	96	89	61	39	80
Mercury	mg/kg	730					0.01	<0.1	0.2	1	<0.1	<0.1	<0.1
Nickel, Ni	mg/kg	6000					0.5	5	9	7	11	5	7
Zinc, Zn	mg/kg	400000					0.5	45	91	130	100	170	55
Asbestos													
Asbestos Detected	No unit	Detection						N.A.	No	N.A.	No	N.A.	No

< HIL D = The results for NAA assessment include results for the TRH fractions that were used prior to the NEPM Amendment in 2013. However, the available data suggests that the reported concentrations are well less than the adopted assessment criteria.
NT = NAA assessment was conducted prior to the NEPM Amendment in 2013, and as such, BaP TEQ was not considered.

			Vapour Intrusion HSL - Commercial and Industrial					SLR 2015	SLR 2015	SLR 2015	SLR 2015	SLR 2015	SLR 2015	SLR 2015	SLR 2015
							Sample Name	TP01/01/0.1-0.3	TP01/03/0.8-1.0	TP01/05/1.6-1.7	TP02/02/0.4-0.5	TP02/04/1.0-1.2	TP02/05/1.8-2.0	TP02/06/2.8-3.0	TP03/01/0.1-0.3
							Sample Date	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015
							Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte Name	**Units**	**Direct Contact HIL - Commercial and Industrial D (mg/kg)**	**0m to <1m (mg/kg)**	**1m to <2m (mg/kg)**	**2m to <4m (mg/kg)**	**EIL / ESL Commercial and Industrial - Coarse (mg/kg)**	**Reporting Limit**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX															
Benzene	mg/kg	430	3	3	3	75	0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
Toluene	mg/kg	99000	NL	NL	NL	135	0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
Ethylbenzene	mg/kg	27000	NL	NL	NL	165	0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
m/p-xylene	mg/kg						0.2	<0.2	N.A.	N.A.	N.A.	<0.2	<0.2	N.A.	N.A.
o-xylene	mg/kg						0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
Total Xylenes	mg/kg	81000	230	NL	NL	180	0.3	<0.3	N.A.	N.A.	N.A.	<0.3	<0.3	N.A.	N.A.
Naphthalene	mg/kg	11000	NL	NL	NL	370	0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
TRH															
Benzene (F0)	mg/kg						0.1	<0.1	N.A.	N.A.	N.A.	<0.1	<0.1	N.A.	N.A.
TRH C6-C9	mg/kg						20	<20	N.A.	N.A.	N.A.	<20	<20	N.A.	N.A.
TRH C6-C10	mg/kg						25	<25	N.A.	N.A.	N.A.	<25	<25	N.A.	N.A.
TRH C6-C10 minus BTEX (F1)	mg/kg	26000	260	370	630	215	25	<25	N.A.	N.A.	N.A.	<25	<25	N.A.	N.A.
TRH >C10-C16 (F2)	mg/kg	20000	NL	NL	NL	170	25	**73**	N.A.	N.A.	N.A.	<25	<25	N.A.	N.A.
TRH >C10-C16 (F2) minus Naphthalene	mg/kg						25	**73**	N.A.	N.A.	N.A.	<25	<25	N.A.	N.A.
TRH >C16-C34 (F3)	mg/kg	27000				1700	90	**260**	N.A.	N.A.	N.A.	<90	<90	N.A.	N.A.
TRH >C34-C40 (F4)	mg/kg	38000				3300	120	<120	N.A.	N.A.	N.A.	<120	<120	N.A.	N.A.
PAH															
Benzo(a)pyrene	mg/kg					0.7	0.1	<0.1	**0.2**	<0.1	<0.1	N.A.	**0.8**	**3.2**	**0.6**
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	40					0.3	<0.3	**0.4**	<0.3	<0.3	N.A.	**1.2**	**4.5**	**0.9**
Total PAH	mg/kg	4000					0.8	**2.0**	**2.1**	<0.8	**1.3**	N.A.	**9.4**	**46**	**6.2**
OCP								ND	N.A.	N.A.	N.A.	N.A.	ND	N.A.	N.A.
PCB															
Total PCBs (Arochlors)	mg/kg	7					1	<1	N.A.	N.A.	N.A.	N.A.	<1	N.A.	N.A.
Metals															
Arsenic, As	mg/kg	3000				160	3	**8**	**4**	<3	**4**	N.A.	<3	<3	**3**
Cadmium, Cd	mg/kg	900					0.3	**1.1**	**0.7**	<0.3	<0.3	N.A.	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	3600					0.3	**8.0**	**5.3**	**3.8**	**8.0**	N.A.	**8.1**	**7.8**	**8.2**
Copper, Cu	mg/kg	240000					0.5	**71**	**100**	**1.1**	**16**	N.A.	**4.6**	**6.0**	**19**
Lead, Pb	mg/kg	1500				1800	1	**170**	**76**	**6**	**250**	N.A.	**21**	**29**	**53**
Mercury	mg/kg	730					0.01	**0.13**	**0.19**	<0.01	**0.05**	N.A.	**0.03**	**0.03**	**0.04**
Nickel, Ni	mg/kg	6000					0.5	**17**	**11**	**0.6**	**5.6**	N.A.	**4.7**	**3.8**	**6.6**
Zinc, Zn	mg/kg	400000					0.5	**69**	**95**	**2.4**	**140**	N.A.	**31**	**30**	**160**
Asbestos															
Asbestos Detected	No unit	Detection						No	N.A.	N.A.	No	N.A.	No	No	N.A.

< HIL D = The results for NAA assessment include results for the TRH fractions that were used prior to the NEPM Amendment in 2013. However, the available data suggests that the reported concentrations are well less than the adopted assessment criteria.
NT = NAA assessment was conducted prior to the NEPM Amendment in 2013, and as such, BaP TEQ was not considered.

							Sample Name	SLR 2015 TP03/02/0.6-0.8	SLR 2015 TP03/03/1.5-1.7	SLR 2015 TP04/02/0.4-0.5	SLR 2015 TP04/04/1.6-1.8	SLR 2015 TP04/05/2.4-2.6	SLR 2015 TP05/01/0.05-0.2	SLR 2015 TP05/02/0.4-0.6	SLR 2015 TP05/03/1.1-1.3
							Sample Date	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015	6-2-2015
			Vapour Intrusion HSL - Commercial and Industrial				Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte Name	**Units**	**Direct Contact HIL - Commercial and Industrial D (mg/kg)**	**0m to <1m (mg/kg)**	**1m to <2m (mg/kg)**	**2m to <4m (mg/kg)**	**EIL / ESL Commercial and Industrial - Coarse (mg/kg)**	**Reporting Limit**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX															
Benzene	mg/kg	430	3	3	3	75	0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
Toluene	mg/kg	99000	NL	NL	NL	135	0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
Ethylbenzene	mg/kg	27000	NL	NL	NL	165	0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
m/p-xylene	mg/kg						0.2	<0.2	N.A.	<0.2	<0.2	N.A.	N.A.	N.A.	N.A.
o-xylene	mg/kg						0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
Total Xylenes	mg/kg	81000	230	NL	NL	180	0.3	<0.3	N.A.	<0.3	<0.3	N.A.	N.A.	N.A.	N.A.
Naphthalene	mg/kg	11000	NL	NL	NL	370	0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
TRH															
Benzene (F0)	mg/kg						0.1	<0.1	N.A.	<0.1	<0.1	N.A.	N.A.	N.A.	N.A.
TRH C6-C9	mg/kg						20	<20	N.A.	<20	<20	N.A.	N.A.	N.A.	N.A.
TRH C6-C10	mg/kg						25	<25	N.A.	<25	<25	N.A.	N.A.	N.A.	N.A.
TRH C6-C10 minus BTEX (F1)	mg/kg	26000	260	370	630	215	25	<25	N.A.	<25	<25	N.A.	N.A.	N.A.	N.A.
TRH >C10-C16 (F2)	mg/kg	20000	NL	NL	NL	170	25	<25	N.A.	<25	<25	N.A.	N.A.	N.A.	N.A.
TRH >C10-C16 (F2) minus Naphthalene	mg/kg						25	<25	N.A.	<25	<25	N.A.	N.A.	N.A.	N.A.
TRH >C16-C34 (F3)	mg/kg	27000				1700	90	**100**	N.A.	**2600**	**110**	N.A.	N.A.	N.A.	N.A.
TRH >C34-C40 (F4)	mg/kg	38000				3300	120	<120	N.A.	**1000**	<120	N.A.	N.A.	N.A.	N.A.
PAH															
Benzo(a)pyrene	mg/kg					0.7	0.1	**1.5**	**12**	**110**	**1.1**	<0.1	**0.2**	N.A.	N.A.
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	40					0.3	**2.1**	**19**	**150**	**1.5**	<0.3	**0.4**	N.A.	N.A.
Total PAH	mg/kg	4000					0.8	**15**	**210**	**1200**	**11**	<0.8	**2.5**	N.A.	N.A.
OCP								N.A.	ND	ND	N.A.	N.A.	N.A.	N.A.	N.A.
PCB															
Total PCBs (Arochlors)	mg/kg	7					1	N.A.	<1	<1	N.A.	N.A.	N.A.	N.A.	N.A.
Metals															
Arsenic, As	mg/kg	3000				160	3	**4**	**4**	<3	**7**	**4**	**6**	N.A.	N.A.
Cadmium, Cd	mg/kg	900					0.3	**0.3**	<0.3	<0.3	**0.9**	**0.4**	<0.3	N.A.	N.A.
Chromium, Cr	mg/kg	3600					0.3	**5.8**	**7.1**	**3.8**	**8.0**	**11**	**13**	N.A.	N.A.
Copper, Cu	mg/kg	240000					0.5	**40**	**28**	**30**	**78**	**75**	**1200**	N.A.	N.A.
Lead, Pb	mg/kg	1500				1800	1	**99**	**49**	**21**	**200**	**26**	**89**	N.A.	N.A.
Mercury	mg/kg	730					0.01	**0.23**	**0.10**	<0.01	**0.27**	**0.05**	**0.06**	N.A.	N.A.
Nickel, Ni	mg/kg	6000					0.5	**5.6**	**5.7**	**12**	**16**	**19**	**10**	N.A.	N.A.
Zinc, Zn	mg/kg	400000					0.5	**110**	**100**	**26**	**480**	**140**	**340**	N.A.	N.A.
Asbestos															
Asbestos Detected	No unit	Detection						No	N.A.	No	No	N.A.	N.A.	No	No

< HIL D = The results for NAA assessment include results for the TRH fractions that were used prior to the NEPM Amendment in 2013. However, the available data suggests that the reported concentrations are well less than the adopted assessment criteria.
NT = NAA assessment was conducted prior to the NEPM Amendment in 2013, and as such, BaP TEQ was not considered.

Table LR1
Soil Analytical Results
Sydney Heritage Fleet

								SLR 2015	SLR 2015
							Sample Name	TP05/04/1.5-1.7	TP05/06/2.6-2.8
							Sample Date	6-2-2015	6-2-2015
			Vapour Intrusion HSL - Commercial and Industrial				**Matrix**	Soil	Soil
Analyte Name	**Units**	**Direct Contact HIL - Commercial and Industrial D (mg/kg)**	**0m to <1m (mg/kg)**	**1m to <2m (mg/kg)**	**2m to <4m (mg/kg)**	**EIL / ESL Commercial and Industrial - Coarse (mg/kg)**	**Reporting Limit**	**Result**	**Result**
BTEX									
Benzene	mg/kg	430	3	3	3	75	0.1	<0.1	N.A.
Toluene	mg/kg	99000	NL	NL	NL	135	0.1	<0.1	N.A.
Ethylbenzene	mg/kg	27000	NL	NL	NL	165	0.1	<0.1	N.A.
m/p-xylene	mg/kg						0.2	<0.2	N.A.
o-xylene	mg/kg						0.1	<0.1	N.A.
Total Xylenes	mg/kg	81000	230	NL	NL	180	0.3	<0.3	N.A.
Naphthalene	mg/kg	11000	NL	NL	NL	370	0.1	<0.1	N.A.
TRH									
Benzene (F0)	mg/kg						0.1	<0.1	N.A.
TRH C6-C9	mg/kg						20	<20	N.A.
TRH C6-C10	mg/kg						25	<25	N.A.
TRH C6-C10 minus BTEX (F1)	mg/kg	26000	260	370	630	215	25	<25	N.A.
TRH >C10-C16 (F2)	mg/kg	20000	NL	NL	NL	170	25	**52**	N.A.
TRH >C10-C16 (F2) minus Naphthalene	mg/kg						25	**52**	N.A.
TRH >C16-C34 (F3)	mg/kg	27000				1700	90	**4000**	N.A.
TRH >C34-C40 (F4)	mg/kg	38000				3300	120	**1200**	N.A.
PAH									
Benzo(a)pyrene	mg/kg					0.7	0.1	**220**	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	40					0.3	**320**	<0.3
Total PAH	mg/kg	4000					0.8	**2900**	<0.8
OCP								ND	N.A.
PCB									
Total PCBs (Arochlors)	mg/kg	7					1	<1	N.A.
Metals									
Arsenic, As	mg/kg	3000				160	3	**4**	**15**
Cadmium, Cd	mg/kg	900					0.3	<0.3	**0.4**
Chromium, Cr	mg/kg	3600					0.3	**9.0**	**8.6**
Copper, Cu	mg/kg	240000					0.5	**32**	**2.2**
Lead, Pb	mg/kg	1500				1800	1	**56**	**8**
Mercury	mg/kg	730					0.01	**0.02**	<0.01
Nickel, Ni	mg/kg	6000					0.5	**14**	**0.5**
Zinc, Zn	mg/kg	400000					0.5	**82**	**15**
Asbestos									
Asbestos Detected	No unit	Detection						No	N.A.

< HIL D = The results for NAA assessment include results for the TRH fractions that were used prior to the NEPM Amendment in 2013. However, the available data suggests that the reported concentrations are well less than the adopted assessment criteria.
NT = NAA assessment was conducted prior to the NEPM Amendment in 2013, and as such, BaP TEQ was not considered.

Table LR1A
Soil LeaCHABILITY Analytical Results
Sydney Heritage Fleet

		Sample Name	TP04/02/0.4-0.5		TP05/04/1.5-1.7	
		Sample Date	6-2-2015		6-2-2015	
		ASLP Extract	DI Water	pH5	DI Water	pH5
Analyte Name	**Units**	**Reporting Limit**	**Result**	**Result**	**Result**	**Result**
pH of solids leachate	pH Units	0	**6.8**		**8.0**	
Naphthalene	µg/L	0.1	<0.1	<0.1	**0.4**	**0.4**
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	**0.1**
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	**0.1**	<0.1	**0.6**	**1.0**
Fluorene	µg/L	0.1	<0.1	<0.1	**0.2**	**0.4**
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.2	<0.2
Anthracene	µg/L	0.1	<0.1	<0.1	<0.2	<0.3
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	**1**	**2**

Table LR2
Sediment Analytical Results
Sydney Heritage Fleet

Project: 610.10676.00100
Limited Contamination Assessment
Sydney Heritage Fleet Base
Bank Street, Pyrmont

				Sample ID	S01	S01	S02	S02	S03	S03	S04	S04
				Sample Date	6-2-2015	TOC%	6-2-2015	TOC%	6-2-2015	TOC%	6-2-2015	TOC%
				Matrix	Soil	0.28	Soil	0.74	Soil	1.1	Soil	0.42
Analyte Name	**Units**	**Direct Contact HIL - Commercial and Industrial D (mg/kg)**	**Interim Sediment Quality Guideline (ISQG) (mg/kg)**	**Reporting Limit**	**Result**	**Results Normalised to 1% TOC**	**Result**	**Results Normalised to 1% TOC**	**Result**	**Results Normalised to 1% TOC**	**Result**	**Results Normalised to 1% TOC**
BTEX												
Benzene	mg/kg	430		0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Toluene	mg/kg	99000		0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Ethylbenzene	mg/kg	27000		0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
m/p-xylene	mg/kg			0.2	<0.2	<LOR	<0.2	<LOR	<0.2	<LOR	<0.2	<LOR
o-xylene	mg/kg			0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Total Xylenes	mg/kg	81000		0.3	<0.3	<LOR	<0.3	<LOR	<0.3	<LOR	<0.3	<LOR
Naphthalene	mg/kg	11000		0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
TRH												
TRH C6-C10	mg/kg			25	<25	<LOR	<25	<LOR	<25	<LOR	<25	<LOR
TRH C6-C10 minus BTEX (F1)	mg/kg	26000		25	<25	<LOR	<25	<LOR	<25	<LOR	<25	<LOR
TRH >C10-C16 (F2)	mg/kg	20000		25	<25	<LOR	<25	<LOR	<25	<LOR	<25	<LOR
TRH >C16-C34 (F3)	mg/kg	27000		90	<90	<LOR	**150**	**203**	<90	<LOR	<90	<LOR
TRH >C34-C40 (F4)	mg/kg	38000		120	<120	<LOR	<120	<LOR	<120	<LOR	<120	<LOR
PAH												
Naphthalene	mg/kg		160	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
2-methylnaphthalene	mg/kg			0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
1-methylnaphthalene	mg/kg			0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Acenaphthylene	mg/kg		44	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Acenaphthene	mg/kg		16	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Fluorene	mg/kg		19	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Phenanthrene	mg/kg		240	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Anthracene	mg/kg		85	0.1	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR	<0.1	<LOR
Fluoranthene	mg/kg		600	0.1	**0.3**	**1.1**	**1.3**	**1.8**	**0.2**	**0.2**	**0.2**	**0.5**
Pyrene	mg/kg		665	0.1	**0.3**	**1.1**	**1.8**	**2.4**	**0.2**	**0.2**	**0.3**	**0.7**
Benzo(a)anthracene	mg/kg		261	0.1	**0.1**	**0.4**	**0.9**	**1.2**	**0.1**	**0.1**	**0.1**	**0.2**
Chrysene	mg/kg		384	0.1	**0.1**	**0.4**	**0.7**	**0.9**	**0.1**	**0.1**	**0.1**	**0.2**
Benzo(b&j)fluoranthene	mg/kg			0.1	**0.2**	**0.7**	**1.0**	**1.4**	**0.2**	**0.2**	**0.2**	**0.5**
Benzo(k)fluoranthene	mg/kg			0.1	<0.1	**<LOR**	**0.4**	**0.5**	<0.1	**<LOR**	**0.1**	**0.2**
Benzo(a)pyrene	mg/kg		430	0.1	**0.1**	**0.4**	**0.9**	**1.2**	**0.2**	**0.2**	**0.2**	**0.5**
Indeno(1,2,3-cd)pyrene	mg/kg			0.1	**0.2**	**0.7**	**0.9**	**1.2**	**0.2**	**0.2**	**0.2**	**0.5**
Dibenzo(a&h)anthracene	mg/kg		63	0.1	<0.1	**<LOR**	<0.1	**<LOR**	<0.1	**<LOR**	<0.1	**<LOR**
Benzo(ghi)perylene	mg/kg			0.1	**0.2**	**0.7**	**0.7**	**0.9**	**0.2**	**0.2**	**0.2**	**0.5**
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)			0.3	<0.3	**<LOR**	**1.3**	**1.8**	**0.3**	**0.3**	**0.3**	**0.7**
Total PAH	mg/kg	4000	4000	0.8	**1.5**	**5.4**	**8.6**	**11.6**	**1.3**	**1.2**	**1.6**	**3.8**
OCP					ND	<LOR	ND	<LOR	ND	<LOR	ND	<LOR
PCB												
Total PCBs (Arochlors)	mg/kg	7	23	1	<1	<LOR	<1	<LOR	<1	<LOR	<1	<LOR
Metals												
Arsenic, As	mg/kg	3000	20	3	<3		<3		5		<3	
Cadmium, Cd	mg/kg	900	1.5	0.3	<0.3		<0.3		<0.3		<0.3	
Chromium, Cr	mg/kg	3600	80	0.3	**4.5**		**5.2**		**10.0**		**5.6**	
Copper, Cu	mg/kg	240000	65	0.5	**9**		**30**		**69.0**		**34**	
Lead, Pb	mg/kg	1500	50	1	**18**		**37**		**84**		**38**	
Nickel, Ni	mg/kg	6000	21	0.5	**2**		**2**		**3.9**		**2.5**	
Zinc, Zn	mg/kg	400000	200	0.5	**37**		**97**		**190.0**		**93**	
Mercury	mg/kg	730	0.15	0.01	**0.02**		**0.08**		**0.1**		**0.03**	

		Sample Name	SE136037.005	SE136037.023	RPD %	M15-Fe07988	RPD %	SE136037.017	SE136037.024	RPD %	M15-Fe07989	RPD %
		Description	TP01/01/0.1-0.3	DUP01		DUP01A		TP04/05/2.4-2.6	DUP02		DUP02A	
		Sample Date	6-2-2015	6-2-2015		6-2-2015		6-2-2015	6-2-2015		6-2-2015	
		Matrix	Soil	Soil		Soil		Soil	Soil		Soil	
Analyte Name	**Units**	**Reporting Limit**	**Result**	**Result**		**Result**		**Result**	**Result**		**Result**	
BTEX												
Benzene	mg/kg	0.1	<0.1	<0.1	--	<0.1	--	N.A.	N.A.	N.A	N.A.	N.A.
Toluene	mg/kg	0.1	<0.1	<0.1	--	<0.1	--	N.A.	N.A.	N.A	N.A.	N.A.
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	--	<0.1	--	N.A.	N.A.	N.A	N.A.	N.A.
m/p-xylene	mg/kg	0.2	<0.2	<0.2	--	<0.2	--	N.A.	N.A.	N.A	N.A.	N.A.
o-xylene	mg/kg	0.1	<0.1	<0.1	--	<0.1	--	N.A.	N.A.	N.A	N.A.	N.A.
Total Xylenes	mg/kg	0.3	<0.3	<0.3	--	<0.3	--	N.A.	N.A.	N.A	N.A.	N.A.
Naphthalene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	N.A.	N.A.	N.A	N.A.	N.A.
TRH												
TRH C6-C9	mg/kg	20	<0.1	<20	--	<20	--	N.A.	N.A.	N.A	N.A.	N.A.
Benzene (F0)	mg/kg	0.1	<20	<0.1	--	<0.1	--	N.A.	N.A.	N.A	N.A.	N.A.
TRH C6-C10	mg/kg	25	<25	<25	--	<20	--	N.A.	N.A.	N.A	N.A.	N.A.
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	--	<20	--	N.A.	N.A.	N.A	N.A.	N.A.
TRH >C10-C16 (F2)	mg/kg	25	**73**	<25	--	**87**	17.5	N.A.	N.A.	N.A	N.A.	N.A.
TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	**73**	<25	--	**87**	17.5	N.A.	N.A.	N.A	N.A.	N.A.
TRH >C16-C34 (F3)	mg/kg	90	**260**	<90	--	**380**	37.5	N.A.	N.A.	N.A	N.A.	N.A.
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	--	<100	--	N.A.	N.A.	N.A	N.A.	N.A.
PAH												
Naphthalene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
1-methylnaphthalene	mg/kg	0.1	**0.2**	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Acenaphthene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Fluorene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Phenanthrene	mg/kg	0.1	**0.6**	**0.2**	100	**0.7**	15.38	<0.1	<0.1	--	<0.5	--
Anthracene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Fluoranthene	mg/kg	0.1	**0.4**	**0.2**	67	**0.5**	22.22	<0.1	<0.1	--	<0.5	--
Pyrene	mg/kg	0.1	**0.3**	**0.1**	100	<0.5	--	<0.1	<0.1	--	<0.5	--
Benzo(a)anthracene	mg/kg	0.1	**0.3**	**0.1**	100	<0.5	--	<0.1	<0.1	--	<0.5	--
Chrysene	mg/kg	0.1	**0.2**	**0.1**	67	<0.5	--	<0.1	<0.1	--	<0.5	--
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.2**	**0.1**	67	<0.5	--	<0.1	<0.1	--	<0.5	--
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	--	<0.5	--	<0.1	<0.1	--	<0.5	--
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	<0.2	<0.2	--	<0.5	--	<0.2	<0.2	--	**1.2**	--
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	--	**1.2**	--	<0.3	<0.3	--	<0.5	--
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	--	**0.6**	--	<0.2	<0.2	--	**0.6**	--
Total PAH	mg/kg	0.8	**2.0**	<0.8	--	**1.2**	50	<0.8	<0.8	--	<0.5	--
OCP												
Alpha BHC	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Lindane	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Heptachlor	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Aldrin	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.

		Sample Name	SE136037.005	SE136037.023	RPD %	M15-Fe07988	RPD %	SE136037.017	SE136037.024	RPD %	M15-Fe07989	RPD %
		Description	TP01/01/0.1-0.3	DUP01		DUP01A		TP04/05/2.4-2.6	DUP02		DUP02A	
		Sample Date	6-2-2015	6-2-2015		6-2-2015		6-2-2015	6-2-2015		6-2-2015	
		Matrix	Soil	Soil		Soil		Soil	Soil		Soil	
Analyte Name	**Units**	**Reporting Limit**	**Result**	**Result**		**Result**		**Result**	**Result**		**Result**	
Beta BHC	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Delta BHC	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Dieldrin	mg/kg	0.2	<0.2	<0.2	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Endrin	mg/kg	0.2	<0.2	<0.2	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Methoxychlor	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Isodrin	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
Mirex	mg/kg	0.1	<0.1	<0.1	--	<0.05	--	N.A.	N.A.	N.A.	N.A.	N.A.
PCB												
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	--	N.A.	--	N.A.	N.A.	N.A.	N.A.	N.A.
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	--	N.A.	--	N.A.	N.A.	N.A.	N.A.	N.A.
Total PCBs (Arochlors)	mg/kg	1	<1	<1	--	<0.1	--	N.A.	N.A.	N.A.	N.A.	N.A.
Metals												
Arsenic, As	mg/kg	3	**8**	**6**	28.57	**12**	40	**4**	<3	--	**3.8**	5.13
Cadmium, Cd	mg/kg	0.3	**1.1**	**1.0**	9.52	**3.4**	**102.22**	**0.4**	**0.4**	0	< 0.4	--
Chromium, Cr	mg/kg	0.3	**8.0**	**3.7**	**73.50**	**8.8**	9.52	**11**	**10**	9.52	**13**	16.67
Copper, Cu	mg/kg	0.5	**71**	**82**	14.38	**120**	**51.31**	**75**	**64**	15.83	**76**	1.32
Lead, Pb	mg/kg	1	**170**	**110**	**42.86**	**85**	**66.67**	**26**	**25**	3.92	**23**	12.24
Nickel, Ni	mg/kg	0.5	**17**	**13**	26.67	**18**	5.71	**19**	**19**	0.00	**18**	5.41
Zinc, Zn	mg/kg	0.5	**69**	**47**	**37.93**	**89**	25.32	**140**	**69**	**67.94**	**75**	**60.47**
Mercury	mg/kg	0.01	**0.13**	**0.13**	0.00	**0.2**	42.42	**0.05**	**0.03**	50.00	**< 0.1**	--

		Sample Name	SE136037.039	SE136037.040
		Description	TRIP BLANK	TRIP SPIKE
		Sample Date	3-2-2015	3-2-2015
		Date Used	6-2-2015	6-2-2015
		Matrix	Water	Water
Analyte Name	Units	Reporting Limit	Result	Result
Benzene	µg/L	0.5	<0.5	[101%]
Toluene	µg/L	0.5	<0.5	[99%]
Ethylbenzene	µg/L	0.5	<0.5	[100%]
m/p-xylene	µg/L	1	<1	[101%]
o-xylene	µg/L	0.5	<0.5	[100%]
Naphthalene	µg/L	0.5	<0.5	N.A.
Total Xylenes	µg/L	1.5	<1.5	N.A.

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