

Roads and Maritime Services
Long-term Environmental Management Plan
5 Banks Street Pyrmont NSW

CDM
Smith

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Long-term Environmental Management Plan
5 Banks Street Pyrmont NSW

30 October 2012

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Section 1 Introduction

This Long-term Environmental Management Plan (EMP) has been prepared to set out the principles for environmental management of proposed parkland at 5 Bank Street, Pyrmont NSW (the Site). The location of the Site is presented on Figure 1 and the layout of the Site is presented on Figure 2.

The Site is currently divided into two main areas. The southern part of the Site is an open area used for storage and launch of dragon boats and equipment. The northern part of the Site, which is fenced off and locked, is being utilised as a construction compound for Bridge Solutions Alliance (BSA) who maintain the Anzac Bridge. Previous investigations have identified Polynuclear Aromatic Hydrocarbons (PAHs) contamination in fill materials at the Site.

This EMP has been developed with reference to the requirements of the NSW Office of Environment and Heritage (OEH) (2011) *Guidelines for Consultants Reporting on Contaminated Sites* and NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme – 2nd Edition* and on the information presented in the following reports:

- “*Soil Contamination Investigation, NSW Public Works, Bank Street, Pyrmont, NSW*” prepared by Noel Arnold & Associates (NA) and dated June 2010 (NA, 2010);
- “*Limited Phase 2 Environmental Site Investigation, Bank Street, Pyrmont, Sydney*” prepared by RCA Australia (RCA) and dated June 2011 (RCA, 2011); and
- “*Limited Phase 2 Environmental Site Assessment, 5 Bank Street, Pyrmont NSW*” prepared by E3 Consulting Australia (E3) and dated July 2012 (E3, 2012).

It is noted that within this EMP direct reference is made to specific guidelines, regulations and legislation that were in force at the time of preparation of this EMP. Over time it is likely that these references will be superseded by updated and revised versions. In applying this EMP those responsible must ensure that the relevant guidelines, regulations and legislation that are applied are those that are in force at that time.

1.1 Purpose of the EMP

This EMP was prepared to document procedures that are required to be implemented to manage identified risks to users of the Site and to ensure that:

- The hardstand surface and grassed and landscaped areas covering the Site is maintained to ensure that users are not exposed to contaminated fill materials which underlie these coverings; and
- Works that require disturbance of the hardstand covering the ground surface of the Site are undertaken in a manner that protects the health of the workers and members of the public and that does not compromise the integrity of the containment wall present in the south eastern area of the Site;

The principal elements of this EMP are to:

- Detail the environmental conditions of the Site at the time of preparation of this EMP;
- Assign responsibilities for implementation of this EMP;

- Protect the health of users of the Site by ensuring maintenance of the hardstand, landscape and grass covering the ground surface to prevent exposure to contaminants that may be present in fill materials;
- Protect the health of maintenance workers at the Site if the hardstand, landscape or grass covering the ground surface is disturbed by works;
- Ensure that contaminated or potentially contaminated fill materials encountered during maintenance works are disposed of properly or are replaced beneath the hardstand, landscape or grass covering the ground surface; and
- Maintain records of inspection of the integrity of the hardstand covering and the condition of the grass and landscape covering the ground surface and of maintenance works.

Section 2 Site Conditions

2.1 Site Details

The Site is located beneath the eastern part of the Anzac Bridge at 5 Bank Street, Pyrmont NSW, an inner-city suburb approximately 2 km south-west of the Sydney central business district (CBD) and is situated within the local government area of the City of Sydney Council. Access is from the north, via Bank Street, and the Site has a generally irregular rectangular shape and an area of approximately 0.56 ha. The location of the Site is shown on Figure 1 and the layout is shown on Figure 2.

2.2 Site Description

At the time of preparation of this EMP the Site was entirely covered with gravels comprising crushed concrete and crushed sandstone, with the exception of a section of bitumen near the boat ramp and some grass near the waters edge. The Site was noted to be generally flat with a moderate slope on the southern boundary that falls to Blackwattle Bay and to the boat ramp.

Several steel shipping containers were stored in the south-eastern corner. The shipping containers are believed to contain equipment associated with the use of dragon boats, although their contents could not be verified. In addition, a number of dragon boats and boats on trailers are stored in rows along the southern boundary of the Site. In the eastern part of the Site, adjacent to Blackwattle Bay, healthy growths of grass, weeds and shrubs are present.

2.3 Topography and Drainage

The Site has an elevation of between 7 and 8 m Australian Height Datum (m AHD) and is generally flat, with the exception of a moderate fall from north to south along the southern boundary of the Site to approximately 4 m AHD. The surface water body nearest to the Site is Blackwattle Bay, which borders the Site to the south and west. Given the fall of the Site and its proximity to the Bay, drainage of storm water and groundwater from the Site is likely into Blackwattle Bay.

The Soil Landscape of the Sydney 1:100 000 Sheet Report indicates that the Site is located in disturbed terrain which has been extensively modified.

The Site has been extensively filled, and natural soils, where present, consist of shallow to moderately deep (30-100 cm) yellow earths and earthy sands, which are characteristically of high permeability.

2.4 Environmental Condition of the Site

The Site has most recently operated as a dragon boat storage and launch area and also has housed the site office of BSA during Anzac Bridge refurbishment activities. The Site is proposed to be redeveloped as parklands used for storage and launching of dragon boats.

Imported fill materials were used to achieve the current Site levels and exist to depths of between 0.75m below ground surface (bgs) and 4.05m bgs. A gravel capping layer is present across the Site surface and is underlain by fill materials consisting mostly of gravelly sand. Natural gravelly, clayey and silty sands and weathered sandstone are present beneath the fill materials.

Investigations undertaken on the Site in 2010 (NA), 2011 (RCA), and 2012 (E3) identified PAH and heavy fraction petroleum hydrocarbon concentration in fill materials at the Site which exceeded health-based investigation levels for open space land use. The origin of the fill materials is unknown however it is noted that within this area of Sydney polynuclear aromatic hydrocarbons (PAHs) are a typical contaminant that is present as a result from the historical partial burning of coal and coke.

No investigation of groundwater was completed during the 2010 (NA) or 2011 (RCA) investigations, and limited groundwater was encountered perched within in the fill materials and natural soils during the 2012 Limited Phase 2 ESA (E3). This is likely to be due to the limited recharge in up-gradient locations and on the Site. As such it is considered that the groundwater quality on the Site has not able to be adequately characterised. However, the results of the 2012 groundwater sampling that was conducted indicate groundwater conditions typical of groundwater encountered within an urban environment and are not considered to pose an unacceptable impact to users of the Site or the waters of Blackwattle Bay.

Given the current and proposed use of the Site for dragon boat storage and launching and the associated limited use of the Site, the restrictions of public access to the Site and the conservativeness of the criteria applied, it was considered that the identified concentrations of PAHs within the fill materials on the Site were not likely to pose a risk of harm to the health of the users of the Site under the current or proposed uses. It is considered that the Site is suitable for continued use as a dragon boat storage and launch area but that this EMP is required to be implemented to control and limit exposure of Site users to the contaminated and potentially contaminated fill materials on Site. If the Site was to be actively utilised for more sensitive open space recreational purposes, such as parks and playgrounds, or more sensitive land uses then this EMP would require revision.

Section 3 Implementation of this EMP

This EMP is required to be implemented as follows:

- Periodic inspections to confirm that grass and/or hardstand Site surface is maintained;
- Access to the Site must be controlled;
- Inform Site users and maintenance personnel of risk management procedures.

3.1 Site Surface

For the purpose of this EMP, the covering of the Site is defined as follows:

- Grass covering is defined as the growing medium or topsoil used to establish the Site level and grass covering which prevents erosion or disturbance of the growing medium or topsoil; and
- Hardstand covering is defined as the materials such as gravels and crushed concrete used to establish the sub-grade and the surface slab constructed of concrete, bitumen, asphaltic cement or other materials that cannot be removed readily without the use of tools.

3.1.1 Grass Surface Maintenance

Grass covering at the Site must be maintained to prevent contact with contaminated soils. Inspections should be undertaken twice annually, to ensure that:

- Grass surfacing is maintained in all garden areas; and
- Growing medium or topsoil underlying the grass surface remains intact and no notable depressions, excavations or other disturbances of the grass and growing medium or topsoil have occurred;

Should devegetation or erosion be observed in areas of Site covered with grass, this should be repaired within a period no greater than two weeks, following the protocol set out below for minor or major works as appropriate.

3.1.2 Hardstand Maintenance

Hardstand across the Site must maintain integrity to prevent contact with contaminated soils. Inspections should be undertaken once annually, to ensure that:

- Cracks within the hardstand are no wider than 5mm at the widest point;
- The hardstand is not showing signs of deterioration.

Should a pothole or cracking wider than 5mm be observed in the hardstand, this should be repaired within a period no greater than two weeks, following the protocol set out below for minor or major works as appropriate.

3.1.3 Management of Minor and Major Works

For the purpose of this EMP:

- Minor works comprise works that require minimal disturbance of the hardstand or grass covering the ground surface and comprise activities such as replacement of pavements, grasses or similar surface cover. As a result of Minor works direct contact with the subgrade is possible.
- Major works comprise larger scale disturbance to the hardstand or grass covering the ground surface and the underlying materials and comprise activities such as:
 - Construction and maintenance of sub-surface services, such as gas, electricity, stormwater, surface drainage, telephone, cabling and water supply;
 - Installation of equipment, such as traffic bollards, loading bays and car spaces that require excavation of and possible direct contact with the potentially contaminated fill material;
 - Installation and maintenance of features or equipment that require disturbance of and possible direct contact with the potentially contaminated fill material; and
 - Any works during which direct contact with potentially contaminated fill material is possible.

3.2 Responsibilities

The Owner is responsible for the overall implementation and maintenance of this EMP and for ensuring that occupiers, tenants and contractors working at the Site have been informed of the requirements of the EMP prior to commencement of works.

The supervisor or person-in-charge of works on the Site is responsible for implementing the requirements of the EMP during the planning process for any works to be conducted at the site, during the course of any works that fall into the "Minor" or "Major" categories as defined below, and at the completion of any "Minor" or "Major" works. The specific responsibilities of the Owner and the supervisor or person in-charge of the works are outlined in Table 3-1 below.

Table 3-1 Responsibility Matrix

Position and Company/Entity	Responsibilities
The Owner	▪ Advise persons occupying and working at the Site of the requirements of the EMP; ▪ Ensure implementation of the EMP requirements including the surface covering inspection programme; ▪ Ensure appropriate consents and licences (as required) are obtained for the works; ▪ Procure the training and induction of employees and contractors before and during the works, as appropriate and relevant; ▪ Provide a copy of the EMP to the occupiers, supervisor or person-in-charge of occupier/tenant employees and/or contractor/s who are undertaking the works; ▪ Ensure relevant and appropriate project/occupier/tenant staff and contractors comply with the requirements of the EMP; ▪ Ensure relevant and appropriate project/occupier/tenant staff and contractors clearly understand the requirements of the EMP and ensure that compliance with the EMP is a condition of any agreement with these parties; ▪ Ensure the conditions of the EMP are implemented and supplemented, if necessary, by conditions of any relevant planning consent; ▪ Obtain advice if the condition of the Site are changed, and, if necessary, arrange for an appropriately qualified party to update the EMP, informing other relevant and appropriate parties, including tenants, of the changes; ▪ Ensure inspections of the surface of the Site is undertaken bi-annually or at another interval as set out in Section 4.2 and record the results of the inspections; ▪ Ensure the Site is maintained in accordance with the EMP; ▪ Provide the EMP for inclusion on the relevant records maintained by project/occupier/tenant.

Position and Company/Entity	Responsibilities
The supervisor or person-in-charge of works (Occupier / Tenant / Contractor / Sub-Contractor)	▪ Implement the EMP to ensure compliance; ▪ Complete the registers, databases and records required by the EMP; ▪ Conduct works in an environmentally responsible manner; ▪ Meet relevant OH&S regulatory requirements; ▪ Implement the works in a safe and responsible manner; ▪ Notify the Owner if suspected contaminated fill materials is encountered during works on the Site; ▪ Complete non-conformance and corrective action reports as required and undertake follow-up corrective actions, as required; ▪ Undertake audits of activities in accordance with the requirements of the EMP; ▪ Ensure non-conformance and/or complaints are reported to the Owner; ▪ Undertake corrective actions in response to requests made by the Owner regarding specific environmental or safety issues; ▪ Ensure all works comply with relevant regulatory requirements; ▪ Inform the Owner if conditions change significantly from those documented in the EMP.

3.3 Document Revision

This EMP is required to be reviewed if a change of Site use or redevelopment of the Site occurs. It is the responsibility of the Owner to ensure the EMP supplied to any person is the current updated or amended version.

It is the responsibility of the supervisor or person-in-charge of works proposed to be undertaken to ensure they have the current version of the EMP.

The up-to-date version of the EMP will be available from the Owner.

Section 4 Risk Control Measures

4.1 Exposure Pathways

The presence of contaminants identified within the fill materials does not affect the present safe use of the Site whilst the grass or hardstand covering the ground surface is undisturbed.

However, if the grass or hardstand covering the ground surface is disturbed through Minor or Major works as defined in Section 3.3, it is possible that a risk of exposure to contaminants may result. In order to develop appropriate measures to control this increased exposure, it is necessary to understand the potential exposure pathways, which comprise inhalation (breathing dust and vapours), dermal (skin) contact and ingestion (swallowing).

A summary of contaminants identified in the fill materials and perched groundwater under the Site, including their potential health affects and exposure pathways, are summarised in Table 4-1 below.

Table 4-1 Exposure Pathways

Contaminant of Concern	Source	Chemicals	Physiological Effect	Exposure Pathway
Petroleum hydrocarbons	Fill materials	Long-chain petroleum hydrocarbons	Inhalation of volatile hydrocarbons, if present, may cause central nervous system effects such as headaches, blurred vision and narcosis, when present in high concentrations. Repeated skin contact may result in allergic dermatitis and skin cancer. Skin contact may cause dermatitis. Long term or chronic exposure may result in liver damage, effects on the blood forming- systems.	Inhalation of vapours or contaminated dust. Skin contact with contaminated soil. Ingestion of contaminated soil
Polycyclic aromatic hydrocarbons	Fill materials	PAHs, including benzo(a)pyrene	Inhalation of PAHs (as dust of PAHs are not very volatile) may cause bronchitis and possibly cancer of the respiratory system. Repeated skin contact may result in allergic dermatitis and skin cancer	Inhalation of vapours or contaminated dust. Skin contact with contaminated soil. Ingestion of contaminated soil.

Contaminant of Concern	Source	Chemicals	Physiological Effect	Exposure Pathway
Heavy Metals	Fill materials and groundwater	Lead, Zinc, Copper		Skin contact with contaminated groundwater, liquids or soil. Ingestion of contaminated liquids or soil.

4.2 Control Measures for Current Activities

Measures to control the risk posed by potential contaminants have been implemented on the Site, by restricting access with fencing and a lockable gate. The grass and hardstand covering the ground surface is required to be maintained in the future to ensure that the risk of exposure to potential contaminants in fill materials at depth is eliminated.

The grass and hardstand covering the ground surface across the Site is required to be inspected bi-annually (twice per 12 month period or once per 6 months). It is the responsibility of the Owner to ensure that these inspections are undertaken. The inspections are to be undertaken as a walkover across the Site surface. The inspection must make a written and photographic record of the following:

- General condition of hardstand surfaced areas of Site;
- General condition of landscaped and grassed areas of the Site;
- Presence of any subsidence, cracks, openings, degradation or similar in the hardstand surfaces of Site – the nature, extent and location needs to be recorded and rectification works are required to be implemented;
- Presence of any subsidence, degradation, devegetation or similar in the grassed and landscape covered areas of the Site – the nature, extent and location needs to be recorded and rectification works are required to be implemented;
- Presence of any obvious repair/maintenance works to the hardstand surfaces or grassed or landscape covered areas of the Site – the nature, extent and location needs to be recorded;
- Presence of any excavation works into the sub-surface and the control measures being undertaken; and
- Any other observations on the condition and/or integrity of the Site surface.

Where rectification works are required to be implemented or where repair/maintenance works are being undertaken, the Owner must ensure that these works are undertaken in accordance with the measures set out in this EMP. On completion of such works, the Owner must conduct an inspection to ensure that the hardstand surface and/or the grass and landscape covering of the Site has been adequately reinstated/restored.

The record of the bi-annual and other required inspections of the condition of the surface of the Site is required to be kept and maintained by the Owner.

4.3 Control Measures for Future Activities

Minor Works, involving activities such as replacement of pavements, grasses, landscaping or similar surface or sub-surface coverings, do not require specific controls, providing the works do not disturb the underlying fill materials.

Where Major Works are required to be undertaken additional control measures may be required depending on the scope of the works. Whilst it is not possible to assess the impacts from all future activities, it is possible to consider exposure scenarios likely to be associated with a range of general maintenance and intrusive works.

Major Works that result in the disturbance of the surface cover and exposure to the underlying fill materials require control measures to be implemented.

The control measure required to be implemented for “minor works” and “major works” are set out in Table 4-2 below:

Table 4-2 Control Measures

Works	Possible Risk to the Site Users	Possible Risks to the Environment	Control Measures Required
Minor Works Minor works comprise maintenance activities involving temporary removal of the hardstand, grass or landscaping covering the ground surface and minimal contact with the underlying fill materials or surface of bedrock. Typical activities include replacement of pavements.	Inhalation and skin contact with soils potentially containing contaminants (though considered unlikely)	Low risk of runoff.	No eating, drinking, smoking; avoid contact with soil (wear gloves); wash hands and clothes after work and before eating or smoking. A P2 face mask should be used if dusty conditions develop. Dust generation should be controlled by dampening the materials. If minor quantities of soil / fill materials are required to be excavated, remove the surface cover material separately, cover excavated fill materials with plastic sheeting. Ensure all excavated materials are disposed off-site in accordance with NSW DECC (2009) Waste, Classification Guidelines or equivalent and disposal to a facility licensed by NSW EPA to receive the class of waste material. Records of disposal to be maintained and recorded in a materials tracking register.

Works	Possible Risk to the Site Users	Possible Risks to the Environment	Control Measures Required
Major Works Major works involve significant contact with fill materials underlying the hard stand, grass or landscaping covering the surface of the Site. Typical activities may include repairs to underground pipes, cables and intrusive earthworks.	Ingestion, inhalation and skin contact with fill materials containing contaminants. Unexpected finds	Potential for runoff / leaching from contaminated soil to impact surrounding land and/or waterways, if not appropriately contained.	No eating, drinking, smoking; avoid contact with groundwater Wear Level D PPE including latex gloves, hard-hat, steel-toed boots, high-visibility vest and safety glasses during manual handling of soil/groundwater in an excavation and in stockpiles. Wash hands and clothes after work. Prevent dust by dampening materials prior to and during excavation. Develop safety documentation for works. Ensure all excavated materials are disposed off-site in accordance with NSW DECC (2009) Waste, Classification Guidelines or equivalent and disposal to a facility licensed by NSW EPA to receive the class of waste material. Records of disposal to be maintained and recorded in a materials tracking register. In the event of unexpected finds that cannot be managed/controlled in the manner set out above e.g. presence of an underground storage tank, drums, pipework or similar, works must cease and the Insurer must inspect the unexpected find. If deemed necessary by the Owner a suitably qualified environmental consultant will need to conduct an inspection and provide a recommendation of what works are required to control/manage the unexpected find in accordance with the relevant NSW EPA endorsed guidelines, NSW regulations and legislation.

4.4 Handling of Contaminated and Potentially Contaminated Materials

Any materials excavated from the Site must be handled with care and in accordance with the requirements set out above. Any materials that require disposal off-site will require the engagement of a suitably qualified environmental consultant to conduct appropriate sampling and analysis to determine the requirements for off-site disposal in accordance with NSW DECC (2009) guidelines or equivalent.

4.5 Reporting of Complaints and Incidents

If a complaint is made by a member of the public or by any other person with respect to any environmental management or control issue either during “Minor Works” or during “Major Works” or at any other time, appropriate corrective action is required to be undertaken as soon as practicable.

Similarly, if an environmental incident occurs that has given or may give rise to pollution of soil, air or waters, appropriate corrective action is required to be undertaken as soon as practicable.

In addition to the above, complaints and environmental incidents are required to be notified to the Insurer as soon as practicable after a complaint has been made or an environmental incident has

occurred. If appropriate, and following the Owner's instructions, notification may need to be made to the applicable regulatory authority.

Records of complaints and incidents are required to be entered into a register to be developed for the Site, but only after corrective action has been taken and the Owner has been notified.

Figures

Figure 1 Site Location

Figure 2 Site Layout



SCALE: DRAWN TO SCALE AS SHOWN

NTS

NORTH

LEGEND:



Image courtesy of www.nearmap.com

**CDM
Smith**

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CLIENT: **Roads and Maritime Services NSW**

PROJECT: **Long-Term EMP
5 Bank Street, Pyrmont NSW**

PROJECT NUMBER: S11363.01

TITLE: Site Location

FIGURE:

1

A4



SCALE: DRAWN TO SCALE AS SHOWN

NTS

NORTH

LEGEND:



Image courtesy of www.nearmap.com



REV: A
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CLIENT: **Roads and Maritime Services NSW**

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5 Bank Street, Pyrmont NSW**

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TITLE: Site Layout

FIGURE:

2
A4

Appendix A - Disclaimer and Limitations

This report has been prepared by CDM Smith Australia Pty Ltd (CDM Smith) for the sole benefit of NSW Road and Maritime Services for the sole purpose of documenting procedures that are required to be implemented to manage identified risks to users of the Site.

This report should not be used or relied upon for any other purpose without CDM Smith's prior written consent. CDM Smith, nor any officer or employee of CDM Smith, accepts no responsibility or liability in any way whatsoever for the use or reliance of this report for any purpose other than that for which it has been prepared.

Except with CDM Smith's prior written consent, this report may not be:

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- (c) filed with any Governmental agency or other person or quoted or referred to in any public document.

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The information on which this report is based has been provided by NSW Road and Maritime Services and third parties. CDM Smith (including its officer and employee):

- (a) has relied upon and presumed the accuracy of this information;
- (b) has not verified the accuracy or reliability of this information (other than as expressly stated in this report);
- (c) has not made any independent investigations or enquiries in respect of those matters of which it has no actual knowledge at the time of giving this report to NSW Road and Maritime Services; and
- (d) makes no warranty or guarantee, expressed or implied, as to the accuracy or reliability of this information.

In recognition of the limited use to be made by NSW Road and Maritime Services of this report, NSW Road and Maritime Services agrees that, to the maximum extent permitted by law, CDM Smith (including its officer and employee) shall not be liable for any losses, claims, costs, expenses, damages (whether in statute, in contract or tort for negligence or otherwise) suffered or incurred by NSW Road and Maritime Services or any third party as a result of or in connection with the information, findings, opinions, estimates, recommendations and conclusions provided in the course of this report.

If further information becomes available, or additional assumptions need to be made, CDM Smith reserves its right to amend this report.