



BAULDERSTONE

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

Barangaroo Central Waterfront Promenade and Interim Public Domain Works

Client: Barangaroo Delivery Authority

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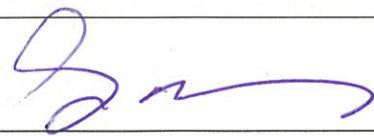
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Terms used in this document

BDA	Barangaroo Development Authority
DECCW	Department of Environment, Climate Change and Water
DGRs	Director-General's Requirements
DP&I	NSW Department of Planning and Infrastructure
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environment Protection Licence
OEH	Office of Environment and Heritage
PCB	Polychlorinated Biphenyls
PWQMP	Preliminary Water Quality Management Plan
RAP	Remediation Action Plan
SEPP	State Environmental Planning Policy
SSDA	State Significant Development Application
SWMS	Safe Work Method Statement

1. INTRODUCTION

1.1 BACKGROUND

It is envisioned that the Barangaroo site be developed into an actively diverse cultural and civic centre. The Barangaroo site is divided into three distinct venues, being Headland Park at the northern end, Barangaroo Central and Barangaroo South. Across these venues a mix of land use including residential, retail, commercial, leisure and community purposes is planned.

The Barangaroo Central Waterfront Promenade and Interim Public Domain ("the Project") is the first phase in the development of the Barangaroo Central site, with works planned for completion in 2015. The project broadly comprises:

- Waterfront promenade - including paving, planting, furniture, lighting signage, a public wharf and water taxi pontoon, provision for the berthing of ships during special events and a low level timber board walk.
- Interim public domain – construction and use of a flexible public space to accommodate a range of temporary and long-term uses, including passive recreation and organised events. The site would be graded to the northwest with a fall of 2 per cent to create a naturalised amphitheatre.
- Structural works – allowing the existing seawall structure to link the Barangaroo Headland Park with Barangaroo South.
- Remediation - remediation and management of contaminated soil and groundwater would be undertaken to a level that supports the intended use of the site.
- Demolition – dismantling of the Interim Cruise Passenger Terminal and associated services. Dismantling of all fencing and kerbs, light poles and traffic signage. Demolition and disposal of above ground temporary water service and fire hydrant lines and equipment.

Barangaroo Central is part of the broader Barangaroo site, which is a State Significant Development site under Schedule 2 of the State Environmental Planning Policy (State and Regional Development) 2011 ("State and Regional Development SEPP"). As the proposed public domain works have a capital investment value of more than \$10 million, the State and Regional Development SEPP requires that a State Significant Development Application (SSDA) and accompanying Environmental Impact Statement (EIS) be prepared for the project.

In July 2012, a request for Director-General's Requirements (DGRs) for an environmental Impact Statement was lodged with the Department of Planning and Infrastructure (DP&I). The Department issued DGRs on 31 July 2012.

1.2 PURPOSE

This document is a Preliminary Water Quality Management Plan (PWQMP), which has been prepared to ensure best practice and legislative compliance in the management of construction stage water quality.

It also specifically responds to the DGRs, in particular elements of DGR No.15 (emphasis added).

5. Water, Drainage, Stormwater and Groundwater

- *Undertake an assessment on surface and groundwater, including:*
 - *a water balance for the site;*
 - *erosion and sediment control plan for the works and operations;*
 - *stormwater management plan for the site, including any bunding of dangerous goods or fuel depots;*
 - *groundwater management, including measures for preventing groundwater pollution;*
 - *consider Environmentally Friendly Seawalls – A Guide to Improving the Environmental Value of Seawalls and Seawall-lined Foreshores in Estuaries (DECC, 2009); and*

- *details on any wastewater disposal.*

The PWQMP is a companion document to the Preliminary Environment and Construction Management Plan, which has been prepared separately to address the requirements of DGR No. 16, specifically:

16. Environmental, Construction and Site Management Plan

The EIS shall provide an Environmental and Construction Management Plan for the proposed works, and is to include:

- *Community consultation, notification and complaints handling.*
- *Impacts of construction on adjoining development and proposed measures to mitigate construction impacts.*
- *Noise and vibration impacts on and off site.*
- *Air quality impacts on the neighbourhood.*
- *Odour impacts.*
- *Water quality management for the site.*
- *Waste and chemical management.*

1.3 DOCUMENT STRUCTURE

The structure of this document is as follows:

- Introduction, background and purpose (this section).
- Goals, outcomes and key issues (Chapter 2) – Sets the goals and outcomes for the management of water. Reviews the key water quality management issues for the proposal.
- Regulatory framework (Chapter 3) – Explains the regulatory framework within which water quality must be managed.
- Water quality management (Chapter 4) – identifies measures to address potential impacts on water quality.
- Monitoring and reporting (Chapter 5) – explains the measures to be implemented to ensure that water quality management performance is properly monitored and reported to relevant parties.

2. GOALS, OUTCOMES AND KEY ISSUES

2.1 GOALS

The following water quality management goals have been adopted:

- Ensure that construction activities are managed to meet water quality objectives set out in Attachment 2 of the of the Department of Environment, Climate Change and Water (DECCW) correspondence dated 23 December 2010 – refer to Appendix B.
- Ensure compliance with relevant provisions of Environment Protection Licence (EPL) No. 13336 issued by the Environment Protection Authority (EPA) for the Barangaroo site.
- Provide adequate erosion and sedimentation controls, including controls to minimise dust and vehicular mud-tracking.
- Monitor the effects of activities and the effectiveness of mitigation measures.

2.2 OUTCOMES

The following are the expected water quality management outcomes:

- Erosion and sediment controls are effective and properly maintained at all times.
- Water treatment plant treat water from the site to achieve water quality criteria set out in EPL 13336.

2.3 KEY ISSUES

The following have been identified as key water quality management issues for the project:

- Management of erosion and sedimentation from exposed fill material.
- Management of site stormwater.
- Management of contamination.

3. REGULATORY FRAMEWORK

The statutory and policy framework for the management of water quality is described below.

3.1 RELEVANT LEGISLATION

Protection of the Environment Operations Act 1997

- Sections 120 and 122 of the Act provide that it is illegal to pollute or cause or permit pollution of waters.
- Under the Act, “Water Pollution” includes debris into waters or placing such material where it is likely to be washed or blown into waters or the stormwater system or percolate into groundwater.

Protection of the Environment Operations (General) Regulation 2009

The Regulation contains provisions relating to environment protection licences, the issuing of penalty notices under the Act and certain related environmental legislation, the appropriate regulatory authority for certain type of activities, and notification of pollution incidents.

4. WATER QUALITY MANAGEMENT AND MONITORING

All surface water runoff from work areas will be captured in basins, overflow tanks and by perimeter containment – refer to Appendix A. It will then be treated at an on-site water treatment plant to the water quality standards applying to the Barangaroo Headland Park project as set out in Attachment 2 of the of the Department of Environment, Climate Change and Water (DECCW) correspondence dated 23 December 2010 – refer to Appendix B.

The draft *Remediation Action Plan* (RAP) for Barangaroo Central Waterfront Promenade and Interim Public Domain notes that it is not anticipated that the current hydrogeological regime would change substantially with the proposed development. The removal of site pavement from some of the Barangaroo Central site (installation of services etc.) may cause some increased surface infiltration to occur. The potential for groundwater contamination via infiltration is to be addressed by ensuring that both reused site materials and imported fill materials meet the site acceptance criteria specified by the draft RAP.

Specific water quality management and measures proposed for project are detailed in Table 4-1. Monitoring and management measures are detailed in Table 4-2.

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Table 4-1 Water Quality management measures

ID	Management measure	Timing		
		Pre-construction	Construction	Post construction
SW1	Store all fuels, oils and chemicals in secure bunded areas and as per Dangerous Goods Storage requirements where applicable. Cover all permanent bunded areas. The bund capacity is to be capable of storing 110% of the capacity of the largest tank stored (DECC, 2007).		■	
SW2	Use a silt curtain, as appropriate, for work immediately adjacent to the harbour.			
SW3	Provide spill kits at all key construction areas, including any refuelling areas, near any permanent fuel / chemical storage bunds, and other static construction activities that present a risk of fuel, chemical or other fluid releases.		■	
SW4	Ensure additional suitable marine containment booms are available and located to allow for rapid deployment in the event of an incident where a release to the harbour has or is likely to occur.		■	
SW5	Manage, notify and report environmental incidents in accordance with an approved <i>Emergency and Response Plan</i> and <i>Pollution Incident Response Management Plan</i> . This includes notifications to regulators where necessary.		■	
SW6	Minimise the area of disturbance at anyone time to the extent necessary to undertake the stage of works in progress.		■	
SW7	Soil erosion and sediment control measures will be designed in accordance with the document titled <i>Managing Urban Stormwater-Soils and Construction, Volume 1</i>		■	
SW8	Implement and maintain all site erosion and sedimentation controls as per the Erosion and Sedimentation Control Plan (ESCP). Update the plan to address changing site conditions and construction activity. ESCPs will include specific details on the location of features such as: • Sediment traps; • Sediment basins; • Diversion banks; • Sediment fences; • Mulch bund/bio bunds;		■	■

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	• Earth bunds; • Stockpiles; • Clean water flow paths; and • Other specific controls as required.			
SW9	Create a continuous impervious water retention barrier around the perimeter of the site as per Erosion and Sedimentation Control Plan.		■	
SW10	Cap and re-align the existing stormwater system to capture and pump all water within the barrier to the site water treatment plant.		■	
SW11	Captured surface water and any extracted groundwater to be treated in a water treatment plant. Water will be treated to comply with the EPL 13336.		■	
SW12	Cover all loads coming onto the site and departing site, including internal loads, to minimise potential spillage / dust generation.		■	
SW13	Prevention of mud tracking through the use of measures including rumble grids and wheel/tailbar wash down facilities.		■	
SW14	Any groundwater, seawater or treated water intended for re-use on site must meet requirements of the HHERA.		■	
SW15	Soil on the site will be stabilised following completion and/or suspension of construction activities. Following 20 working days of inactivity, all lands (drainage lines, batters, stockpiles) are to be protected. Permanent rehabilitation of sites will take place as soon as practicable following completion of works in accordance with an approved landscape plan.		■	■

Table 4-2 Water quality monitoring and reporting measures

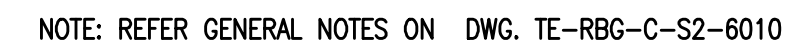
Item	Frequency	Applicable standards / goals	Action if non-compliance detected
Water quality monitoring in accordance with a specific program to be developed and implemented prior to construction. The program would cover: • Water quality monitoring of discharge from water treatment plant. • Discharge volumes from the water treatment plant. • Recycled water volumes from the water treatment plant (if used). • Monitoring in Darling Harbour measuring temperature, electrical	As determined by the monitoring programme	EPL requirements	Notification to EPA Investigation into causation Corrective action put in place as required

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Item	Frequency	Applicable standards / goals	Action if non-compliance detected
conductivity, pH, and turbidity. Supplementary monitoring of receiving waters in response to plumes, incidents, audits and other compliance programs.			
Inspection of the construction site and stormwater discharge outlets.	Weekly and daily after rainfall	-	Notification to Superintendent/Foreman
Visual inspection for turbidity and plumes.	Minimum daily, with frequency depending on the nature of the works being carried out.	-	Corrective action put in place as required

APPENDIX A WATER QUALITY MANAGEMENT LAYOUT



**Captured water to
Water Treatment Plant**

TEMPORARY LAWN

EXISTING PAVEMENT TO BE CUT
AND REMOVED ALONG PART OF
PROPOSED ACCESSWAY. REFER
PLAN TE-RBG-C-S2-6110 FOR
DETAILS

FOR PROMENADE BULK
EARTHWORKS REFER DWG. —
TE-RBG-C-S2-6110

LEGEND

-  Indicative location of spill kits
-  Existing Stormwater Outlets blocked
-  Sumps for water collection
-  Water Collection Pipeline
-  Perimeter Containment

NOTE: This plan is preliminary and will be amended as necessary during the course of works

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APPENDIX B WATER QUALITY LIMITS

DECCW Correspondence December 2010 (Attachment 2)

Preliminary Water Quality Management Plan

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Indicator	Indicator	Criteria
Total Suspended Solids	mg/L	50
Turbidity	NTU	Monitor
Sheens or plumes	Inspections	No visible sheen or plumes outside the silt curtain.
pH	pH	6.5–8.5
Arsenic	µg/L	2.3
Cadmium	µg/L	0.7
Copper	µg/L	1.3
Lead	µg/L	4.4
Mercury	µg/L	0.1
Zinc	µg/L	15
Chromium (trivalent)	µg/L	27
Chromium (VI) compounds	µg/L	4.4
Nickel	µg/L	7
Cyanide	µg/L	4
Ammonia	µg/L	910
BTEX		
Benzene	µg/L	500
Ethyl benzene	µg/L	80
Toluene	µg/L	180
m-Xylene	µg/L	75
p-Xylene µg/L 200	µg/L	200
o-Xylene µg/L 350	µg/L	350
Phenol µg/L 400	µg/L	400
TPH C10-C14 Fraction	µg/L	50#
TPH C15-C28 Fraction	µg/L	100#

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Indicator	Indicator	Criteria
TPH C29-C36 Fraction	µg/L	50#
TPH C6-C9 Fraction	µg/L	20#
Oil and Grease	mg/L	10
PAHs		
Naphthalene	µg/L	50
Anthracene	µg/L	2*
Phenanthrene	µg/L	2*
Fluoranthene	µg/L	2*
Benzo(a)anthracene	µg/L	2*
Benzo(a)pyrene	µg/L	2*
Benzo(b)fluoranthene	µg/L	2*
Benzo(k)fluoranthene	µg/L	2*
Acenaphthene	µg/L	2*
Acenaphthylene	µg/L	2*
Chrysene	µg/L	2*
Indeno(1,2,3-cd)pyrene	µg/L	2*
Pyrene	µg/L	2*
Fluorine	µg/L	2*
Benzo[ghi]perylene	µg/L	2*
Dibenz[a,h]anthracene	µg/L	2*
Electrical conductivity		Monitor
Dissolved Oxygen		Monitor
Total PCBs	µg/L	Early non-detects, can be removed from ongoing