

Prepared for
John Holland CPB Ghella Joint Venture

Prepared by
Ramboll Australia Pty Ltd

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TO-024-6

SITE AUDIT REPORT

SYDNEY METRO BLUES POINT ACCESS SHAFT, BLUES POINT ROAD, MCMAHONS POINT NSW

27 November 2020

John Holland CPB Ghella Joint Venture
Attn.: Krissy Vajda
Level 9, 50 Bridge Street
Sydney NSW 2000

By email: krissy.vajda@sydneymetro2.com.au

Dear Krissy

**SITE AUDIT REPORT - SYDNEY METRO BLUES POINT
ACCESS SHAFT, BLUES POINT ROAD, MCMAHONS POINT
NSW**

I have pleasure in submitting the Site Audit Report for the subject site. The Site Audit Statement, produced in accordance with the NSW *Contaminated Land Management Act 1997*, is included as Appendix B of the Site Audit Report. The Audit was commissioned by John Holland CPB Ghella Joint Venture to ultimately assess the suitability of the site for its intended public open space/recreational land use following use as an access shaft for construction of the Sydney Metro City and Southwest. Use of the shaft is ongoing, so this Section B Site Audit Statement and accompanying Site Audit Report were prepared to assess the remedial works undertaken to date.

The Audit was initiated to comply with requirements of *Condition E67 of Infrastructure Approval, application SSI 15_7400*, approved by the Minister for Planning on 9 January 2017, and is therefore a statutory audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 9954 8100 if you have any questions.

Yours faithfully,
Ramboll Australia Pty Ltd



Tom Onus
EPA Accredited Site Auditor 1505

cc: NSW EPA – Statement only
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Appendix A

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Site Audit Statement

Appendix C

Interim Audit Advice

LIST OF ABBREVIATIONS

Measures

%	per cent
µg/L	Micrograms per Litre
ha	Hectare
km	Kilometres
m	Metre
mAHD	Metres Australian Height Datum
mbgl	Metres below ground level
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
mm	Millimetre
ppm	Parts Per Million

General

ACM	Asbestos Containing Material
ADE	ADE Consulting Group Pty Ltd
ADWG	Australian Drinking Water Guidelines
AHD	Australian Height Datum
ANZG	Australian & New Zealand Guidelines
ASS	Acid Sulphate Soil
AST	Aboveground Storage Tank
ANZECC	Australian and New Zealand Environment and Conservation Council
BaP	Benzo(a)pyrene
BGL	Below Ground Level
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes & Naphthalene
CLM Act	NSW Contaminated Land Management Act 1997
COC	Chain of Custody
Council	North Sydney Council
CSM	Conceptual Site Model
Douglas	Douglas Partners Pty Ltd
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
ENM	Excavated Natural Material
EPA	Environment Protection Authority (NSW)
EPL	Environment Protection Licence
GIL	Groundwater Investigation Level
GSW	General Solid Waste
HIL	Health Investigation Level
HSL	Health Screening Level
IAA	Interim Audit Advice
JHCPBG JV	John Holland CPB Ghella Joint Venture
LEP	Local Environment Plan
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
ML	Management Limits
MS	Matrix Spike
NATA	National Association of Testing Authorities
NC	Not Calculated
ND	Not Detected
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NL	Non-Limiting
n	Number of Samples
OCPs	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OPPs	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls

pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd – previously Ramboll Environ Australia Pty Ltd
RAP	Remediation Action Plan
RPD	Relative Percent Difference
RRE	Resource Recovery Exemption
RRO	Resource Recovery Order
RSL	Regional Screening Level
SAR	Site Audit Report
SAS	Site Audit Statement
SPR	Source-pathway-receptor
SSI	State Significant Infrastructure
TEQ	Toxic Equivalence Quotient
TPHs	Total Petroleum Hydrocarbons
TRHs	Total Recoverable Hydrocarbons
USEPA	United States Environmental Protection Agency
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1 Audit Details

A site contamination audit has been conducted in relation to the Blues Point Access Shaft site of the Sydney Metro City and South West, which is located at the corner of Blues Point Road and Henry Lawson Avenue, McMahons Point NSW.

The Audit was conducted to provide an independent review by an EPA Accredited Auditor of what management remains necessary before the land is suitable for any specified use or range of uses i.e. a "Site Audit" as defined in Section 4 (1) (b) (iv) of the NSW Contaminated Land Management Act 1997 (the CLM Act).

A State Significant Infrastructure (SSI) development application (SSI 15_7400) was approved by the NSW Minister for Planning on 9 January 2017 for the construction and operation of a metro rail line, approximately 16.5 km long (of which approximately 15.5 km is located in underground rail tunnels) between Chatswood and Sydenham, including the construction of a tunnel under Sydney Harbour, links with the existing rail network, seven metro stations, and associated ancillary infrastructure. Condition E67 of the SSI development approval relates to contamination and requires a site audit as follows:

"If a Site Contamination Report prepared under Condition E66 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with."

The Audit was initiated to comply with condition E67 of the SSI approval and is therefore a statutory audit. The site audit is also a requirement of Clause 10.14B of the Sydney Metro City & Southwest Tunnel and Station Excavation Works Design and Construction Deed (Contract No: 00013/11200).

Details of the Audit are:

Requested by:	Caitlin Richards on behalf of John Holland CPB Ghella Joint Venture (JHCPBG JV)
Request/Commencement Date:	5 October 2017
Auditor:	Tom Onus
Accreditation No.:	1505

1.2 Project Background

As part of the Sydney Metro City and South West (Sydney Metro) Tunnel and Station Excavation (TSE) Works Package, a Remediation Action Plan (RAP) was developed to detail the work required to remediate impacted fill material during construction of the access shaft. The RAP was reviewed by the Auditor (see Section 1.3 for details) prior to remediation commencing.

The site comprises the 'excavation footprint' shown in yellow on Attachment 1 (Appendix A). The surrounding 'construction site area' shown in red is not part of the site. Remediation was undertaken by excavation and off-site disposal of all fill material and natural soil/bedrock to an average depth of approximately 36 metres below ground level (mbgl). Walls of the shaft comprise 900 mm bored piles with the floor of the shaft comprising 250 mm thick concrete.

Following use as an access shaft, the shaft will be backfilled, and the site will be used as an open space/recreational area. At the time of preparing this audit, the site was still in use as an access shaft and, hence, a conclusion on the suitability of the site for the proposed future use as an open space/recreational area could not be made. This audit has reviewed the suitability and appropriateness of the investigation, remediation and validation works completed to date. Following backfilling of the access shaft and completion of earthworks to final site levels, a Section A Site Audit Statement (SAS) and supporting Site Audit Report (SAR) certifying suitability for the proposed use should be prepared.

1.3 Interim Audit Advice

Interim Audit Advice (IAA) was prepared by the Auditor in 2018 which provided an initial review of the suitability and appropriateness of a RAP, as well as a review of the previous investigations undertaken at the site. The reports reviewed for the IAA are listed in Section 1.4 below.

The IAA concluded that the proposed process for remediation of fill material was practical and that the site could be made suitable for the proposed land use if remediated in accordance with the RAP. The IAA noted that *"At the completion of remediation of the site, a Section A Site Audit Statement and supporting Site Audit Report certifying suitability for the proposed use should be prepared."*

The IAA is attached in Appendix C and is referenced throughout this SAR where required, however, full details of the IAA are not repeated.

1.4 Scope of the Audit

The scope of work undertaken for the IAA included:

- Review of the following reports:
 - 'Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, McMahons Point, NSW, prepared for John Holland CPB Ghella JV, Project 85608.07, May 2018', report reference: 85608.07.R.001.Rev0, dated 4 December 2018 prepared by Douglas Partners Pty Ltd (Douglas) (*the PSI*).
 - 'Report on Detailed Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point Road, McMahons Point, prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018', report reference: 85608.07.R002.Rev1.DSI, dated 27 November 2018 prepared by Douglas (*the DSI*).
 - 'Remediation Action Plan, Sydney Metro City and South West - Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point Road, McMahons Point prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018', report reference: 85608.07.R003.Rev1.RAP, dated 15 November 2018, prepared by Douglas (*the RAP*).
- A site visit by the Auditor on 28 February 2018.
- Discussions with JHCPBG JV and with Douglas who undertook the investigations and prepared the RAP.

The PSI, DSI and RAP make reference to previous reports prepared by Douglas and Golder Associates Pty Ltd (Golder) (Geotechnical and Contamination) in 2017 and by Casey & Lowe (Archaeological) in 2018. These reports were not provided to the Auditor for review, however a summary of relevant information was included in the Douglas reports.

The scope of work undertaken in competing the SAR included:

- Review of the following reports:
 - 'In Situ Waste Classification – Access Shaft Excavation Sydney Metro City & SW, Tunnel & Station Excavation Works Package, Proposed Shaft Site, Blues Point Road, McMahons Point', dated 3 September 2018, prepared by Douglas
 - 'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 20 December 2018, prepared by ADE Consulting Group Pty Ltd (ADE)
 - 'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 18 February 2019, prepared by ADE
 - 'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 21 May 2019, prepared by ADE
 - 'Report on Validation of Remediation, Sydney Metro City & South West - Tunnel and Station Excavation Works Package, Blues Point Access Shaft, Henry Lawson Avenue, McMahons Point', report reference: Revision 0, dated 25 November 2020, prepared by Douglas (*the Validation Report*).
- Discussions with JHCPBG JV, and with Douglas who undertook the remediation and validation works.

2. SITE DETAILS

2.1 Location

The site is identified as the 'excavation footprint' (the site) for the access shaft shown on Attachment 1, Appendix A. The 'construction site area' surrounding the 'excavation footprint' has been excluded from the Douglas investigations and is not part of the site audit area.

The site details are as follows:

Street address:	Corner of Blues Point Road and Henry Lawson Avenue, McMahons Point, NSW 2060
Identifier:	Part of Lot 1 DP902933
Local Government:	North Sydney Council
Owner:	Transport for New South Wales
Site Area:	Approximately 220 m ²

The boundaries of the site comprise the walls of the excavation. The *construction site area* is bound by Henry Lawson Avenue to the north, Blues Point Road to the west, Henry Lawson Reserve to the east and Sydney Harbour (Blues Bay) to the south.

A survey plan of the site has been provided in Attachment 2 (Appendix A) and identifies the Site Audit boundary (points A to D).

2.2 Zoning

The current zoning of the site is RE1 Public Recreation under the North Sydney Local Environment Plan (LEP) 2013.

2.3 Adjacent Uses

The site is located within an area of medium to high density residential land uses and within the public open space of Henry Lawson Reserve. The site uses surrounding Henry Lawson Reserve include:

- North: Henry Lawson Avenue with medium density residential land use beyond.
- East: Henry Lawson reserve.
- South: Sydney Harbour (Blues Bay).
- West: Blues Point Road with a car park and high-density residential land use beyond.

Based on topography, groundwater flow and stormwater run-off is expected to be to the south with discharge into Blues Bay, located approximately 15 m beyond the southern site boundary. The PSI indicates that there are no registered groundwater bores within 500 m of the site.

The PSI did not identify nearby land uses with the potential to impact the site. A search of the NSW EPA public records did not identify any sites listed as contaminated in the immediate vicinity of the subject site.

2.4 Site Condition

The Auditor inspected the site on 28 February 2018. At that time the site was grassed open space forming part of Henry Lawson Reserve on the foreshore of Sydney Harbour. The reserve is used for recreational purposes. The site topography slopes from the north to the south, towards the harbour. The PSI indicates site topography falls from approximately 8.5 metres Australian Height Datum (m AHD) along the northern site boundary to 5.5 m AHD on the southern site boundary. An outcrop of sandstone bedrock was observed in the southern portion of the reserve.

An old sign board adjacent to the site indicated that in 1928, Henry Lawson Reserve formed part of a ferry depot. A monitoring well, assumed to be well SRTBH033A constructed by Douglas Golder (2017), was present in the north of the site.

Douglas indicated in the Validation Report that in November 2020 the site comprised a vertical shaft approximately 36 m below ground level (bgl). The upper walls of the shaft comprise concrete piles and the lower parts appear to be sandstone. The floor of the shaft comprised concrete.

2.5 Proposed Development

The proposed development includes the construction of a vertical shaft to approximately 36 mbgl. Walls of the shaft comprise 900 mm bored piles with the floor of the shaft comprising 250 mm thick concrete.

Following the excavation and site use as an access shaft, the shaft will be backfilled, and the surface area will continue to be used as an open space/recreational area. For the purposes of this audit, the 'public open space' land use scenario will be assumed.

3. SITE HISTORY

The IAA included a summary of the site history provided in the PSI, including a review of historical title deeds, aerial photographs, NSW EPA records and Section 149 (now termed Section 10.7) certificates. Douglas reviewed NSW SafeWork records as part of the DSI. The site history from the IAA is summarised in Table 3.1.

Table 3.1: Site History

Date	Activity
1817-1860	Land granted to William Blue in 1817 and used to grow produce and provide a ferry service. The land was subdivided in the 1850s and buildings and drainage constructed.
1860-1902	In the late 1800s to 1902, the site was part of a boat/shipping dock and, later, a timber yard. Land to the south of the site was reclaimed between 1866 and 1885 and the sea wall constructed.
1902-1926	From 1902, the site was used as a depot for the Fresh Food and Ice Company that included an ice-house and cool storage. Land to the west was reported to be used by Sydney Ferries as a depot for idle ferries.
1926-1962	Owned by the Harbour Land and Transport Company Limited from 1926 to 1954 and Harbour Lighterage & Showboat Limited from 1954 to 1960. These companies were subsidiaries of the Sydney Ferry Company that operated ferries across the harbour. Historical aerial imagery shows that by 1942 on-site structures had been demolished and the wharf removed. Land was possibly being used as a depot for storing building materials or as a salvage yard. Historical photographs indicate that in 1962 the site was being used as part of a larger timber yard.
1971 to date	The PSI indicates that in 1971 the site was included as part of allotments for use as a public park, reserve or recreational space and has remained used for this purpose since that time. The site is currently owned by Transport for NSW.

A review of the NSW EPA public records did not identify the site or surrounding land uses as being notified as contaminated or of holding licenses under the *Protection of the Environment Operations Act, 1997* (POEO Act). The results of a search of the SafeWork NSW records for storage of hazardous chemicals included in the DSI indicated there were no records of chemical storage on the site.

3.1 Auditor's Opinion

In the Auditor's opinion, the site history provides an adequate indication of past activities. Sources of contamination appear to be limited to imported fill used to level the site, hazardous building materials from demolition of former on-site structures, and previous commercial/industrial activities primarily associated with boat/ferry docking/maintenance operations and use as a timberyard.

The Auditor considers that the site history is broadly understood and adequate for identification of contaminants of concern (Section 4) and remediation of the site (Section 10).

4. CONTAMINANTS OF CONCERN

As outlined in the IAA, the PSI and DSI provided a list of contaminants of concern and potentially contaminating activities. These have been tabulated in Table 4.1.

Table 4.1: Contaminants of Concern

Area	Activity	Potential Contaminants
Entire site	Fill and surface soil imported from unknown sources to level the site	Metals, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes & naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCBs), phenols and asbestos
Entire site	Hazardous building material from former structures	Asbestos, lead and PCB
Entire site	Activities associated with operation and maintenance of a boat/ferry service/dockyard and timberyard	Metals, organotins, volatile organic compounds (VOC), and trichloroethene (TCE), TPH, BTEX, PAHs and cresols.

4.1 Auditor's Opinion

The Auditor considers that the analyte list used by Douglas is generally adequate to assess the potential sources of contamination.

There has been no assessment by the consultants for the presence of per- and poly-fluoroalkyl substances but in the Auditor's opinion there are no indications in the site history that they would be potential contaminants of concern.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1 Stratigraphy

Douglas reviewed geological maps and reported that the site is underlain by Hawkesbury Sandstone which comprises medium to coarse grained quartz sandstone, with very minor shale and laminite lenses.

The sub-surface profile of the site encountered during the Douglas DSI prior to remediation is summarised by the Auditor in Table 5.1.

Table 5.1: Stratigraphy

Depth (mbgl)	Subsurface Profile
0.0 – 0.2	Brown silty sand fill (topsoil) with rootlets
0.1 – >2.5	<p>Fill materials were observed from beneath the topsoil at all test pit locations. Test pits were terminated in fill at depths of between 0.5 m and 2.5 m, except for test pit BHTP03 where sandstone bedrock was encountered at a depth of 1.7 mbgl. According to bore logs provided in the DSI, fill was encountered to depths of 1.8 mbgl in bore SRTBH033 and to 1.7 mbgl in bore BPMW01.</p> <p>The composition of the fill material varied between locations but generally comprised brown silty sand with inclusions of demolition rubble (concrete, glass, brick) and sandstone.</p> <p>Gravel, timber, coke and charcoal fragments were encountered in test pit BPTP02 from 1.4 m to 2.5 mbgl.</p> <p>Traces of slate fragments and charcoal are described in BPTP03 from depths of 0.5 m to 1.7 mbgl and a probable old road surface, including asphalt, is described at depths of 0.95 to 1.2 mbgl at this location.</p> <p>Traces of slag were encountered in yellowy brown, orange sand in BPTP04 at a depth of 0.1 to 0.4 mbgl and fragments of ceramics, brick, concrete and cinder ash were described in BPTP04 from 0.4 m to 1.5 mbgl.</p> <p>A fragment of bonded asbestos containing material (ACM) was identified at one location in BPTP01 at a depth of 0.5 mbgl (sample A1). According to the DSI, additional fragments of ACM (samples A2, A3 and A5) were identified during a trench excavation at the site for archaeological purposes.</p>
1.7 - >2.5 to termination depth (40m)	Sandstone bedrock.

mbgl – metres below ground level

The subsurface profile comprised relatively shallow fill underlain by natural clay soil and sandstone bedrock.

Douglas indicated that the site is located within an area of no known occurrence of acid sulfate soils (ASS) however noted that Blues Bay located approximately 15 m south of the site is within an area of high probability in bottom sediments.

Following remediation of the site (discussed in Section 11), fill material and natural soil/rock were removed from the entire site area to depths of up to approximately 36 mbgl.

5.2 Hydrogeology

The PSI included a search of the groundwater information database maintained by the NSW Government and did not identify any registered groundwater bores within a 0.5 km radius of the site. Based on the topography, groundwater is anticipated to flow to the south. Douglas identified the closest sensitive ecological receptor for groundwater to be Blues Bay, located approximately 15 m to the south. Excess surface water run-off is anticipated to flow into the local stormwater network and drain to Blues Bay.

The PSI included installation details and bore logs for two groundwater monitoring wells previously installed at the site. Groundwater monitoring well SRTBH033 was installed by Golder Douglas as part of the geotechnical investigation in June 2016. The well was drilled to a depth of 39 mbgl and was reported in the PSI to be screened within the sandstone bedrock from a depth of 32 mbgl to 39 mbgl. Well construction details are not included on the borelog for SRTBH033. According to the PSI, groundwater ingress was noted at a depth of 2.5 m during well installation. Well BPMW01 was installed by Douglas in March 2018 as part of a geotechnical investigation. This well was installed to a depth of 10 mbgl and screened in sandstone from 4.0 m to 10 mbgl. No groundwater ingress was noted in the log for well BPMW01. Groundwater seepage was also not encountered during test pitting to depths of 2.5 mbgl.

Gauging and sampling of groundwater from well SRTBH033 for aggressivity and contamination was completed by Golder Douglas in 2016. Groundwater in this well had a standing water level of 5.54 mbgl on 23 September 2016.

Groundwater observations and sampling of existing well BPMW01 was undertaken as part of the DSI on 22 August 2018 when the depth to groundwater in the monitoring well was recorded at 7.24 mbgl. The RAP infers groundwater flow direction to be to the south based on topography. An accurate flow direction cannot be estimated based on one well and it is possible that groundwater flow is tidally influenced.

The DSI included field records of groundwater parameters recorded during sampling. They indicated that the pH was 5.9, dissolved oxygen (DO) was 2.6 mg/L, redox was 88 mV, and electrical conductivity (EC) was 619 mS/cm.

5.3 Auditor's Opinion

The Auditor considers that the site stratigraphy and hydrogeology are sufficiently well known for the purpose of the Audit.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

An evaluation of the overall quality of the data obtained in previous investigations (DSI) at the site was presented in the IAA (Appendix C). In considering the data as a whole the Auditor concluded in the IAA that:

- The data are likely to be representative of the overall site conditions, including fill and groundwater.
- The investigation data are considered to be complete.
- There is a high degree of confidence that the data are comparable for each sampling and analytical event.
- The laboratories provided adequate information to conclude that the data are of sufficient precision.
- There is a high degree of confidence that the data are accurate.

An evaluation of the overall quality of the data obtained during remediation and validation is presented in Section 11.3.3.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the results against Tier 1 criteria from National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure 1999, as Amended 2013 (NEPM, 2013). Other guidance has been adopted where NEPM (2013) is not applicable or criteria are not provided. Based on the proposed end use of the development as recreational land, the human health criteria for 'public open space' were adopted. This was considered to be most relevant for the proposed future use of the site but is likely to be conservative for short term exposure by construction workers.

7.1 Soil Assessment Criteria

7.1.1 Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) Health Investigation Levels (HILs) for 'public open space' (HIL C) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'public open space' (HSL C) land use. The HSLs assumed a sand soil type. Depth to source adopted was <1 m as an initial screen.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Residential and Open Space' land use and assuming coarse soil texture.
- The presence/absence of asbestos.
- Friebel & Nadebaum (2011) HSLs for direct contact for all land use categories, and vapour inhalation/direct contact pathways for intrusive maintenance workers.
- USEPA Regional Screening Levels (RSL) Generic Tables, Resident soil criteria for organotins

7.1.2 Ecological Assessment Criteria

The Auditor has not adopted ecological soil assessment criteria as soil from the site was excavated to a depth of 36 mbgl and disposed off-site during development of the access shaft. Ecological soil criteria are applicable to depths of up to 2 mbgl and are therefore not applicable for the remaining natural soil.

7.1.3 Soil Aesthetic Considerations

The Auditor has considered the need for soil remediation based on 'aesthetic' contamination as outlined in *Section 3.6 Aesthetic Considerations* of NEPM (2013) Schedule B1, which acknowledges that there are no chemical-specific numerical aesthetic guidelines. Instead, site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7.1.4 Imported Fill

Imported fill has been assessed in relation to attributes expected of virgin excavated natural material (VENM). The NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* defines VENM as "...natural material (such as clay, gravel, sand, soil or rock fines):

- *'that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities*
- *'that does not contain sulphidic ores or soils, or any other waste, and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice in the NSW Government Gazette.'*

On this basis, the Auditor considers that for soil to be classified as VENM, the following criteria generally apply:

- Organic compounds (including petroleum hydrocarbons, PAHs, OCPs, PCBs and phenols) should be less than the PQLs.
- Inorganic compounds should be consistent with background concentrations.
- The material should not contain or comprise actual or potential acid sulphate soil.

Imported material, such as excavated natural material (ENM) or non-VENM construction materials, were assessed against the requirements of the applicable resource recovery order (RRO) and resource recovery exemption (RRE) issued by the EPA under clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014*.

7.2 Groundwater Assessment Criteria

7.2.1 Human Health Assessment Criteria

NEPM (2013) HSLs are not appropriate for assessing risks from groundwater to human health at the site due to the potential for direct contact. The Auditor has adopted human health assessment criteria from the following sources to assess risk from direct contact, inhalation and incidental ingestion:

- NHMRC (2011) *National Water Quality Management Strategy, Australian Drinking-Water Guidelines* (ADWG), Version 3.5 Updated August 2018.
- USEPA Regional Screening Levels (RSLs) Residential Tap Water Criteria. Online database of assessment criteria that are current as of May 2020. Tap water assessment criteria derived for carcinogenic compounds were multiplied by a factor of 10 to adjust the target cancer risk level from 1:1,000,000 to 1:100,000 to be consistent with Australia's recommended target cancer risk level. For some chemicals, where a criteria has been derived using both non-cancer and cancer toxicity data, the lower criteria was adopted.
- WHO (2017) *Guidelines for Drinking-Water Quality, Fourth Edition, incorporating the 1st addendum*.
- WHO (2008) *Petroleum Products in Drinking-water. Background document of WHO Guidelines for Drinking-water Quality* (adopted in absence of health-based criteria in WHO (2017) because the taste and odour of petroleum products will in most cases be detectable at concentrations below those of health concern).

7.2.2 Ecological Assessment Criteria

The Auditor has adopted ecological groundwater assessment criteria from the following sources:

- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (www.waterquality.gov.au/anz-guidelines). Criteria for marine water and 95% level of protection were adopted.

7.3 Auditor's Opinion

The standing water level measured in well BPMW01 during the DSI was recorded at 7.24 mbgl and is therefore within sandstone bedrock. Given the absence of bores for beneficial groundwater use and presence of a reticulated water supply for the area, extraction and use of groundwater as a resource is unlikely. There was the potential that direct contact with groundwater may occur at the site during construction based on the proposed depth of excavation and SWL.

The environmental quality criteria referenced by the Auditor are consistent with those adopted by Douglas, with the exception of the following:

- The DSI does not mention assessment of 'aesthetic' contamination as outlined in the NEPM (2013). However, the report results discuss potential aesthetic issues detected during sampling.

- The DSI adopted terrestrial ecological assessment criteria for soils. Ecological criteria would be relevant to material imported to backfill the access shaft.

Given the results obtained, the Auditor considers that these discrepancies do not affect the overall conclusions reached by Douglas and the Auditor.

8. EVALUATION OF SOIL RESULTS

The soil analytical results from the investigations (DSI) undertaken prior to the preparation of the RAP were reviewed by the Auditor and presented in the IAA (Appendix C). Soil sample locations are shown on Attachment 1, Appendix A. In assessing the results reviewed in the IAA, the Auditor made the following observations:

- Four fragments of bonded ACM (fibre cement) were detected at the site. One from a depth of 0.5 m in TP01 and three additional fragments at depths of 0.4 to 0.5 mbgl in a trench excavated for archaeological purposes on 23 August 2018 in the northern portion of the site. Asbestos was also detected in one soil sample from the trench. Douglas conclude that the ACM is associated with building rubble in fill material and is likely to be present in fill containing building rubble across the site.
- Concentrations of metals were below adopted assessment criteria in soil sampled during the test-pitting investigation documented in the DSI. The DSI includes soil results from a geotechnical investigation completed by Douglas in March 2018 in which the concentration of lead in the fill sample collected from a depth of 0.4-0.5 mbgl at location BPMW01 exceeded the human health screening criteria. The Auditor has not reviewed this report.
- Elevated PAH concentrations were reported in samples of fill material from several locations, with the concentration of benzo(a)pyrene TEQ exceeding health screening criteria in seven soil samples obtained from five locations. The concentration of total PAH in fill material at location BPTP03 at 1.0-1.1 mbgl also exceeded the health screening criteria.
- A layer of potential coal tar pitch asphalt was identified as the source of elevated PAH and TRH in BPTP03, however, the description of fill material in other locations with elevated concentrations of PAHs included descriptions of charcoal, coke and cinder ash.
- Other organics were less than the adopted screening criteria, and typically less than the PQL.
- Sandstone was only sampled at one location during a previous investigation (BPMW01 at 1.9-2.0 mbgl). Concentrations of metals in this sample were considered typical of background concentrations. Organics were not detected. Groundwater results discussed in Section 9 did not identify contamination, therefore contamination within sandstone is not expected. Further sampling of the sandstone/natural soils was proposed during remediation for waste classification purposes.

8.1 Auditor's Opinion

The soil analytical results obtained during the DSI were consistent with the site history and field observations. The results indicate the fill to be impacted by asbestos, lead and PAHs. There is considered to be high potential for ACM contamination in fill material given the fill composition and site history. Douglas suggest that the source of elevated PAH concentrations in BPTP03 and BPTP02 is coal tar pitch asphalt. While the description of fill in the log for BPTP03 does support this, elevated PAH concentrations in other locations may be attributable to other sources including coal and coke. Fill material will be removed as part of remediation and development of the site. The remedial strategy outlined in the RAP is reviewed and summarised in Section 11.

In the Auditor's opinion, the soil analytical results reviewed in the IAA indicate that contamination was present at the site and remediation was required. Remediation of fill material was undertaken and is discussed further in Section 11.

9. EVALUATION OF GROUNDWATER RESULTS

Groundwater monitoring was undertaken during the DSI. Douglas installed one monitoring well (MW05) at the site (Attachment 1, Appendix A) and undertook one groundwater monitoring event as part of the DSI. The groundwater analytical results from the DSI, undertaken prior to the preparation of the RAP, were reviewed by the Auditor in preparation of the IAA (Appendix C). In assessing the results reviewed in the IAA, the Auditor made the following observations:

- Metals were detected at low concentrations, with copper and zinc exceeding the ecological criteria. The DSI concluded that the concentrations of heavy metals can be attributed to diffuse urban-sourced background levels and are not from a site-specific source. Concentrations were less than the human health screening criteria.
- Organic contaminants were not detected above the PQL.
- It is noted that previous sampling of groundwater from well SRTBH033A in 2016 indicated elevated concentrations of manganese above ecological screening levels in deeper groundwater. Given that this well is screened in sandstone at depths of 32 to 39 mbgl, Douglas considered that the concentrations were naturally occurring. Manganese was not analysed as a contaminant of concern during the DSI groundwater sampling in 2018.

The IAA concluded that *"the analytical results indicate an absence of groundwater contamination at the site. Marginal exceedances of ecological screening criteria reported for metals (copper, zinc and manganese) are considered representative of background concentrations. Groundwater is not considered to present a risk to human health and ecological receptors. Further investigation or remediation of groundwater is therefore not considered to be required"*.

9.1 Auditor's Opinion

Groundwater assessments undertaken at the site have not identified significant groundwater contamination. The Auditor is satisfied that further investigation or remediation of groundwater is not required to demonstrate suitability of the site for the proposed use.

10. EVALUATION OF CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. Douglas developed a CSM and used it iteratively throughout the site assessment to inform decisions around investigation and remediation requirements. The CSM was initially developed following the preliminary investigations and included in the RAP and was reviewed by the Auditor in the IAA. Table 10.1 provides the Auditors review of the CSM based on the PSI and DSI (presented in the IAA).

Table 10.1: Review of the Conceptual Site Model

Element of CSM	Consultant	Auditor Opinion
Contaminant source and mechanism	Contaminated fill material containing lead, TRH >C ₁₆ -C ₃₄ , benzo(a)pyrene, total PAH and asbestos. Unexpected contamination finds during excavation.	The source and mechanism for soil is considered appropriate.
Affected media	Fill material	Fill material is considered to be the primary affected media. Concentrations of contaminants were detected in groundwater, however concentrations were less than the human health screening criteria and groundwater was therefore not considered affected media.
Receptor identification	Construction workers, adjacent land users, surface water, groundwater, terrestrial ecology and future site users.	The receptors have been adequately identified.
Exposure pathways	Ingestion and dermal contact with soil, inhalation of dust, surface water runoff, leaching and vertical migration to groundwater, and lateral migration of groundwater.	The CSM identified all potential exposure pathways. Complete exposure pathways are considered to be inhalation, direct contact and incidental ingestion during construction. No complete pathways are considered likely to be present following construction of the access shaft.
Presence of preferential pathways for contaminant movement	Not discussed	Not considered relevant for fill material removed during remediation. Preferential pathways for groundwater and vapour migration are likely to be present on the site, however, are not considered relevant as contamination representing a risk to human health has not been identified.
Potentially complete source-pathway-receptor (SPR) linkages requiring remediation or management	The pre-remediation CSM did not clearly specify potentially complete SPR linkages.	Potentially complete SPR linkages were to be largely addressed during excavation of the access shaft.
Evaluation of data gaps	The RAP states that sampling of natural soils will be required to confirm classification as VENM. The RAP states that the contaminants in groundwater will require treatment prior to disposal. However, treatment options have not been addressed in the RAP.	No potentially significant data gaps were identified during review of the PSI, DSI and RAP. A layer of potential coal tar pitch asphalt was identified in test pit BPTP03. The source of elevated concentrations of PAH in fill at other locations is not discussed and may be related to a different source (coal, ash). Fill material will be removed during remediation and development of the site and the data gap is

Element of CSM	Consultant	Auditor Opinion
		therefore not considered significant with respect to site remediation.

The Auditor concluded in the IAA that the CSM was an adequate representation for assessing remedial requirements.

10.1 Auditor’s Opinion

The Auditor is of the opinion that the CSM was a reasonable representation of the contamination at the site prior to remediation during the access shaft excavation.

11. EVALUATION OF REMEDIATION

11.1 Remediation Required

Douglas determined remedial requirements based on review of investigation results against screening criteria and consideration of aesthetic issues. The RAP considered the horizontal extent of the remediation to be the excavation footprint, and the vertical extent to be the depth of contaminated or potentially contaminated soils, or the base of the excavation (whichever occurs first). Douglas anticipated that all contaminated or potentially contaminated soils within the excavation footprint will be removed as part of the bulk excavation works required for the development. Excavation and off-site reuse or disposal of the soil was therefore considered to be the only practicable remediation strategy.

An evaluation of the RAP was undertaken by the Auditor as part of the IAA (Appendix C), which included a comparison with the requirements of OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites* (current at the time of the IAA). The RAP was found to address the required information, and the Auditor concluded that the remediation approach was adequate to address contaminated fill material during redevelopment of the site through excavation and off-site disposal of contaminated fill material and natural soil and successful validation.

11.2 Remedial Works Undertaken

General excavation was carried out by JHCPBG JV with the asbestos remediation works carried out by Pure Contracting Pty Ltd (Pure) (Licence number: AD210803) as the licensed asbestos removal contractor with ADE Consulting Group Pty Ltd (ADE) providing occupational hygiene services (surface clearances). Environmental consulting was provided by Douglas and ADE between April 2018 and November 2020.

Following the demolition of site buildings and structures, the following sequence of remediation/validation works were noted by Douglas in the Validation Report:

- Excavation and disposal of fill and non-VENM soils under assigned waste classifications between September and November 2018.
- Importation of materials in October and November 2018 for use as a (temporary) piling pad at the site.
- In December 2018, assessment of the imported materials that were used for the (temporary) piling pad, for off-site disposal purposes.
- Excavation and off-site disposal of the imported materials in January to April 2019.
- Inspections and assessment of natural rock in February 2019 and May 2019 for off-site disposal purposes.
- Excavation and off-site disposal of natural rock between February and September 2019.

11.3 Validation Activities

11.3.1 Validation of Lead and PAH Human Health Exceedances

Douglas indicated in the Validation Report that ADE undertook two VENM assessments of in situ natural rock materials which covered an area of approximately 320 m² and included the site as well as parts of the adjacent construction site area. The assessments were limited to depths from the observed excavation level which were 0.2 mbgl and 7.25 mbgl. Sampling and an initial inspection were undertaken by ADE on 7 February 2019, and a second inspection was undertaken on 18 February 2019 to confirm that all overlying fill materials at the assessment area (observed by ADE on 7 February 2019) had been removed.

ADE described the natural bedrock as medium to coarse grained, grey to yellow orange sandstone. No foreign materials, paint chips, sulfidic ores, hydrocarbon odours/staining or asbestos containing materials were observed in any of the materials inspected.

Initially, five samples of the sandstone were analysed for metals, TRH, PAH, BTEX, PCB, OCP, OPP, VOC, phenols, textures, pH, EC, sulfates, chlorides, organotins and asbestos. Concentrations of arsenic, cadmium, copper, mercury, nickel, zinc, TRH, OCP, PCB, OPP, phenols, organotins, VOC and chlorides were less than the PQL. Concentrations of remaining metals were within background ranges. Results for pH ranged between 5.1 and 6.3, EC results ranged between 0.014 dS/m and 0.059 dS/m, and sulfate concentrations ranged up to 10 mg/kg. Asbestos was not detected in the analysed samples. Based on the results ADE classified the sandstone as VENM.

The VENM assessments were undertaken over the entire access shaft excavation area which included the previously identified lead and PAH impacted locations. Concentrations of PAHs were less the laboratory PQL and lead concentrations were below the adopted human health criteria.

11.3.2 Validation of Asbestos

The Validation Report indicates that an asbestos clearance was provided by ADE when the site was excavated to approximately 7 mbgl. As discussed in Section 11.3.1, ADE obtained samples from the exposed natural surface during the VENM assessment. The VENM assessment included laboratory analysis of five samples for asbestos. Asbestos was not detected in the samples analysed.

Documentation provided in the Validation Report included the asbestos clearance documentation prepared by ADE. The Validation Report indicates that ADE were advised that approximately 2,400 tonnes of ACM impacted soils sourced from within the site were encapsulated in the southern portion of the area subject to the ADE assessment and these materials were capped with geofabric material and imported sandstone materials. Douglas indicated that the area covered by geofabric was not within the site boundary and it is not clear whether the encapsulated materials were for temporary or permanent storage. Given the mass of fill materials disposed from the site, Douglas considered it reasonable to assume that the encapsulated material was not sourced from the subject site (access shaft excavation), but was sourced from outside the access shaft excavation within the larger construction site (off-site).

11.3.3 Evaluation of Validation QA/QC

Validation data generally included walkover inspections and observations including clearance documentation. Analytical validation data for natural soils was also obtained for VENM assessments undertaken following removal of fill material. The Auditor has assessed the overall quality of the data presented in the Validation Report with consideration of the quality criteria outlined in the QA/QC tables in Section 6 of the IAA (Appendix C). In considering the validation data as a whole, the Auditor concludes that:

- The data from the validation are likely to be representative of the overall soil conditions.
- The data is considered to be adequately complete.
- There is a high degree of confidence that data is comparable for each sampling and analytical event.
- The laboratories provided sufficient information to conclude that data is of sufficient precision.
- There is a high degree of confidence that data is accurate.

11.3.4 Imported Material

The Validation Report indicates that approximately 3,744.84 tonnes (t) of VENM was imported to the site and adjoining construction site area for a temporary piling pad. Douglas noted that sandstone VENM was imported from the Sydney Metro Victoria Cross Station South development

site at Miller Street, North Sydney under two classification reports prepared by ADE in September and October 2018.

Douglas appended the two ADE reports to the Validation Report and also provided a summary of the reports in the Validation Report. ADE undertook sampling events on 5 September (event 1) and 28 September 2018 (event 2). ADE described the in-situ materials inspected as yellowy orange mottled red sandstone during event 1 and coarse-grained, light orange to grey sandstone during event 2. No foreign materials, paint chips, sulfidic ores, hydrocarbon odours/staining or asbestos containing materials were observed in any of the inspected materials.

ADE obtained five samples during event 1 and three samples in event 2. All samples were analysed for metals, TRH, PAH, BTEX, PCB, OCP, OPP, pH, electrical conductivity (EC), sulfates and chlorides, textural analysis and asbestos. Concentrations of cadmium, copper, mercury, nickel, TRH, PAH, BTEX, PCB, OCP, OPP and chlorides were less than the laboratory's PQL. Concentrations of remaining metals were within background ranges. Results for pH ranged between 4.8 and 7.7, EC results ranged between 0.022 dS/m and 0.086 dS/m, and sulfate concentrations ranged between 10 mg/kg and 70 mg/kg. Asbestos was not detected in the analysed samples. Based on the results ADE classified the in-situ sandstone as VENM.

Following use on site, Douglas indicated that the imported material was subsequently classified by ADE Consulting Group Pty Ltd (ADE) and disposed of off-site as excavated natural material (ENM) and GSW. The off-site disposal of this imported material is discussed in Section 14.4.

Importation of material to reinstate the shaft and park had not occurred at the time of preparing this SAR.

11.3.5 Material Disposed Off-Site

Waste materials generated on-site were sampled and classified in accordance with the EPA (2014) *Waste Classification Guidelines*. Sampling from stockpiles of excavated soils and in-situ material was undertaken to characterise and classify the waste materials prior to off-site disposal. The Validation Report indicates that 29,195.23 tonnes (t) of waste material was disposed off-site including the following waste types:

- General Solid Waste (non-putrescible) (GSW) - Special Waste (Asbestos)
- GSW (non-putrescible)
- Restricted Solid Waste (non-putrescible) (RSW)
- ENM
- VENM

Waste materials were disposed from the site between September 2018 and September 2019. Douglas included supporting documentation from the contractors including waste disposal dockets, tipping information and registers for receival sites.

The Auditor has reviewed the documentation provided and is of the opinion that the supplied documentation is consistent with the remedial works described. Further assessment of the waste classifications and disposal quantities is provided in Section 14.4.

11.4 Auditor's Opinion

In the Auditors' opinion, the excavation works were appropriate to remediate onsite contamination.

12. CONTAMINATION MIGRATION POTENTIAL

Based on the remediation/excavation works outlined in the Validation Report, it is considered that all on-site sources of contamination have been removed during remediation/excavation works. Contaminants detected prior to remediation within the soil at the site have not adversely affected the groundwater quality. As localised soils impacts were removed as part of the remediation works, ongoing impacts to groundwater are unlikely. In the Auditor's opinion, the site in its remediated condition has a negligible potential for migration of contamination, including to groundwater.

13. ASSESSMENT OF RISK

Based on assessment of results against relevant guidelines and consideration of the overall investigations and remediation performed, the Auditor considers that contaminant concentrations remaining onsite do not pose a risk to site users or the environment under the proposed land use scenario.

Contaminants within groundwater are not likely to pose a risk to human health as the impacts are representative of diffuse urban-sourced background levels and are not from a site-specific source. It is also noted that abstraction and use on-site is not expected as a viable aquifer is not readily accessible.

There is a risk of importing contamination during the backfilling works if recycled materials are used. In the event that non-quarried material is to be imported during backfilling works, such materials should be validated for potential contamination prior to, or following, importation.

14. COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS

14.1 General

The Auditor has used guidelines currently made and approved by the EPA under section 105 of the NSW *Contaminated Land Management Act 1997*.

The investigation was generally conducted in accordance with SEPP 55 Planning Guidelines and reported in accordance with the OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites* (which was applicable at the time the reports were prepared). The Validation Report was generally prepared in accordance with the NSW EPA (2020) *Consultants Reporting on Contaminated Land*.

14.2 Development Approvals

A statutory site audit is required for the Blues point access shaft site, part of the Sydney Metro rail project between Chatswood and Sydenham, to address the requirements of Condition E67 of Infrastructure Approval, application SSI 15_7400, approved by the NSW Minister for Planning on 9 January 2017. Condition E67 relates to contamination and requires a site audit as follows:

"If a Site Contamination Report prepared under Condition E66 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with."

This SAR and accompanying Site Audit Statement (SAS) were prepared to comply with this condition.

14.3 Duty to Report

Consideration has been given to the requirements of the EPA (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. Based on the findings of this SAR, the Auditor considers that the site is not required to be notified under the Duty to Report requirements.

14.4 Waste Management

In accordance with Section 4.3.7 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor has checked the following aspects relating to waste disposal.

14.4.1 Waste Classification

One waste classification letter prepared by Douglas was appended to the RAP, with three letters prepared by ADE included within the validation report. It was reported that wastes were classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*. The adopted waste classification strategy included sampling generally from in-situ material however sampling was also undertaken from stockpiles of excavated soils.

Waste classification reports were prepared for the following soils at the site:

- GSW (non-putrescible) for topsoil fill and western portion of piling pad.
- GSW (non-putrescible) - Special waste (asbestos waste) for underlying in situ fill.
- ENM for the eastern portion of piling pad.
- VENM for in situ natural soils and bedrock following fill removal.

14.4.2 Waste Volumes, Disposal Receipts and Disposal Facilities

The Validation Report provides disposal dockets for the off-site disposal of different wastes which occurred between September 2018 and September 2019. The Validation Report also includes a waste receiving site register and a waste tracking register prepared by JHCPBG JV.

Douglas and the JHCPBG JV records provided in Appendix D of the Validation Report indicate that a total of 29,195.23 t of material (including ENM and VENM) was removed off-site. The Auditor has assessed the volumes presented and calculates a similar number to those provided by Douglas and JHCPBG JV.

Table 14.1 summarises the waste disposal information for soil disposed off-site (excluding construction/demolition waste, ENM and VENM) to several waste management facilities that are licensed to receive the specified waste under their Environmental Protection Licence (EPL).

Table 14.1: Summary of Waste Disposal

Waste Classification	Tonnage (t)	Disposal Facility	EPL No.
GSW (non-putrescible) and Special waste (Asbestos)	621.58	Cleanaway (Erskine Park)	4865
GSW (non-putrescible)	1,306.86	MET Recycling (Silverwater)	20948
GSW (non-putrescible)	97.4	Sydney Recycling Park (Kemps Creek)	12901
RSW (non-putrescible)	643.22	Suez (Kemps Creek)	4068

The Validation Report indicates that correspondence from NSW EPA was received in regard to the application of the NSW EPA Organotin Waste Materials Chemical Control Order 1989 to soil materials found to contain organotin compounds. Monobutyltin was recorded in waste classified as GSW Special Waste (asbestos) at concentrations of 12 µg/kg and 8.3 µg/kg.

Douglas indicated that as of the time of Waste Classification report (3 September 2018), a telephone enquiry with the NSW EPA indicated that the recorded concentrations of organotin compounds in soil could be classified as GSW (and so fill material containing concentrations of monobutyltin was subsequently disposed in September 2018 to a landfill able to accept GSW Special Waste (asbestos)). A later email from NSW EPA, dated 10 October 2018, indicated that the recorded concentrations of organotin compounds in the fill material was within the 'moderately contaminated threshold for organotin waste' and, under the NSW EPA's waste management framework, disposal of such material in the metropolitan region was required to be at a RSW landfill. Consequently, fill material containing concentrations of monobutyltin disposed after 10 October 2018 and in November 2018 was disposed of to a landfill able to accept RSW. It is noted that Suez Recycling & Recovery Pty Ltd is licensed to accept asbestos waste (as well as RSW) at the Elizabeth Drive landfill facility. Further email correspondence from NSW EPA, dated 21 December 2018, stated that the recorded concentrations of organotin compounds in soil were acceptable for disposal as GSW at a landfill and the Organotin Waste Materials Chemical Control Order is for regulation of organotin waste scrapings from boats (etc.) on a slipway (i.e. highly contaminated material). From this information, it was determined that disposal of the fill material containing monobutyltin to a landfill able to accept GSW Special Waste (asbestos) was appropriate, however, disposal of fill and non-VENM soils from the site had been completed by the time of this correspondence.

14.4.3 Auditor's Opinion

The Auditor considers that the waste management assessed as part of the remedial works was undertaken in accordance with the relevant guidelines and regulations.

14.5 VENM and Other Imported Materials

As detailed in Section 11.3.4, materials were imported to the site temporarily to allow for construction activities. The Auditor is of the opinion that the materials imported were fit for purpose. Douglas indicated in the Validation Report that these materials were excavated, waste classified and disposed off-site and therefore are no longer present at the site.

14.6 Licenses

Excavation, onsite remediation and offsite removal of ACM contaminated soils were required to be conducted by at least a Class B licensed contractor.

Douglas confirmed that the asbestos remediation works were completed by Pure who hold a Class A and Class B Asbestos removal licence. Copies of the appropriate licences were not provided to the Auditor, however the Auditor undertook a search of the SafeWork NSW asbestos licence database on 12 November 2020 which indicates that Pure are licenced for non-friable asbestos removal works (Licence number: AD210803).

14.7 Conflict of Interest

The Auditor has considered the potential for a conflict of interest in accordance with the requirements of section 3.2.3 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme*.

The Auditor considers that there are no conflicts of interest, given that:

1. The Auditor is not related to a person by whom any part of the land is owned or occupied.
2. The Auditor does not have a pecuniary interest in any part of the land or any activity carried out on any part of the land.
3. The Auditor has not reviewed any aspect of work carried out by, or a report written by, the site auditor or a person to whom the site auditor is related.

15. CONCLUSIONS AND RECOMMENDATIONS

Based on the results documented in the Validation Report, Douglas concluded that the remediation objection of “*no contamination presenting an unacceptable risk of harm to human health or the environment remains within the site...’ has been achieved as all identified on-site sources of contamination have been removed, the results of VENM inspections and testing indicated an absence of soil contamination following the removal of all overlying contaminated materials, including recently imported materials for piling pad foundations, and there are no off-site contamination sources which would render the site unsuitable for its intended use. Accordingly, it is considered that the site has been made suitable for the proposed access shaft usage.*”.

Based on the information presented in Douglas reports and observations made on site, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the onsite contamination has been adequately remediated and validated and the site in its current condition does not present a contamination risk to human health or the environment. However, it is understood that following the site use as an access shaft, the site will be backfilled and the site will be used as an open space/recreational area. Importation of materials will be required to backfill the access shaft and this material has the potential to introduce contamination to the site if not imported in accordance with the RAP. The procedures outlined within the RAP are considered sufficient to ensure imported materials are suitably assessed and approved, provided the procedures are implemented by a suitably qualified environmental consultant.

The following remains necessary before the land is suitable for the proposed open space/recreational use:

- Preparation of a report documenting the material/s imported to the site for use as backfill and the validation of the material/s for potential contamination in accordance with the RAP.
- Preparation of a Section A Site Audit Statement by a NSW EPA Accredited Site Auditor reviewing the above information and confirming the suitability of the site for the intended use.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

16. OTHER RELEVANT INFORMATION

This Audit was conducted on behalf of JHCPBG JV for the purpose of assessing what management remains necessary before the land is suitable for any specified use or range of uses i.e. a "Site Audit" as defined in Section 4 (1) (b) (iv) of the NSW *Contaminated Land Management Act 1997* (the CLM Act).

This summary report may not be suitable for other uses. Douglas included limitations in their reports. The Audit must also be subject to those limitations. The Auditor has prepared this document in good faith, but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

The Auditor has relied on the documents referenced in Section 1 of the Site Audit Report in preparing the Auditors' opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in a Site Audit Report to present all data which could be of interest to all readers of this report. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

APPENDIX A ATTACHMENTS

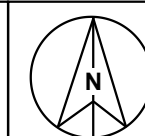
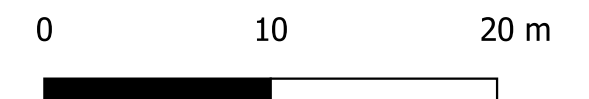
Attachment 1: Site Location and Sample Locations
Attachment 2: Site Survey



Notes:
 1. Basemap sourced from nearmap, dated 26/09/2020.
 2. Construction site boundary is approximate only.

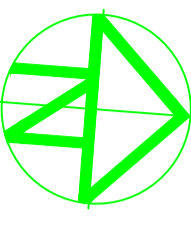
Legend

- Access Shaft Site Boundary
- Construction Site
- ✦ Test Pit
- ◆ Borehole
- ⬢ Monitoring Well
- ▲ Fibre cement sample & soil sample



LEGEND

- CADASTRAL BOUNDARY
- STATION MCO
- TSE SITE BOUNDARY



LW-DRG-536511

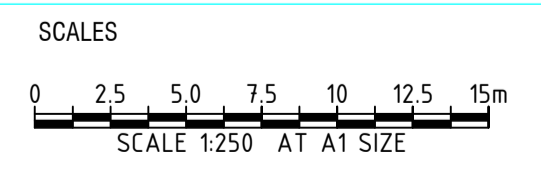
BLUES POINT RD

HENRY LAWSON AVE

Point	Easting	Northing
A	333827.341	6253150.063
B	333826.082	6253161.594
C	333852.194	6253152.776
D	333850.935	6253164.307

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DRAWN	E. ESTORES JR.	01.08.18
DESIGNED	C. HIGGIN	01.08.18
DRG CHECK	F. BATHAN	01.08.18
DESIGN CHECK	R. VO	01.08.18
APPROVED	D. ROBERTSON	01.08.18

FOR INFORMATION
SYDNEY METRO CITY & SOUTHWEST
 BLUES POINT SHAFT AND PRECINCT
 LOCAL AREA WORKS
 OVERVIEW PLAN

FILE No.	SHEET: 5 OF 30	A1
STATUS: FOR CONSTRUCTION		©
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APPENDIX B SITE AUDIT STATEMENT



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 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. TO-024-6

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: Tom Onus

Company: Ramboll Australia Pty Ltd

Address: Level 3

100 Pacific Highway, North Sydney

Postcode: 2060

Phone: 02 9954 8133

Email: tonus@ramboll.com

Site details

Address: Blues Point Road, McMahons Point, NSW

Postcode: 2060

Property description

Part of Lot 1 DP902933 (shown as points A to D in the figure at end of Part I of this statement).

Local government area: North Sydney Council

Area of site (include units, e.g. hectares): Approximately 220 m²

Current zoning: RE1 Public Recreation under North Sydney Local Environment Plan 2013

Regulation and notification

To the best of my knowledge:

- the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)

Declaration no.

Order no.

Proposal no.

Notice no.

- the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

- the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

- the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name: Caitlin Richards

Company: John Holland CPB Ghella Joint Venture

Address: Level 9, 50 Bridge Street, Sydney, NSW

Postcode: 2000

Phone: N/A

Email: N/A

Contact details for contact person (if different from above)

Name: Krissy Vajda

Phone: 0439 477 649

Email: krissy.vajda@sydneymetro2.com.au

Nature of statutory requirements (not applicable for non-statutory audits)

- Requirements under the *Contaminated Land Management Act 1997* (e.g. management order; please specify, including date of issue)

- Requirements imposed by an environmental planning instrument (please specify, including date of issue)

Condition E67 of Infrastructure Approval, application SSI 15_7400, approved by the Minister for Planning on 9 January 2017

- Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

- Requirements under other legislation (please specify, including date of issue)

Purpose of site audit

- A1** To determine land use suitability

Intended uses of the land:

OR

- A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land:

OR

(Tick all that apply)

- B1** To determine the nature and extent of contamination
- B2** To determine the appropriateness of:
- an investigation plan
 - a remediation plan
 - a management plan
- B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*
- B4** To determine the compliance with an approved:
- voluntary management proposal** or
 - management order** under the *Contaminated Land Management Act 1997*
- B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land:

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Douglas Partners Pty Ltd (Douglas)

ADE Consulting Group Pty Ltd (ADE)

Titles of reports reviewed:

'Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, McMahons Point, NSW, prepared for John Holland CPB Ghella JV, Project 85608.07, May 2018', report reference: 85608.07.R.001.Rev0, dated 4 December 2018, prepared by Douglas

'Report on Detailed Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point

Road, McMahons Point, prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018', report reference: 85608.07.R002.Rev1.DSI, dated 27 November 2018, prepared by Douglas

'Remediation Action Plan, Sydney Metro City and South West - Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point Road, McMahons Point prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018', report reference: 85608.07.R003.Rev1.RAP, dated 15 November 2018, prepared by Douglas

'In Situ Waste Classification – Access Shaft Excavation Sydney Metro City & SW, Tunnel & Station Excavation Works Package, Proposed Shaft Site, Blues Point Road, McMahons Point', dated 3 September 2018, prepared by Douglas

'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 20 December 2018, prepared by ADE

'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 18 February 2019, prepared by ADE

'Waste Analysis & Classification Report, Blues Point Site, Blues Point Road, McMahons Point NSW', dated 21 May 2019, prepared by ADE

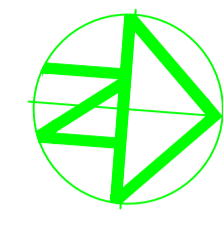
'Report on Validation of Remediation, Sydney Metro City & South West - Tunnel and Station Excavation Works Package, Blues Point Access Shaft, Henry Lawson Avenue, McMahons Point', report reference: Revision 0, dated 25 November 2020, prepared by Douglas

Other information reviewed, including previous site audit reports and statements relating to the site:

Site audit report details

Title: Site Audit Report – Sydney Metro Blues Point Access Shaft, Blues Point Road, McMahons Point NSW

Report no.: TO-024-6 (Ramboll Ref: 318000323-004) Date: 27 November 2020



LEGEND	
	CADASTRAL BOUNDARY
	STATION MCO
	TSE SITE BOUNDARY

LW-DRG-536511

BLUES POINT RD

HENRY LAWSON AVE

Point	Easting	Northing
A	333827.341	6253150.063
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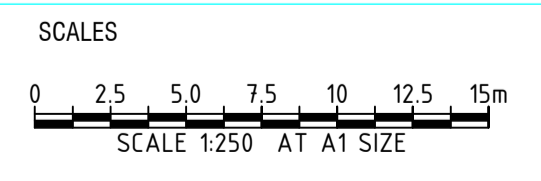
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DRAWN	E. ESTORES JR.	01.08.18
DESIGNED	C. HIGGIN	01.08.18
DRG CHECK	F. BATHAN	01.08.18
DESIGN CHECK	R. VO	01.08.18
APPROVED	D. ROBERTSON	01.08.18

FOR INFORMATION
SYDNEY METRO CITY & SOUTHWEST
 BLUES POINT SHAFT AND PRECINCT
 LOCAL AREA WORKS
 OVERVIEW PLAN

FILE No.	SHEET: 5 OF 30	A1
STATUS: FOR CONSTRUCTION		©
DRG No. SMCSWTSE-JAB-BPS-LW-DRG-536510	00	EDMS No.

Plot Date & Time: 11/27/2020 3:23 PM
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Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section.
(Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
 - (B1) the nature and extent of contamination, and/or
 - (B2) the appropriateness of an investigation, remediation or management plan¹, and/or
 - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
 - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
 - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

¹ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

~~I certify that, in my opinion:~~

~~The site is 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):~~

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:~~

Section A2

I certify that, in my opinion:

Subject to compliance with the ~~attached~~ environmental management plan² (EMP), the site is 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):

EMP details

Title: _____

Author: _____

Date: _____ No. of pages: _____

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

- requires operation and/or maintenance of **active** control systems³
- requires maintenance of **passive** control systems only³.

² Refer to Part IV for an explanation of an environmental management plan.
³ Refer to Part IV for definitions of active and passive control systems.

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Section B

Purpose of the plan⁴ which is the subject of this audit:

Report on validation of remediation undertaken to address onsite sources of contamination during construction of the access shaft. Remediation of the site for open space use will be completed in the future following backfill of the shaft and reinstatement of the park.

I certify that, in my opinion:

(B1)

- The nature and extent of the contamination **has** been appropriately determined
- ~~The nature and extent of the contamination **has not** been appropriately determined~~

AND/OR (B2)

- The investigation, remediation or management plan **is** appropriate for the purpose stated above
- ~~The investigation, remediation or management plan **is not** appropriate for the purpose stated above~~

AND/OR (B3)

- ~~The site testing plan:
 - ~~**is** appropriate to determine~~
 - ~~**is not** appropriate to determine~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

AND/OR (B4)

- ~~The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):~~

- ~~**have** been complied with~~
- ~~**have not** been complied with.~~

~~*voluntary management proposal no.~~

~~**management order no.~~

AND/OR (B5)

- ~~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~~

⁴ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- 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):

IF the site is remediated/managed* in accordance with the following plan (attached):

*Strike out as appropriate

Plan title

Plan author

Plan date

No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Historical investigations at the site identified lead, polycyclic aromatic hydrocarbons (PAHs) and asbestos contamination in fill soils. There was considered to be high potential for asbestos contamination in fill material given the fill composition and site history. The source of elevated PAH concentrations was considered to be from coal tar pitch asphalt and/or may be attributable to other sources including coal and coke. Low concentrations of metals (copper and zinc) were detected in groundwater samples above the ecological assessment criteria. The metal concentrations in groundwater were considered to be representative of diffuse urban-sourced background levels and were not related to a current or historical on-site source.

The development (access shaft) required excavation to a maximum depth of 36 m. Excavated soils and rock were classified and disposed offsite. The excavation works successfully removed the onsite sources of contamination. The site currently does not pose a risk of harm to human health or the environment.

It is intended that, following use as an access shaft, the site will be backfilled to allow use as a public open space/recreational area. Importation of materials will be required to backfill the access shaft. The backfill material will require assessment and validation in order to confirm the site is suitable for the proposed public open space use. A Section A Site Audit Statement (SAS) and Site Audit Report (SAR) assessing the suitability of the site for use as a park should be prepared following reinstatement of the site.

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*.

Accreditation no. 1505

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.

Signed



Date

27 November 2020

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

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

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

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses 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 investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may 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.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the 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*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

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.

Section B

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 the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified 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. The condition must not specify an individual auditor, only that further audits are required.

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.

Part III

In **Part III** the auditor certifies their 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

- the **NSW Environment Protection Authority**:
nswauditors@epa.nsw.gov.au or as specified by the EPA

AND

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

APPENDIX C INTERIM AUDIT ADVICE

17 December 2018

John Holland CPB Ghella Joint Venture
Attn: Robert Muir
Senior Environment Coordinator
Sydney Metro City & Southwest
Level 3, 140 Sussex Street, Sydney NSW 2000

By email: Robert.Muir@sydneymetro2.com.au

Dear Robert

RE: INTERIM AUDIT ADVICE LETTER NO. 7 - REMEDIATION ACTION PLAN - PROPOSED BLUES POINT ACCESS SHAFT, BLUES POINT ROAD, MCMAHONS POINT

1. INTRODUCTION

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, I am conducting an Audit in relation to the subject site. This initial review has been undertaken to provide an independent review of the suitability and appropriateness of a Remediation Action Plan (RAP).

A statutory site audit is required for the Blues Point access shaft, part of the Sydney Metro rail project between Chatswood and Sydenham, to address the requirements of *Condition E67 of Infrastructure Approval, application SSI 15_7400, approved by the Minister for Planning on 9 January 2017*. This Interim Audit Advice (IAA) letter was also prepared to satisfy conditions of the deed agreed between Transport for NSW and John Holland CPB Ghella Joint Venture (JHCPBG JV).

This IAA letter is based on a review of the documents listed below and observations made on a site visit on 28 February 2018, as well as discussions with JHCPBG JV and Douglas Partners Pty Ltd (DP) who undertook the investigations.

The reports reviewed were:

- *'Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, McMahon's Point, NSW, prepared for John Holland CPB Ghella JV, Project 85608.07, May 2018'*, report reference: 85608.07.R.001.Rev0, dated 4 December 2018, prepared by DP (the PSI).
- *'Report on Detailed Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point Road, McMahon's Point, prepared for John*

Ramboll Australia Pty Ltd

Level 3, 100 Pacific Highway
PO Box 560
North Sydney NSW 2060

T +61 2 9954 8100

www.ramboll.com

Ref 318000323-004

17 December 2018

Holland CPB Ghella JV, Project 85608.07, November 2018, report reference:
85608.07.R002.Rev1.DSI, dated 27 November 2018, prepared by DP (the DSI).

- *'Remediation Action Plan, Sydney Metro City and South West - Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, Blues Point Road, McMahons Point prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018*, report reference:
85608.07.R003.Rev1.RAP, dated 15 November 2018, prepared by DP (the RAP).

A draft version of the PSI, DSI and RAP reports were issued for audit review. Review comments (issued by the Auditor by email) were incorporated into the final DP reports (listed above). The PSI and DSI make reference to the following reports:

- Golder Douglas, Sydney Metro TSE – Geotechnical Data Report - Tunnels and Station Excavation (TSE) Works, Chatswood to Sydenham, 20 January 2017 (1650773-041-R-Rev1) (Golder-Douglas, 2017a);
- Golder Douglas, Sydney Metro TSE – Contamination Assessment Report – Tunnels and Station Excavation (TSE), Chatswood to Sydenham, 20 January 2017 (1650773-42-R-Rev0) (Golder-Douglas, 2017b);
- DP Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Blues Point Road Access Shaft, McMahons Point, NSW, May 2018 Ref 85608.07.R.001.DftA (DP, 2018a) (the PSI); and
- Casey & Lowe, Archaeological Method Statement, Temporary Works Site, Blues Point Reserve, Blues Point, June 2018 (Casey & Lowe, 2018).

These reports were not provided to the Auditor for review, however a summary of relevant information from the reports was included in the DP reports.

2. SITE DETAILS

2.1 Location

The site is identified as the '*excavation footprint*' (the site) for the access shaft shown on Attachment 1. The '*construction site area*' shown on Attachment 1 surrounding the '*shaft excavation*' has been excluded from the DP investigations and is not part of the site audit area.

The site details are as follows:

Street address:	Corner of Blues Point Road and Henry Lawson Avenue
Identifier:	Part of Lot 1 DP902933
Local Government:	North Sydney Council
Owner:	Transport for New South Wales
Site Area:	320 m ²
Zoning:	RE1 – Public Recreation

2.2 Site Condition

The Auditor inspected the site on 28 February 2018. At that time the site was grassed open space forming part of Henry Lawson Reserve on the foreshore of Sydney Harbour. The reserve is used for recreational purposes. The site topography slopes from the north to the south, towards the harbour. The PSI indicates site topography falls from approximately 8.5 metres Australian Height Datum (m AHD)

17 December 2018

along the northern site boundary to 5.5 m AHD on the southern site boundary. An outcrop of sandstone bedrock was observed in the southern portion of the reserve. An old sign board adjacent to the site indicated that in 1928, Henry Lawson Reserve formed part of a ferry depot. A monitoring well, assumed to be well SRTBH033A constructed by Douglas Golder (2017), was present in the north of the site.

2.3 Adjacent Uses

The site is located within an area of medium to high density residential land use and public open space. The site uses surrounding Henry Lawson Reserve include:

North: Henry Lawson Avenue with medium density residential land use beyond.

East: Henry Lawson reserve

South: Sydney Harbour (Blues Bay).

West: Blues Point Road with a car park and high density residential land use beyond.

Based on topography, groundwater flow and stormwater run-off is to the south with discharge into Blues Bay, located approximately 15 m beyond the southern site boundary. The PSI indicates that there are no registered groundwater bores within 500 m of the site.

The PSI did not identify nearby land uses with the potential to impact the site. A search of the NSW EPA public records did not identify any sites listed as contaminated in the immediate vicinity of the subject site.

2.4 Proposed Development

The proposed development comprises an access shaft to a depth of approximately 36 metres below ground level (mbgl). The dimensions of the access shaft excavation are detailed in the DSI to be 21.4 m long, 10 m wide and 36 m deep. The floor of the shaft will comprise a 250 mm thick unreinforced concrete slab and the walls of the shaft will comprise 900 mm bored concrete piles with depth and spacing to be confirmed. The excavation will extend below the expected groundwater table and water collection methodology is to be confirmed.

It is understood that following the excavation, the shaft will be backfilled, and the surface area will continue to be used as an open space / recreational area. For the purposes of this audit, the 'public open space' land use scenario will be assumed.

3. SITE HISTORY

The PSI site history assessment included a review of historical title deeds, historical aerial photographs, NSW EPA records and Section 149 (2&5) certificates. DP reviewed SafeWork NSW records as part of the DSI. The site history is summarised in Table 3.1.

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Date	Activity
1817-1860	Land granted to William Blue in 1817 and used to grow produce and provide a ferry service. The land was subdivided in the 1850s and buildings and drainage constructed.
1860-1902	In the late 1800s to 1902, the site was part of a boat/shipping dock and, later, a timber yard. Land to the south of the site was reclaimed between 1866 and 1885 and the sea wall constructed.
1902-1926	From 1902, the site was used as a depot for the Fresh Food and Ice Company that included an ice-house and cool storage. Land to the west was reported to be used by Sydney Ferries as a depot for idle ferries.
1926-1962	Owned by the Harbour Land and Transport Company Limited from 1926 to 1954 and Harbour Lighterage & Showboat Limited from 1954 to 1960. These companies were subsidiaries of the Sydney Ferry Company that operated ferries across the harbour. Historical aerial imagery shows that by 1942 on-site structures had been demolished and the wharf removed. Land was possibly being used as a depot for storing building materials or as a salvage yard. Historical photographs indicate that in 1962 the site was being used as part of a larger timberyard.
1971 to date	The PSI indicates that in 1971 the site was included as part of allotments for use as a public park, reserve or recreational space and has remained used for this purpose since that time. The site is currently owned by Transport for NSW.

A review of the NSW EPA public records did not identify the site or surrounding land uses as being notified as contaminated or of holding licenses under the *Protection of the Environment Operations Act, 1997* (POEO Act). The results of a search of the SafeWork NSW records for storage of hazardous chemicals included in the DSI indicated there were no records of chemical storage on the site.

3.1 Auditor's Opinion

In the Auditor's opinion, the site history provides an adequate indication of past activities. Sources of contamination appear to be limited to imported fill used to level the site, hazardous building materials from demolition of former on-site structures, and previous commercial/industrial activities primarily associated with boat/ferry docking/maintenance operations and use as a timberyard.

The Auditor considers that the site history is broadly understood and adequate for identification of contaminants of concern (Section 4) and remedial planning (Section 10).

4. CONTAMINANTS OF CONCERN

The PSI and DSI provided a list of the contaminants of concern and potentially contaminating activities. These have been tabulated in Table 4.1.

Area	Activity	Potential Contaminants
Entire site	Fill and surface soil imported from unknown sources to level the site	Metals, total petroleum hydrocarbons (TPH), benzene, toluene,

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Area	Activity	Potential Contaminants
		ethylbenzene, xylenes & naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCBs), phenols and asbestos
Entire site	Hazardous building material from former structures	Asbestos, lead and PCB
Entire site	Activities associated with operation and maintenance of a boat/ferry service/dockyard and timberyard	Metals, organotins, volatile organic compounds (VOC), and trichloroethene (TCE), TPH, BTEX, PAHs and cresols.

4.1 Auditor's Opinion

The Auditor considers that the analyte list used by DP is adequate to assess the potential sources of contamination identified through review of site history.

5. STRATIGRAPHY AND HYDROGEOLOGY

Following a review of the DP reports, a summary of the site stratigraphy and hydrogeology conditions at the site are compiled below.

5.1 Topography, Geology and Stratigraphy

The PSI states that the site is at an elevation of approximately 5.5 to 8.5 m AHD with a slope to the south. The site is within the Hawkesbury soils landscape which comprises colluvial soils and is underlain by Hawkesbury Sandstone which comprises medium to coarse grained quartz sandstone, very minor shale and laminite lenses. The NSW Acid Sulfate Soil (ASS) Risk Map shows that the site is located in an area of no known occurrences of ASS, although Blues Bay located approximately 15 m south of the site is mapped as being within an area with a high probability of presence of ASS in bottom sediments.

The field observations made during the DSI indicate that the site specific subsurface profile comprised topsoil underlain by fill of varying composition to depths of greater than 2.5 m, underlain by sandstone bedrock.

The subsurface profile detailed by DP in the DSI is summarised in Table 5.1.

Depth (mbgl)	Subsurface Profile
0.0 – 0.2	Brown silty sand fill (top soil) with rootlets
0.1 – >2.5	Fill materials were observed from beneath the top soil at all test pit locations. Test pits were terminated in fill at depths of between 0.5 m and 2.5 m, except for test pit BHTP03 where sandstone bedrock was encountered at a depth of 1.7 mbgl. According to bore logs provided in

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Table 5.1: Stratigraphy	
Depth (mbgl)	Subsurface Profile
	<p>the DSI, fill was encountered to depths of 1.8 mbgl in bore SRTBH033 and to 1.7 mbgl in bore BPMW01.</p> <p>The composition of the fill material varied between locations but generally comprised brown silty sand with inclusions of demolition rubble (concrete, glass, brick) and sandstone.</p> <p>Gravel, timber, coke and charcoal fragments were encountered in test pit BPTP02 from 1.4 m to 2.5 mbgl.</p> <p>Traces of slate fragments and charcoal are described in BPTP03 from depths of 0.5 m to 1.7 mbgl and a probable old road surface, including asphalt, is described at depths of 0.95 to 1.2 mbgl at this location.</p> <p>Traces of slag were encountered in yellowy brown, orange sand in BPTP04 at a depth of 0.1 to 0.4 mbgl and fragments of ceramics, brick, concrete and cinder ash were described in BPTP04 from 0.4 m to 1.5 mbgl.</p> <p>A fragment of bonded asbestos containing material (ACM) was detected at one location in BPTP01 at a depth of 0.5 mbgl (sample A1). According to the DSI, additional fragments of ACM (samples A2, A3 and A5) were identified during a trench excavation at the site for archaeological purposes.</p>
1.7 - >2.5 to termination depth (40)	Sandstone bedrock.

mbgl – metres below ground level

5.2 Hydrogeology

The PSI included a search of the groundwater information database maintained by the NSW Government and did not identify any registered groundwater bores within a 0.5 km radius of the site. Based on the topography, groundwater is anticipated to flow to the south. DP identified the closest sensitive ecological receptor for groundwater to be Blues Bay, located approximately 15 m to the south. Excess surface water run-off is anticipated to flow into the local stormwater network and drain to Blues Bay.

The PSI included installation details and bore logs for two groundwater monitoring wells previously installed at the site. Groundwater monitoring well SRTBH033 was installed by Golder Douglas as part of the geotechnical investigation in June 2016. The well was drilled to a depth of 39 mbgl and was reported in the PSI to be screened within the sandstone bedrock from a depth of 32 mbgl to 39 mbgl. Well construction details are not included on the borelog for SRTBH033. According to the PSI, groundwater ingress was noted at a depth of 2.5 m during well installation. Well BPMW01 was installed by DP in March 2018 as part of a geotechnical investigation. This well was installed to a depth of 10 mbgl and screened in sandstone from 4.0 m to 10 mbgl. No groundwater ingress was noted in the log for well BPMW01. Groundwater seepage was also not encountered during test pitting to depths of 2.5 mbgl.

Gauging and sampling of groundwater from well SRTBH033 for aggressivity and contamination was completed by Golder Douglas in 2016. Groundwater in this well had a standing water level of 5.54 mbgl on 23 September 2016.

Groundwater observations and sampling of existing well BPMW01 was undertaken as part of the DSI on 22 August 2018 when the depth to groundwater in the monitoring well was recorded at 7.24 mbgl. The RAP infers groundwater flow direction to be to the south based on topography. An accurate flow

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direction cannot be estimated based on one well and it is possible that groundwater flow is tidally influenced.

The DSI included field records of groundwater parameters recorded during sampling. They indicated that the pH was 5.9, dissolved oxygen (DO) was 2.6 mg/L, redox was 88 mV, and electrical conductivity (EC) was 619 mS/cm.

5.3 Auditor's Opinion

The Auditor considers that the site stratigraphy and hydrogeology conditions detailed by DP adequately reflect the site conditions and are sufficient for remediation planning.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the referenced reports, supplemented by field observations. The Auditor's assessment follows in Tables 6.1 and 6.2.

Table 6.1: QA/QC – Sampling and Analysis Methodology Assessment	
Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p>Data Quality Objectives (DQO)</p> <p>The PSI and DSI defined specific DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013).</p>	<p>These were considered appropriate for the investigations conducted.</p> <p>The Auditor notes that DQOs were not included in the RAP for the validation of the site and importation of backfill material. These should be included in the validation report.</p>
<p>Sampling pattern and locations</p> <p><i>Soil:</i> The DSI reports that a grid sampling pattern was adopted. Investigation locations were spaced to gain coverage of the majority of the site. The fill materials at the site were targeted for sampling.</p> <p><i>Groundwater:</i> Sampling of one existing monitoring well, installed in the sandstone bedrock (BPMW01), was undertaken during the DSI. This well is in the north-western portion of the site. Historical groundwater data from sampling of well SRTBH033A was also included in the DSI. This well is in the north eastern portion of the site and screened at a greater depth than BPMW01.</p>	<p>Grid based soil sampling is considered appropriate given that the potential source of contamination is heterogeneous fill material, demolition of historical buildings and site wide historical use as a dockyard/timberyard.</p> <p>Groundwater sampling from well BPMW01 is considered representative of groundwater quality at the site.</p> <p>Seepage water was not encountered during installation of BPMW01 or during test pitting. The Auditor is satisfied that perched water is likely to be minor and intermittent based on rainfall.</p>
<p>Sampling density</p> <p><i>Soil:</i> The DSI included a sampling density of 7 locations over approximately 0.03 ha, which meets the minimum recommended by EPA (1995) <i>Sampling Design</i></p>	<p>In the Auditor's opinion the sampling density was appropriate for general site characterisation. Further ex situ sampling</p>

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Table 6.1: QA/QC – Sampling and Analysis Methodology Assessment	
Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p><i>Guidelines.</i> The coverage provides a 95% confidence of detecting a residual hot spot of approximately 12 m diameter.</p> <p><i>Groundwater:</i> One groundwater sample was obtained from the site.</p>	<p>may be required for waste classification purposes.</p>
<p>Sample depths</p> <p><i>Soil:</i> Samples were collected and analysed from a range of depths targeting the fill at each location and potentially natural sand at one location.</p> <p>Natural clay and sandstone bedrock were not encountered during the DSI. Sampling of natural sandstone was completed during installation of well BPMW01 and the analytical results included in the DSI. A layer of asphalt identified in fill in BPTP03 was targeted for sampling and fill layers containing cinder ash and coke and charcoal fragments in BPTP02 and BPTP04 were targeted for sampling and analysis.</p> <p><i>Groundwater:</i> Groundwater samples were obtained from 8.5 mbgl, approximately midway between the standing water level (SWL) (7.24 mbgl) and the base of the well (9.76 mbgl).</p>	<p>In the Auditor's opinion, this sampling strategy was adequate to characterise the primary material types present on site. Further targeted sampling of layers within fill material may be required for appropriate waste classification depending on observations during excavation. Sampling of natural material would be required for VENM classification.</p> <p>The groundwater sample depth was considered appropriate.</p>
<p>Well construction</p> <p>Monitoring well BPMW01 was installed to a depth of 10 mbgl, and was constructed of 50 mm diameter acid washed, class 18, PVC casing and machine slotted well screen intervals.</p> <p>The screened interval was from 4-10 mbgl, and therefore the screen of the well extends above the groundwater table.</p> <p>The DSI states that monitoring well SRTBH033A is installed to a depth of 40 m with a screened interval between 32 and 39 mbgl. Well construction details are not included on the log for this well included in the PSI.</p>	<p>The Auditor notes that, whilst it is preferable for monitoring wells to be screened over a discrete short vertical interval, the well construction of BPMW01 is sufficient to provide an indication of the groundwater conditions.</p> <p>The well construction details for SRTBH033A are unclear. The DSI indicates that the well is installed to target deeper groundwater. Given the low concentrations of contaminants of concern in groundwater from both wells, the Auditor considers that well construction is sufficient to provide an indication of groundwater conditions at the site.</p>
<p>Sample collection method</p> <p><i>Soil:</i> Sample collection was by test pit (5 locations). Test pit samples were obtained directly from the excavator bucket.</p>	<p>The soil and groundwater sample collection methodology is considered acceptable.</p>

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Table 6.1: QA/QC – Sampling and Analysis Methodology Assessment	
Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<i>Groundwater:</i> Wells were developed with a pump and samples were collected by low flow peristaltic pump with dedicated sample tubing.	
<p>Decontamination procedures</p> <p><i>Soil:</i> DP indicate in the DSI that no re-usable sampling equipment was used during soil sampling.</p> <p><i>Groundwater:</i> Dedicated sampling equipment was used for sampling.</p>	Acceptable.
<p>Sample handling and containers</p> <p>Samples were placed into prepared and preserved sampling bottles provided by the laboratory and chilled during storage and subsequent transport to the laboratories. It is noted that asbestos samples were sub-sampled from the soil jars provided. Groundwater samples to be analysed for heavy metals were field filtered.</p>	Acceptable.
<p>Chain of Custody (COC)</p> <p>Completed chain of custody forms were provided in the report. Soil COC was appended to the waste classification report in Appendix G of the DSI.</p>	Acceptable.
<p>Detailed description of field screening protocols</p> <p>Field screening for volatiles was undertaken using a hand held PID unit.</p> <p>The PID screening procedure was provided and involved placing the samples in ziplock plastic bags and measuring VOCs in the headspace after allowing time for equilibration. PID readings are provided on the borehole log.</p> <p>The DSI reported groundwater quality parameters measured during well sampling in a field log.</p>	Overall, the field screening protocols were acceptable to assess site contamination.
<p>Calibration of field equipment</p> <p>DP report that the PID was calibrated prior to use in the field. Calibration information for the field equipment (PID and groundwater meters) was included in the DSI.</p>	Acceptable.
<p>Sampling logs</p> <p>Soil logs were provided within the DSI for the test pit locations, indicating sample depth, PID readings and lithology.</p>	Acceptable.

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Table 6.1: QA/QC – Sampling and Analysis Methodology Assessment	
Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p>Bore logs were also available in the PSI for wells BPMW01 and SRTBH033A. The log for SRTBH033A did not include well construction details.</p> <p>Groundwater field sampling records were included in the DSI with well development and sampling details.</p>	

Table 6.2: QA/QC – Field and Lab Quality Assurance and Quality Control	
Field and Lab QA/QC	Auditor's Opinion
<p>Field quality control samples</p> <p>Field quality control samples including trip blanks (1 per field batch) and trip spikes (1 per field batch) were undertaken by DP during the DSI.</p> <p>A field intra-laboratory duplicate (5% of primary samples) was collected for the soil sample batch collected on 28/03/2018 and one inter-laboratory duplicate (5% of primary samples) was collected for the soil sample batch collected on 17/08/2018. Over the two sampling events, 20 primary samples were collected.</p> <p>A field intra-laboratory duplicate was collected with the one primary groundwater sample collected on 22/08/2018.</p>	<p>Overall, the field quality control sampling is considered acceptable. The lack of an inter-laboratory duplicate sample for groundwater is not considered to materially impact the dataset given the low concentrations of contaminants in groundwater and low RPDs between the primary and intra-laboratory duplicate.</p>
<p>Field quality control results</p> <p>The results of field quality control samples were generally within appropriate limits. The trip blank results were below the laboratory PQL. The trip spike recovery was acceptable.</p> <p>Relative Percent Difference calculations (RPDs) for the intra-laboratory soil duplicate were within RPD acceptable limits. The RPDs for the inter-laboratory soil duplicate sample were elevated for lead (116%) and zinc (117%) and for benzo(a)pyrene (109%) and total PAH (179%).</p> <p>RPDs for the intra-laboratory groundwater duplicate sample were within acceptable limits.</p> <p>The DSI has assessed field duplicate results along with the primary sample results against the site acceptance criteria.</p>	<p>Overall, the field quality control results were found to be acceptable. RPD exceedances were infrequent and minor and do not impact the overall dataset. DP assessed the results for primary samples and field duplicates against the site acceptance criteria which is considered appropriate.</p>
<p>NATA registered laboratory and NATA endorsed methods</p> <p>Laboratories used included: Envirolab Services Pty Ltd (primary) and ALS (secondary). Laboratory certificates were NATA stamped.</p>	<p>Acceptable.</p>

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Table 6.2: QA/QC – Field and Lab Quality Assurance and Quality Control	
Field and Lab QA/QC	Auditor's Opinion
<p>Analytical methods</p> <p>Analytical methods were included in the laboratory test certificates. Both Envirolab and Eurofins provided brief method summaries of in-house NATA accredited methods used based on USEPA and/or APHA methods (excluding asbestos) for extraction and analysis in accordance with the NEPM (2013). Asbestos analysis was based on AS4964-2004.</p>	Acceptable.
<p>Holding times</p> <p>Review of the COCs and laboratory certificates indicate that the holding times had been met. DP also reported that holding times have been met.</p>	Acceptable.
<p>Practical Quantitation Limits (PQLs)</p> <p><i>Soil:</i> PQLs for individual OCP/OPPs, PCBs and organotin compounds were slightly raised in some soil samples due to interference from analytes other than those being tested. The raised PQLs were below the quality criteria.</p> <p><i>Groundwater:</i> PQLs for groundwater were sufficiently low in the majority of the analytes and acceptable for the DSI. The PQL for the OPP compound Fenitrothion was above the screening criteria.</p>	Overall the PQLs are acceptable. The elevated OPP PQL in groundwater was marginally above the trigger value and in the context of the results reported, this discrepancy does not materially affect the outcome of the audit.
<p>Laboratory quality control samples</p> <p>Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks, internal standards and duplicates were undertaken by the laboratory.</p>	Acceptable.
<p>Laboratory quality control results</p> <p>The results of laboratory quality control samples were generally within appropriate limits, with the following exceptions:</p> <ul style="list-style-type: none"> The laboratory RPD acceptance criteria were exceeded for chromium. The laboratory reported that this was attributed to the non-homogenous nature of the samples. 	In the context of the dataset reported, the laboratory quality control results are acceptable for remediation planning purposes.
<p>Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy)</p> <p>The DSI assessed the field and laboratory results against predetermined data quality indicators (DQIs) and internal standards. These were discussed with regard to the five category areas. DP did not provide an overall conclusion regarding the data quality, however significant data quality issues were not identified.</p>	An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.

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In considering the data as a whole the Auditor concludes that:

- The laboratories provided adequate information to conclude that the data are of sufficient precision.
- There is a high degree of confidence that the data are accurate.
- The data are likely to be representative of the overall site conditions, including fill and groundwater.
- The investigation data are considered to be complete.
- There is a high degree of confidence that the data are comparable for each sampling and analytical event.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed **soil** data provided with reference to criteria from National Environmental Protection Council (NEPC) *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as Amended 2013 (NEPM, 2013). Based on the proposed end use of the development as recreational land the Tier 1 (screening) criterion for a public open space land use setting were adopted. This was considered to be most relevant during remediation and ongoing operation of the site, however is likely to be conservative for short term exposure by construction workers.

The Auditor has adopted **soil** assessment criteria protective from the following sources:

- Human Health Assessment:
 - NEPM (2013) Health Investigation Levels (HILs) for non-volatile soil compounds for public open space (HIL C) land use.
 - NEPM (2013) Health Screening Levels (HSLs) for TRH, BTEX and naphthalene compounds for public open space (HIL C) land use, for the vapour inhalation pathway. The HSLs assumed a sand soil type.
 - Friebel & Nadebaum (2011) HSLs for vapour inhalation/direct contact pathways for intrusive maintenance workers.
 - Asbestos presence/absence.
 - USEPA Regional Screening Levels (RSL) Generic Tables, Resident soil criteria for organotins
- Terrestrial Ecological Assessment (TEA)
 - The soil data has not been assessed against the TEA as soil from the site will be excavated to a maximum depth of 36 mbgl and disposed off-site during development. The TEA is applicable to depths of 2 mbgl and is therefore not applicable for the remaining natural soil.
- NEPM (2013) Management Limits for Petroleum Hydrocarbons for Residential and Open Space land use and assuming coarse soil texture.
- Aesthetics
 - The Auditor has considered the need for remediation based on 'aesthetic' contamination as outlined in the NEPM (2013).

Groundwater at the site is not extracted for beneficial use. The only identified risk pathway is to construction workers from incidental direct contact (for non-volatiles) and to construction workers and future site users through potential vapour inhalation. The following assessment criteria for **groundwater** were considered applicable:

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- Human health assessment:
 - NHMRC (2011 updated 2018) Australian Drinking Water Guidelines criteria including a factor of 10 for incidental direct contact by construction workers (for non-volatiles).
 - NEPM (2013) HSLs for TRH, BTEX and naphthalene compounds for recreational (HIL C) land use, for the vapour inhalation pathway. The HSLs assumed a sand soil type with groundwater at a depth of 4 – 8 mbgl.
 - Friebel & Nadebaum (2011) HSLs for vapour inhalation pathways for intrusive maintenance workers.
 - USEPA Regional Screening Levels (RSL) Generic Tables, Residential tap water criteria for organotins.
- Ecological assessment criteria:
 - ANZG (2018) Australian and New Zealand Guidelines for slightly/moderately disturbed ecosystem, at a general protection level of protection of 95% of species.

7.1 Auditors opinion

The standing water level measured in well BPMW01 during the DSI was recorded at 7.24 mbgl and is therefore within sandstone bedrock. Given the absence of bores for beneficial groundwater use and presence of a reticulated water supply for the area, extraction and use of groundwater as a resource is considered unlikely. Direct contact with groundwater may occur at the site during construction based on the proposed depth of excavation.

The environmental quality criteria referenced by the Auditor are consistent with those adopted by DP, with the exception of the following:

- The DSI does not mention assessment of 'aesthetic' contamination as outlined in the NEPM (2013). However, the report results discuss potential aesthetic issues detected during sampling.
- The DSI did not adopt CRC CARE HSLs for intrusive maintenance workers.
- The DSI adopted terrestrial ecological assessment criteria for soils.

8. EVALUATION OF SOIL ANALYTICAL RESULTS

Soil samples, generally collected from fill material, were analysed for a variety of contaminants. The results have been assessed against the environmental quality criteria and summarised below in Table 8.1. Only one sample of natural material (sandstone) was analysed during a previous investigation (BPMW01 at 1.9-2.0 mbgl) and concentrations of contaminants were either below PQL or below assessment criteria in this sample. Soil sampling locations are presented in Attachment 1.

Table 8.1: Evaluation of Fill Soil Analytical Results – Summary Table (mg/kg)				
Analyte	n	Detections	Maximum	n > Human Health Screening Criteria (NEPM, 2013)
Asbestos in soil (presence/ absence)	23	1	Detected	-
Asbestos in potential ACM fragment	4	4	Detected	-

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Table 8.1: Evaluation of Fill Soil Analytical Results – Summary Table (mg/kg)				
Analyte	n	Detections	Maximum	n > Human Health Screening Criteria (NEPM, 2013)
Arsenic	24	9	14	0 above HIL C 300 mg/kg
Cadmium	24	2	0.5	0 above HIL C 90 mg/kg
Total Chromium	24	23	11	0 above HIL C 300 mg/kg
Copper	24	22	96	0 above HIL C 17,000 mg/kg
Lead	24	24	720	1 above HIL C 600 mg/kg
Mercury (inorganic)	24	9	3.7	0 above HIL C 80 mg/kg
Nickel	24	20	17	0 above HIL C 1,200 mg/kg
Zinc	24	24	390	0 above HIL C 30,000 mg/kg
TRH (C ₆ -C ₁₀ minus BTEX)	23	0	<PQL	0 above HSL C (sand 0-1 m) NL 0 above ML 700 mg/kg
TRH (>C ₁₀ -C ₁₆ minus naphthalene)	23	1	87	0 above HSL C (sand 0-1 m) NL 0 above ML 1,000 mg/kg
TRH (>C ₁₆ -C ₃₄)	23	7	2600	0 above ML 3,500 mg/kg
TRH (>C ₃₄ -C ₄₀)	23	2	400	0 above ML 10,000 mg/kg
BTEX	23	0	<PQL	0 above HSL C (sand 0-1 m)
Total PAHs	23	19	720	1 above HIL C 300 mg/kg
Carcinogenic PAHs (BaP TEQ)	23	9	80	7 above HIL C 3 mg/kg
Benzo(a)pyrene	23	18	56	-
Naphthalene	23	7	2.6	0 above HSL C (sand 0-1 m) NL
Total Phenols	9	0	<PQL	0 above HIL C 40,000 mg/kg
PCBs	19	0	<PQL	0 above HIL C 1 mg/kg
OPPs	19	0	<PQL	0 above HIL C
OCPs	19	0	<PQL	0 above HIL C
Monobutyltin	8	2	12	No Criteria
Dibutyltin	8	0	<PQL	0 above residential RSL 19 mg/kg
Tributyltin	10	0	<PQL	0 above residential RSL 23 mg/kg

n number of samples
 - No criteria available/used
 NL Non limiting
 TEQ Toxicity equivalent quotient

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In assessing the results, the Auditor makes the following observations:

- Four fragments of bonded ACM (fibre cement) have been detected at the site. One from a depth of 0.5 m in test pit BPTP01 and 3 additional fragments at depths of 0.4 to 0.5 mbgl in a trench excavated for archaeological purposes on 23 August 2018 in the northern portion of the site. Asbestos was also detected in one soil sample from the trench. DP conclude that the ACM is associated with building rubble in fill material and is likely to be present in fill containing building rubble across the site.
- Concentrations of metals were below adopted assessment criteria in soil sampled during the test-pitting investigation documented in the DSI. The DSI includes soil results from a geotechnical investigation completed by DP in March 2018 in which the concentration of lead in the fill sample collected from a depth of 0.4-0.5 mbgl at location BPMW01 exceeded the human health screening criteria. The Auditor has not reviewed this report.
- Elevated PAH concentrations were reported in samples of fill material from several locations, with the concentration of benzo(a)pyrene TEQ exceeding health screening criteria in seven soil samples from 5 locations. The concentration of total PAH in fill material at location BPTP03 at 1.0-1.1 mbgl also exceeded the health screening criteria.
- A layer of potential coal tar pitch asphalt was identified as the source of elevated PAH and TRH in BPTP03, however, the description of fill material in other locations with elevated PAH included descriptions of charcoal, coke and cinder ash.
- Other organics were less than the adopted screening criteria, and typically less than the PQL.
- Sandstone was only sampled at one location during a previous investigation (BPMW01 at 1.9-2.0 mbgl). Concentrations of metals in this sample were considered typical of background concentrations. Organics were not detected. Groundwater results discussed in Section 9 did not identify contamination, therefore contamination within sandstone is not expected. Further sampling of the sandstone/natural soils is proposed during remediation for waste classification purposes.

8.1 Auditor's Opinion

In the Auditor's opinion, the soil analytical results are consistent with the site history and field observations. The results indicate the fill to be locally impacted by asbestos, lead and PAHs. There is considered to be high potential for ACM contamination in fill material given the fill composition and site history. DP suggest that the source of elevated PAH concentrations in BPTP03 and BPTP02 is coal tar pitch asphalt. While the description of fill in the log for BPTP03 does support this, elevated PAH in other locations may be attributable to other sources including coal and coke. Fill material will be removed as part of remediation and development of the site. The remedial strategy outlined in the RAP is reviewed and summarised in Section 10.

9. EVALUATION OF GROUNDWATER ANALYTICAL RESULTS

Groundwater samples were collected from monitoring well BPMW01 by DP as part of the DSI. Concentrations of contaminants of concern were below the laboratory PQL for most contaminants, with the exception being some metals. The analytical metal results are summarised below in Table 9.1. Sampling locations are presented in Attachment 1.

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Analyte	BPMW01	ANZG Marine DGV (2018)	Human Health Screening Criteria
Arsenic	<1	-	10
Cadmium	<0.1	0.7	2
Total Chromium	<1	4.4 for Cr(VI)	50 for Cr(VI)
Copper	5	1.3	2,000
Lead	<1	4.4	10
Mercury	<0.05	0.1	1
Nickel	4	7	20
Zinc	66	15	-

- No criteria available/used

Bold Values exceed criteria

<PQL Less than the practical quantitation limit

In assessing the results, the Auditor makes the following observations:

- Metals were detected at low concentrations, with copper and zinc exceeding the ecological criteria. The DSI concluded that the heavy metals can be attributed to diffuse urban-sourced background levels and are not from a site-specific source. Metals concentrations were less than the human health screening criteria.
- Organic contaminants were not detected above the PQL.
- It is noted that previous sampling of groundwater from well SRTBH033A in 2016 indicated elevated concentrations of manganese above ecological screening levels were present in deeper groundwater. Given that this well is screened in sandstone at depths of 32 to 39 mbgl, DP considered that the concentrations were naturally occurring. Manganese was not analysed as a contaminant of concern during the DSI groundwater sampling in 2018.

9.1 Auditor's Opinion

In the Auditor's opinion, the analytical results indicate an absence of groundwater contamination at the site. Marginal exceedances of ecological screening criteria reported for metals (copper, zinc and manganese) are considered representative of background concentrations. Groundwater is not considered to present a risk to human health and ecological receptors. Further investigation or remediation of groundwater is therefore not considered to be required.

10. EVALUATION OF PROPOSED REMEDIATION

10.1 Conceptual Site Model

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. DP has developed a CSM based on the PSI and DSI. Table 10.1 provides the Auditor's review of the CSM used by DP to inform remediation of the site.

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Table 10.1: Review of the Conceptual Site Model		
Element of CSM	Consultant	Auditor Opinion
Contaminant source and mechanism	Contaminated fill material containing lead, TRH >C ₁₆ -C ₃₄ , benzo(a)pyrene, total PAH and asbestos. Unexpected contamination finds during excavation.	Source of soil contamination considered appropriate.
Affected media	Fill material	Agree fill is the primary affected media.
Receptor identification	Construction workers, adjacent land users, surface water, groundwater, terrestrial ecology and future site users.	The receptors have been appropriately identified.
Exposure pathways	Ingestion and dermal contact with soil, inhalation of dust, surface water runoff, leaching and vertical migration to groundwater, and lateral migration of groundwater.	The exposure pathways have been appropriately identified.
Presence of preferential pathways for contaminant movement	Not discussed in the CSM	Preferential pathways are considered unlikely based on the contaminants of concern and site setting.
Evaluation of data gaps	The RAP states that sampling of natural soils will be required to confirm classification as VENM.	No potentially significant data gaps were identified during review of the PSI, DSI and RAP. A layer of potential coal tar pitch asphalt was identified in test pit BPTP03. The source of elevated concentrations of PAH in fill at other locations is not discussed and may be related to a different source (coal, ash). Fill material will be removed during remediation and development of the site and the data gap is therefore not considered significant with respect to site remediation.

In the Auditor's opinion, the CSM developed is considered an adequate basis for assessing remedial requirements.

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10.2 Remediation Required

The Auditor has assessed the RAP by comparison with the checklist included in OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. The RAP was found to address the required information, as detailed in Table 10.2, below.

Table 10.2: Evaluation of Remedial Action Plan	
Remedial Action Plan	Auditor Comments
<p>Remedial Goal</p> <p>The RAP stated four remediation goals as outlined below: '<i>render the site suitable for the proposed land use; maintain records of the remediation and earthworks undertaken including validation as required; mitigate adverse impacts on surrounding land and waterways during the remediation by the management of dust, water and noise emissions; and maximise the protection of workers involved with remediation and earthworks</i>'.</p>	<p>In the Auditor's opinion, the goals are appropriate considering the proposed development of the site.</p>
<p>Discussion of the extent of remediation required</p> <p>DP identified the entire excavation footprint (Attachment 1) as the lateral remediation extent, with the dimensions of the excavation expected to be 21.4 m long by 10 m wide, and the vertical extent to a depth of approximately 36 mbgl.</p> <p>The bulk excavation will involve removal of fill and natural material. Once the access shaft is no longer required, the shaft will be backfilled, and the surface area will continue to be used for open space/recreational land use.</p> <p>The RAP states that validation sampling of the base and walls of the excavation will not be undertaken as these represent the lateral and vertical extent of the excavation. Also, walls are unlikely to be accessible due to pile walls. Instead, validation will be achieved by removal of all fill and natural material from within the site footprint to a depth of approximately 36 mbgl, and disposal off-site. This is to be assessed through visual inspection, review of disposal documentation, field screening and where required sampling and analysis.</p>	<p>The proposed extent of remediation is considered adequate.</p> <p>It is understood that remediation of the site will be achieved through excavation of the entire extent of the site footprint.</p> <p>Should fill material differ from that identified in the DSI, additional sampling will be required for waste classification purposes. Sampling of VENM is required for classification purposes.</p>
<p>Remedial Options</p> <p>The RAP stated that due to the bulk excavation requirement for the proposed development, excavation and off-site disposal was the only viable option.</p>	<p>Acceptable.</p>
<p>Selected Preferred Option</p> <p>Excavation and off-site disposal of contaminated fill.</p>	<p>Acceptable.</p>
<p>Rationale</p> <p>Use of the site as an access shaft will require bulk excavation from the surface to depths of approximately 36 mbgl.</p>	<p>Acceptable.</p>
<p>Waste Characterisation and Disposal</p> <p>The DSI has identified the following waste streams based on <i>in situ</i> testing of fill material: general solid waste (non-putrescible); special waste asbestos – general solid waste (non-putrescible) and a preliminary classification of virgin excavated natural material</p>	<p>Acceptable. The Auditor will review the final waste classifications in the validation report.</p>

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Table 10.2: Evaluation of Remedial Action Plan	
Remedial Action Plan	Auditor Comments
<p>(VENM). DP also identify that, due to detections of monobutyltin, the NSW EPA <i>Organotin Waste Materials Chemical Control Order 1989</i> is in effect.</p> <p>DP are to provide documented waste classifications in accordance with EPA (2014) <i>Waste Classification Guidelines</i> based on an inspection of the material and available analytical data. Further <i>ex situ</i> waste characterisation will be undertaken if considered necessary. DP note that further assessment is required for: fill material, particularly at depths below the extent of test pits undertaken during the DSI; validation and classification of natural soils beneath fill material; any materials encountered during excavation that were not assessed in the DSI; any soils not meeting the descriptions provided in the DSI test pit and borehole logs; and any materials considered potentially suitable for re-use.</p> <p>Waste material is to be removed by a licensed contractor. Each load will be documented, including weighbridge slips, trip tickets and consignment disposal confirmation. Waste will be disposed of at a facility legally able to accept the material.</p> <p>The RAP includes a plan for the classification, handling, characterisation, treatment and disposal of hazardous waste in the event that it is identified on the site.</p>	
<p>Containment</p> <p>No requirement at this stage.</p>	Acceptable.
<p>Proposed Validation Testing</p> <p>A plan for validation testing is included in the RAP.</p> <p>Validation samples are to be collected following removal of waste with a higher waste classification and fill material, as well as the footprint of stockpile areas.</p> <p><i>Excavations (base <500 m²):</i></p> <p>Base – one sample per 25-50 m² with a minimum of 3 samples.</p> <p>Walls – one sample per 10 m length exposed with additional samples collected at depths based on observations.</p> <p><i>Excavations (base ≥500 m²):</i></p> <p>Base – grid based sampling to meet the density recommended in the NSW EPA <i>Sampling Design Guidelines</i> (minimum of 10 samples).</p> <p>Walls – one sample per 20 m length exposed with additional samples collected at depths based on observations.</p> <p><i>Stockpiles:</i></p> <p>If <250 m³; one sample per 25 m³ or a minimum of 3 samples.</p> <p>If >250 m³; one sample per 50-250 m³ or a minimum of 10 samples.</p> <p>The RAP states that samples collected will be analysed for the contaminants of concern, however, it does not list the contaminants.</p>	<p>The Auditor considers the validation sampling densities to be acceptable.</p> <p>Contaminants of concern for validation of fill material removal are considered to include metals, PAHs, TRHs and asbestos.</p> <p>The density of testing for imported material would need to be commensurate with the documentation provided, source, observations and the consistency of the results. VENM certificates based on the template available on the NSW EPA website should be provided.</p>

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Table 10.2: Evaluation of Remedial Action Plan	
Remedial Action Plan	Auditor Comments
Imported material is expected for bulk backfilling works following completion of use of the shaft. The RAP states that a Fill Management Protocol (FMP) will be developed prior to commencement of any bulk backfilling. The RAP includes general requirements for management of imported fill.	
Interim Site Management Plan (before remediation) No requirement for interim site management was identified in the RAP.	Acceptable. No interim management is considered necessary given the site is fenced and occupied by JHCPBG JV.
Unexpected Finds The RAP includes a contingency plan for unexpected finds, including stopping work and assessment of the find by an environmental consultant.	The unexpected finds procedure (UFP) is considered acceptable. Validation of unexpected finds should be undertaken in accordance with the procedures in the RAP.
Site Management Plan (operation phase) including stormwater, soil, noise, dust, odour and OH&S The RAP includes a site management plan for implementation during remediation and validation that covers specific requirements for asbestos (including notification, air monitoring), specific requirements for chemical contaminants, fencing and signage, security and restriction of access, PPE, decontamination, disposal of water, clearance inspection and certificates.	The site management plan is considered acceptable for remedial planning.
Contingency Plan if Selected Remedial Strategy Fails The RAP does not specifically refer to contingency measures in the event of validation failure, however, excavation of fill and natural soils across the entire site footprint to depths of approximately 36 mbgl are to be undertaken, hence, there is low risk of impacted material remaining on the site.	The remedial strategy has a low risk of failure, as soils at the site are to be excavated to depths of 36 mbgl. Imported material is to be validated as part of a Fill Management Protocol to ensure only suitable materials are imported.
Contingency Plans to Respond to Site Incidents The RAP includes a contingency plan for unexpected finds, UST removal, unexpected groundwater and/or hazardous ground gas.	Acceptable.
Remediation Schedule and Hours of Operation Not provided in the RAP.	The hours of operation are to be governed by consent conditions.
Licence and Approvals Waste is to be tracked, and the receiving facility is to be licensed to accept the material in accordance with the <i>Protection of the Environment Operations Act 1997</i> . Asbestos removal contractors are to be appropriately licensed. Air monitoring for asbestos is to be conducted during remediation.	Acceptable

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Table 10.2: Evaluation of Remedial Action Plan	
Remedial Action Plan	Auditor Comments
The development is approved as critical State significant infrastructure under the <i>Environmental Planning and Assessment Act 1997</i> (EP&A Act). SEPP55 does not apply to the development.	
Contacts/ Community Relations Contacts were not provided in the RAP. Direct community consultation is not proposed.	Contacts should be made available during remedial works in accordance with WHS requirements.
Long-term environmental management plan No requirement based on the proposed remedial strategy.	Acceptable.
Validation Reporting The RAP includes a validation plan which addresses validation requirements including site inspections, sampling, documentation and reporting. The RAP does not include specific validation DQOs, QA/QC and DQIs.	Acceptable. Validation DQOs and DQIs should be included in the validation report.

It is considered that the remediation approach recommended by DP is appropriate. Staged remediation of the different waste streams would be feasible and considered appropriate for this site.

10.3 Auditor's Opinion

In the Auditors' opinion, the proposed remediation works should ensure that the site is suitable for the proposed land uses through: excavation and off-site disposal of contaminated fill material and natural soil; implementation of the UFP; implementation of a fill management protocol, and successful validation.

11. CONCLUSIONS AND RECOMMENDATIONS

The RAP concluded "... *that the site can be rendered suitable for the proposed development subject to implementation of this RAP*".

Based on the information presented in the referenced reports and observations made on site, the Auditor concludes that the proposed process of remediation is practical and that the site can be made suitable for the proposed land use if remediated in accordance with the following RAP:

'Remediation Action Plan, Sydney Metro City and South West - Tunnel and Station Excavation Works Package, Proposed Blues Point Access Shaft, Blues Point Road, McMahons Point, prepared for John Holland CPB Ghella JV, Project 85608.07, November 2018', report reference: 85608.07.R003.Rev1, dated 18 November 2018, prepared by Douglas Partners Pty Ltd.

At the completion of remediation of the site, a Section A Site Audit Statement and supporting Site Audit Report certifying suitability for the proposed use should be prepared.

Remediation and reporting can be conducted in stages provided suitable provisions are made to avoid cross-contamination.

* * *

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Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd



Tom Onus
EPA Accredited Site Auditor 1505

Attachments: 1. The DSI Sampling Location Plan



Legend

- Previous Borehole (DP & Golder)
- Monitoring Well
- Test Pit
- Fibre cement sample & 500 ml soil sample

↑ N

Approximate Scale 0 20 m

Douglas Partners Geotechnics Environment Groundwater	CLIENT: John Holland CPB Chella JV OFFICE: SYD SCALE: As shown	TITLE: Site Location and Test Locations Detailed Site Investigation Proposed Shaft Site, Blues Point Road, McMahons Point	PROJECT No: 85608.07 DRAWING No: 1 REVISION: 0
	DRAWN BY: LT DATE: 31 Aug 2018		



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