Bank Street Park
Blackwattle Bay / Tjerruing

SSD-53386706

Appendix AA

Remediation Action Plan (JBS&G)

December 2023

Infrastructure NSW
Bank Street Park

Remedial Action Plan

1A-19 Bank Street, Pyrmont NSW

26 October 2023

64669/ 153,792 (Rev 1)

JBS&G Australia Pty Ltd

www.jbsg.com.au

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JBS&G Australia Pty Ltd

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Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AF/FA	Asbestos Fines/Friable Asbestos
ARAP	Addendum to the Remediation Action Plan
AEC	Area of Environmental Concern
AHD	Australian Height Datum
AMP	Asbestos Management Plan
ANZECC	Australian and New Zealand Environment and Conservation Council 2000
APEC	Area of Potential Environmental Concern
ASC	Assessment of Site Contamination
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
B(a)P	Benzo(a)Pyrene
BSA	Bridge Solution Alliance
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
BWBDG	Blackwattle Bay Design Guidelines
CCME	Canadian Council of Ministers of the Environment
CEMP	Construction Environmental Management Plan
COC	Custody of Documentation
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquids
DOH	Western Australia Department of Health
DP	Deposited Plan
DPI	Department of Primary Industry
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
E3C	E3C Consulting
EMP	Environmental Management Plan
EIL	Ecological Investigation Levels
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environment Protection Authority
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GSV	Gas Screening Value
Ha	Hectare
HBMS	Hazardous Building Material Survey
HIL	Health Investigation Levels
HSL	Health Screening Levels
I/DTD	Indirect/Direct Thermal Desorption
INSW	Infrastructure NSW
JBS&G	JBS&G Australia Pty Ltd
JRA	Job Risk Assessments
LAA	Licensed Asbestos Assessor
LEP	Local Environmental Plan
LNAPL	Light Non-Aqueous Phase Liquids
LOR	Limit of Reporting
LTEMP	Long Term Environment Management Plan
m bgs	Metres Below Ground Surface
MTP	Material Tracking Plan
NAA	Noel Arnold & Associates
NAPL	Non Aqueous Phase Liquids
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NOHSC	National Occupational Health & Safety Commission

Term	Definition
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAD	Potential Archaeological Deposits
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFHxS	Perfluorohexanesulfonic
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PID	Photo-ionisation Detector
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RCD	Residual Current Device
RMS	NSW Roads and Maritime Services
RPD	Relative Percent Difference
SAQP	Sampling Analysis Quality Plan
SAS	Site Audit Statement
SEPP	State Environmental Planning Policy - Resilience and Hazards
SWC	Sydney Water Corporation
SWMS	Safe Work Method Statements
SWRCP	Site Wide Remedial Concept Plan
TBT	Tributyl Tin
TEQ	Toxic Equivalency Quotient
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
TWA	Trade Waste Agreement
UFP	Unexpected Finds Protocol
UGNSW	UrbanGrowth NSW
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compounds
WH&S	Work Health and Safety

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by Infrastructure NSW (INSW, the client) to provide environmental consulting services for remediation works for the proposed Bank Street Park located at 1A-19 Bank Street, Pyrmont.

Bank Street Park comprises 13 individual lots formally identified as Lot 1 in Deposited Plan (DP) 188671, Lot 1 in DP439245, Lot 1 in DP85206, Lots 1 and 2 in DP1089643, Lots 19 – 22 in DP803159, Lots 5-6 in DP803160, Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596 and part Bank Street road reserve (inclusive of the existing Anzac Bridge pylon footprint, for which it is not anticipated any specific work will be required). The 'Site' as being the relevant lots within the red line in the attached **Figures** has been defined for the purposes of this investigation report to exclude Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596 and part Bank Street road reserve and comprises an area of approximately 1.1 ha. The 'broader site area' comprises the proposed extent of works, including the area covered by the purple line, inclusive of the water based portion (Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596) and current public domain areas (part Bank Street road reserve) the subject of street improvements. The Site and broader site area are shown in **Figures 1 and 2A**.

Bank Street Park forms part of the Blackwattle Bay Precinct (BWBP), which is an area of predominantly government owned land located on the western edge of the Pyrmont Peninsula and adjoining the waters of Blackwattle Bay. The precinct was rezoned in December 2022 to facilitate a new mixed-use community, providing for around 2,000 new residents and 5,600 new jobs and creating a vibrant 24/7 economy. Updated planning and land use controls were incorporated into the Sydney Local Environmental Plan 2012, along with site specific design guidance in the *Blackwattle Bay Design Guidelines.*

A critical part of the BWBP is the high quality public domain which includes a series of parks and open spaces connected by a foreshore promenade. Bank Street Park will bring new active and passive recreation uses into a unique park environment, catering for both existing and future communities in the vicinity.

JBS&G completed a Detailed Site Investigation (DSI) (JBS&G 2023a[1]) supplementing existing historical investigation data to characterise potential contamination conditions at the Site, and to draw conclusions regarding the suitability of the site for the proposed development, or, to make recommendations to enable such conclusions to be made. The investigation characterised a number of soil contamination impacts that require to be addressed at the site including asbestos fines/friable asbestos (AF/FA) and asbestos containing material (ACM), heavy metals, total recoverable hydrocarbon (TRHs), polycyclic aromatic hydrocarbons (PAHs) including benzo(a)pyrene (B(a)P that represent a potentially unacceptable health, ecological and aesthetic issues for the proposed future land use at the site. The requirement to further assess Per- and polyfluoroalkyl substances (PFAS) in groundwater at the site was also necessary to confirm potential concerns associated with ecological risks at the site and the potential for contaminant migration from the site. In addition, a potential underground storage tank (UST), comprising a contamination source, was identified in the yard area between the buildings in the northern portion (1A-3 Bank St) of the site which will require further confirmation.

JBS&G (2023a) considered that the site could be made suitable for the proposed land use subject to development and implementation of a Remedial Action Plan (RAP), an Acid Sulfate Management Plan (ASSMP) and an Asbestos Management Plan (AMP, inclusive of an Asbestos in Soils Register) during future redevelopment works.

[1] *Bank Street Park, Detailed Site Investigation, 1A-19 Bank Street, Pyrmont NSW*, JBS&G Australia Pty Ltd, 64669/151,386 Rev 2, 26 October 2023 (JBS&G 2023a)

This document presents a RAP that outlines the principles of remediation/validation works required for the site, that when completed, will make and demonstrate that the site has been made suitable for the intended land use. Specifically, the objective of this RAP is to document the procedures and standards to be followed in order to remove the potential contamination risks for the proposed development such that the site can be made suitable for the intended public open space land use with a community facility, consistent with the requirements of 'Chapter 4 Remediation of land' in the Resilience and Hazards State Environmental Planning Policy (SEPP) 2021.

Potential remedial options have been assessed, giving consideration to the proposed public open space land use and with the preferred remedial strategy for the site identified as a combination of primary source removal (for the potential UST infrastructure), onsite containment of fill material where practicable and it is demonstrated the material is immobile with regard to off-site migration and offsite disposal (where material cannot physically be contained due to development constraints and/or material has been identified as presenting a potential contaminant migration risk).

Subject to the successful implementation and validation of the measures detailed in this RAP, inclusive of ongoing management of contained contaminated material in accordance with a future long term Environmental Management Plan (EMP) and subject to the limitations in **Section 12**, it is considered the site can be made suitable for the proposed public open space land use.

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Infrastructure NSW (INSW, the client) to provide site contamination assessment and planning stage remediation advice for the new waterfront public park within Blackwattle Bay, to be known as Bank Street Park (State Significant Development (SSD-53386706)). Bank Street Park is located at 1A-19 Bank Street, Pyrmont on the shoreline of Tjerruing Blackwattle Bay and adjacent areas of Blackwattle Bay.

Bank Street Park comprises 13 individual lots formally identified as Lot 1 in Deposited Plan (DP) 188671, Lot 1 in DP439245, Lot 1 in DP85206, Lots 1 and 2 in DP1089643, Lots 19 – 22 in DP803159, Lots 5-6 in DP803160, Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596 and part Bank Street road reserve (inclusive of the existing Anzac Bridge pylon footprint, for which it is not anticipated any specific work will be required). The 'Site' as being the relevant lots within the red line in the attached **Figures** has been defined for the purposes of this investigation report to exclude Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596 and part Bank Street road reserve and comprises an area of approximately 1.1 ha. The 'broader site area' comprises the proposed extent of works, including the area covered by the purple line, inclusive of the water based portion (Part Lot 5 in DP1209992, Part Lot 107 in DP 1076596) and current public domain areas (part Bank Street road reserve) the subject of street improvements. The Site and broader site area are shown in **Figures 1 and 2A**.

Bank Street Park forms part of the Blackwattle Bay Precinct (BWBP), which is an area of predominantly government owned land located on the western edge of the Pyrmont Peninsula and adjoining the waters of Blackwattle Bay. The precinct was rezoned in December 2022 to facilitate a new mixed-use community, providing for around 2,000 new residents and 5,600 new jobs and creating a vibrant 24/7 economy. Updated planning and land use controls were incorporated into the Sydney Local Environmental Plan 2012, along with site specific design guidance in the Blackwattle Bay Design Guidelines.

A critical part of the BWBP is the high quality public domain which includes a series of parks and open spaces connected by a foreshore promenade. Bank Street Park will bring new active and passive recreation uses into a unique park environment, catering for both existing and future communities in the vicinity.

JBS&G completed a Detailed Site Investigation (DSI) (JBS&G 2023a[2]) on 11 lots (Site) supplementing existing historical investigation data to characterise potential contamination conditions at the Site, and to draw conclusions regarding the suitability of the Site for the proposed development, or, to make recommendations to enable such conclusions to be made. The investigation characterised a number of soil contamination impacts that require to be addressed at the Site including asbestos fines/friable asbestos (AF/FA) and asbestos containing material (ACM), heavy metals, total recoverable hydrocarbon (TRHs), polycyclic aromatic hydrocarbons (PAHs) including benzo(a)pyrene (B(a)P that represent a potentially unacceptable health, ecological and aesthetic issues for the proposed future land use at the Site. The requirement to further assess Per- and polyfluoroalkyl substances (PFAS) in groundwater at the site was as necessary to confirm potential concerns associated with ecological risks at the Site. In addition, a potential underground storage tank (UST), comprising a contamination source, was identified in the yard area between the buildings in the northern portion (1A-3 Bank St) of the Site which will require further confirmation.

JBS&G (2023a) considered that the Site can be made suitable for the proposed land use subject to remediation and/or management of the identified impacts, inclusive of development and

[2] *Bank Street Park, Detailed Site Investigation, 1A-19 Bank Street, Pyrmont NSW*, JBS&G Australia Pty Ltd, 64669/151,386 Rev 2, 26 October 2023 (JBS&G 2023a)

implementation of a Remedial Action Plan (RAP), an Acid Sulfate Management Plan (ASSMP) and an Asbestos Management Plan (AMP, inclusive of an Asbestos in Soils Register) during future redevelopment works.

This document presents a Remedial Action Plan (RAP) in response to the relevant requirements outlined in section 19 (Contamination) within the Planning Secretary's Environmental Assessments Requirements (SEARs) issued on 11 May 2023 for application SSD-53386706 that outlines the principles of remediation/validation works required for the site, that when completed, will make and demonstrate that the site has been made suitable for the intended land use.

This RAP has been prepared with reference to relevant guidelines made or endorsed by the NSW Environment Protection Authority (EPA) inclusive of National Environmental Protection Council (NEPC 2013[3]) and EPA (2020[4]), EPA (2017[5]) and State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP R&H[6]). Further, consideration has also been given to the remedial strategies presented in the Blackwattle Bay Study Area Site Wide Remedial Concept Plan (SWRCP, JBS&G 2021[7]) prepared to support the broader area planning efforts.

1.2 Objectives

The objective of this RAP is to document the procedures and standards to be followed in order to remove the potential contamination risks for the proposed development such that the site can be made suitable for the intended public open space land use, consistent with the requirements of 'Chapter 4 Remediation of land' in SEPP R&H.

1.3 Proposed Development

JBS&G understands that development consent is being sought for a recreation area for the primary purpose of a public park. The concept design plan is provided in **Figure 4** where the deepest anticipated excavation extends more than 3.5 m in depth in the southeast portion of the site based upon the proposed cut/fill plan provided by the client. As such, consideration has been given to a variety of generic land-uses as provided to N*ational Environment Protection (Assessment of Site Contamination) Measure, 1999 Amendment No 1*, National Environment Protection Council (NEPC 2013) for public open space such as parks, playgrounds, playing fields, secondary schools and footpaths (HIL-C) considered as the applicable land use for the site. The public park will comprise the following:

- Site preparation works, including tree removal, earthworks and remediation to facilitate proposed use;
- Demolition of three existing buildings at 1-3 Bank Street;
- New and adapted facilities for community use, including:
    - New single storey building to accommodate flexible community space, café, and marina office/store facilities, with green roof and photovoltaics;
    - Adaptive reuse of Building D for public amenities, bin and other storage;
    - Boat launching ramp and pontoon for passive watercraft, including dragon boats and kayaks;

[3] *National Environment Protection (Assessment of Site Contamination) Measure, Amendment No 1 (2013)*. National Environment Protection Council (NEPC 2013)
[4] *Consultants Reporting on Contaminated Land – Contaminated Land Guidelines.* NSW EPA 2020 (EPA 2020)
[5] *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition*). NSW Environment Protection Authority 2017 (EPA 2017)
[6] *State Environmental Planning Policy– (Resilience and Hazards)* 2021
[7] *Site Wide Remedial Concept Plan, Blackwattle Bay Study Area*, JBS&G Australia Pty Ltd, Rev 3, 12 January 2021 (JBS&G 2021b)

- Boat storage building with change facilities for dragon boat users with publicly accessible rooftop deck.

- Public domain works including:
  - 'Interpretation Garden' in existing building 'ruins' at 1-3 Bank Street;
  - Split level foreshore promenade;
  - Multi-purpose court with edge seating and partial fence;
  - Nature-based inclusive playspace for ages 2-12;
  - Fitness equipment;
  - Public plaza and grassed open space areas;
  - New tree plantings and planter beds;
  - Public art, wayfinding and interpretative signage, lighting, bike parking and seating.
- Harbour works including:
  - Overwater boardwalk;
  - Land/water interface works, including sandstone terracing into water and support structure, to improve marine habitat;
  - Demolition and construction of a new timber launching ramp for dragon boats;
  - Kayak/passive craft pontoon; and
  - Restoration, repair and alterations to the existing seawall for new stormwater outlets.
- Works to Bank Street road reserve, including:
  - Road space reallocation to provide separated cycleway;
  - Cycleway transition to Bank Street to continue south as part of future works;
  - Reinstatement of existing on-street parallel parking;
  - Tree planting;
  - Accessible parking space; and
  - Loading zone adjacent 1-3 Bank Street.

1.4 Environmental Assessments Requirements

The site contamination investigation is required in response to the relevant requirements outlined in section 15 (Ground and Water Conditions) and section 19 (Contamination) within the SEARs issued on 11 May 2023 for application SSD-53386706 and sections 2.4 (Staging and Delivery) and 4.8 (Contamination) within Black Wattle Bay Design Guidelines (BWBDG) such that appropriate decisions can be made in development of the land use design. **Table 1.1** below addresses the relevant SEARS requirements and provides a project response.

Table 1.1: Summary Site Details

Item	Environmental Assessments Requirements
Sears Section 19 (Contamination)	In accordance with SEPP (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.

Item	Environmental Assessments Requirements
BWBDG Section 4.8 (Contamination)	1. The processes outlined in the Site Wide Remedial Concept Plan – Blackwattle Bay Study Area, (JBS&G Australia Pty Ltd, 12 January 2021) are to be implemented, including: • a Remediation Environmental Management Plan (REMP), to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed • a Work Health and Safety Management Plan (WHSP) to document the procedures to be followed to manage the risks posed to the health of the remediation workforce. 2. A REMP must be provided by the applicant as a separate document for each remediation works stage. A WHSP is to be developed prior to the commencement of remediation works. 3. Each REMP and WHSP should address the potential for a range of chemical contaminant conditions in soil in addition to groundwater, ground gas/vapour and sediment in various areas of the Precinct, in addition to the potential occurrence and storage / handling of asbestos contaminated soils on the Precinct. 4. Upon completion of the works, validation reports and on-going Environmental Management Plans (EMPs) for residual impacted materials as may be retained beneath the specific area footprints will be required to be submitted to the consent authority documenting that the applicable footprint is considered suitable for the proposed use(s), subject (where applicable) to implementation of the relevant ongoing EMP. 5. Any development is not to activate polluted sediments by disturbance. 6. Strategies for extraction, capture and disposal are to be developed for the most polluted sediments (close to existing stormwater outfalls) to ensure that the local marine ecosystem improves in line with well-established biodiversity conservation principles and obligations. 7. Continued engagement of a NSW EPA accredited site auditor/s is required, where necessary, to help any consent authority be satisfied that the specific parcels of land are suitable for all the purposes for which it is permitted to be used.

2. Site Condition and Environmental Setting

2.1 Site Identification and Details

The Site and broader site area location are shown on **Figure 1**. The extent of the Site, broader site area and associated cadastral boundaries and features are shown on **Figures 2A** and **2B**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary of Site Details

The Site - Lot / DP Property Identification and Ownership	The Site is comprised of the following legal properties: • Lot 1 in DP188671- Transport for NSW • Lot 1 in DP439245 - Infrastructure NSW • Lot 1 in DP85206 - Transport for NSW • Lot 1 in DP1089643 – Infrastructure NSW • Lot 2 in DP1089643 - Infrastructure NSW • Lot 19 in DP803159 - Transport for NSW • Lot 20 in DP803159 - Transport for NSW • Lot 21 in DP803159 - Transport for NSW • Lot 22 in DP803159 - Transport for NSW • Lot 5 in DP803160 - Transport for NSW • Lot 6 in DP803160 - Transport for NSW
The broader site area - Lot / DP Property Identification and Ownership	The broader site area is comprised of the following added legal properties: • Part Lot 5 in DP1209992 – Roads and Maritime Services (Transport for NSW) • Part Lot 107 in DP1076596 – Transport for NSW • Part Bank Street road reserve – Transport for NSW (City of Sydney Council)
Local Government Authority	City of Sydney Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2A**
Current Site Zoning	RE1 Public Recreation under City of Sydney Local Environmental Plan (LEP) 2012 and Zone 1 Maritime Waters under Section 6.27 of State Environmental Planning Policy (Biodiversity and Conservation) 2021
Current Use	Lots 5-6 in DP803160 and Part Lot 20 in DP803159 – Vacant Lot 19, Part Lot 20, Lot 21 and Lot 22in DP803159 – Blackwattle Bay Marina Lot 1 in DP 188671, Lot 1 in DP85206, Lot 1 in DP439245 and Lots 1-2 in DP1089643 – Vacant Part Lot 5 in DP 1209992- Blackwattle Bay Part Lot 107 in DP1076596 - Blackwattle Bay Part Bank Street road reserve – Public road
Previous Use	Holding yard, Blackwattle Marina Bay, industrial purposes and public road
Proposed Use	Public open space / Public park and community facility
Site Area	Approximately 1.1 ha

2.2 Site Description

The Site and broader site were inspected by a suitably qualified and experienced JBS&G environmental consultant on 27 March 2023. They are located within the City of Sydney local government area (LGA) and includes harbour development in Blackwattle Bay and situated on Gadigal Land, one of the twenty-nine clans of the great Eora Nation and adjoins the foreshores of Glebe to the west and Pyrmont Bridge Road and Wentworth Park to the south. The Site in general comprised an irregular shaped parcel of land comprising 11 lots with the broader site area comprising Part Lot 5 in DP1209992, Part Lot 107 in DP1076596 and Part Bank Street road reserve. Bank Street and Bowman Street bound the Site to the east and northeast, respectively. The southeastern portion of the site was secured via a steel fence towards Bank Street and a chain link fence to the north separating that portion from the central portion which was occupied by Blackwattle Bay Marina. The Site contained four access points as follows:

- An access gate along Bank Street providing access to Lots 5-6 in DP803160 and Part Lot 20 in DP803159;

- A driveway along Bank Street providing access to Lot 19, Lot 21, Lot 22 and Part Lot 20 in DP803159;
- An access gate along Bank Street providing access to Lot 1 in DP439245 and Lots 1-2 in DP1089643;
- An access gate along Bank Street and Bowman Street providing access to Lot 1 in DP 188671 and Lot 1 in DP85206.

Broadly the site was covered by hardstand and buildings with some vegetated areas observed in the northwestern corner of the site and along the southern portion along the seawall adjacent to Blackwattle Bay.

No existing storage of bulk chemicals or wastes were observed at the site. Observations of site conditions indicated the ground was generally absent of apparent odours or staining.

The key features noted within the Site and broader site area were discussed in JBS&G (2023a) and presented in **Figure 2B**.

2.2.1 Lots 5-6 in DP803160 Part Lot 20 in DP803159

This area comprised a large vacant space surfaced generally with compacted aggregate. Several shipping containers, dragon boat vessel storage, vehicle trailers and other associated infrastructure were stored within this yard. A ramp extended down to the southwest and there is a landscaped area adjoining a boat launching ramp at the water's edge.

2.2.2 Lot 19, Part Lot 20, Lot 21 and Lot 22 in DP803159

This area comprised the Blackwattle Bay Marina and was covered by hardstand apart from a feature in the northern portion comprising gravel gabions placed across four levels. A substation and exposed soils were observed adjacent to gravel filled gabion feature to the north along Bank Street.

A demountable office structure was observed in the northeastern portion, with an adjacent area containing an above ground storage tank (AST), heating unit, pump and a sewer alarm believed to be used for pumping sewage water from moored boats. Adjacent to the west of the sewage pumping system was a brick structure that housed the waste bins for the Marina. A small workshop and multiple shipping containers used for storage (tools, beverages, solvents, etc) were observed in the southeastern portion of the area.

Anzac Bridge infrastructure is situated in the western portion of this premises, including a large pylon structure and an asphalt hardstand area.

2.2.3 Lot 1 in DP 188671, Lot 1 in DP85206, Lot 1 in DP439245 and Lots 1-2 in DP1089643

The premises comprised a series of adjoining brick commercial/industrial type buildings built to the Bank Street boundary with a central enclosed courtyard. Based on the layout, it appeared the premises facing Bank St to the east and vacant land to the north (buildings C and D) were likely residences formerly converted to commercial offices. Building B at the west was likely formerly a workshop where a rusted engine and an empty drum were observed at ground level, whereas the level above appeared to be a residence. The buildings at the south site extent (building A) may have previously also been used as a seafood/poultry distribution premises and an abattoir. At the time of the inspection, the premises were all vacant and displaying signage noting the presence of asbestos containing material within the buildings.

Previous assessment reports including CDM (2012a[8]) reported two vents and associated indicators of a UST and former bowser plinth within the paved central courtyard. At the time of the current inspection JBS&G couldn't verify these conditions as at the time of the recent inspection remnants of

[8] *Phase 2 Environmental Site Assessment, 1 Bank Street, Pyrmont NSW*. CDM Smith Australia Pty Ltd, 27 November 2012 (CDM 2012a)

the heritage coal loader originating from the Fish Market construction site were stored in this area (and could not be moved given their heritage significance).

A seawall retaining the property above the water line was apparent at the southwest property extent. Several large trees and understorey vegetation were situated in the southwest property corner adjacent to the water's edge, in addition to an area (Lot 1 in DP85206 and Lot 1 in DP 188671) of overgrown vegetation suited to the north between the property boundary and the Glebe Island Bridge approach to the northwest.

2.2.4 Part Lot 5 in DP1209992, Part Lot 107 in DP1076596 and Part Bank Street road reserve

Part Lot 5 in DP1209992 and Part Lot 107 in DP1076596 comprise portions of Blackwattle Bay in the western and southern portions of the site respectively, whereas part Bank Street road reserve comprises an asphalt paved public road.

2.3 Surrounding Land Use

The land uses of adjacent properties or properties across adjacent roads at the time of inspection are summarised below.

- North – The site is bound to the north by a NSW Roads and Maritime Service (RMS) depot and a high rise office building followed by Waterfront Park and Johnston's Bay further north;
- South – The site is bound to the south by Blackwattle Bay;
- West – The site is bound to the west by Blackwattle Bay overlain by the Anzac Bridge; and
- East – The site is bound to the east by Bank Street followed by sandstone rock and high rise residential and office buildings on top of the sandstone rock.

2.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer, LPI (2015[9]) regional topographic map indicated that the site ground level range between approximately 4 and 7 m Australian Height Datum (AHD) and was generally flat, consistent with historical amendment of ground levels as associated with quarrying and reclamation activities.

The site is located adjacent to Blackwattle Bay, with a combination of batter slopes and/or sea (retaining) walls along the southwestern site boundary. The general suburb of Pyrmont located to the east of the site is located on a sandstone headland with a vertical relief of approximately 30 m AHD within approximately 100 m to the east of the site. Historical quarrying activities have occurred in proximity of the site as apparent by the vertical sandstone quarry face to the east of the Bank St road reserve with a height of approximately 3 – 6m above the current street pavement level.

2.5 Geology and Soils

JBS&G (2023a) reported that the site is underlain by three geological types as follows:

- Man-made fill typically comprising dredged estuarine sand and mud, demolition rubble, industrial and household waste;
- Quaternary aged silty to peaty quartz sand, silt and clay deposits with ferruginous and humic cementation in places and with common shell layers; and
- Hawkesbury Sandstone typically characterised as medium to coarse-grained quartz sandstone with very minor shale and laminate lenses.

[9] *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 21 March 2023, https://maps.six.nsw.gov.au/;

Reference to the NSW Department of Planning and Environment's online eSPADE application[10] indicates that the site is within two landscape groups as follows:

- Disturbed Terrain: The landscape is characterised by level plain to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil, with < 10m local relief, < 30% slopes, inclusion of soil, rock building and waste material within landfill. Soils comprise turfed fill areas commonly capped with sandy loam or compacted clay over fill or waste material. Limitations include mass movement hazard, unconsolidated low wet strength materials, impermeable soil, poor drainage, localised very low fertility and toxic materials.
- Gymea: The landscape is characterised by undulating to rolling rises and low hills on Hawksbury Sandstone, with 20-80 m local relief and 10-25% slopes. Soils are characterised by shallow to moderately deep (30-100 cm) yellow earth sand earthy sands on crests and inside of benches; shallow siliceous sands on leading edges of benches; localised gleyed podzolic soils and yellow podzolic soils on shale lenses; shallow to moderately deep (<100 cm) siliceous sands and leached sands along drainage lines. Limitations included localised steep slopes, high erosion hazard, rock outcrop, shallow highly permeable soil and very low soil fertility.

Site characteristics as reported in JBS&G (2023a) identified fill material encountered at all sample locations and typically ranged in depths from approximately 0.0-6.0 m below ground surface (bgs). The fill generally comprised silty sand, gravelly sand, clayey sand, clayey sand, sandy gravels, sandy clay, sandstone and ash, ranging in colour between brown, dark brown, grey and black with inclusions of slag, ash, charcoal, seashells, wood, gypsum, brick, sandstone and concrete fragments. Sample locations are shown on **Figures 3** and **5**. Additional observations made during the sampling program are summarised in the following:

- In addition to the ash observed in the majority of the sampling locations, an ash layer was observed in two boreholes with a thickness of 0.1 m (BH11 0.8-0.9) and 0.2 m (BH13 0.9-1.1);
- Hydrocarbon odours were observed at borehole BH16 in fill material between 0.0 and 1.0 m bgs;
- Six boreholes did not reach the extent of fill material for the following reasons:
    - BH01: borehole advanced via hand auger due to limited accessibility and refused on a potential concrete or sandstone obstruction at 0.4 m bgs;
    - BH02: borehole advanced via hand auger due to limited accessibility and terminated at 1.0 m bgs;
    - BH06: borehole advanced via hand auger due to presence of electrical services and terminated at 1.0 m bgs;
    - BH07: refusal on a potential concrete obstruction at 5.5 m bgs;
    - BH09: borehole advanced via hand auger due to presence of electrical easement and terminated at 0.3 m bgs due to presence of electrical services; and
    - BH12: borehole advanced to the programmed depth.

[10] eSPADE DPE web application accessed on 21 March 2023 https://www.environment.nsw.gov.au/eSpade2WebApp

There were no significant indicators (odours or staining) of potential contamination within the fill or natural materials observed elsewhere across the site, apart from the potential ASS (as discussed separately in **Sections 3.17 and 3.18**).

Fill material was underlain by natural grey/brown/red/ sandy clay, grey/brown/red/grey gravelly sand and clayey gravelly sand and grey/yellow/brown/white/red sandstone. Seepage was observed at four sampling locations (BH04, BH07, BH08 and BH12) with the depth ranging between 3.0 m bgs (BH04) and 4.7 m bgs (BH12).

2.6 Hydrology

The nearest surface body receptor is Blackwattle Bay located at the south and west boundary of the site. Given the local topography and existing site features comprising buildings, hard stand pavements and/or compacted aggregate, there is limited potential for infiltration of surface water into site soils. Rainfall runoff following precipitation events is controlled by building/site stormwater infrastructure and is expected to discharge into Blackwattle Bay located west and south of the site. This is expected to predominantly occur via collection in localised stormwater systems and subsequent discharge to the nearest down-gradient location. Infiltration in unsealed areas of the site and subsequent tidal influences in shallow groundwater near sea walls are expected to be a minor source of discharge. Direct run off from sealed surfaces into the Bay is also expected to be a minor source of discharge directly adjoining the waterfront.

2.7 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW Department of Primary Industries (DPI 2016[11]). A review of the registered bore information indicated that there were 36 bores within a 1.5 km radius of the Site.

The registered groundwater bores located within a 1.5 km radius of the site are summarised in **Table 2.2** below.

[11] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 22 March 2023.

Table 2.2 Summary of Registered Groundwater Bores

Bore ID	Approximate distance/ direction from site centre	Date and Intended Use	Final Drilled Depth (m)	Standing Water Level (swl)	Encountered Geology
GW102671	0.96 km Northwest	1993 – Monitoring Bore	4.80	NA	0-1.0 Sandy Oil 1.0-2.5 Soil 2.5-4.3 Sandy Clay 4.3-4.8 Sandstone
GW109713	1.1 km North	2004 – Monitoring Bore	6.00 m	2.521	0-2.6 Fill 2.6-6.0 Weathered Sandstone
GW115130	1.3 km North	2011 – Monitoring Bore	10.00 m	NA	0-0.2 Concrete 0.2-1.6 Fill, Gravelly Sand 1.6-3.4 Weathered Sandstone 3.4-10.0 Bedrock Sandstone
GW113562	1.40km Northeast	2011 – Monitoring Bore	10.7 m	NA	NA
GW113565	1.4km Northeast	2011 – Monitoring Bore	4.00 m	NA	NA
GW109086	1.3km Northeast	2008 – Monitoring Bore	5.68 m	NA	0-0.5 Fill, medium to coarse 0.5-1.0 Fill, Silty Sand 1.0-1.8 Fill, Clayey Sand 1.8-2.0 Fill, Gravelly Sand 2.0-3.8 Fill, Silty Sand 3.8-4.5 Fill, Clay/Silt/Sand 4.5-5.68 Sand
GW111329	0.3km Southeast	2010 – Monitoring Bore	6.00 m	NA	0-0.15 Unknown 0.15-1.5 Fill, Silty Sand 1.5-6.0 Sandstone
GW114182	0.33km Southeast	2013 – Monitoring Bore	11.55 m	NA	NA
GW114187	0.4km Southeast	2013 – Monitoring Bore	6.00 m	NA	NA
GW110373	0.6km South	2001 – Monitoring Bore	4.00 m	0.60	0-1.6 Fill, Sandy Clay 1.6-3.4 Silt 3.4-3.7 Silty Sand 3.7-4.0 Sandy Clay

Given the proximity of the site to Blackwattle Bay and the infilled nature of the site, it is anticipated that broadly, groundwater flow direction at the site will occur toward the Bay, however there may be localised variability associated with the underlying sandstone bedrock formation, inconsistent permeability of the overlying soil/fill profile and the influence of the mass bridge foundation. In general, it is anticipated that the majority of groundwater seepage will occur in proximity to the fill-natural strata (residual soil/sandstone profile) in addition to influence of the seawater level at the west extent of the site.

2.8 Acid Sulfate Soils

Review of the *Prospect/Parramatta River 1:25 000 Acid Sulfate Soil Risk Map Sheets 9130N3* indicates that the majority of the Site is located within an area classed as 'disturbed terrain'. Areas having this classification typically include filled areas which often occur following reclamation of low lying swamps for urban development. Other areas with this classification may include areas which have been mined, dredged, or have undergone heavy ground disturbance through general urban development. Soil investigation is required to assess these areas for acid sulfate potential.

Blackwattle Bay immediately to the west of the site comprises an area of 'high probability' of acid sulfate soils (ASS) within bottom sediments. In such areas, there is the potential for severe environmental risk if bottom sediments are disturbed by activities such as dredging.

Previous investigations conducted across the broader Blackwattle Bay as discussed in **Section 4**, identified sediments within the bay to comprise PASS. In addition, as part of the most recent investigative works (JBS&G 2023a) which comprised an ASS assessment, the following conclusions and recommendations were made with regards to ASS:

- Field observations during field works reported moderate to strong reactions within fill black sand and brown clayey gravelly sand and natural light brown/light grey/red sandstone materials with pH_{ox} values in 3 samples being less than pH4 and associated with significant drops from pH_{KCl} to pH_{ox} values;
- Six samples of natural material and four samples of fill material were assessed for the presence of ASS via the sPOCAS analysis method;
- Material represented by BH12 (5.0-5.1) and BH12 (5.9-6.0), being disturbed (fill) black sand and the brown clayey gravelly sand were considered to exceed the site assessment criteria and were consistent with potential ASS;
- BH04 (5.9-6.0) comprising natural brown/red gravelly sand and BH07 (5.4-5.5) comprising dark brown/black disturbed (fill) clayey sand reported S_{pos}% of 0.4 % and 0.26 % respectively, exceeding the action criteria and also representative of PASS material;
- The material represented by PASS generally ranged in depth from approximately 5.0 to 6.0 m bgs in proximity of the Blackwattle Bay sea wall, being overlain by non-ASS fill material;
- Natural profile soil/sandstone across the balance of the site has been characterised by collected data as non-PASS material; and
- Based on the results of the investigation, assessment of fill materials situated above the groundwater table have not been identified as PASS.

Where the natural alluvial/marine soil/sediments or fill materials situated below the water table are identified on site and works may result in their disturbance, appropriate measures to manage the acid generation risks will include the procedures documented separately in a standalone ASS management plan (ASSMP, JBS&G 2023b[12]). The ASSMP will require implementation prior to the commencement and during any works that may result in disturbance (and so oxidation) of these materials.

2.9 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Sydney Airport AMO[13]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 7.4 ^{o}C in July to 19.2 ^{o}C in February;
- Average maximum temperatures vary from 17.2 ^{o}C in July to 26.7 ^{o}C in January;
- The average annual rainfall is approximately 1093.4 mm with rainfall greater than 1 mm occurring on an average of 96 days per year; and

[12] *Bank Street Park, Acid Sulfate Soil Management Plan, 1A-19 Bank Street, Pyrmont NSW*, JBS&G Australia Pty Ltd, 64669/153,913 Rev 1, 26 October 2023 (JBS&G 2023b)

[13] http://www.bom.gov.au/climate/averages/tables/cw_066037.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 16 March 2023 and accessed by JBS&G on 22 March 2023.

- Monthly rainfall varies from 59.8 mm in September to 124.7 mm in March with the wettest periods occurring on average in January to June.

3. Site History

3.1 Summary Site History

JBS&G (2023a) reported the site to historically have been used for industrial purposes, with several buildings observed in the northern portion (1A-3 Bank St) of the site, while the central and southern portions of the site were used as holding yards. Portions of the site to the west and south, adjacent to Blackwattle Bay comprised reclaimed lands forming the site in its current layout.

3.2 Previous Contamination Assessment Reports

The following environmental reports were provided to JBS&G for review:

- *Review of Environmental Factors Pier Demolition at Blackwattle Bay, Pyrmont*. Umwelt Australia Pty Ltd. June 2008. (Umwelt 2008) incorporating *Report on Marine Sediment Contamination Assessment – Hymix Wharf Blackwattle Bay*, Pyrmont. Douglas Partners Pty Ltd, June 2008, Ref: 45560 (DP 2008);
- *Environmental Site Investigation, Blackwattle Bay Maritime Precinct, Blackwattle Bay Maritime Precinct, NSW*. March 2009, Parsons Brinckerhoff (PB 2009);
- *Soil Contamination Investigation, 1 Bank Street, Pyrmont NSW*. June 2010, Noel Arnold and Associates Pty Ltd (NAA 2010);
- *Report to Land and Property Management Authority C/- Government Architects Office on Preliminary Environmental Site Assessment for Proposed Redevelopment – Waterfront at Markets, 56-60 Pyrmont Bridge Road, Pyrmont, NSW*. Ref: E24125Krpt, EIS, August 2010 (EIS 2010);
- *Limited Phase 2 Environmental Site Investigation, Bank Street, Pyrmont NSW*. June 2011, RCA Australia Pty Ltd (RCA 2011);
- *Limited Phase 2 Investigation, 5 Bank Street, Pyrmont NSW.* 16 July 2012, E3 Consulting Australia Pty Ltd. (E3C 2012a);
- *Stage 1 Preliminary Site Investigation, 1 Bank Street, Pyrmont NSW*. 27 July 2012, E3 Consulting Australia Pty Ltd (E3C 2012b);
- *Phase 2 Environmental Site Assessment, 1 Bank Street, Pyrmont NSW*. 27 November 2012, Draft, CDM Smith Australia Pty Ltd (CDM 2012a);
- *Long-term Environmental Management Plan, 5 Bank Street Pyrmont, NSW*. 30 October 2012, CDM Smith Australia Pty Ltd (CDM 2012b);
- *Validation Report, Maritime Facility, Northern Part of 5-11 Bank Street, Pyrmont NSW.* 10 July 2020, Consara Pty Ltd, (Consara 2020a); and
- *Long Term Environment Management Plan Maritime Facility, Northern Part of 5-11 Bank Street, Pyrmont NSW.* 10 July 2020, Consara Pty Ltd, (Consara 2020b).

In addition, JBS&G has previously prepared the following reports for the broader Blackwattle Bay site which includes the current site:

- *Preliminary Site Investigation, Bays Precinct*. October 2014, JBS&G Australia Pty Ltd, Rev 1 (JBS&G 2014);
- *The Bays Precinct Urban Transformation Area – Environmental Site Assessment,* 18 November 2015, JBS&G Australia Pty Ltd, Rev 1 (JBS&G 2015);
- *Environmental Site Assessment, the Sydney Fish Market, Corner of Pyrmont Bridge Road and Bank Street, Pyrmont, NSW*. JBS&G, 17 July 2019 (JBS&G 2019a);

- *Environmental Site Assessment, Blackwattle Bay Study Area*, 12 January 2021, JBS&G Australia Pty Ltd, Rev 3 (JBS&G 2021a);
- *Site Wide Remedial Concept Plan, Blackwattle Bay Study Area*, JBS&G Australia Pty Ltd, Rev 3, 12 January 2021 (JBS&G 2021b);
- *Bank Street Park, Detailed Site Investigation, 1A-19 Bank Street, Pyrmont NSW*, JBS&G Australia Pty Ltd, 64669/151,386 Rev 2, 26 October 2023 (JBS&G 2023a); and
- *Bank Street Park, Acid Sulfate Management Plan, 1A-19 Bank Street, Pyrmont, NSW,* JBS&G Australia Pty Ltd, 64669/153,913 Rev 1 - 26 October 2023 (JBS&G 2023b).

3.3 Summary of Previous Investigations

The following provides a summary of the information and site characterisation data presented within key assessment reports. These reports include both historical reviews and information relating to investigations conducted at that time within the subject site.

Comments in relation to contaminants of potential concern (COPC) are provided in the following text in relation to assessment criteria adopted at the time of report preparation. Sample locations completed during the previous investigations are shown on **Figure 3**.

It is noted that at the time of many of the previous investigations, NEPC (1999) and EPA (1994[14]) were the guidelines enforced which have since been updated to the *National Environment Protection (Assessment of Site Contamination) Measure* (ASC NEPM) (NEPC 2013[15]). During the pre-2013 investigations, petroleum based hydrocarbons were reported as total petroleum hydrocarbons (TPH) and compared against EPA (1994) criteria, however; with the updated guidelines (NEPM 2013), petroleum based hydrocarbons are now also reported as TRH (comprising different carbon chain links) with guidelines available for TRH. On this basis, the results from the previous investigations were compared against the criteria in force (NEPM 2013), while still considering EPA (1994) for TPH reported impacts. Reference to adopted site assessment criteria as derived from NEPM (2013) is further discussed in **Section 7.4** of the RAP.

It should also be further noted that development works completed subsequent to previous investigations, including but not necessarily limited to those within the Consara (2021a) site boundary, may have resulted in changes to the location and extent of site contamination as reported in these documents. As such, whilst the information is presented and discussed with regard to development of the conceptual site model (CSM) of site contamination conditions, further investigation is required to confirm the current status of site conditions.

Reports from the broader Blackwattle Bay Precinct have been included with discussion focused on sediment assessment within Blackwattle Bay. The reports conveyed consistent conclusions identifying sediments within the Bay to be impacted variously with heavy metals, PAHs, TPH/TRH and some tributyl tin (TBT). In addition, sediments within the Bay were considered to comprise PASS and should be treated as such in the case of works resulting in disturbance.

3.4 Review of Environmental Factors Pier Demolition (Umwelt 2008)

Umwelt prepared a Review of Environmental Factors (REF) to assess the potential environmental impacts of demolishing a pier at the Hymix concrete batching plant located at 41-45 Bank Street Pyrmont. The report discussed a marine sediment contamination assessment conducted by Douglas

[14] *Contaminated Sites: Guidelines for Assessing Service Station Sites*. NSW EPA 1994 (EPA 1994).
[15] *National Environment Protection (Assessment of Site Contamination) Measure 1999*. As compiled 16 May 2013 National Environment Protection Council (NEPC 2013)

Partners Pty Ltd (DP 2008[16]) which comprised collection of five sediment samples from within the footprint of the pier and five additional samples from the surrounding areas of Blackwattle Bay.

Samples were collected via insertion of PVC tubes into the sediment by commercial divers to a depth of approximately 0.3 m below the sediment bed. The surface material typically comprised dark grey silty sand and sandy silt material. Some clay material and organic material was present in a number of locations, whilst those closest to the shoreline identified gravel inclusions.

A number of contaminants (heavy metals, TRH and PAHs) were reported at elevated concentrations within the sediment samples which were considered to be representative of background concentrations in sediments across Blackwattle Bay and in the Port Jackson/Parramatta River system.

3.5 Blackwattle Bay Maritime Precinct Environmental Site Investigation (PB 2009)

This report prepared for Maritime NSW was completed for an area comprising the former coal loader and adjacent wharf, situated between the Hanson Concrete batching plant site and the Sydney Fish Markets at the southeastern extent of Blackwattle Bay. The site comprised a land portion of approximately 3422 m^2 formally identified as Lots 3 and 4 DP1064339 and an adjoining water portion of approximately 17 923 m^2 identified as Part Lot 107 DP1076596.

The scope of works included a desktop assessment of historical site use and review of previous assessment reports; a soil sampling program including 7 soil boreholes, installation of 3 monitoring wells and sediment sampling at 18 locations; laboratory analysis of selected samples and assessment of the investigation data.

Eighteen sediment samples were collected via either drop core or hand collected as surface sediment samples by a professional diver.

Various sediment samples were identified to have individual heavy metal concentrations, PAHs and TPH concentrations above the adopted criteria. In addition, TBT concentrations were reported above the nominated criteria for five surface sediment samples.

3.6 Soil Contamination Investigation (NAA 2010)

Noel Arnold & Associates (NAA) was engaged to conduct a soil contamination investigation at a portion of the site covering an area of approximately 10,000 m^2 (although sampling was limited to an area of approximately 1,600 m^2 in the middle of the site). The objective of the works was to evaluate potential contamination conditions with respect to planned redevelopment of the site to include a boat ramp (public open space).

The scope of works included eight test pit locations to a maximum of 1.3 m bgs; sampling of representative soil strata; a laboratory analysis program; data assessment and documentation of the assessment results. Selected soil samples were analysed for TPH, benzene, toluene, ethyl benzene and xylene (BTEX), heavy metals, volatile organic compounds (VOCs), PAHs and asbestos in soil.

The test pits locations as shown on **Figure 3** identified the presence of rubble/sand fill material with sandstone gravel and/or concrete rubble fill, roadbase gravel and subsurface asphalt pavements overlying sand/sandstone strata. No obvious signs of contamination were noted on the ground surface at the time of the inspection.

A summary of the reported sample laboratory analysis results compared against the updated criteria (NEPM 2013) are provided in **Table A2, Appendix A**.

[16] *Report on Marine Sediment Contamination Assessment – Hymix Wharf Blackwattle Bay, Pyrmont*. Douglas Partners Pty Ltd, June 2008, Ref: 45560 (DP 2008)

The laboratory analysis results identified elevated TPH (C_{10}-C_{36}) and PAH concentrations in fill material at several sampling locations. The PAH concentrations exceeded the adopted health and ecological criteria (NEPM 2013), while two samples reported TPH concentrations exceeding the EPA (1994) criteria (adopted at the time of investigation).

The elevated TPH results coincided with samples with the highest PAH concentrations, indicating the TPH may be attributable to PAHs rather than petroleum hydrocarbon impacts. These samples were all encountered at 0.3 m to 0.6 m bgs at the time of the investigation.

Heavy metals in soil concentrations were all less than the adopted site criteria whilst BTEX, VOC and asbestos concentrations in all analysed samples were less than the laboratory limit of reporting (LOR) and below the site assessment criteria.

Based on the results, NAA considered that management of the identified site contamination concerns would be required for the site to be considered suitable from a contamination viewpoint for use as a boat ramp (public open space). It was recommended that subsurface materials be excavated, sorted into building/demolition rubble, roadbase, sandstone fill etc. and characterised as suitable for on-site reuse, or otherwise disposed of from the site.

Given the reviewed report copy did not include detailed sample logs, laboratory sample receipt advice or chain of custody documentation (COCs). Further the field quality assurance/quality control (QA/QC) program was very limited. On this basis, JBS&G considers that the NAA (2010) data would be suitable to provide an overall understanding of site conditions, however, should not be solely relied upon in drawing conclusions with respect to land use suitability and/or requirements for remedial actions within the relevant site portion.

3.7 Preliminary Assessment Sydney Fish Markets Waterfront Redevelopment, 56-60 Pyrmont Bridge Rd, Pyrmont (EIS 2010)

This report documents a preliminary environmental site assessment for the proposed redevelopment of waterfront land at the Sydney Fish Markets site. The objectives of the investigation were to assess the potential for significant soil, sediment and groundwater contamination conditions and acid sulfate soils at the site in relation to the proposed land use and to provide a waste classification for potential off-site removal of excess soil.

Three sediment samples were collected from the site with elevated levels of heavy metals, PAHs, TPHs and TBT identified above the adopted criteria.

3.8 Limited Phase 2 Environmental Site Investigation (RCA 2011)

RCA was engaged to complete a limited phase 2 investigation of a parcel of land off Bank Street, Pyrmont beneath the Anzac Bridge overpass. This site incorporated the footprint of the previous NAA (2010) investigation, in addition to an extended area between Bank St and Blackwattle Bay to the south-east (outside the current site boundaries) comprising a total footprint of approximately 5,600 m^2 (this referenced site size is likely more defensible than the 10,000 m^2 noted by NAA given the inclusion of a referenced survey drawing). The objective of the works was to characterise the contamination status of the site prior to the commencement of earthworks to address due diligence and work health and safety (WH&S) purposes.

At the time of the field investigation the site had been divided into two sections comprising a construction compound for bridge maintenance activities in the north-west and storage/access for dragon boat users in the south-east. RCA indicated that the bridge maintenance contractors proposed to complete minor earthworks to re-grade the compound area, including adjustment of site levels and construction of a boat ramp.

The RCA scope of work included the installation of nine test pits, primarily to the south-east of the previous NAA investigation locations as shown in **Figure 3**, to provide for sampling of representative soil strata; a laboratory analysis program; data assessment; and documentation of the assessment

results. Selected soil samples were analysed for TRH, BTEX, heavy metals, PAHs and tributyl tin (TBT). In addition, one composite sample of surface soils was prepared and analysed for organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs).

The completed sampling locations generally extended only 0.3-0.4 m bgs and encountered fill material of clayey sand with concrete/tile/brick inclusions and gravels. Natural soil was reportedly identified in one sampling location extended through the fill material, with dark brown/black clayey sand soil encountered at a depth of 0.6 m bgs that extended to the completed test pit depth of 0.8 m bgs (JBS&G consider that this material is likely to be fill material rather than natural soil).

A summary of the reported sample laboratory analysis results is provided in **Table A2, Appendix A**. Review of the QA/QC assessment indicated that the data as summarised is suitable to be adequately reliable for the purposes of developing a conceptual site model and future remedial strategy for the broader site.

The laboratory analysis results identified TPH (C_{10}-C_{36}) and PAH concentrations in fill material at several sampling locations. The PAH concentrations exceeded the adopted health and ecological criteria (NEPM 2013), while two samples reported TPH concentrations exceeding the EPA (1994) criteria (adopted at the time of investigation). All individual heavy metals concentrations were less than the adopted site criteria, with the BTEX, TPH (C_6-C_9), OCPs, PCBs and TBT concentrations reported to be less than the laboratory LOR and less than the guidelines.

RCA recommended that capping of the impacted material be implemented to provide a complete exposure barrier between future site users and the impacted material such that the site could be considered suitable from a contamination viewpoint for the proposed use. In addition, a site environmental management plan (EMP) was recommended to address worker exposure during site activities.

JBS&G note that no evaluation of potential risks to the environment of the identified TPH/PAH impacted 'natural' soil, in particular to the adjoining Blackwattle Bay ecological receptor, was completed as part of this assessment.

3.9 Limited Phase 2 Investigation (E3C 2012a)

E3 Consulting (E3C) was engaged by NSW Roads and Maritime (RMS) to undertake a limited phase 2 investigation of a land parcel known as 5 Bank Street Pyrmont which comprised a portion of the current site. The reviewed report documents additional investigation works completed within the portion of land consistent with that identified and assessed in NAA (2010) and RCS (2011). The reported objective of the E3C works was to address data gaps from these previous site assessments to evaluate the potential need to complete remediation works such that the site could be considered suitable for the proposed recreational use and/or whether the contamination could be managed via implementation of a long term EMP.

At the time of the investigation activities, the site had been divided into two areas, the northern portion being a fenced off area in use as a construction compound for the Bridge Solutions Alliance (BSA) associated with maintenance of the Anzac Bridge. The southern portion of the site was undergoing construction works for the proposed use of the site as a dragon boat equipment storage and launch area.

The scope of this investigation included installation of three additional boreholes and their conversion into monitoring wells; sampling of soil and groundwater; and subsequent laboratory analysis for targeted contaminants of concern. Selected soil samples were analysed for TPHs, BTEX, PAHs and heavy metals and some were also analysed for OCPs and PCBs. Groundwater samples were analysed for TPH, BTEX, PAHs and heavy metals. Laboratory analysis results were compared with the previously adopted criteria (parks and public recreational open space, NEPC 1999) for soils

and Australian and New Zealand Environment and Conservation Council (ANZECC 2000[17]) ecological thresholds for groundwater. The completed sampling locations are presented in **Figure 3**.

The field investigation was reported to have encountered generally gravelly sand fill material with crushed sandstone gravel. At one location (BH1) in the south-east most site extent, 'black tar staining' and a slight petroleum hydrocarbon odour were noted. Gravelly sand fill material was identified to extend to depths of between 0.75 m to 4.05 m bgs. At several locations, some fragments of slag and tarry material were observed. Natural gravelly, clayey and silty sand soils underlay the fill material and were in turn underlain by sandstone bedrock. No staining or odours were noted in the natural soil/rock profile. No standing groundwater was observed by E3C at sampling location BH01 installed to a depth of approximately 3.3 m, whilst groundwater levels in BH03 closer to Blackwattle Bay were reported to be 1.833 m below well collar height. Standing water levels at BH02 adjacent to the Bank St boundary were reported at a depth of 2.281 m below well collar height.

A summary of the reported sample laboratory analysis results are provided in **Tables A2** and **D2, Appendix A**.

Review of the reported assessment indicated that the E3C (2012a) data as summarised is suitable to be adequately reliable for the purposes of developing a conceptual site model and future remedial strategy for the broader site.

E3C reported elevated concentrations of TPH (C_{10}-C_{36}) and PAHs in one soil sample collected from BH01 (0.5-0.7 m), consistent with the tar stained and odorous material. One fill material sample was reported to have arsenic and benzo(a)pyrene (b(a)p) concentrations above the adopted ecological criteria and lead and b(a)p toxic equivalency quotient (TEQ) concentrations above the adopted health criteria. Two other soil samples were reported to have B(a)P and B(a)P TEQ concentrations above the adopted ecological and health criteria, respectively. All other heavy metals, BTEX, OCPs and PCB concentrations were less than the adopted criteria.

A groundwater sample from one installed well was analysed for TPH, BTEX and PAHs with concentrations of these organic analytes reported to be less than the laboratory LOR and below the adopted criteria. Copper and zinc concentrations in groundwater were reported to exceed the adopted site assessment criteria, whilst the remaining individual heavy metals concentrations were below the LOR or the adopted assessment criteria.

E3C considered that the limited scope of groundwater assessment completed was inadequate to characterise site conditions. However, based on the scope of the collected data, the groundwater conditions were indicated to be typical of those in the urban environment and were considered to not pose an unacceptable impact to users of the site or adjoining Blackwattle Bay.

E3C reported that the soil assessment program identified results similar to those reported by RCA and NAA. The surficial fill material comprising gravelly silty sand with crushed sandstone and concrete was underlain by subsurface fill profile of 0.7 m to 4.05 m bgs. Whilst the subsurface fill material was identified as impacted with TPH, PAHs and b(a)p at one location and by b(a)p and PAHs more broadly across the site, the recent gravelly fill material surface profile was considered by E3C to provide a suitable capping mechanism for protecting site users from exposure. Based on the use of the site for dragon boat storage and launching, E3C considered the identified contaminant concentrations would not likely pose a risk of harm to the health of site users.

Based on the outcomes of the assessment, E3C considered that the site was suitable for continued use associated with the dragon boat club subject to implementation of a LTEMP to control and limit

[17] *Australian and New Zealand Guidelines for Fresh and Marine Waste Quality, Volume 1*, Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand, October 2000 (ANZECC 2000)

the exposure of site users to the underlying fill material. It was further noted that if a more sensitive land use was proposed, further assessment of potential risks to human health would be required to establish appropriate recommendations in relation to the specific site use.

3.10 Stage 1 Preliminary Site Investigation (E3C 2012b)

This report documented a preliminary site investigation completed for the property identified as 1 Bank Street, Pyrmont, located at the northern most extent of the current site. The site occupied an area of approximately 1,500 m^2. The objective of the work was to review current and former site activities to assess the potential for soil and/or groundwater contamination to be present at the site that would require further investigation.

The scope of works included a review of available historical records and a detailed site inspection. It was identified that three of the buildings were reported to have formerly been used as residences, one of which housed a former boat builder's workshop beneath the living area. One building was reported as formerly having been used as an abattoir whilst the last building was reported to have previously been used as an art studio/gallery. The buildings were assessed to have been constructed prior to 1961. A small boiler was identified in this building. One drainage pit was identified at the site, however there were no other UST/ASTs identified at the time of this investigation.

Potential areas of concern identified during the Stage 1 preliminary assessment included the presence of a collection pit of unknown historical use; a former boiler; the presence of oil or greases stored at the site; paint associated with the former use of one building; possible historical use of one building as an abattoir; possible historical use OCPs and organophosphate pesticides (OPPs) in pest control activities; possible use of hazardous materials in buildings currently and formerly at the site and the potential presence of fill material of unknown origin to generate current site levels.

E3C recommended that further assessment of potential contamination conditions be completed to evaluate the potential suitability of the site for future proposed uses and/or identify remediation and/or long term management requirements to make the site suitable for a future proposed use.

3.11 Phase 2 Environmental Site Assessment (Draft) (CDM 2012a)

This draft report documented an assessment of the property identified as 1 Bank Street, Pyrmont, located at the northern most extent of the current site. The site occupied an area of approximately 1500 m^2. The report copy provided for review comprised an incomplete draft. The objectives were reported to include an assessment of soil and groundwater quality at the site such that potential contamination could be identified and the need for further assessment/ management assessed. It was indicated that the site was being considered for future potential redevelopment for commercial/industrial and open space land uses.

CDM (previously E3C) indicated that a previous Phase 1 assessment (as discussed above) had identified the potential for site contamination as a result of historical use of the five existing buildings. As such, potential contaminating activities may have previously included the storage of oils/fuel, paint and possibly an abattoir/cooling room; hazardous building materials; and historical site filling activities.

The scope of work undertaken for the assessment included installation and sampling of seven boreholes and three monitoring wells located as shown in **Figure 3** with subsequent laboratory analysis of representative samples. Soil and groundwater samples were analysed for heavy metals, TRH, BTEX, PAHs, OCPs, PCBs, VOCs and semi VOCs (sVOCs), in addition to limited analysis for ammonia, nitrate and nitrite in surface soil samples.

A potential current/former UST location was identified in the central yard area of the site during this investigation with possible vents attached to the north-east most building wall.

Sampling locations identified fill material at the site extending to depths of up to 2.4 m bgs underlain by natural sand, sandy clay and sandstone bedrock. The fill material comprised silty sand, sand, silt

and gravel based fill material. Odorous soil conditions were identified in fill material at BH01 at depths of up to 1.5 m bgs, in near surface soils at BH02, and in natural sand soil in BH05 (3-3.8 m bgs), downgradient of the suspected UST location. Groundwater was at the time of the field works identified in the natural sand and weathered sandstone bedrock and was considered by E3C as likely to be influenced by tidal variation given the proximity of the adjoining bay.

A summary of the reported sample laboratory analysis results are provided in **Tables A2** and **D2, Appendix A**.

CDM indicated that data validation procedures employed in the assessment identified that the analytical data could be relied upon with respect to the project requirements. It is considered that the CDM (2012a) data as summarised herein is suitable to be adequately reliable for the purposes of developing a conceptual site model and future remedial strategy for the broader site.

TPH (C_{10}-C_{36}) concentrations in a number of analysed soil samples were reported to exceed the site assessment criterion (EPA 1994). Samples with elevated TPH were reported to have been collected from surface soils to depths of 3.5-3.8 m bgs. Lead, zinc, B(a)P and B(a)P TEQ concentrations were also reported to exceed the adopted health and ecological criteria at a number of locations.

All reported BTEX, PCB, VOC and sVOC (other than OCPs/PAHs) concentrations in soil were below the laboratory LOR and less than the adopted site criterion. Individual OCP concentrations in soil were less than the adopted site criteria for the respective compounds. It is noted that for several individual soil samples total PCB LORs were raised above the NEPM (2013) site assessment criteria as a result of matrix interference. All reported total PCBs were less than the resulting LORs.

Elevated concentrations of TPH (C_6-C_{36}) in groundwater were identified at MW5 (**Figure 3**). TPH concentrations in MW1 were less than the laboratory LOR, whilst MW2 was not analysed for TPH. BTEX and PAH compound concentrations in MW5 and MW1 were reported to be below the laboratory LOR. No significant concentrations of VOCs or sVOCs were identified in either sampled well. Copper, lead and zinc concentrations in groundwater also exceeded the adopted criteria at one sampling location.

Given the proximity of BH05/MW05 to the suspected UST, it was considered likely that the soil and groundwater impacts identified at this sampling location were associated with the present/former feature. Given the absence of volatile contaminants associated with the petroleum impact it was further considered that the impacts were associated with less mobile compounds (i.e. not petrol) or are weathered.

CDM recommended that should hardstand pavements remain at the site, the identified impacts and potential risks to human health and the environment be appropriately managed via a long term EMP. However, where a more sensitive land use was contemplated, identified impacts would require further consideration and potentially remediation.

3.12 Long-term Environmental Management Plan (CDM 2012b)

CDM (formerly E3C) prepared a long term EMP document for approximately 9,000 m^2 of land beneath the Anzac Bridge overpass known as 5 Bank St Pyrmont, parts of which had formerly been the subject of site contamination investigation activities as documented in NAA (2010), RCA (2011) and E3C (2012a) as discussed above.

The purpose of the long term EMP was to identify requirements for the control and limitation of site user exposure to the contaminated and potentially contaminated fill material at the site. CDM assumed the presence of PAH and heavy fraction petroleum hydrocarbon concentration in fill materials that exceed adopted health-based investigation levels for recreational land uses. Groundwater was considered by CDM to be typical of that encountered within an urban environment and are not considered to pose an unacceptable impact to users of the site.

The LTEMP identified that the hardstand surface and grassed/landscaped areas were required to be maintained such that site users are not exposed to the underlying contaminated fill material. In the event that works are required that disturb the ground surface, appropriate protocols as addressed in the LTEMP should be implemented such that workers and members of the public are not unacceptably exposed to the contaminated material.

3.13 Validation Report (Consara 2020a)

Consara prepared a validation report for approximately 3,600 m^2 of land comprising the central portion of the current site. The validation report was prepared to document the works undertaken to implement a RAP prepared by SLR Consulting Australia Pty Ltd (SLR 2015[18]) which has not been sighted by JBS&G, and the addendum to the remediation action plan (ARAP, Consara 2018[19]) (also not sighted) in relation to the identified and potential contamination within the site as documented in previous investigations (**Sections 3.6 and 3.8** to **3.12**). Site development and associated validation works reported to have been conducted comprised the following:

- Excavation of soils to a depth ranging between 0.2 and 1.5 m bgs to allow the installation of underground services and to create a new surface on which the new surface treatments were installed;
- A cut and fill program which was required as part of the redevelopment of the site, which also dictated the containment of the contaminated material onsite;
- Sampling of approximately 300 m^3 of stockpiled material resulting from the cut and fill program and analysis for a range of COPC to characterise the material for on-site retention or off-site disposal. These works identified concentrations of some PAHs in a limited number of samples that were above the adopted assessment criteria. In addition, bonded asbestos containing material (ACM) was identified within the stockpile fill material. All other COPC were reported below the adopted assessment criteria;
- Surplus soils which required offsite disposal accounted for 1621.76 tonnes and was classified in accordance with the *NSW EPA Waste Classification Guidelines* (EPA 2014[20]) with all material disposed of from the site as general solid waste (GSW, non putrescible);
- Soils contaminated with PAHs and bonded ACM retained onsite were covered with a marker layer (geofabric) and capped with hardstand (concrete, asphalt, pavements, roadways) and with imported material that was characterised to be suitable for onsite use within landscaped areas; and
- A survey plan was provided of the location and extent of capped material showing the capping thickness achieved ranged between 282 mm and 606 mm within landscaped areas.

Following the validation works, Consara considered that the remediation and validation works required by the RAP and the ARAP were successfully implemented on the site such that the remedial objectives were achieved, and the site was suitable for commercial/industrial and open space/recreational land uses, subject to the implementation of a long term environment management plan (LTEMP).

3.14 Long Term Environment Management Plan (Consara 2020b)

Consara prepared a LTEMP document for the land comprising the central portion of the current site as discussed above to set out the requirements for the management of the potential risks to human

[18] *Remedial Action Plan, Sydney Heritage Fleet Base, Bank Street Pyrmont*. 23 April 2015, SLR Consulting Australia Pty Ltd (SLR 2015)
[19] *Addendum to Remediation Action Plan, Maritime Facility, 5-11 Bank Street Pyrmont NSW*. Consara Pty Ltd, 10 September 2018 (Consara 2018)
[20] *Waste Classification Guidelines, NSW EPA*, November 2014 (EPA 2014)

health associated with the presence and potential presence of contamination in fill materials in the subsurface of the northern part of 5-11 Bank Street (site).

The purpose of the LTEMP was to identify requirements for the control and limitation of site user exposure to the contaminated and potentially contaminated fill material at the site. PAH contamination was identified within fill across the site and asbestos impacts were noted within fill materials limited to the northeastern site portion. Consara also considered the potential for fill material to be present within the subsurface contaminated with petroleum hydrocarbons and/or heavy metals.

The LTEMP identified that the hardstand surface and grassed/landscaped areas were required to be maintained such that site users are not exposed to the underlying contaminated fill material. In the event that works are required that disturb the ground surface, appropriate protocols as addressed in the LTEMP should be implemented such that workers and members of the public are not unacceptably exposed to the contaminated material.

JBS&G notes that a Site Audit Statement (SAS) was issued to that portion following submission of the validation report and LTEMP. The extent of the capped area and areas covered by marker layer are presented in **Figure 2B.**

3.15 Preliminary Site Investigation, Bays Precinct (JBS&G 2014)

JBS&G was engaged by UrbanGrowth NSW (UGNSW) to complete a phase 1 preliminary site investigation covering all seven Precincts of the Bays Precinct site (including Blackwattle Bay, White Bay Power Station, Rozelle Rail Yards, Rozelle Bay, Glebe Island, White Bay and Wentworth Park) to commence a staged site contamination evaluation process.

It was understood that the evaluation would contribute to a UGNSW driven concept plan for rezoning and future mixed use redevelopment of under-utilised foreshore land for mixed purposes. No surface or sub-surface intrusive investigations were undertaken for this assessment.

The objective of the Phase 1 assessment was to identify and document the potential for contamination concerns at the site based on available historical and current site use information in conjunction with available previous investigation information as available at the time of the engagement.

The outcomes of the phase 1 assessment included a CSM which identified: known and potential sources of impact and constituents of potential concern including the mechanism(s) of impact; potentially affected media (soil, sediment, groundwater, surface water, indoor air and ambient air); human and ecological receptors; potential and complete exposure pathways; and potential preferential pathways for migration. For the Blackwattle Bay (specifically the site) portion, the outcomes of this investigation were discussed in the DSI (JBS&G 2023a).

3.16 Environmental Site Assessment – Bays Precinct (JBS&G 2015)

JBS&G was engaged by UrbanGrowth NSW (UGNSW) to complete a range of site contamination activities, inclusive of review of existing available reports and targeted supplementary assessment to provide a basis for preparation of a Site Wide Remedial Concept Plan (SWRCP) document as per the adopted UGNSW Management Strategy for Impacted Land within the Bays Precinct. The investigation covered all seven Precincts of the Bays Precinct site (including Blackwattle Bay, White Bay Power Station, Rozelle Rail Yards, Rozelle Bay, Glebe Island, White Bay and Wentworth Park).

The broadscale investigation works were part of a staged strategy designed to result in the delivery of a SWRCP to support the future rezoning application for the Bays Precinct Urban Transformation Program.

The scope of work comprised: implementation of a targeted site investigation program including soil, groundwater, soil vapour, landfill gas and acid sulfate soil sampling as per an approved Sampling

Analysis and Quality Plan (SAQP); comparison of levels of environmental constituents against relevant guidelines; and preparation of the ESA report.

The soil sampling program comprised the collection of soil samples from boreholes advanced by push tube at nine locations within the Blackwattle Bay Study Area, with sampling and subsequent analysis of representative samples for identified COPCs from all locations and sampling/analysis for ASS characterisation at one location. Assessment of groundwater conditions comprised the installation of two new groundwater monitoring wells and sampling/ analysis of the 2 new wells in addition to 6 existing monitoring wells. Soil vapour assessment was also completed at 6 locations.

Fill material was identified underlying ground levels within the Blackwattle Bay Study Area to depths ranging between 1 m to 4 m bgs. The fill typically comprised gravelly sand and crushed sandstone with inclusions of sandstone, brick, ash, wood, metal, glass and concrete. The fill observed in this precinct was underlain by natural sand/clayey sand material and sandstone. Fill material consistent with a black coal tar type substance was noted at sampling location HHBH04 at a depth of approximately 3.0 m bgs (concrete batching plant site). Other than this location, there was no significant evidence of staining observed within the soil/fill profile during the field works, However, hydrocarbon odours were noted in fill and residual soils at sampling locations within the Fish Market portion in proximity to the identified UST locations.

Groundwater was grey-brown and ranged from clear to moderately turbid. Hydrocarbon odours and a sheen were present in groundwater at a number of locations within the Fish Markets site. However, field evaluation did not identify the presence of measurable non-aqueous phase liquid (NAPL) at any of the sampled monitoring wells. Standing groundwater levels were between 1.075 m bgs and 3.549 m bgs at the 8 sampled locations within the Blackwattle Bay Study Area.

Whilst no detections of methane gas were identified, low concentrations of carbon dioxide were identified in a number of the gas monitoring wells. In accordance with the EPA (2012[21]) methodology, a gas screening value (GSV) of 0.021 L/h CO2 was adopted as worst case for the Precinct. This GSV value falls within 'characteristic gas situation 2', comprising low risk conditions.

Laboratory analysis results for soil identified the presence of TRH >C_{10}-C_{16} at two sampling locations exceeding the adopted criteria in localised fill material and natural soils adjacent to the USTs at the Fish Markets. Elevated levels of b(a)p and benzene were also detected at a number of groundwater sampling locations within the existing Fish Markets site, when considered against the adopted site assessment criteria. Limited characterisation of natural soils was also completed, which confirmed the occurrence of potential ASS conditions above the ASSMAC (1998[22]) trigger values.

The report concluded the following with regard to the broad Blackwattle Bay Study Area:

- Significant widespread soil contamination conditions were not identified at soil sampling locations. However, the assessment confirmed specific areas where contaminant concentrations in soil will require further consideration, in conjunction with other existing site soil characterisation data in relation to the suitability of these areas for future uses.
- Investigation of groundwater did not identify significant widespread contaminant conditions at the implemented sampling locations. However, as with the soil conditions, groundwater characteristics at a number of locations will require further evaluation in conjunction with existing groundwater data to evaluate the need for ongoing monitoring and/or management of groundwater conditions.
- Volatile contaminant concentrations in soil, soil vapour and groundwater samples analysed for specific locations within the Blackwattle Bay Study Area did not identify indications of

[21] *Guideline for the Assessment and Management of Sites Impacted by Hazardous Ground Gases*, NSW EPA 2012 (EPA 2012)
[22] *Acid Sulfate Soil Manual*, New South Wales Acid Sulfate Management Advisory Committee, August 1998 (ASSMAC 1998)

significant widespread volatile contaminant impacts that may be indicative of an unacceptable risk to human health in relation to the current or future potential land uses.

- The potential for ground gas conditions was assessed at investigation groundwater monitoring wells using a landfill gas meter. Based on the recorded field data, a conservative estimate of the Gas Screening Value (GSV) places conditions within the characteristic gas situation 2 category. As such, further assessment of potential ground gas conditions should be completed as part of future detailed site assessment activities where buildings and/or other infrastructure are proposed to be constructed.
- Limited sampling and assessment of alluvial soil conditions confirmed the occurrence of potential ASS (PASS) conditions that will require further consideration and where required, development and implementation of acid sulfate soil management measures during future disturbance of the alluvial soils.

The report recommended that the investigation data presented in this document be further evaluated in combination with the existing site contamination investigation data identified to be of suitable quality such that broader decisions could be made with respect to the potential requirements for management and/or remediation future development areas across the broader Precinct. Subsequent to the outcomes of this evaluation, it was anticipated that sufficient site characterisation information was available to support the development of a high level strategy for future management of contamination risks at the site.

3.17 Environmental Site Assessment, new Sydney Fish Market Site JBS&G (2019)

JBS&G was engaged to prepare a site contamination assessment to support the proposed new Fish Market site development application. The site was located at the head of Blackwattle Bay between the Pyrmont Peninsula and the foreshore of Glebe. The site is legally identified as Lots 3-5 in DP 1064339, part Lot 107 in DP 1076596 and part Lot 1 in DP835794 totalling an approx. 3.7 Ha, of which 0.7 Ha consists of land based areas above the high water mark.

The report identified that heavy metal, PAH and TRH contaminated sediments have been identified within the extent of the development site that were reported to exceed both low and high trigger value sediment quality guidelines protective of ecological communities. UNSW (2017[23]) further reported sediments within Blackwattle Bay had significant metal and nutrient contamination that were indicative of highly disturbed conditions.

3.18 Environmental Site Assessment – Blackwattle Bay (JBS&G 2021a)

JBS&G was engaged by Infrastructure NSW (INSW) to complete an Environmental Site Assessment (ESA) for the properties comprising the Blackwattle Bay Precinct which included individual properties along Bridge Road and Bank Street in addition to the Blackwattle Bay water. The ESA was required to assist with the State Significant Precinct (SSP) Study requirements.

The ESA aimed to complete a broad-scale assessment of contamination within the Blackwattle Bay Study Area, where individual lots will be subject to future redevelopment and as required, identify requirements for additional detailed contamination assessments and/or remediation.

The scope of work undertaken for this assessment included: a desktop review of site contamination and geotechnical investigation reports as available; a review of historical site use information and regional environmental information to identify areas of potential environmental concern (APECs) and associated COPCs; and development and documentation of a CSM based on the available information with consideration to the future redevelopment scenarios.

[23] *Baseline Assessment of Ecological Structure and Environmental Conditions at the Bays Precinct*, University of New South Wales, March 2017 (UNSW 2017)

For the Blackwattle Bay (specifically the site) portion, the outcomes of this investigation the outcomes of this investigation were discussed in the DSI (JBS&G 2023a).

3.19 Site Wide Remedial Concept Plan – Blackwattle Bay Study Area (SWRCP, JBS&G 2021b)

JBS&G was engaged by INSW to prepare a SWRCP for the properties that comprise the Blackwattle Bay Study Area (including the site) to assist with the SSP Study requirements to establish a suitable framework for management of potentially contaminated media at the site in order to facilitate the staged redevelopment of the Blackwattle Bay Study Area.

The SWRCP identified strategies and remedial/management options to address identified and suspected environmental (site contamination) impacts present at the site such that all areas of the site may be considered suitable for the proposed permissible land use(s) prior to future uses.

The SWRCP concluded that the Blackwattle Bay Study Area can be made suitable for the range of intended uses as proposed and that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment. Further it was recommended that the processes outlined in the SWRCP be implemented and that a REMP, WHSP in addition to the area specific RAPs be developed to ensure the risks and impacts during remediation works were controlled in an appropriate manner.

In addition, following the completion of remedial works it was recommended that validation report(s) and on-going EMP(s) for residual impacted materials as may be retained beneath the specific area footprints would be required to be submitted to the consent authority documenting that the applicable footprint is considered suitable for the proposed use(s), subject (where applicable) to implementation of the relevant ongoing EMP.

3.20 Detailed Site Investigation (JBS&G 2023a)

JBS&G conducted a DSI across the site (11 of the 13 lots) with the scope of work comprising a desktop review, detailed site investigation including the implementation of 15 sampling locations, subsequent laboratory analysis of representative soil and groundwater samples for COPC, data evaluation and preparation of the DSI report presenting the outcomes of the investigation. Further characterisation of potential ASS conditions was also undertaken during this investigation.

Based on the results of the investigation it was concluded that:

- The investigation included the implementation of 15 soil sampling locations and sampling of four existing groundwater wells to facilitate analysis of selected representative soil and groundwater samples undertaken for a broad range of COPCs identified in the CSM including heavy metals, PAHs, TRH/BTEX, OCPs, PCBs, VOCs, PFAS and asbestos. With consideration to the adopted site assessment criteria, the following conditions were identified that will require to be managed from a health and/or ecological risk viewpoint with regard to the suitability of the site for the proposed land use:
    - The presence of AF/FA/ACM contaminated soils at one sampling location (BH01 0.0-0.4), that represents a potentially unacceptable risk to future site users under a long term land use exposure scenario, unless subject to remediation and/or management;
    - The presence of trace level AF/FA impacts in fill material at two sampling locations (BH05 and BH09). Whilst not currently constituting an exceedance of the applicable long term land use exposure site assessment criteria, management of these materials would be required to ensure workplace exposure hazards during and following development of the site to ensure that there are no unacceptable asbestos exposures to site workers, nor asbestos present on the site surface following redevelopment;

- Fill material contaminated with lead and PAHs (carcinogenic and total PAHs) was distributed across the broader site with contaminant concentrations exceeding the adopted health based criteria posing an unacceptable risk to future site users under a under a long term land use exposure scenario, unless subject to remediation and/or management;
- Fill material was also observed to be impacted with copper, lead, zinc, TRHs and B(a)P exceeding the adopted ecological based criteria broadly across the site and as such management of the fill material would require consideration with regard to proposed remediation requirements;
- Perfluorooctanesulfonic acid (PFOS) in groundwater concentrations were identified at the four current groundwater monitoring locations being reported at levels above the most sensitive 99 % criterion for ecological protection[24] at all locations. The PFOS concentration in groundwater at one location was reported in exceedance of the less sensitive 95% ecological protection criterion. All PFAS compound concentrations were less than the adopted health based recreational exposure criterion. Given the limited data set, further assessment of the potential nature and extent of PFOS in groundwater in this portion of the site was recommended prior to final decisions with regard to management requirements; and

- In addition to the PFOS in groundwater, copper, lead and zinc in groundwater were also considered to be elevated with regard to the generic site assessment criteria. The concentrations were considered to most likely reflect urban background conditions within the site setting, however further consideration of contaminant migration to groundwater was recommended with consideration to the management of heavy metal contaminated fill material at the site (as discussed above).
- Alluvial/marine soils present at depth in proximity of the Blackwattle Bay site boundary were assessed as PASS material. Given the potential or site development works to result in disturbance of such materials, development of an ASSMP to support the development proposal was recommended;
- The potential presence of a UST and associated fuel lines in the northern site portion was also identified to require further consideration. Whilst significant soil impact had not been identified as associated with this potential infrastructure during investigations to date, the UST remains a potential contamination source, if present, and as such would require decommissioning and removal during site preparation activities to ensure that no minor areas of inground impact occur within these areas of the site;
- In the short term, it was recommended that the presence of asbestos in soil at the site be identified via inclusion of the conditions in the site Asbestos Register incorporated into the existing site Asbestos Management Plan (AMP) in accordance with WHS Regulations such that potential occupational exposure scenarios may be appropriately addressed during maintenance of the site in its current state;
- No other potentially unacceptable risks to future site users from contamination conditions were identified at the site during this assessment;
- No evidence of background contamination of site soils was identified;
- No potential issues resulting from chemical mixtures were identified at the site;

[24] *PFAS National Environmental Management Plan Version 2.0, January 2020*. National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (HEPA, NEMP 2.0, 2020)

- With consideration of the proposed land uses, and observations made during the investigation, aesthetic issues other than the presence of ACM within soil and the hydrocarbon odours at BH16 were not identified at the site; and
- It was considered that the site could be made suitable for the proposed public open space land use comprising a public park and community facility subject to preparation and successful implementation of an appropriate RAP to address the areas of concern as outlined above.

Based on the conclusions of the investigation it was recommended that:

- Management of the identified asbestos and chemical contamination in fill material be identified via preparation and implementation of a RAP to be prepared in conjunction with design of the site redevelopment;
- In the meantime, appropriate site management procedures should be implemented via update of the site AMP/asbestos register to ensure occupational exposure risks are appropriately managed during any/all activities that result in ground surface disturbance;
- Management of the identified PASS occur via preparation and future implementation of an ASSMP specific to the proposed development works; and
- During development of the site, a construction environmental management plan (CEMP) be prepared (in conjunction with the RAP), which incorporates an unexpected finds protocol (UFP) to address any unexpected contamination and/or ASS conditions encountered during development of the site.

3.21 Acid Sulfate Soil Management Plan (JBS&G 2023b)

JBS&G prepared an ASSMP for the site with consideration to the requirements of Section 15 within the SEARs and with consideration to the National Acid Sulfate Soils Guidance (DAWR 2018[25]).

Based on the previous investigation findings and advice provided (JBS&G 2023a), an ASSMP was prepared to document appropriate procedures during development works and implementation of management controls, where PASS material is identified within the excavation envelope.

The proposed development works will generally be completed above the existing water table (sitting at approximately 1.6-3.4 m bgs), with limited excavations potentially extending past the water table anticipated to a maximum depth of 2.5 m bgs. It is anticipated that works that may disturb ASS are likely to be limited to activities in proximity of the foreshore boundary, or activities that result in lowering of the groundwater table in these areas of the site, would require to be completed under the oversight of the ASSMP. These may include the removal of existing site infrastructure, excavation/installation of footings, fixtures and foundations including new foreshore walk infrastructure, and installation of underground services, all of which may require the excavation or otherwise disturbance of fill material and natural soils that may comprise PASS.

Subject to design of the detailed construction methodology, it was anticipated that in areas where PASS material may be disturbed, either such material is presumed to comprise PASS, or further investigation is completed in advance of the disturbance works. PASS material that is subsequently disturbed will be treated with neutralising agent (lime) in a controlled manner. Once successfully neutralised the material will either be reinstated within the site, or alternatively disposed of in accordance with EPA (2014) requirements as outlined in the ASSMP.

[25] *National Acid Sulfate Soil Guidance*. Australian Government Department of Agriculture and Water Resources (DAWR), June 2018 (AGDAW, 2018)

4. Contamination Status

4.1 General

Environmental data as abstracted from previous investigations (NAA 2010, RCA 2011, E3C 2012a and CDM 2012a) and JBS&G (2023a) are provided as **Appendix A**. Concentrations of COPCs have been screened against human health and ecological criteria adopted to assess the potential for contamination risks based on the proposed public open space land use scenario.

The following sections present a Conceptual Site Model (CSM) for the site prior to the commencement of remediation. The purpose of the CSM is to identify potentially complete source-pathway-receptor linkages at the site such that an informed assessment of potential remedial options can be made. **Figure 8** presents the identified areas of environmental concern (AECs) following the intrusive investigation works presented in JBS&G (2023a) which have been adopted based on the age of the remaining data and uncertainty as to potential ground disturbance during activities in the intervening period.

In addition, previous investigations as discussed in **Section 3** were considered for the development of the CSM with regards to sediments within the broader site area.

4.1.1 Source of Contamination

Sources of contamination exist at the site as reported in JBS&G (2023a). Identified sources include:

- Placed fill and reclaimed land areas across the site reported to variously contain ACM/AF/FA, elevated levels of copper, lead, zinc, PAHs, TRH and inclusions of coal, ash and slag.
- Current and former industrial areas including petroleum product storage, marine repairs/equipment storage, creative industries (art studio/workshop), abattoir, waste storage/transporting, shipping, etc;
- Suspected current and former petroleum based storage and dispensing facilities;
- Known impacted material contained onsite;
- Natural and fill soils comprising PASS/ASS; and
- Blackwattle Bay sediments.

4.1.2 Affected Media

The available environmental data indicates that fill material across the site is contaminated. Soil media has been identified to variously contain bonded and friable asbestos, copper, lead, zinc, TRH, B(a)P, and B(a)P TEQ, in addition to some fill and natural soils which comprised PASS. Furthermore, groundwater was reported to be impacted with PFOS. Exceedances of the adopted site assessment criteria in representative analysed samples are shown on **Figures 6A, 6B** and **7**. Each of the affected areas are discussed following:

- Bonded and friable asbestos in fill material at one sampling location (BH01, JBS&G 2023a) exceeded the human health criteria from ground surface to 0.4 m bgs;
- AF/FA in three samples (BH05_0.2-1.2, BH05_1.2-2.2 and BH09_0-0.3) at two sampling locations (BH05 and BH09) within surface soils and fill materials were also an aesthetic impact and will require management under workplace health and safety regulations even though the concentrations do not exceed the long term health based assessment criteria for the nominated landuse scenario;
- The presence of aesthetic issues comprising hydrocarbon odours in fill material at one soil sampling location (BH16);

- Fill material at the site exceeded the health adopted criteria for lead and PAHs (carcinogenic and total PAHs) across multiple sample locations;
- Fill material at the site exceeded the adopted ecological criteria for copper, lead, zinc, TRH and B(a)P across multiple sample locations;
- Fill material within 5-11 Bank Street is impacted with PAHs and asbestos and has been contained within that parcel of land (Consara 2020a and 2020b);
- PFOS concentrations in groundwater were reported at the four groundwater monitoring locations sampled as part of the JBS&G (2023a) investigation at levels above the most sensitive 99 % criterion for ecological protection at all locations with one location exceeding the less sensitive 95% criterion for ecological protection;
- TRH/TPH was reported in one groundwater monitoring well (MW05) in two rounds of sampling (JBS&G 2023a and CDM 2012a) below the criteria but above the LOR, and will likely require management should dewatering be proposed; and
- The potential presence of a UST and associated fuel lines was identified in the courtyard at the northern portion (1A-3 Bank St) of the site which will require decommissioning and removal if present. The approximate location of the UST is shown on **Figure 2B**. The location of the tank was inferred, based on previous recorded observations of two vents and a distinct patch of concrete, with a length of approximately 3 m and width of approximately 2 m. These dimensions represent an inferred tank of approximately 10,000 L capacity.

In addition, as discussed in **Sections 2.8** and **3.16**, an acid sulfate soil assessment of fill and natural soils at the site was conducted. The assessment identified fill soils comprising black sand and brown clayey gravelly sand at BH12 (**Figure 5**), fill soils comprising dark brown/black clayey sand at BH07 and natural soils comprising brown gravelly sand at BH04 to comprise PASS which will require management if disturbed. Should the proposed design plans (**Figure 4**) result in requirements for excavation works through the identified PASS soils, management measures will primarily comprise controlling the potential acid generation of ASS/PASS material once excavated by appropriately managing the soils in accordance with a separate ASSMP (JBS&G 2023b).

Furthermore, as discussed in **Section 3,** sediments within Blackwattle Bay were noted to be impacted with heavy metals, TRH/TPH, PAHs and TBT with concentrations considered reflective of conditions throughout the extent of Blackwattle Bay as a result of historical industrial activities along the foreshore of the Bay. In addition, surface water is also considered to be potentially impacted with COPCs identified on Site (JBS&G 2023a) and in sediments.

The presence of ASS/PASS at the site is considered to be a contaminated land/site suitability issue given the occurrence of ASS/PASS in fill soils and natural soils rather than natural materials. The presence of ASS/PASS also represents a construction and waste management issue that should also be managed via implementation of the requirements of the ASSMP in addition to this RAP.

4.1.3 Human and Ecological Receptors

The primary human receptors of concern are future site visitors. Other potential receptors will include construction workers during the site redevelopment, and potential future sub-surface intrusive / maintenance workers.

Potential ecological receptors within the assessment area and the broader site include existing and/or future flora and fauna species established within the assessment area and Blackwattle Bay under the proposed land-use scenario. Off-site ecological receptors may potentially be impacted by surface/groundwater and windblown dusts discharged from the site, including those associated with Blackwattle Bay.

4.1.4 Potential Exposure Pathways

Based on the COPCs identified in various media as discussed above, the exposure pathways for the site include:

- Potential inhalation of airborne asbestos fibres and/or impacted dust particles during site redevelopment activities and future use of the site as associated with inground disturbance;
- Potential dermal contact with and ingestion of impacted soils/sediments present at shallow depths, and/or accessible by future excavations, particularly during development activities;
- Potential inhalation exposure to vapours migrating upward and laterally from fill material, as may occur during redevelopment activities and/or intrusion into the inground services etc;
- Potential inhalation exposure to vapours during site redevelopment activities;
- Potential dermal contact with and ingestion of impacted groundwater during redevelopment activities; and/or
- Onsite ecological receptors in vegetated areas of the site and the Bay and situated downgradient of the site via migration of contaminants to the broader Blackwattle Bay.

4.1.5 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gases.

Man-made preferential pathways at the site are limited to fill materials, including contained contaminated fill, sub-surface services and infrastructure (present and former) in which it is anticipated that the materials will have a high permeability, where present. Where environmental impact (particularly in liquid or gaseous form) is observed within fill materials, further consideration to the potential migration of these impacts will be required.

Natural preferential pathways are likely limited to natural lithological borders, such as between porous soils and bedrock, where infiltrating groundwater is vertically confined and begins to migrate laterally. Where environmental impact is observed within surface soils or surface water, in proximity of the drainage line, further consideration to the potential migration of these impacts will be required.

4.2 Data Gaps

It is considered that, based on the current site knowledge, an appropriate density of data has been completed to adequately characterise site contamination and facilitate broad decisions with regard to requirements for remediation to enable the site to be made suitable for the proposed development.

However, it is identified that there are a number of site contamination characteristics for which additional data is required to finalise the extent of remediation required specifically in these areas of the site. As such, it is anticipated that further targeted investigation will be undertaken upon finalisation of the development plans and when building footprints are accessible, to address the following data gaps:

- Potential presence of an on-site PFOS source (as opposed to variation in groundwater PFOS conditions migrating onto the site from an upgradient source) in the northern portion (1A-3 Bank St) of the site; and
- Potential presence of leachable heavy metal impacted fill material at BH05_0.2-0.3 (JBS&G 2023a) and across the site such that the fill material is considered unsuitable to be retained under a cap and containment remedial strategy.

In both instances, the identified data gaps relate to the potential presence of fill material contaminant characteristics that may contribute to groundwater impacts identified at the site. As such, where conditions are identified in fill/soil at the site, this will drive remediation requirements to address the potential contaminant migration source. In the event that such conditions are not identified, it is anticipated that materials the subject of the data gap assessment may be managed consistent with the balance of the fill material at the site.

In addition, as mentioned in **Section 4**, sediments within the broader Blackwattle Bay have previously been identified to be impacted with heavy metals, TPH/TRH, PAHs and TBT. The assessments concluded that the reported concentrations were considered representative of background concentrations in sediments across Blackwattle Bay and in the Port Jackson/Parramatta River system. On this basis, and considering the proposed redevelopment works across the site which will involve only limited disturbance of sediments, JBS&G does not consider sediment sampling to be required as part of the Data Gap Assessment (DGA) to establish site suitability. However, should the proposed construction works result in the generation of sediment material requiring off-site disposal and/or relocation within the broader site, characterisation sampling/analysis of such material will be undertaken as per **Table 7.3** and included in the validation report.

If significant unexpected/additional environmental impact is identified during remedial activities, a range of remediation options available for the site are detailed in **Section 5**, with a contingency plan and unexpected finds protocol outlined in **Section 8**. If significant additional impact is identified, these options may be re-evaluated to determine the most appropriate option for the impacted media.

5. Remedial Options

5.1 Remediation Objectives

The remediation objectives are outlined as follows:

- Remove or manage contamination sources and potentially unacceptable human health, ecological and aesthetic issues for the public open space as proposed for the site;
- Decommissioning and removal of the potential UST and associated infrastructure, if found to be present;
- Ensure unexpected contamination finds are assessed, managed and validated appropriately for the proposed land use;
- Validate the remedial works in accordance with relevant NSW EPA guidelines and with reference to the site-specific validation assessment criteria; and
- Document the validation process.

The RAP has been prepared with reference to the following guidelines:

- *State Environmental Planning Policy (Resilience and* Hazards) *2021*;
- *Contaminated Land Guidelines, Sampling Design part 1 – Application*, NSW EPA, 2022 (EPA, 2022a);
- *Contaminated Land Guidelines, Sampling Design part 2 – Interpretation*, NSW EPA, 2022 (EPA, 2022b);
- *Contaminated Land Management: Consultants Reporting on Contaminated Land*, NSW EPA, May 2020 (EPA 2020);
- *Contaminated Land Management: Guidelines for NSW Site Auditor Scheme (3rd Edition)*, October 2017 NSW EPA (EPA 2017);
- *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contaminated Land Management Act 1997*, NSW EPA, September 2015 (EPA 2015);
- *National Environment Protection (Assessment of Site Contamination Measure) Measure 1999, as amended 2013*, National Environment Protection council (NEPC 2013);
- *Work Health and Safety Act 2011*. NSW Government Legislation. (*WHS Act 2011*);
- Safe Work Australia's (2020) C*ode of Practice: How to Manage and Control Asbestos in the Workplace* (SWA 2020a);
- Safe Work Australia's (2020) *Code of Practice: How to Safely Remove Asbestos* (SWA 2020b);
- *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.* WA Department of Health, 2009 (WA DoH 2009);
- *Waste Classification Guidelines. Part 1: Classifying Waste, NSW EPA*, November 2014 (EPA 2014a);
- *Waste Classification Guidelines. Part 4: Acid Sulfate Soils, NSW EPA, November 2014 (EPA 2014b);*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 29 August 2018, (ANZG 2018);

- *National Acid Sulfate Soils Guidance – Guidelines for the Dredging of acid sulfate soil sediments and associated dredge spoil management*. Water Quality Australia, June 2018 (WQA, 2018a);
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*, NSW DEC, March 2007 (DEC 2007);
- *PFAS National Environmental Management Plan Version 2.0, January 2020*. National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (HEPA, NEMP 2.0, 2020); and
- *Guidelines for the Assessment of On-Site Containment of Contaminated Soil*, September 1999, ANZECC (ANZECC 1999)

5.2 Extent of Remediation

Remediation is required to address the contamination/impact risks discussed in **Section 4.1.2** to ensure the suitability of the site for the proposed public open space.

Historical data from previous investigations (NAA 2010, RCA 2011 and E3C 2012a) were not considered as part of the remediation assessment due to changes in the site conditions since the intrusive works were conducted. On this basis, the most recent data (JBS&G 2023a) and data from CDM (2012a) and Consara (2020a and 2020b) were considered relevant for assessment of required remediation.

The extent of remediation to be undertaken within the development site has been estimated as discussed below and shown on **Figure 8.**

- Fill material across the site was reported to be contaminated with asbestos, copper, lead, zinc, TRH and PAHs covering an approximate area of 1 ha;
- The presence of aesthetic issues comprising hydrocarbon odours in fill material at one soil sampling location (BH16);
- Groundwater at MW05 was reported to be impacted with TRH which will require management should dewatering be proposed during redevelopment works noting that based upon the proposed design plans, it is not anticipated that dewatering will be required in this area of the site; and
- The presence of a potential UST and associated fuel lines will require decommissioning and removal of any associated localised impacted material.

As discussed in **Section 4.2**, sediments at the site are considered to be consistent with the surrounding Blackwattle Bay and hence impacted with heavy metals, PAHs, TRH and TBT. The elevated contaminant concentrations reported in sediments are considered to be likely reflective of conditions throughout the extent of Blackwattle Bay as a result of historical industrial activities along the foreshore of the Bay. On this basis, no active remediation of the in-situ sediment is required.

Notwithstanding, there is the potential that limited disturbance may occur to sediments within the site as a result of piling works and redevelopment of the seawall. These works will require management, from both a contamination and ASS view point which will primarily comprise controlling the potential for resuspension of sediments during development works such that mobilisation of contaminants and changes in the sulfate-sulfide equilibrium of the sediment are minimised such that associated short-term ecological risks are appropriately mitigated. It is expected that best-practice management procedures will be informed by development of a site-specific CEMP based on management principles provided in a separate ASSMP (JBS&G 2023b) and therefore the appropriate management of sediments during development works requires no further detail herein.

It is noted that a number of data gaps have been identified in **Section 4.2** of this RAP for which further assessment is required to characterise these conditions such that the remediation strategy may be finalised. In addition, subject to the findings of the DGA, PFOS in groundwater may also require management during the redevelopment of the site. In advance of the data gap assessment, conservative assumptions have been adopted, such that the presence of this material on site is assumed and thereby the remedial strategy addresses requirements for management of this material.

The potential nature and occurrence of the material(s) comprises fill material with elevated concentrations of leachable heavy metals and/or detectable concentrations of PFOS (or other PFAS compounds) in soils. Should the data gap assessment not identify such conditions, fill material within the relevant areas may be managed consistent with fill material across the balance of the site.

The potential for unexpected contamination finds is addressed in the Contingency Plan in **Section 8**.

5.3 Remedial Options Assessment

EPA (2017) adopts the NEPC (2013) ASC NEPM preferred remediation hierarchy as follows:

- on-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level; and
- off-site treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,

if the above are not practicable,

- consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

or,

- where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

The remedial options for management of contaminated/impacted fill/soil material are evaluated in **Table 5.1** below. It should be noted that heavy metals/PAH/TRH impacts located at the same location as AF/FA contaminated/impacted soils would be subject to the suggested/preferable remediation option which applies to all. As noted above, pending addressing the data gaps, a conservative approach has been adopted to addressing fill material that comprises an groundwater contaminant source migration risk.

Table 5.1: Remediation Options Assessment Matrix

Remedial Option	Applicability	Assessment
Option 1: On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level.	<u>Asbestos</u> Bonded ACM can be removed from impacted soils by hand-picking (emu-picking). Hand picking of ACM within fill material is labour intensive and can be costly and time, dependent upon specific factors, albeit typically less costly than landfill disposal of bulk soil material. Sufficient space is also required to temporarily stockpile and spread the material. The success of the remediation method is dependent upon the soil type and the amount of other building rubble present within the fill, and also on the adopted validation criterion. High proportions of clay or the building rubble may reduce the effectiveness of this option. It is noted that fill material is considered to be impacted with heavy metals/TRH/PAH throughout the site, and hence following remediation of ACM (where present), additional remediation/treatment will be required for the remaining COPCs. AF / FA contaminated/impacted soils are typically heterogeneously distributed throughout impacted soils and are not readily visible to the naked eye. As such, on-site remediation of AF/FA soils is considered to not be a feasible option. <u>Heavy Metals/PAHs/TRH</u> Heavy metals identified in soil cannot be destroyed by treatment methods. However, there are a number of commercially available microencapsulation measures available, including cement stabilisation that effectively reduce hazards associated with soil heavy metal contaminant migration in leachable material. PAHs identified in soil, with the exception of any impacts associated with fuel and/or tar impacts (as may be identified), are typically present in the heavy, non-volatile range. These contaminants can be remediated by application of thermal processes such as indirect/direct thermal desorption (I/DTD). TRH impacted soils can be treated on-site through landfarming to promote biodegradation of petroleum-based impacts. As the material is impacted with heavy metals, PAHs and TRH and/or asbestos, these issues will remain upon treatment of one of these contaminants and hence each will require treatment separately. On this basis, the costs associated with plant establishment, the sensitivity of the site, on-site approvals and running (energy) costs in addition to space and time considerations, such methods are considered unlikely to be practicable at this site.	Not a suitable option Not a suitable option
Option 2: Off-site treatment of excavated soil so that the contaminant	As above (Option 1).	Not a suitable option.

Remedial Option	Applicability	Assessment
is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.		
Option 3: Consolidation and isolation of the soil on-site by containment within a properly designed barrier.	<u>Heavy Metals/PAHs/TRH/Asbestos Fill material not presenting leachable potential</u> Fill contaminated/impacted soils demonstrated as not having an unacceptable potential to leach contaminants to groundwater are readily able to be consolidated and contained within the extent of the site under a suitable permanent physical barrier (cap) which would remove the future exposure pathways between the contaminated soil and site users/workers. Given the absence of unacceptable contaminant migration risks, containment would also address the potential risks to the environment on and downgradient of the site. The retention of the materials will reduce the waste generation and resource requirements of the remediation of the site. The proposed redevelopment has the potential to provide suitable opportunities for the onsite containment of contaminated material, including beneath future building /or at depth below public open space. It is noted that onsite containment would encumber the site with ongoing management requirements as the suitability of the site will be dependent upon maintaining the physical barrier. As such, ongoing implementation of a passive asbestos management plan (AMP) and Environment Management Plan (EMP) would be required by the incoming property managers. As such, there must be acceptance by the ultimate custodian of the land that future controls will be implemented and a future Consent Authority (Department of Planning and Environment or City of Sydney Council as appropriate) will be required to confirm its acceptance of the requirements to note the EMP/AMP in its property database and on future Section 10.7 Planning Certificates.	This is the preferred option with respect to the remediation principles as a result of the low waste volumes, energy use, timeliness and waste disposal cost, subject to the agreement of relevant stakeholders (future site custodians and consent authority).
	<u>Heavy Metals/PAHs/TRH/Asbestos/PFOS Fill material with groundwater contaminant migration potential</u> Fill material identified as having the potential to leach one or more contaminants (including heavy metals, TRH and/or PFOS) are considered unsuitable for management via insitu cap and containment given the risk associated with the migration of contaminants to groundwater and subsequent migration off-site cannot be adequately managed under this scenario.	Not a suitable option.

Remedial Option	Applicability	Assessment
Option 4: Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill	<u>Heavy Metals/PAHs/TRH/Asbestos Fill material not presenting leachable potential</u> There are currently suitably licensed waste facilities in the Sydney Metropolitan region capable of accepting asbestos/heavy metals/TRH/PAH contaminated soils. Off-site disposal of contaminated soils is likely the fastest method of remediation and removes the requirement for ongoing management of the site under the contaminated land management framework. However, there are significant costs associated with disposal as a result of the NSW Waste Levy. Suitable material may possibly also be required to be imported to establish development levels, adding costs and vehicle movements during site works.	This is a suitable option where impacted soil removal is required to facilitate site redevelopment. However, when considered in comparison to the cap and containment option, this is not the preferred option given the project cost and sustainability objectives.
	<u>Heavy Metals/PAHs/TRH/Asbestos/PFOS Fill material with groundwater contaminant migration potential</u> As per the above, there are suitable waste facilities available for accepting this material and off-site disposal of the material will likely be the fastest remediation method. Excavation and off-site disposal of the identified source material will resolve the ongoing environmental risk associated with the leachable material and as a byproduct, remove the other associated contaminants specific to this material. It is not anticipated that this area would be separated from the balance of the site's LTEMP requirements, but removal of this material will be addressed in identification of material remaining on-site subject to remediation.	This option is suitable/preferred for fill material identified as having a contaminant leachate to groundwater potential.

Two options exist for decommissioning fuel storage infrastructure, and the selected option must follow the established hierarchy for selection of soil remediation methods in NSW as outlined above. Reference to DECC (2009[26]) indicates that it is industry best practice to remove USTs that are no longer required.

With consideration to EPA's endorsed guideline hierarchies for soil remediation options and groundwater clean-up objectives (DECC 2009), and to the site specific contaminants and environmental setting, the preferred remediation strategy is outlined as follows. Where geotechnical and/or heritage considerations do not restrict earthworks, then:

- Decommission and remove the UST and associated linework, if present, including removal and disposal of any residual contents, in accordance with relevant regulations standards and guidelines, as noted in **Section 6.2.3**;
- Excavation and off-site disposal, on-site containment or onsite treatment of any impacted backfill material and natural soils exceeding adopted validation criteria (**Section 7.4**); and
- Reinstatement of excavations to proposed site development levels in these areas using a combination of validated excavated and/or site-won material or validated imported fill, if required.

Remediation works under these circumstances will include the removal of the UST and any related infrastructure (bowser plinths, anchors, pipework, fill points, etc), and the excavation of tank backfill materials, fill material and natural soils to the limits of impact, or to practical limits (e.g. site boundary or building footings).

Should earthworks be restricted by geotechnical and/or heritage considerations, remediation will proceed to the extent practicable at the advice of geotechnical engineers and/or heritage consultants.

5.4 Proposed Remedial Approach

Potential remedial options have been outlined in **Table 5.1** in addition to discussion above of the strategy to address the potential UST infrastructure and any associated impacts. Based on assessment of the above options, giving consideration to the proposed public open space land use, the preferred remedial strategy for the site is:

- Decommissioning and removal of the potential UST infrastructure and any associated impacts via excavation and off-site disposal to a licensed waste facility;
- Identification (via further data gap assessment) and subsequent excavation, followed by off-site disposal at a licensed waste facility of fill material with elevated contaminant leachate potential assumed present in the northern section of the site; and
- On-site containment of the balance of the fill material characterised with asbestos (AF/FA/ACM), lead, copper, zinc, PAH and TRH contamination beneath a permanent physical barrier (where achievable) with regard to proposed development levels, or alternatively off-site disposal of material excess to development levels.

As a contingency, if additional unexpected asbestos or other impacts are identified, or the preferred remedial options or validation fails, alternate approaches may be adopted. Contingency including unexpected finds is dealt with in **Section 8.1**.

[26] *Guidelines for Implementing the POEO (Underground Petroleum Storage Systems) Regulation 2008*, NSW Department of Environment and Climate Change (DECC 2009)

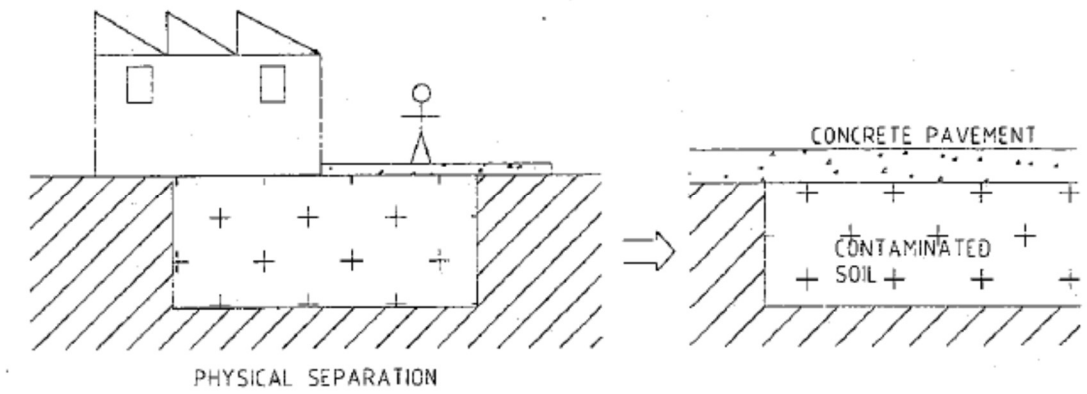
5.5 On-Site Containment Requirements

As identified in the SWRCP (JBS&G 2021b), Requirements for installation of the physical barrier over impacted fill material are based upon ANZECC (1999) guidance with regard to the suitability of contaminants for on-site containment. With consideration to the primary COPCs, other than those identified in **Section 6.2.1**, containment by physical covering in conjunction with appropriate control measures is considered appropriate for the impacted fill/disturbed natural materials.

The minimum typical requirements for physical separation to ensure that there are no complete exposure pathways include:

- Permanent pavement measures such as a concrete ground slab, asphalt surfaced pavement, mortared stone/concrete pavers or similar. The pavement base course shall be underlain by an easily discernible visual marker layer; or
- A thickness of soil that is unlikely to be penetrated by future users during everyday activities at the site (or relevant parts thereof). A minimum soil cover thickness of 0.5m is nominated in general site areas where exposed soil is proposed, which is to be underlain by a visual marker layer. However, it is noted that to achieve ecological objectives, increased depths of suitable non-contaminated soil may be required.

An example of such measure is shown schematically below:



Source: ANZECC (1999)

The purpose of the marker layer is to serve as a visual signal to those disturbing the capping system of the presence of potentially contaminated fill material at depth. The marker layer should be of a distinctive bright colour such that future workers and/or site users will be alerted to conditions as documented in a site environmental management plan (EMP) prior to breaching the marker layer.

Where soil/rock based material is proposed to be used as part of the capping media and placed above the marker layer, the material will be required to be validated as meeting the adopted health / ecological criteria for the site such that there are no unacceptable risks to future site users/ occupants and/or workers during day to day site activities. A cross section showing the capping arrangements is provided in **Figures 9A** and **9B**.

For the site, the following physical separation strategy will comprise:

- Permanent paved areas: measures such as a building footprints, concrete ground slabs, asphalt surfaced pavements, mortared stone/concrete/brick pavers or similar. The pavement base course shall be underlain by an easily discernible visual marker layer.
- Existing trees: A robust visual marker layer installed around the trees with minimal disruption to the shallow root system and without significantly raising soil levels against the tree trunks. The proposed methodology to be applied will be confirmed by consultation with the project arborist, but is anticipated to comprise the careful removal of the existing

ground cover by hand, installation of a robust visual marker (such a geogrid product or similar) and subsequent covering with a free draining, no-fines inorganic mulch (10-20 mm diameter pea gravel or river pebbles, hard wood mulch, or similar), subject to the arborist's approval.

- New landscaped areas:
    - Shallow rooted plants: a thickness of soil/growing media (to be validated) that is unlikely to be penetrated by future users during everyday activities at the site (or relevant parts thereof). A minimum of 0.5m is nominated in general site areas where shallow rooted plants are proposed, which is to be underlain by a visual marker layer.
    - Deep rooted plants: a thickness of soil/growing media (to be validated) that is unlikely to be penetrated by future users during everyday activities at the site (or relevant parts thereof). A minimum of 1.5 m is nominated where deep rooted plants (including trees) are proposed, which is to be underlain by a visual marker layer. Consideration of the specimen rootball size is also required, however the 1.5 m thickness may be reduced upon consultation with the design team/arborist, based on the specific size/details of proposed species.
- Service trenches: all utilities are to be installed in excavated trenches that are lined with geofabric and backfilled with suitable validated material such that future maintenance activities may occur without the requirement for workers to encounter contaminated material.

6. Remedial Plan

The remedial scope of works is provided in the following sections:

6.1 Preliminary Works

6.1.1 Approvals, Licences and Notices

State Environment Planning Policy (Resilience and Hazards) 2021

From review of the site location and proposed activities, the remediation works are expected to be classified as Category 1 Remediation Works (**Section 11.1**) as per the meaning provided in *State Environment Planning Policy (Resilience and Hazards) 2021* (SEPP R&H) under which Section 4.8 requires development consent for remediation of contaminated land. It is anticipated that preparation in relation to SEARs, the works will be undertaken ancillary to the redevelopment works package and as such consent for remediation will be sought in conjunction with these plans.

Notification of completion of remediation must be given to the council within 30 days of completion to meet SEPP R&H requirements.

Asbestos Works

Asbestos was noted within fill material as reported in JBS&G (2023a) and Consara (2020a and 2020b). The asbestos has been identified in friable and bonded forms. To this extent, all asbestos management works will require the implementation of asbestos controls such as donning personal protective equipment (PPE), air monitoring for friable asbestos (or where close to sensitive public areas) and dust suppression in accordance with relevant Codes of Practice (SWNSW 2022a[27] and 2022b[28]) and further detailed in **Section 10**.

As friable asbestos has been identified within a portion of the fill materials at the site, a Class A friable asbestos removal contractor must be engaged to supervise or perform the works in these areas and the contractor will be required to obtain a site-specific permit from SafeWork NSW.

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019

The removal of the UST and associated infrastructure will be undertaken in accordance with WorkSafe NSW requirements, and a validation report will be provided addressing the provisions of the *Protection of the Environment Operations (UPSS) Regulation 2019*. It is noted that given consent for the remediation works is being obtained under the SSDA process, notification of the intent to remove the UST and associated infrastructure is not considered to be required.

The removal of underground petroleum storage infrastructure will be undertaken in accordance with *The Removal and Disposal of Underground Petroleum Storage Tanks – Australian Standard 4976-2008.*

Demolition of Existing Buildings

Existing buildings on site were noted to contain hazardous material (ACM and lead paint) and as per the design plans, some will require to be demolished. On this basis, a contractor who holds a demolition license and license to remove asbestos must be engaged to conduct the works, in addition to being presented with the most recent Hazardous Building Material Survey (HBMS) and asbestos register. Demolition works must be conducted in accordance with SafeWork NSW *Code of Practice – Demolition Work* (SWNSW 2019[29]).

[27] *How to safely remove asbestos - Code of Practice*, Safe Work NSW, December 2022 (SWNSW 2022a)
[28] *How to manage and control asbestos in the workplace - Code of Practice*, Safe Work NSW, December 2022 (SWNSW 2022b)
[29] Demolition Works - Code of Practice, Safe Work NSW, August 2019 (SWNSW 2019)

Remediation works shall not commence until all required approvals, licences and notifications have been granted and/or received.

6.1.2 Site Establishment

All safety and environmental controls are to be implemented as the first stage of remediation works. These controls will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for traffic and pedestrian controls;
- Work area security fencing;
- Site signage and contact numbers;
- Stabilised site entry gate;
- Appropriate decontamination areas for personnel and plant
- Sediment fencing (attached to security fencing); and
- Stormwater runoff sediment controls.

Environmental controls are outlined in **Section 9**.

6.2 Remedial Works

Areas requiring remediation are discussed in **Section 5.2**. The remedial works are required to be undertaken by a remedial contractor with appropriate qualifications, licenses and experience, under the supervision of an Environmental Consultant. The scope of works will comprise:

- Pre-remediation site investigation activities to close out remaining data gaps and confirm assumptions made in development of this RAP, inclusive of an additional assessment of fill material across the site to establish its contaminant migration (leachate generation) potential;
- Removal of Existing Hazardous Building Materials associated with built structures in the northern portion of the site;
- Pavement removal and excavation works to confirm the presence of the potential UST and associated pipelines (if present) and subsequent decommissioning and removal of this infrastructure and associated impacts;
- Excavation and off-site disposal of contaminated fill material identified during the data gap assessment as material with an elevated contaminant leachate generation/migration potential such that they are unsuitable to be retained under a cap and containment remedial strategy; and
- Implementation of civil works as required to regrade the current site ground levels and install below ground infrastructure, surface treatments, etc, inclusive of installation of a permanent physical barrier to cap and contain the balance of fill material at the site.

Each of the remedial work stages are described in more detail in the following sections.

6.2.1 Pre-remediation works Data Gap Assessment

Prior to the remediation activities further assessment of the potential for contaminant migration conditions will be completed across the site to establish the potential presence of fill material impacted with leachable metals (including in the vicinity of BH05) and potential for soil conditions contributing to PFAS compound concentrations inconsistent with the balance of the site background.

It is anticipated that a detailed scope of work will be developed in consultation with the site auditor via preparation of a sampling, analysis and quality plan (SAQP) prior to commencement of the investigation. In general, the proposed scope of works will comprise the following:

- Installation of three additional groundwater monitoring wells to further assess concentrations of heavy metals, TRH/VOCs and PFAS at:
    - the inferred upgradient site boundary between Buildings A (proposed to be partially demolished) and D (proposed to be retained);
    - the inferred upgradient site boundary at 5 Bank Street adjacent to the former groundwater monitoring well (BH02, E3C 2012) which has been confirmed to have been removed; and
    - the inferred downgradient site boundary in the southeast portion of the site.
- Sampling of the three additional groundwater monitoring wells and the four existing groundwater monitoring wells to confirm the existing groundwater characterisation data.
- Installation of additional soil sampling locations across the site, inclusive of building footprints with characterisation of underlying fill material and soil for potential heavy metals, PAHs, TRH/BTEX, VOCs, PFAS and asbestos in soil, including total soil and leachable soil concentrations to establish the potential contamination and leachate characteristics of the in-situ soils.

The data gap investigation should be completed once access is provided (following removal of heritage items, and removal of hazardous materials including friable asbestos/lead dust within the buildings). As will be documented in the SAQP, the drilling investigation and sample collection will be conducted in accordance with the procedures in **Section 7.3** and samples analysed in accordance with validation activities as per **Table 7.3**. Following completion of the works the outcomes will be presented in a standalone advice for the information of the site auditor, client and its contractors in establishing the anticipated scope of remedial works at the site. Where appropriate, the advice will document the extent of leachable contaminated material required to be excavated and removed from the site, a waste classification for the material and guidance on the requirements for management/validation of the resulting excavation.

6.2.2 Removal of Existing Hazardous Building Materials

JBS&G understand that some existing structures on site require demolition and removal from the site. Previous assessment of hazardous building materials within existing structures in the northern site portion has been completed (Prensa 2021[30]) which identified a range of hazardous materials, including, but not limited to lead and asbestos within the four structures (A, B, C and D, **Figure 2A**) at 1A-3 Bank Street. The removal and disposal of the hazardous materials in these structure is required in accordance with relevant regulatory guidance including Work Health and Safety Regulations 2017 and Waste Classification Guidelines 2014 (EPA 2014).

Building foundations that are proposed to be retained onsite will be inspected by a suitable and qualified consultant to confirm the absence of any residual lead paint or ACM.

6.2.3 UST Removal (If Present)

Removal of the potential UST infrastructure, as identified on **Figure 2B**, and any associated localised TRH impacted soils, will include the following:

[30] *Destructive Hazardous Building Materials Assessment, 1-3 Bank Street, Pyrmont NSW 2009*. Prensa Pty Ltd, May 2023 (Prensa 2023)

- Removal and disposal of any pavements/hardstand in the vicinity of the suspected UST and associated infrastructure (including associated fuel lines), and any concrete anchors that may be in place;
- Inspection and removal of any residual liquid contents from the UST and linework (e.g. fuel, water and rust inhibiter mix) and off-site disposal in accordance with the EPA (2014) Waste Classification Guidelines;
- Excavation and off-site disposal of all fuel related infrastructure to a licensed destruction facility (retaining destruction documentation for validation purposes);
- Identification and excavation of all contaminated backfill sands/surrounding soils in the vicinity of the UST and associated line work and former bowser (if present), including discoloured/odorous soil, followed by temporary stockpiling;
- Validation of the walls and base of the excavations as per requirements of **Sections 7.3.2** and **7.4**;
- Sampling of the excavated/stockpiled soils for on-site reuse, containment or waste classification and offsite disposal; and
- Reinstatement of the excavation with material obtained from either suitable excavated backfill, site-won soils or imported soils, which have been validated as appropriate for placement beneath the proposed future permanent physical capping arrangements that will apply to the site.

Decommissioning, removal, transport and disposal of the UST and removal and disposal of any residual contents should be undertaken with consideration of applicable legislation, standards and guidelines, including but not limited to:

- *Work, Health and Safety Act* 2011 and associated regulations;
- *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019* (UPSS Regulation);
- *Waste Classification Guidelines Part 1: Classifying waste*, NSW EPA (2014);
- *Guidelines for Implementing the POEO (Underground Petroleum Storage Systems) Regulation 2008*, DECC (2009) UPSS Guidelines;
- *Australian Standard AS1940-2004: The storage and handling of flammable and combustible liquid*;
- *AS 4976-2008 The removal and disposal of underground petroleum storage tanks*; and
- *WorkCover (2005) Code of Practice: Storage and Handling of Dangerous Goods (*as a guide only).

6.2.4 Excavation of Contaminated Soils Not Suitable for Onsite Treatment and/or Retention

Where the data gap assessment as outlined in **Section 6.2.1** identifies material unsuitable, as a result of leachable contaminant potential, for retention under the cap and containment measures, this material will require excavation and offsite disposal to a lawful facility. The procedure for undertaking this excavation activity will be as follows:

- Excavation of the impacted soils will occur to a lateral and vertical extent as identified by the data gap assessment and subsequently designated by the Environmental Consultant. Following excavation, the Environmental Consultant will complete validation activities as per **Table 7.3** to demonstrate the unsuitable material has been removed and the balance of the site fill material is suitable to be retained below future capping. The excavation will be

inspected by an Environmental Consultant prior to sampling of the walls and base of each of the excavations for the relevant COPCs where applicable;

- Should the initial validation assessment fail, the excavation will be extended laterally and/or vertically and additional validation samples are collected for analysis to demonstrate the validation has been successful;
- It is anticipated that excavated material will be directly loaded onto vehicles for off-site disposal to a lawful waste facility.
- are transferred to a temporary holding area on-site (as required) and stockpiled in accordance with **Section 9.3.2** (i.e. appropriately covered);
- Should direct load out not occur, where excavated material is required to be temporarily stockpiled outside of identified impacted areas on plastic or geofabric, a visual inspection only of the stockpile footprint will be required following loading into trucks for offsite disposal. Where impacted material is temporarily placed on unsealed ground, the area is to be validated by the Environmental Consultant as per **Section 7**; and
- Once validation of the remedial excavation is achieved, the consultant will advise the contractor that the excavation area can be reinstated with validated site won or imported soil (**Section 7.4**), or if reinstatement is not required for development levels, the area can be made safe.

6.2.5 Containment of Impacted Soils

As identified in **Section 5.5**, onsite management of impacted fill is preferred to be managed via containment and the implementation of permanent physical separation which eliminates future exposures. Subject to completion of the data gap assessment as discussed in **Section 6.2.1** and removal of any material identified as unsuitable for on-site cap and containment, the balance of the fill material is anticipated to be suitable for onsite retention below a permanent physical barrier.

It is anticipated that implementation of the on-site retention measures will be completed in conjunction with civil works to establish proposed development levels and installation of new site infrastructure, with final capping arrangements to be completed with the landscaping works, which will comprise a portion of the cap.

However, in the event that such works include a broader cut/fill program that requires material to be excavated and relocated within the site to achieve proposed development levels, the following procedure will be followed:

- The contractor will commence excavation of the material required to be relocated under the supervision of the Environmental Consultant;
- Excavation of the impacted soils by the remedial contractor will occur to a lateral and vertical extent as required to achieve specific site levels allowing room for placement of marker layer and capping material;
- If excavation extends to natural material, JBS&G will complete validation activities as per **Table 7.3**. The excavation will be inspected by the Environmental Consultant prior to sampling of the base and walls (if present) of the excavations for the relevant COPCs where applicable;
- Should the initial natural material validation fail, the excavation will be extended laterally and/or vertically and additional validation samples will be collected for analysis to demonstrate the validation has been successful. Alternatively, the area may be deemed to require cap and containment as though remaining within fill material;

- Impacted soils will be either directly placed within the proposed fill area, or alternatively transferred to a temporary holding area on-site (as required) and stockpiled in accordance with **Section 9.3.2** (i.e. appropriately covered);
- Where impacted material is temporarily stockpiled outside of identified impacted areas and is placed on plastic or geofabric, a visual inspection only of the stockpile footprint will be required following movement of the stockpile. Where impacted material is temporarily placed on unsealed ground in areas beyond the unfinished containment zone, the area is to be validated by the Environmental Consultant as per **Section 7**. Should validation fail, the failed portion will be excavated a further 0.1 m in the direction of the failure and the validation process repeated until validation is successfully achieved; and
- Once required levels are achieved, installation of the visual marker layer will be completed, followed by implementation of relevant capping measures as discussed following.

The marker layer shall consist of a bright coloured (orange or similar) non-woven polyester continuous filament or PET (such as nonwoven geotextiles), geogrid or similar with a minimum density of approximately 150 grams per square metre (or equivalent). The marker layer must:

- Be easily recognisable within soils (i.e., bright orange in colour);
- Be durable as a long term marker layer (i.e., > 140 grams per square metre); and
- Maintain integrity during remedial/civil works such as capping layer insulation and road/building construction.

Additionally, the marker layer must meet geotechnical and civil specifications where required.

The specific details of the marker layer are required to be included in the site validation report and LTEMP documents in addition to surveyed plans showing the extent of capped area within the site.

6.2.5.1 Specific Capping Arrangements

The following capping procedures will be applied to appropriate scenarios across the site, prior to completion of construction works:

- Beneath permanent structures – installation of a marker layer over contaminated fill material and permanent concrete slab as the physical barrier.
- Permanent hardstand structures (i.e., concrete slabs, pile caps or asphaltic concrete or mortared stone/concrete/brick pavers or similar) – installation of a marker layer overlying potentially contaminated material followed by pavement base course.
- Within underground services trenches / services – service infrastructure will require remediation to 150 mm below the depth of services, with a marker layer installed on the vertical and horizontal trench faces, followed by service installation and backfill consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Turfed areas/shallow rooted plants – installation of the marker layer at a minimum depth of 500 mm below final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- New tree pit zones – installation of an open cell mesh instead of a non-woven geotextile marker layer at a minimum depth of 1500 mm below the final finished site levels, with a capping layer consisting of drainage/growing media that is environmentally suitable materials for potential human and/or ecological exposure, noting that the maker layer should extend the depth required for installation of the new tree's existing root ball. The open cell mesh is adopted instead of the non-woven geotextile to avoid silt build up and allow water infiltration as per the arborist recommendations.

- Existing trees – installation of an open cell mesh instead of a non-woven geotextile marker layer around the trees with minimal disruption to the shallow root system and without significantly raising soil levels against the tree trunks. The proposed methodology to be applied will be confirmed by consultation with the arborist, but is anticipated to comprise the careful removal of the existing ground cover by hand, installation of an open cell mesh and subsequent covering with environmentally suitable materials for potential human and/or ecological exposure comprising free draining, no-fines inorganic mulch (10-20 mm diameter pea gravel or river pebbles, hard wood mulch, or similar), subject to the arborist's approval.

Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). This may include: virgin excavated natural material (VENM) sourced from on-site, imported VENM, excavated natural material (ENM) or similar material certified in accordance with an exemption issued by the NSW EPA that also meets site suitability criteria.

At the interface of remediated and non-remediated areas, the extent of the marker and capping layer should be extended a minimum of 300 mm laterally outside the extent of remediated area or to the extent of the site boundary, where practicable. This may include battering of the marker/capping layer to tie-in with existing site levels within the 300mm outside of the remediated area, where practicable.

Validation of capping arrangements will be required as outlined in **Section 7.3.1**, including inspections by the Environmental Consultant, a survey plan prepared by a registered surveyor showing the level and lateral extent of the marker layer and permanent capping in relation to the site boundaries. This survey should identify the location of inground services and/or tree pits for the future information of site maintenance personnel.

6.2.6 Off-site Disposal of Material

Any contaminated soils or other waste generated during remediation to be disposed off-site shall be classified in accordance with EPA (2014) *Waste Classification Guidelines.*

Should natural soils/bedrock require off-site disposal then these shall also be classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

Waste certificates will be prepared for each stockpile and/or material type that is to be disposed. Disposal of waste to licensed waste facilities in accordance with relevant waste regulations will be undertaken by the Remediation Contractor and the waste facility must be lawfully licensed to receive the material sent to it for disposal.

All waste tracking documentation including disposal dockets must be maintained by the remedial contractor and must be provided to the client's representative and environmental consultant for inclusion in the validation report.

Any asbestos waste exceeding 100 kilograms or more than 10 m^2 of bonded ACM in one load disposed off-site must also be tracked using the NSW EPA online system WasteLocate.

6.2.7 Asbestos Management

Based on the available characterisation information as discussed in **Section 4**, it should be assumed that all fill material at the site is either asbestos impacted or contaminated as per SWA (2022b) until demonstrated otherwise. Asbestos contaminated soil necessitating management for potential asbestos exposure is defined in SWNSW (2022b) as:

- Soil that contains visible asbestos as determined by a competent person; or

- Soil that contains asbestos fibres at quantities exceeding trace levels (considered to be the analytical detection limit in lieu of alternate guidance) as reported by analysis undertaken in accordance with AS4964:2004 *Method for the qualitative identification of asbestos in bulk samples*.

Environmental, health and safety management requirements for the handling of these materials will be documented in an AMP to be prepared based on the requirements provided for asbestos-related works in SWNSW (2022b), inclusive of preparation of an asbestos register and associated asbestos removal control/management plan.

Excavation and removal of friable asbestos contaminated soils are required to be conducted by a Class-A asbestos removal licensed contractor. Before starting any affected works, the appointed contractor is required to obtain a site-specific permit approving the proposed friable asbestos works from SafeWork NSW. A permit will not be granted without a current licence and the permit application must be made at least five days before the work is due to commence (or as advised by SafeWork NSW).

Where sampling and analysis of specific fill materials is completed in conjunction with inspection by a competent person, and the results indicate the material does not fall within the "asbestos contaminated soil" definition, the requirements for management of "asbestos contaminated soils" will not be required to be implemented.

As per the requirements of SWNSW (2022b), works during the remediation and materials management of friable asbestos contaminated fill from the site is required to be supervised by a Licenced Asbestos Assessor (LAA), with appropriate controls and monitoring program to be implemented in accordance with the requirements of SWA (2022a/2022b), the AMP, ARCP and **Section 8**.

For the purposes of remediation works within site, in addition to a LAA, a competent person shall be considered to be a person who holds a tertiary degree in a science of engineering discipline, has experience in contaminated site assessment, has completed a WorkSafe approved Asbestos Removal Supervisor course.

6.3 Material Importation

Based on the scope of remedial works described herein, it is anticipated that if materials are required to be imported to site, it will generally be as a result of construction requirements or otherwise to ensure appropriate growing media are established within the planter boxes / garden areas as proposed on the site.

Prior to importation of all material, appropriate assessment of such materials must be completed to demonstrate the material is both fit for purpose and suitable from a contamination viewpoint. In accordance with EPA requirements, the extent of assessment will be determined by the type of material proposed to be imported.

Where material proposed to be imported is Virgin Excavated Natural Material (VENM), an assessment must demonstrate that the material is compliant with the definition of VENM as presented in the POEO Act 1997, adopting in the minimum requirements for characterisation of fill material as presented in EPA (2022a).

Where material proposed to be imported has been characterised under the Resource Recovery Framework (Order/Exemption), the material must firstly be demonstrated by the supplier as suitable for use in accordance with the requirements of the Order via provision of a statement of compliance. Suitable materials are anticipated to comprise but will not necessarily be limited to: excavated natural material – ENM, recycled aggregate, basalt fines, compost, mixed organic waste, pasteurised garden organics and recovered fines, with reference to the list of current orders and exemptions on the NSW EPA website.

In addition to the testing completed by the supplier, given the low frequency of compliance testing required under these Exemptions and the absence of an obligation to analyse materials for asbestos, the specific material proposed to be imported will require an additional compliance assessment prior to approval to import. The additional assessment is required to ensure that the incoming material does not pose an unacceptable risk to human health and/or environment at the placement site and is therefore suitable for use. It is anticipated that such assessment activities will include visual inspections, representative sampling and laboratory analysis (including asbestos as per NEPM/DOH) of material at the source site location to demonstrate the material meets the requirements of this RAP. As for VENM assessments, it is considered suitable to define such requirements on a specific site basis given the potential variability of project site requirements.

Material tracking records in addition to the import assessment report are required to be included in the final validation report for the site.

6.4 Surveying

A registered surveyor will be required to conduct surveying of excavations, stockpiles and remedial extent as required by the Client's representative such that the remedial/validation objectives can be achieved.

6.5 Validation

Validation of the remedial works will be conducted by the Environmental Consultant to demonstrate the remediation/management objectives have been achieved and to document the final condition of the site at the completion of works such that conclusions may be drawn on the end use suitability of the site for the proposed development. Details of the validation program are provided in **Section 7**.

6.6 Site Disestablishment.

On completion of the remediation works all plant/equipment and safety/environmental controls should be removed from the site. Equipment used during asbestos remediation works will need to be appropriately decontaminated or disposed of as asbestos waste by the Remediation Contractor, in accordance with SWNSW (2022a), EPA (2014) and relevant waste regulations.

Details are provided in **Section 9**.

6.7 Contingency Plan

Given the available site history information, consideration has been given to the potential for additional small scale issues that may arise during works (from a contamination viewpoint). Should further impacted material (i.e. not previously identified in historical investigations) be identified as part of an Unexpected Find during remediation and/or earthworks/construction works, the remedial options screening matrix in **Table 5.1** will be required to be reviewed. Notwithstanding, due to the site history it is anticipated that any additional impacts will be relatively isolated and could be appropriately managed through either on site treatment/management or controlled excavation and off-site disposal.

6.8 Remedial Strategy Failure

In the event that the proposed remediation works do not meet the validation criteria, or if the selected remedial strategy is not able to proceed, the following actions will be considered to ensure firstly the safety and health of people and the environment and secondly that the overall project objectives are achieved.

1. Reassessment of remedial and validation options for the proposed development area.
2. Continued controlled excavation for on-site remediation or off-site disposal until validation is achieved.

6.8.1 Change in Development Plans

In the event that the development plans are changed from those available at the time of preparation of this RAP, consideration of the suitability of the proposed remediation strategy will be required.

6.8.2 Unexpected Finds

Whilst the risk of identification of additional USTs being encountered during bulk excavation works is considered to be relatively low, in the event of such an occurrence, the Unexpected Finds Protocol as discussed below (**Figure 6.1**) will be implemented and remediation actions defined with consideration to the requirements for known USTs in EPA made or endorsed guidelines.

6.8.3 Identification of Oil or Tarry Materials

In the event that oily/tarry materials are encountered during inground works, the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Environmental Consultant.

Any suspected oily/tarry materials must be segregated from other excavated materials and placed in a designated area with appropriate odour (as deemed necessary by the Environmental Consultant) and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their appropriate management.

6.8.4 Materials Storage Breach

In the event that any materials storage containment controls are breached, and stockpiled materials classified as asbestos contaminated soil or otherwise have escaped (or have the potential to escape), then the management controls shall be rectified, and investigations undertaken to review the adequacy of the controls and any improvements implemented. The CEMP (**Section 8.1**) shall include a documented process for identifying and responding to such incidents.

6.8.5 Emissions Complaints

Due to the nature of the activities and type of contaminants identified within the site, there is a potential for complaints to be received from members of the public and/or occupants of surrounding properties relating to environmental emissions including:

- Odour emissions arising from handling of malodorous soil (if encountered);
- Noise and vibration arising from excavation, piling and other works;
- Dust emissions arising from excavation, material handling and placement; and
- Visibly impacted water quality in surface water discharge from the site.

Monitoring of all environmental emissions shall be undertaken during the works as detailed in the CEMP (discussed in **Section 8.1**) and appropriate actions taken to further control emissions following receipt of a complaint. The CEMP shall contain provision for contingency actions where excessive emissions occur, however it is anticipated that one or more of the following actions will be considered:

- Increased application of odour screening/masking chemicals on odorous materials (as required);
- Disturbance of soils during meteorologically favourable periods only; and/or
- Covering of impacted soils.

6.8.6 Unexpected Finds

The possibility exists for hazards that have not been identified to date to be present within fill materials or underlying pavements/buildings on the site. The nature of hazards which may be

present, and which may be discovered at the site are anticipated to be detectable through visual or olfactory means, for example:

- The presence of significant aggregates of friable asbestos materials (visible) as opposed to minor occurrences of fragments or fibre bundles in soil; and/or
- Excessive quantities of Construction/Demolition Waste (visible); and/or
- Hydrocarbon impacted materials (visible/odorous); and/or
- Drums, waste pits, former pipework or USTs (visible); and/or
- Oily Ash and/or oily slag contaminated soils/fill materials (visible/odorous); and/or
- Tarry like impacted soil/fill material (visible/odorous); and/or
- Potential chlorinated hydrocarbon impact (sweet odour soils).

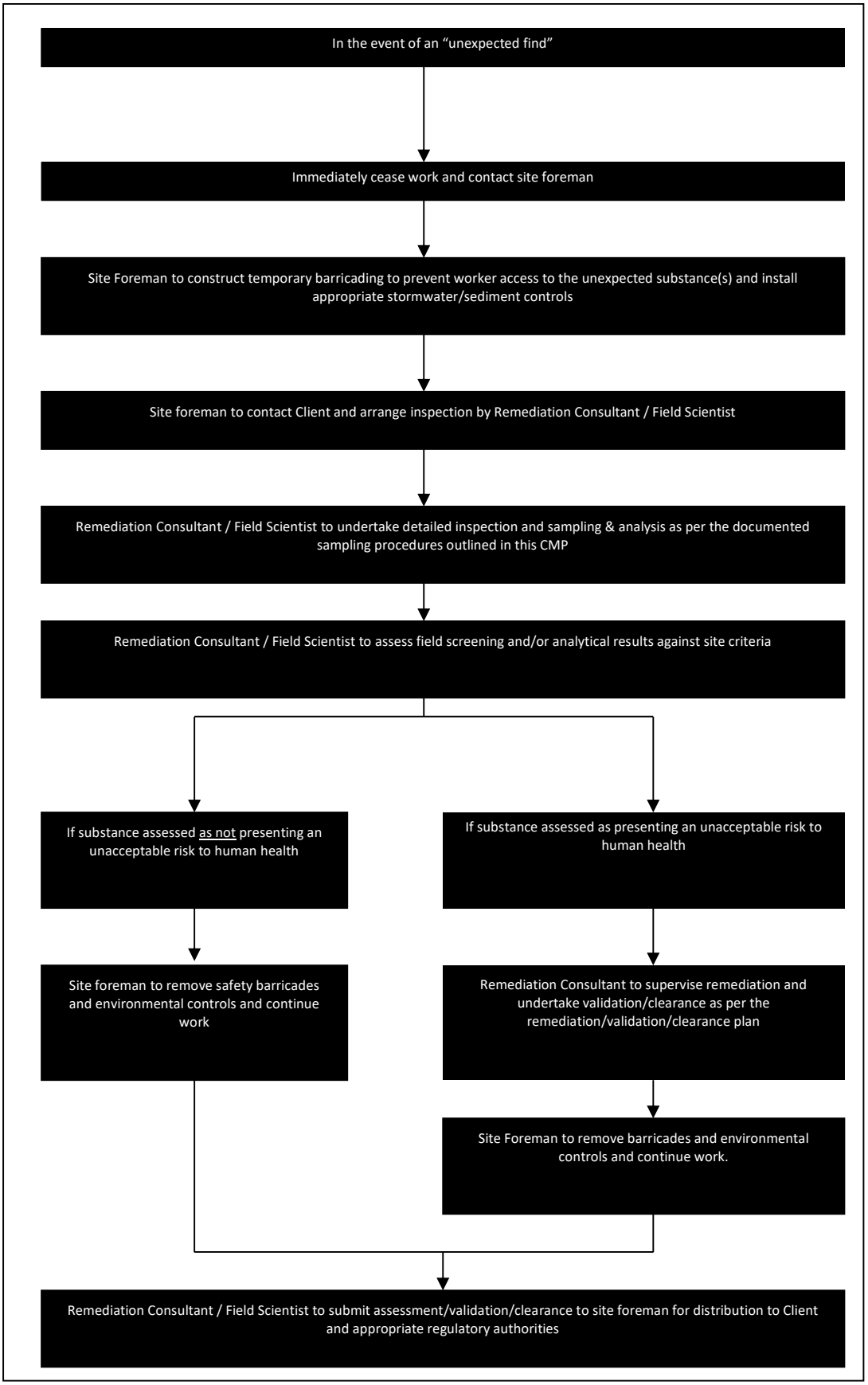
As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances (or any other unexpected potentially hazardous substance) be identified, the procedure summarised in **Figure 6.1** is to be followed.

An enlarged version of the Unexpected Finds Protocol, suitable for use on site, should be posted in the site office, or another suitable common area during redevelopment works, and referred to during the site-specific induction by the Principal Contractor.

The sampling strategy for each "unexpected find" shall be designed by a suitably qualified environmental consultant. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The sampling approach for each unexpected find shall be undertaken in accordance with the protocols presented in EPA (2022a). It is not possible to provide a specific sampling approach prior to encountering the unexpected find(s) as the approach will require to be altered on the basis of observable material characteristics and an updated CSM as specific to the unexpected find. Similarly, the approach for validating remediation of any further contaminated media discovered at the site will need to be determined if/when any such media are encountered.

Figure 6.1 - Unexpected Finds Protocol



7. Validation Plan

7.1 General

Data will be required to be collected during remediation/management and construction works to assess the effectiveness of the implemented management actions and document the final condition of the site at the completion of all works. Such information will allow conclusions to be drawn on the end suitability of the site for the proposed use. The general principles to be implemented with regard to the validation assessment are discussed in accordance with EPA (2017) requirements in the following sections.

It is anticipated that the validation assessment will be required to address the following broad issues:

- Confirm the site conditions are consistent with those identified during previous site investigation activities as documented herein;
- Validation that soil remediation works has managed aesthetic, heavy metals, asbestos, PAH and TRH contaminated soils at the site;
- Validation that soil remediation works has managed / removed asbestos contaminated soils at the site;
- Excavations formed by removal of the UST (if present), associated petroleum infrastructure and impacted soil/bedrock;
- Validation that the final site surface (<100mm) does not contain visually identifiable bonded asbestos impacts or other unacceptable aesthetic issues; and
- Confirmation that marker layer / site pavement is in place to retain underlying asbestos, heavy metals, PAH and TRH contaminated soils.

7.2 Data Quality Objectives

Data quality objectives (DQOs) have been developed for the validation assessment, as discussed in the following sections.

7.2.1 State the Problem

JBS&G (2023a) has identified the presence of contaminated site media and/or material of aesthetic concern at the site. The contaminated media require to be remediated and the aesthetic concerns addressed to make the site suitable for the proposed development.

To appropriately demonstrate that the remedial/management works have been completed in accordance with this RAP, sufficient data in the form of observations, sample analytical data, material tracking records, survey data, disposal docket, etc. are required to be collected and assessed in a defensible manner.

7.2.2 Identify the Decision

The decisions which are required to be made for validation of the site are as follows:

- Are there any unacceptable risks to onsite or offsite receptors following the remediation of impacted soil?
- Are there any aesthetic issues remaining following remediation works?
- Are there any unacceptable risks to future site receptors, associated with groundwater impacts?

- Are there any outstanding issues in relation to the removal/disposal of UST-related infrastructure (if present)?
- Has all material imported to site to achieve development objectives been demonstrated as suitable for use?
- Was waste or excess excavated soil been classified and disposed of offsite to a facility licensed to accept the classified waste?
- Are there any outstanding issues associated with potential migration of contaminants from the site?
- Have marker and capping layers (where required) been installed appropriately and in accordance with RAP requirements?
- Have the works been completed in accordance with the RAP, or where variations to the works were required, have these met the objectives of the RAP?
- Is the site suitable for the proposed land uses without any requirement for ongoing management of contamination, or alternatively where material has been contained onsite is the site suitable subject to an ongoing EMP?

7.2.3 Identify Inputs to the Decision

The inputs to the decision are:

- Previous investigation results as discussed in **Section 3**;
- The proposed development and final proposed landform and site features;
- Field observations, sampling and analytical validation data during remedial works;
- Material characterisation data obtained during assessment of contaminated material for off-site disposal and/or surplus material prior to off-site beneficial re-use or disposal;
- Disposal dockets and relevant documents in relation to appropriate disposal of material (if required) to be removed from site as part of the remediation works (landfill dockets, EPA Waste Locate, beneficial reuse / recycling dockets, trade waste disposal, etc.);
- Relevant guideline criteria for validation and waste classification;
- Management measures documented within an Asbestos Register/Management Plan (if required) to ensure compliance with WHS legislation; and
- Data quality indicators (DQIs) as assessed by quality assurance / quality control (QA/QC).

7.2.4 Define the Study Boundaries

The site boundaries are defined in **Section 2.1** and presented on **Figures 1** and **2A**. The surrounding land uses are outlined in **Section 2.3**. The vertical extent of the works will be the maximum depth of remedial excavations (refer to **Section 4.1**).

Validation works will be completed within development timelines to be informed by the Client.

7.2.5 Develop a Decision Rule

The decision rules adopted to answer the decisions identified in **Section 7.2.2** are discussed below in **Table 7.1** following.

Table 7.1: Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite or offsite receptors following the remediation of impacted soil?	Soil validation data shall be collected of the walls and base of excavations and treated material/soil proposed for reuse onsite with comparison of the subsequent laboratory data with adopted site validation criteria relevant for the proposed land use. If the soil validation results for each data set meet the adopted validation criteria, then the answer to the question is No. If the soil validation results fail the adopted validation criteria for one or more datasets, then the answer to the question is Yes. Further remedial works may be undertaken in this instance, with a subsequent repeat of the validation process.
2. Are there any aesthetic issues remaining following remediation works?	If the final site surface and near surface soils are free of aesthetic impacts, asbestos impacts and absent of significant odours or otherwise visual indicators of staining, the answer to the decision will be No. Otherwise, the answer to the decision will be Yes, subject to implementation of further remedial actions.
3. Are there any unacceptable risks to future site receptors, associated with groundwater impacts?	Additional groundwater data shall be collected from the sampled groundwater monitoring wells with comparison of the subsequent laboratory data with previous results and adopted site validation criteria relevant for the proposed land use. If the groundwater validation results meet the adopted validation criteria, then the answer to the question is No. If the groundwater validation results fail the adopted validation criteria, then the answer to the question is Yes.
4. Are there any outstanding issues in relation to the removal/disposal of UST-related infrastructure (if present)?	Has the UST and associated infrastructure (if present) been decommissioned, removed and disposed offsite according to the relevant guidelines? Has the material within the UST excavation area been validated? If there are no outstanding issues, the answer to the decision is No. If there are outstanding issues, the answer to the decision is Yes.
5. Has all material imported to site to achieve development objectives been demonstrated as suitable for use?	Analytical data sets and inspection data will be reviewed for each proposed material type/source against established definitions for acceptable material (i.e. VENM, resource recovery exemptions, etc) and EPA endorsed criteria as established in the RAP as validation criteria. If the complete data set for the applicable material meet the requirements relevant to the material type, the answer to the decision is Yes and material may be imported to site. If the data set exceeds the adopted criterion, the answer to the decision is No and the material cannot be imported to site for use in development activities.
6. Was waste or excess excavated soil classified and disposed of offsite to a facility licensed to accept the classified waste?	All material disposed from the site will require to be accompanied by adequate characterisation data (as appropriate) and waste classification (for soils). Documentation from the operation receiving the material including the dates, tonnage/volume and classification of the accepted material will be required to facilitate the decision. If the criteria stated above are satisfied, the decision is Yes, and if receipts are provided recording the disposal of material to an off-site licensed facility, the decision is Yes. If the material exceeds the criteria, and no disposal receipts are provided, the answer is No.
7. Are there any outstanding issues associated with potential migration of contaminants from the site?	Should concentrations of contaminants remain at the site following validation which could pose an unacceptable risk from migration (or should off-site sources pose a potentially unacceptable risk to the site), the answer is Yes, and further investigation or management may be required. Otherwise, the answer is No.

Decision Required to be Made	Decision Rule
8. Have marker and capping layers (where required) been installed appropriately and in accordance with RAP requirements?	Where onsite containment is proposed to be implemented, has the marker and capping layer been installed appropriately and in accordance with the RAP requirements? If the criteria stated above are satisfied, the decision is Yes. If the criteria are not satisfied, the decision is No.
9. Have the works been completed in accordance with the RAP, or where variations to the works were required, have these met the objectives of the RAP?	Evaluation of the RAP requirements and completed scope of works will be completed on a qualitative basis. If the completed works are inconsistent with the RAP objectives, the answer will be No. In this instance, evaluation of the works will be undertaken with consideration to the RAP objectives. If the works are inconsistent with the stated objectives, the answer is No. Otherwise, the answer to the decision is Yes.
10. Is the site suitable for the proposed land uses without any requirement for ongoing management of contamination?	If the answer to questions 1 to 4 and question 7 of the above is No, and the answer to questions 5, 6 and 8 to 10 of the above is Yes, then the answer to the decision is also Yes. Otherwise, the answer to the decision is No. In this instance further remediation/ management actions will require to be implemented and appropriately documented such that a future review of the above decisions may result in a different decision outcome.

7.2.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), appropriate data quality indicators (DQIs used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQI) established for the project as discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters). The acceptable limit on decision error is 95% compliance with DQIs.

The DQIs and data assessment criteria are summarised as presented in **Table 7.2**.

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.

- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen field and laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 7.2: Summary of Quality Assurance/Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 primary samples	1-10x Limit Of Reporting (LOR) – no limit; 10x-30x LOR - <50 % relative percent difference (RPD)[1] >30x LOR - <30 % RPD
Blind duplicates (inter laboratory)	1 / 20 primary samples	
Laboratory duplicates	1 / 20 primary samples	
Accuracy		
Surrogate spikes	All organic samples	70-130 %
Laboratory control samples	1 per lab batch	70-130 %
Matrix spikes	1 per lab batch	70-130 %
Representativeness		
Sampling appropriate for media and analytes	All samples	-[2]
Samples extracted within holding times.	All samples	Soil: organics (14 days), inorganics (6 months), PFAS (14 days), ASS (24 hours, frozen: indefinite), asbestos (no limit) Water: organics (7 days to extract and 14 days to analyses). Metals (6 months), PFAS (14 days)
Trip spike (BTEX only)	1 per sampling event	70-130% recovery
Rinsate blank	1 per sampling event	<LOR
Method blank	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	National Association of Testing Authorities (NATA) accredited methods
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples	All QA/QC samples	95% compliance
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR ≤ site assessment criteria

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data. Corrective actions may include requesting further information from samplers and/ or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

7.2.7 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field validation sampling design that generates data that are expected to satisfy the decision performance criteria, as specified in the preceding steps of the DQO process. The output of this step is the sampling design that will guide development of the field sampling and analysis plan. This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

The remediation validation and subsequent laboratory analysis program as outlined in the following sections will need to be implemented during site remediation activities to demonstrate the successful completion of works in compliance with the RAP goals. The validation/characterisation sampling and analytical program for the site is outlined in **Table 7.3** below.

Table 7.3: Characterisation/Remediation Validation Program

Item	Sampling Frequency			Analytical Suite
	Excavation Floors	Excavation Walls	Materials /Other	
Pre remediation Investigation				
Fill material/natural soils	N/A	N/A	Scope/locations as per **Section 6.2.1**.	Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), TRHs, PAHs, VOCs, PFAS, Asbestos (500 mL NEPM), TCLP/ASLP/LEAF USEPA SW846 1314 Metals, PAHs and PFAS
Groundwater	N/A	N/A	1 sample per monitoring well (7 locations)	Heavy Metals, TRHs, VOCs, PFAS (low levels), pH, electrical conductivity (EC), total dissolved solids and hardness
Validation of Excavations of Material Proposed to be Disposed Offsite				
Leachable metals and/or PFAS fill material	1/25 m^2 (5 m grid) with a minimum of 2 samples	1 per 10 linear m, with minimum of 1 per excavation face	N/A	Heavy metals, TRH, PAHs, PFAS
Stockpile footprints	1/100 m^2 (10 m grid) with a minimum of 2 samples	N/A	N/A	Relevant COPCs as per impacted material type
Validation of Excavations of Material Proposed to be Retained Onsite				
Validation of Excavations of impacted material (where natural encountered)	1/100 m^2 (10 m grid) with a minimum of 2 samples	1 per 10 linear m	N/A	Copper, Lead, Zinc, TRH, PAHs Asbestos (500 mL NEPM) (if fill)
Validation of UST (If Present)				
Excavations formed by the removal of UST and associated impacted soils	1 sample / 25 m^2 minimum of 2 per base	1 sample / 10 linear metres, minimum of 1 per excavation face; and 1 sample / per strata type	N/A	Heavy metals, PAHs, TRHs, phenols, VOCs and Asbestos (500 mL NEPM, if fill)
Fuel feed lines	1 sample / 5 m line	N/A	N/A	Heavy metals, PAHs, TRHs, phenols, VOCs and Asbestos (500 mL NEPM, if fill)

Item	Sampling Frequency			Analytical Suite
	Excavation Floors	Excavation Walls	Materials /Other	
Fill materials associated with UST	N/A	N/A	1/25 m^3 to 200 m^3, then as per Table 4 *Sampling design part 1 - application* (EPA, 2022a). (Minimum of 3 samples)	Heavy metals, PAHs, TRHs, OCPs, PCBs, phenols and VOCs (plus asbestos (500 mL NEPM) for off-site disposal)
Soil/Fill Requiring Off-Site Disposal				
Waste classification of materials requiring offsite disposal are to be classified in accordance with NSW EPA (2014), EPA (2022a) and ASSMP (JBS&G 2023b)	1/100 m^3 with a minimum of 3 samples[1]			Heavy metals TRH/BTEX PAHs OCPs/PCBs Asbestos (500 mL NEPM) SPOCAS TBT (sediments) TCLP (as required)
Unexpected Finds				
Assessment of unexpected finds and/or validation of excavations formed by unexpected finds	1/25 m^2 (5 m grid) with a minimum of 2 samples	1 per 10 linear m, minimum of 1 per excavation face	1/25 m^3 to 200 m^3, then as per Table 4 *Sampling design part 1 - application* (EPA, 2022a)	Relevant contaminants of concern determined by Environmental Consultant
Material Importation				
Imported VENM (other than material sourced from a commercial quarry)	N/A	N/A	Minimum of 3 check samples per source site/material type to 500 m^3 then 1 sample per 500m^3 thereafter.	Heavy metals TRH/BTEX PAHs OCPs/PCBs Asbestos (500 mL NEPM)
Quarry VENM material (eg, aggregate, sandstone etc)	Confirmation that the material is quarried rock or other material as appropriate, prior to importation, and visual confirmation.			Site inspection required upon arrival.
Imported ENM, if required for remedial excavation reinstatement	N/A	N/A	As per EPA ENM Order	Heavy metals TRH/BTEX PAHs pH EC RTA 276 (foreign materials) Asbestos (500 mL NEPM)
Material subject to a NSW EPA Resource Recovery Order/Exemption	Confirmation by the supplier that the material meets the terms of the order. Then Environmental Consultant sampling at a minimum of 3 samples per source site / material type to 500 m^3 then 1 sample per 500 m^3 thereafter, prior to importation.			TRH/BTEX PAH Heavy Metals OCP/PCBs Asbestos (500 mL NEPM)
Site-won soils for remedial excavation reinstatement	N/A	N/A	Minimum 3 soil samples per site source area, and/or use of JBS&G 2023 data, to be determined by Environmental Consultant.	Heavy metals TRH/BTEX PAHs OCPs/PCBs SPOCAS Asbestos (500 mL NEPM)

[1] Sampling density decreased from the recommended EPA (2014) due to available and reliable historical data

The nominated sampling densities and analytical program have considered sample density guidance provided in EPA made and endorsed guidelines.

7.3 Sampling Methodology

7.3.1 Soil Sampling Methodology

7.3.1.1 Validation of Excavation(s)

Samples will need to be collected by an appropriately trained and experienced environmental scientist/engineer using a hand trowel or from the bucket of mechanical excavation equipment, at the required densities to meet the project DQOs.

Prior to collection of each sample, hand tools will need to be thoroughly decontaminated using phosphate free detergent and distilled water as per **Section 7.3.7**.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination will need to be noted on the field documentation.

7.3.1.2 Validation of Retention of Impacted Soils On-Site

The preferred remedial method for the impacted soil is beneficial reuse / long term containment on the site subject to management conditions. This shall be undertaken as per a long-term containment strategy, subject to the agreement of relevant stakeholders.

A further objective of the site development works will be minimisation of wastes as generated by the project. There is the potential that consequent to the proposed development works, e.g. excavations as required to facilitate sub-surface service installation, that surplus soils will be generated during the site remediation and associated earthworks. Consideration may be given to assessment of surplus soils for beneficial reuse where the subject soils comprise natural non PASS or natural treated PASS soils .

The relocation of impacted soils / fill materials is proposed to be completed where required to reinstate remedial excavations, and/or achieve proposed development levels, subject to requirements for capping installation and placement only in unsaturated horizons within the site.

Material Tracking

The movement of all impacted materials (subject to long term containment) on the site is required to be subject to a Material Tracking Plan (MTP). The MTP shall be administered by the Environmental Consultant with the provision of all required information by the remediation contractor and will generally contain the following elements:

- Date (yyyy/mm/dd);
- Site figure showing source (cut) and placement (fill);
- Estimated volume (cubic metres);
- Type of material (asbestos, VENM etc);
- Depth of source (RL);
- Depth of placement (RL);
- Source (from) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Placement (to) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Source (from) information in terms of site feature (e.g. Building X);
- Placement (to) information in terms of site feature (e.g. under future basement);

- Reference document (where necessary, i.e. virgin excavated natural material / excavated natural material classification);
- Purpose of placement (i.e. containment, surplus to site requirements etc); and
- Comments (when required).

Where on-site containment of impacted material is undertaken via a cell during the remediation activities, validation of the implemented measures will be required as per the following.

Marker Layer

Visual inspection will be undertaken by the Environmental Consultant to verify the suitable installation of the marker layer across required areas. Photographic records and a survey prepared by a Registered Surveyor of the marker layer installation, including vertical and lateral extents will be organised by the Contractor and submitted to the Client and Environmental Consultant for inclusion in the validation report.

Capping Layer

Material to be used as a capping layer must be validated by the Environmental Consultant as environmentally suitable, consisting of VENM, ENM, suitable on-site materials (i.e. treated material or VENM from the site) or material considered suitable for beneficial reuse via a resource recovery exemption issued by NSW EPA. Additionally, contaminant concentrations in any capping layer material must not exceed the adopted site validation criteria for soils.

The capping layer must be placed at the thicknesses specified for each capping scenario as detailed in **Section 6.2.5.** Photographic records and a survey of the capping layer installation, which details the final thicknesses of the capping layer, including the vertical and lateral extents must prepared for/by the Contractor and provided to the Client and Environmental Consultant for inclusion in the validation report.

Surveys

The Remedial Contractor must provide a survey of the marker layer and capping layer prepared by a registered surveyor that demonstrates the lateral and vertical extents of each layer. The capping layer survey must demonstrate that the minimum capping thicknesses (as per **Section 6.2.5**) have been achieved. In addition, a survey showing the alignment of underground services must also be provided by the registered surveyor.

7.3.2 UST and Impacted Soil Removal

The validation program for the removal of the UST (if present) and associated impacted soils shall be undertaken in accordance with *UPSS Technical Note: Site Validation Reporting*[31] and comprises:

- Inspection of the excavated areas by a suitably trained and experienced environmental consultant to confirm the extent of potentially impacted materials have been removed. Screening using a calibrated photo-ionisation detector (PID) to be used where appropriate. If additional potentially impacted material is identified, further excavation will be conducted, and the affected area will be re-inspected until such time as visual and olfactory validation is obtained;
- Following visual, olfactory and field volatile screening (PID) validation, soil samples will be collected from the remediation excavation as per **Table 7.3**;
- Excavation validation samples will be analysed at a laboratory National Association of Testing Authorities (NATA) accredited for the required analyses. If the concentration of

[31] UPSS Technical Note: Site Validation Reporting. NSW DECCW January 2010

COPCs are identified in any of the excavation validation samples exceeding criteria, then the soils will be excavated a minimum 0.3 m up to 0.5 m further in the direction of failure and the validation process repeated. Alternatively, where impact exceeding criteria is not identified by the laboratory, the remedial areas will be deemed to have been successfully remediated and validated; and

- Excavated soils associated with the UST removal that are potentially not impacted will be sampled as per the rate identified in **Table 7.3**. If the concentration of contaminants in stockpiled materials are above the adopted site criteria, the materials will be disposed of off-site. Alternatively, if the materials are found to be suitable for on-site retention (either below site criteria or the statistical criteria are satisfied) – they can be reinstated on-site.

7.3.3 Footprint of Contaminated Stockpiles

Where stockpiles have been stored on hardstand, geo-textile or plastic lining, visual validation will be used for validation of the stockpile footprint. Validation sampling would only occur when a breach of the containment method is identified.

Where impacted material has temporarily been stored on unsealed ground surfaces beyond those proposed to be the subject of capping, the validation program for the footprint of contaminated stockpiles is:

- Inspection of the stockpile footprint by a suitably trained and experienced person. If impacted material is identified, surface soils are required to be scraped (100 mm), and the footprint re-inspected until such time as visual validation is obtained;
- Following visual validation, soil samples will be collected from the footprint on a 10 m grid, and analysed in accordance with **Table 7.3**, based on the material type previously stockpiled; and

If contamination is identified in a validation sample at concentrations above the site validation criteria, the soil represented by the failed validation sample will be disposed offsite, and the validation inspection and sampling process repeated for the failed area. Alternatively, where contamination is not identified in the samples by laboratory analysis, the footprint will be deemed to have been successfully validated.

7.3.4 Groundwater Sampling Methodology

The depth to standing water will be gauged and an assessment of the presence of light non-aqueous phase liquids/dense non-aqueous phase liquids (LNAPL/DNAPL) will made using an interface probe.

Subsequent to groundwater gauging, the following methodology will be adopted for the collection of PFAS/PFOS samples:

- Before and between sampling each well, the interface probe and all other non-disposable equipment (i.e. HydraSleeve weights and clips) will be decontaminated in line with project/PFAS specific wash-down procedures, Decon 90 will not be used, the wash-down will involve the use of PFAS free products such as Liquinox.
- The HydraSleeve sampler will comprise a flexible 3mm thick lay-flat polyethylene sleeve with a weight on the bottom and check valve on the top and will be lowered into the well to the prescribed sampling depth (i.e. within the screened interval).
- The correct HydraSleeve size selection for each monitoring well will be undertaken. After placement in the monitoring well, the HydraSleeve will be left for a minimum of one hour to allow the water column to re-equilibrate following the minor disturbance that will occur during deployment.

- The groundwater samples will be collected by pulling the HydraSleeve up through the water column and to the surface. The recovered water sample will then be decanted into the appropriate laboratory supplied sample bottles.
- Collected groundwater samples will be immediately transferred to sample containers of appropriate composition (non-Teflon lined), which will be pre-treated in a manner appropriate for the laboratory analysis. Groundwater samples will be obtained in a manner that ensures no headspace remained in the bottles.
- Each of the sample bottles will be labelled only using ball point pens with the project ID, date, sampler's initials and unique monitoring well ID (or QC sample name).
- In order to minimise exposure to sunlight, sample bottles will be placed immediately into a pre-chilled ice chest, for transport to the testing laboratories.

Following the sampling for PFAS/PFOS as described above, the wells will be purged and sampled using a low-flow methodology with peristaltic pump for all other constituents. Purging will be undertaken to ensure the sample collected is representative of groundwater conditions. Field parameters of pH, conductivity, redox and temperature will be measured with field electrodes in a flow cell and samples obtained once the parameters stabilise such that:

- Consecutive electrical conductivity (EC) readings within 3%;
- Consecutive redox (Eh) readings within 10mV;
- Consecutive DO readings within 10%; and
- Consecutive pH readings within 0.5.

JBS&G will utilise a low-flow peristaltic pump with dedicated tubing to purge and sample wells. JBS&G considers that this method is appropriate and will not result in measurable loss of VOCs when sampling at low flow rates in shallow groundwater and provides a significantly lower risk of cross-contamination between locations due to use of dedicated materials. Non-disposable groundwater monitoring equipment will be decontaminated in accordance with the procedure detailed below in between each monitoring well.

Collected groundwater samples will be immediately transferred to laboratory supplied sample bottles in the order of those for most-volatile to least volatile contaminants. Field filtering using a 0.45 µm filter will be undertaken for metals/metalloid samples. The sample containers will be transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples. Samples will be analysed at a NATA accredited laboratory in accordance with the schedule presented in **Table 7.3.**

A record of gauging data, sample observations (including colour, odour, presence of LNAPL, DNAPL, sheens) and sampling method details will be recorded.

7.3.5 Sample Handling

Collected samples will be immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis, plastic bags for asbestos and ASS). Sample labels recorded: job number; sample identification number; and date of sampling.

Sample containers will be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

7.3.6 Duplicate and Triplicate Sample Preparation and QA/QC Requirements

Field duplicate and triplicate samples for the characterisation/validation assessment will be obtained during sampling using the procedures outlined at a frequency outlined in **Table 7.2**. The primary sample will be divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and / or plastic bags. All jars will be filled completely with no headspace to reduce the potential for loss of volatiles and separately labelled as the primary, duplicate and triplicate samples before being placed in the same chilled esky for laboratory transport.

Trip spike, storage blank and rinsate samples will be collected where analysis for volatile compounds is required.

7.3.7 Sampling Equipment Decontamination

The following procedure will be used to clean non-disposable equipment, including the trowel, pick etc., prior to the collection of each sample:

- Scrubbing with a wire brush to remove gross contamination;
- Pressure spray with Decon 90 or Liquinox (if PFAS is identified as a COPC) detergent and potable water mix;
- Pressure spray rinse with potable water; and
- Air drying.

Rinsate samples will be obtained during the field decontamination procedures at regular intervals during characterisation/validation sampling activities (which include reusable equipment). Each rinsate sample will be obtained by rinsing the trowel with laboratory grade demineralised water following the decontamination procedure. The water sample will be appropriately preserved and stored with the site samples prior to transport to the laboratory for chemical analysis.

7.3.8 Laboratory Analyses

Eurofins MGT Pty Ltd (Eurofins) will function as the primary laboratory for the required analyses. The secondary laboratory to be contracted for the works will be Envirolab Services Pty Ltd (Envirolab). All laboratories are NATA registered for the relevant analyses. In addition, the laboratories are required to meet JBS&G's internal QA/QC requirements.

7.3.9 Validation of Unexpected Finds

The procedure described below shall be required if unexpected, impacted soils requiring remediation and validation are identified during the works, consistent with the unexpected find protocol presented in **Section 6.7** and **Figure 6.1**.

Samples will be collected and analysed in accordance with the analytical schedule (**Table 7.3**) by NATA accredited laboratories.

A suitably qualified Environmental Consultant will be required to assess unexpected finds and undertake the validation inspections and sampling to verify such finds have been addressed and the areas meet the validation criteria in this RAP.

7.4 Validation Criteria

7.4.1 Soil Validation Criteria

As discussed, it is anticipated that the site will be developed for public/open space land use in addition to the construction of a community facility building and in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017), validation criteria sourced from the publications have been adopted:

- Health Investigation Levels (HILs) for recreational / public open space (HIL-C) land use scenarios;
- Soil Health Screening Levels (HSLs) for Vapour Intrusion, recreational / public open space (HSL-C) land use scenario;
- Soil Health Screening Levels (HSLs) for Vapour Intrusion, commercial / recreational (HSL-D) land use scenario;
- HSLs for asbestos levels in soil for recreational / public open space (HSL C) land use scenario;
- Site specific Ecological Investigation Levels (EILs) for urban residential / public open space land use scenarios;
- Ecological Screening Levels (ESLs) for urban residential / public open space land use scenarios; and
- Management limits for petroleum hydrocarbons for residential, parkland and public open space land use scenarios. Following the NEPM guidance, Management limits are considered only after HIL/HSLs and EIL/ESLs.

The results of asbestos analysis are assessed in general accordance with NEPC (2013) including DOH (2009) guidance with regard to asbestos in soil.

Where there are no NSW EPA endorsed thresholds the laboratory limit of reporting (LOR) will be adopted as an initial screening value for the purposes of this assessment.

Consideration will also be given to the Canadian Council of Ministers of the Environment (CCME 2010[32]) where PAH concentrations exceeds the current NSW EPA endorsed criteria to support decisions with respect to the requirement for management/remediation of soil with elevated PAH concentrations.

In addition to the numerical criteria for chemical and asbestos contaminants, consideration shall be given to the aesthetic characteristics of material the subject of validation, including the presence of soils that are odorous or discoloured because of contamination, or otherwise contain significant quantities of non-soil inclusions (ie. construction and demolition waste and similar).

7.4.2 Groundwater Validation Criteria

Groundwater data are to be assessed with consideration of published levels as sourced from the following:

- Groundwater health screening levels (HSLs) for vapour intrusion in coarse soil as presented in NEPC (2013);
- Criteria for the 95% protection in marine ecosystems presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (ANZG 2018);
- NEPC (2013) Groundwater Investigation Levels (GILs) Marine Waters;
- PFAS National Environmental Management Plan (NEMP) Tier 1 Screening Values for Fresh Water (99% Species Protection) (HEPA 2020); and
- Drinking water and recreational criteria will be adopted as a conservative assessment of worker exposure risk during potential excavation works involving interaction with

[32] *Canadian Soil Quality Guidelines for Carcinogenic and Other Polycyclic Aromatic Hydrocarbons (Environmental and Human Health Effects).* Scientific Criteria Document (revised), Canadian Council of Ministers of the Environment, 2010 (CCME 2010)

groundwater, from the Australian Drinking Water Guidelines NHMRC (2011[33]) (Recreational is 10x the drinking water criteria for health).

Where there are no NSW EPA endorsed thresholds, the laboratory LOR will be adopted as an initial screening value for the purpose of this assessment in lieu of site-specific risk assessment derived criteria.

7.4.3 Offsite Disposal Criteria

Where contaminated fill/soil is not suitable for onsite management or is surplus to construction requirements, materials are proposed to be remediated by off-site disposal. Materials shall be classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

7.4.4 Imported Soil Criteria

In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. Imported materials will only be accepted to the site if they meet the restrictions placed on these materials and meet the definition of:

- VENM as defined in the *Protection of the Environment Operations Act* (1997) Schedule 1;
- ENM as defined in EPA (2014); or
- Resource recovery materials as per an EPA exemption.

All material imported onto the site are required to be accompanied by appropriate documentation that has been verified by the appointed site contamination (environmental) consultant. All materials will be required to be inspected upon import to the site by the appointed site contamination (environmental) consultant to confirm consistency with provided documents and/or consistency with observations made at the source site.

Sampling of materials as per an EPA exemption (recycled products) is required to be undertaken by the facility in accordance with the relevant exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by an Environmental Consultant for land use suitability.

7.4.5 Statistical Criteria

Statistical analysis of the data will be completed, where necessary, in accordance with relevant EPA made/endorsed guidance, to facilitate data assessment. The statistical criteria below are noted:

- Either:
    - the reported concentrations are all below the site criteria;
- Or:
    - no single analyte concentration exceeds 250 % of the adopted site criterion; and
    - the standard deviation of the results is less than 50 % of the site criterion; and
    - the 95 % UCL of the average concentration for each relevant analyte is below the adopted site criterion.

For soil exceedances further consideration will be given to depth of the sample (i.e. EILs <2.0 m bgs, HILs <3.0 m bgs and HSLs <4.0 m bgs as per NEPC 2013) and the finished development scenario (i.e.

[33] Australian Drinking Water *Guidelines* (ADWG) NHMRC (2011, as amended 2016)

concrete hardstand/paved areas across the entire site, importation of material for constructed garden beds/landscaped areas).

7.5 Reporting

7.5.1 SAQP Reporting

Prior to the commencement of field works associated with the DGA, a SAQP will be prepared in general accordance with the *NSW EPA Guidelines for Consultants Reporting on Contaminated Land* (EPA 2020), documenting the sampling, analytical and quality requirements for the DGI to address the data gaps identified from historical investigations and (where appropriate) identify any changes in site condition and/or the proposed development as may occur between preparation of the RAP and the SAQP. This report will contain information including:

- Recent aerial photographs to identify potential changes in land use since previous reports were completed at the site;
- Consideration of EPA and other information relating to potential off site impacts from adjacent regulated and notified land as may have been identified following issue of the RAP;
- Review and update of the site CSM based on the available information
- Completion of a thorough inspection of the site and immediate surrounds; and
- Methodology, analytical schedule and adopted criteria to guide the DGI for the current contamination status at the site.

7.5.2 DGA Reporting

Prior to the commencement of remedial works, a DGA will be prepared in general accordance with the *NSW EPA Guidelines for Consultants Reporting on Contaminated Land* (EPA 2020), documenting the data gaps identified in this report and the associated works. This report will contain information including:

- Recent aerial photographs to identify changes in land use since previous reports were completed at the site;
- Consideration of EPA and other information relating to potential off site impacts from adjacent regulated and notified land as may be identified subsequent to issue of the RAP;
- Review and update of the site conditions via inspection of the site and immediate surrounds;
- Review and update of the site CSM based on the available information;
- Documentation of the outcomes of implementation of the SAQP, comprising an intrusive site investigation program including soil sampling and analysis across the assessment area, installation of three additional groundwater wells, sampling and analysis of groundwater samples from newly installed and existing site monitoring wells, etc;
- Assessment of investigation data with consideration to established Data Quality Objectives and adopted site assessment criteria; and
- Presentation and discussion of the findings of the DGA with respect to the remediation works as proposed in this document, with recommendations where appropriate to amend the proposed remediation/management requirements, in general accordance with relevant EPA made or endorsed guidelines.

7.5.3 Validation Reporting

At the completion of the remedial works a Validation Report will be prepared in general accordance with the *NSW EPA Guidelines for Consultants Reporting on Contaminated Land* (EPA 2020), documenting the works as completed. This report will contain information including:

- Results of previous investigations conducted at the site;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined DQO and the remediation acceptance (validation) criteria;
- All material tracking data;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Results of all environmental monitoring undertaken during the course of the remedial works;
- Details of any environmental incidents occurring during the remedial works and the actions undertaken in response to these incidents;
- Verification of regulatory compliance;
- Details on waste classification, tracking and off-site disposal including landfill dockets;
- The extent of impacted materials as retained on the site and subject to the long-term management provisions (as required); and
- Clear statement of the suitability of the site with respect to permissible land uses.

The report will serve to document the remediation and validation works for future reference.

7.5.4 Long-term Environmental Management Plan

In addition to the requirements of the validation plan, should the remediation strategy implementation result in onsite containment of material such that an LTEMP is required, this document will be required to address the following in accordance with EPA (2022c[34]).

The precise nature and extent of the management requirements will not be known until remediation/management works are conducted and the validation data obtained. The LTEMP will be prepared for the relevant portions of the Site following the completion of the validation report(s) such that the requirements may be reviewed by an appointed Site Auditor in preparation of the Part A Site Audit Statement (SAS).

The LEMP(s) are required to document the following elements:

- A statement of the objectives of the LTEMP – i.e., to ensure continued suitability of the Site portion following remediation.
- Identification of residual environmental contamination issues at the Site that require ongoing management/monitoring to meet the LTEMP objectives, including the type of contamination and location within the Site (including a survey plan prepared by a registered surveyor).
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at the Site.

[34] *Practice Note. Preparing Environmental Management Plans for Contaminated Land*. NSW EPA January 2022 (EPA 2022c)

- Description of management controls to limit the exposure of Site users to known areas of contamination to acceptable levels.
- Description of responsibilities for implementing various elements of the provisions contained in the LTEMP.
- Timeframes for implementing the various control/monitoring, etc. elements outlined in the LTEMP.
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the Site including:
    - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
    - Relevant assessment criteria to be used in evaluating monitoring results;
    - Frequency of monitoring and reporting;
    - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
    - The length of time for which monitoring is expected to continue;
    - The regulatory authorities involved, and the management inputs required from each;
    - The integration of environmental management and monitoring measures for soil;
    - Health and safety requirements for particular activities;
    - A program of review and audits;
    - The provisions in the LTEMP are feasible (i.e., able to be implemented) and able to be legally enforceable (i.e., a mechanism exists, such as development consent conditions, to give the plan a basis in law); and
    - The relevant consent authority is satisfied that the inclusion of a development consent condition relating to the implementation of the LTEMP is acceptable.
- Corrective action procedures to be implemented where LTEMP assessment criteria are breached.

8. Site Management Plan

8.1 Contact Persons

Contact details for key personnel involved in remediation and validation works are summarised in **Table 8.1.**

Table 8.1 Contact Details

Client's Supervisor/Manager	Details
Name	To be advised
Company	To be advised
Address	To be advised
Contact Phone	To be advised
Remediation Contractor	**Details**
Name	To be advised
Company	To be advised
Contact Phone	To be advised
Environmental Consultant	**Details**
Name	To be advised
Company	To be advised
Address	To be advised
Contact Phone	To be advised

8.2 Hours of Operation

Remediation works shall only be permitted during the following hours, or as approved by the Department of Planning and Environment within the consent:

- Monday to Friday: 7:00 am to 5:30 pm
- Saturdays: 7:30 am to 3:30 pm
- Sundays and Public Holidays: No work permitted.

8.3 Soil and Water Management

All works shall be conducted in general accordance with Landcom (2004)[35] guidance (the Blue Book), (as updated) which outlines the general requirements for the preparation of a soil and water management plan.

All remedial works shall be conducted in accordance with a soil and water management plan, which is to be kept onsite and made available to council officers on request. All erosion and sediment measures must be maintained in a functional condition through the remediation works by the remedial contractor.

To prevent the migration of impacted soil off site, silt fences shall be constructed at the down-gradient site boundaries by the remedial contractor. Any material which is collected behind the sediment control structures shall be removed off site to a licensed waste facility after waste classification.

In storm or extended rainfall event, the structures located on site for sediment control shall be monitored and replaced or altered if necessary by the contractor. Collected material shall be managed in accordance with remediation works by the contractor.

8.3.1 Site Access

During remediation works, perimeter fencing will be maintained to restrict access to the works area. Only authorised persons will be able to enter the works area.

[35] *Managing Urban Stormwater: Soils and Construction*, Landcom 4th Edition, March 2004.

Vehicle access to the works area shall be stabilised to prevent the tracking of soil around the site and the adjoining driveway/access point to the road will be swept or cleaned on an as-needed basis. Any collected materials shall be treated as potentially contaminated and will be suitably managed.

8.3.2 Stockpile Management

The following procedures will be implemented:

- No stockpiles or other materials shall be placed on footpaths or roadways and will be away from all stormwater infrastructure (including drainage lines, stormwater pits, gutters, etc) where possible. Where this is not possible, sediment controls will be placed over stormwater grates to prevent ingress of sediment to stormwater drainage lines.
- Stockpiles shall be formed with sediment control structures placed immediately down slope to protect other lands and waters from sediment pollution.
- All asbestos impacted soils will be covered with plastic or geotechnical fabric.

8.3.3 Excavation Pump out

Excavation pump out water (if any) shall be sampled by the environmental consultant for analysis for total suspended solid concentrations, turbidity, pH and the identified contaminants of concern prior to irrigation on site, release to stormwater with permission from Council, discharge to sewer (only if trade waste permit obtained), or removal by a licensed liquid waste Contractor.

8.4 Noise

The remediation works shall comply with the NSW EPA's Environmental Noise Control Manual for the control of noise from construction sites.

All machinery and equipment used on site will be in good working order and with the fitted with appropriate silencers when necessary.

8.5 Air Quality

8.5.1 Air Monitoring

Airborne asbestos fibre monitoring is recommended to be conducted during the works in accordance with requirements of the National Occupational Health and Safety Commission (NOHSC) *Asbestos Code of Practice and Guidance Notes*, in particular the guidance note for the estimated of airborne dust [NOHSC 3002:2005].

The consultant shall undertake airborne asbestos fibres monitoring at a minimum of four static locations daily during remediation works that will disturb asbestos impacted or contaminated materials. Monitoring locations will include works perimeter locations and downwind locations. Wind Rose information available from the Bureau of Meteorology (BOM) for the nearest weather stations will be used to determine common prevailing winds in the area.

Air filters shall be analysed by a NATA accredited laboratory and results shall be required to be below 0.01 fibres/mL. All detections of fibres shall be further analysed by scanning electron microscope (SEM) to confirm the fibres are asbestos.

If respirable asbestos fibres are confirmed and present between 0.01 and 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with SWNSW (2022a):

- Review control measures;
- Investigate the cause; and
- Implement controls to eliminate or minimise exposure and prevent further release.

If respirable asbestos fibres are confirmed and present above 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with SWNSW (2022a):

- Stop removal work;
- Notify SafeWork NSW by phone, then by fax or written statement that work has ceased;
- Investigate the cause;
- Implement controls to eliminate or minimise exposure and prevent further release; and
- Do not recommence removal work until further air monitoring is conducted and fibre levels are detected below 0.01 fibres/mL.

A daily report air monitoring report will be prepared documenting the previous/same days airborne asbestos fibre air monitoring results. This report will be made available to all relevant stakeholders and site workers.

8.5.2 Dust Control

During the remediation, dust levels will be monitored and minimised as necessary by using mist sprays or water spray application on the ground surface via watercart. Dust shall also be controlled by ensuring vehicles leave via the designated (stabilised) site access point.

8.5.3 Odour

No odours should be detectable at the site boundary. Appropriate actions will be taken to reduce the odours, which may include increasing the amount of covering of excavations / stockpiles, mist sprays, odour suppressants or maintenance of equipment.

Records of volatile emissions and odours shall be kept by the remediation manager. Equipment and machinery will be adequately maintained to minimise exhaust emissions. No materials shall be burnt on the site.

8.6 Groundwater

In the event that groundwater is encountered during redevelopment works that will require dewatering, evaluation of the requirements to obtain a dewatering license in accordance with the *Water Management Act 2000* will be undertaken. Where anticipated to be required, the license must be obtained prior to the installation of the dewatering system. The license application must be submitted to the WaterNSW, and a Dewatering Management Plan should be included as part of the submitted licence application.

It is noted that excavation water may require treatment prior to disposal, potentially including pH correction, sediment concentrations and potentially chemical contaminants. Procedures for treatment and validation of water will be documented in the documented Dewatering Management Plan.

In accordance with the Council development controls, no wastewater, chemicals or other substances harmful to the environment shall be permitted to discharge to Council's stormwater system or the harbour. Only clean, unpolluted water is permitted for discharge. Wastewaters not suitable for discharge to stormwater or the harbour must be the subject of on-site treatment to address contaminant concentrations prior to stormwater disposal, disposed of using a licensed liquid waste contractor or alternatively directed to the sewer of the Sydney Water Corporation (SWC) under a Trade Waste Agreement (TWA). The pre-treatment of wastewater may be a requirement of SWC prior to discharge.

8.7 Material Transportation

The transporting contractor shall ensure there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

All appropriate road rules shall be observed, and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

Where material is to be imported, controls are to be implemented to maintain separation between contaminated and non-contaminated materials.

8.8 Hazardous Materials

All hazardous and/or intractable wastes (if any) shall be removed and disposed of in accordance with the relevant regulatory requirements. In particular, any hazardous wastes will be transported by a licensed transporter.

8.9 Containment Cell

Leaving contaminated soil in-situ is an element of the remediation strategy for the site. Any materials to be retained on site will have regard to the requirements outlined in the *Guidelines for the Assessment of On-site Containment of Contaminated Soil* (ANZECC 1999) and any ongoing management provisions shall meet the requirements outlined in *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme, 3rd Edition* (EPA 2017).

Implementation of the ongoing LTEMP will manage risks associated with disturbance of the contained material.

8.10 Disposal of Contaminated Soil

All soil will be classified, managed and disposed in accordance with the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA 2014a), *Waste Classification Guidelines Part 4: Acid Sulfate Soils* (EPA 2014b) and *Protection of the Environment Operation (Waste) Regulation* (Waste Regulation).

8.11 Site Signage and Contact Numbers

Throughout the duration of the works appropriate signage shall be erected around the remediation area and stockpiles with the contact details of the remediation contractor and project manager.

8.12 Complaint Reporting and Resolution

Complaints from adjoining site occupants or workers on site will be directed initially to the civil/remediation contractor on site. Following that, discussion with the Environmental Consultant and the Client, and the complaint will be investigated, and the issue remedied as required or applicable.

9. Health and Safety Plan

This health and safety plan contains procedures and requirements that are to be implemented as a minimum during the remediation works.

The objectives of the health and safety plan are:

- To apply standard procedures that reduce risks resulting from the above works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.
- These objectives will be achieved by:
- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards and mandatory safety practices and procedures; and
- Provision for contingencies that may arise while operations are being conducted at the site.

This health and safety plan does not provide safety information specific to construction or excavation activities carried out by contractors, such as the safe operation, maintenance and inspection of plant, etc. Contractors will be required to prepare their own Safe Work Method Statements for their work activities. All parties working on the site shall comply with all applicable Health and Safety legislation, regulations, codes and guidelines.

9.1 Responsibilities

Remediation Supervisor

The remediation supervisor is responsible for ensuring that the work is carried out in accordance with the health and safety plan. This will include:

- Ensuring a copy of the health and safety plan is available at the site during the remediation/validation activities;
- Confirming individuals are competent in performing allotted tasks;
- Liaison with the contractor representatives, as appropriate, regarding safety matters; and
- Investigation and reporting of incidents and accidents.

Other Members of the Site Workforce

Every individual worker is responsible for conducting their allocated tasks in a safe manner and in accordance with their training and experience. They must give due consideration to the safety of all others in their proximity and cooperate in matters of health and safety. All workers must leave their work areas in such a condition that the location will not be hazardous to others at any time.

9.2 Hazards

Job Risk Assessments (JRAs) and Safe Work Method Statements (SWMS) will need to be supplied by the Remediation Contractor and incorporated into the Health and Safety plan detailing all the known or potential hazards associated with the work activities some are listed below.

9.2.1 Inhalation Hazards

The main inhalation hazards from the remediation/validation works are consequent of the presence of asbestos. Measures are required to be put in place to prevent/ minimise the generation of

airborne fibres. These have been described in the environmental controls for the works. Where there is a potential for airborne emissions to be generated, PPE shall be required to be worn to prevent potential exposure, as described in **Section 10.3**.

9.2.2 Chemical Hazards

In addition to the identified asbestos hazards, chemical impacts identified as requiring remediation at the site include heavy metals, PAHs and hydrocarbon,

When working with contaminated materials in general, care must be taken to ensure that the contamination is not introduced to the worker via ingestion, inhalation or absorption. PPE and decontamination requirements related to asbestos remedial works and summarised in **Sections 10.3** and **10.5** are sufficient for managing any potential exposure to chemical hazards in soils.

9.2.3 Physical Hazards

Operating Machinery

Heavy plant and equipment operating in the vicinity of field personnel presents a risk of physical injury. Personnel should be cognisant of their position in relation to operating machinery at all times.

Never walk behind or to the side of any operating equipment without the operator's knowledge. Do not assume that the operator knows your position. Personnel should stay at least 1 m from the operational area of heavy equipment and should not stand directly below any load or piece of equipment (e.g. backhoe/excavator).

Work In or Near Excavations

All excavations shall be shored, sloped or otherwise constructed so as to minimise the potential for collapse. Appropriate physical barriers should be erected during and on completion of excavations to prevent any personal entering the excavation area.

Cuts and Abrasions

The manual work associated with the remediation works may give rise to the risk of cuts and abrasions to personnel working in the area. As well as the direct consequences of any cut or abrasion, such injuries can lead to the possibility of exposure to contaminants through the wound as well as diseases such as tetanus. To minimise the risk of direct or indirect injury, personnel will wear the personal protective equipment described in **Section 10.3**.

Heat Stress and UV Exposure

Site personnel may experience heat stress due to a combination of elevated ambient temperatures and the concurrent use of personal protection equipment; this depends in part on the type of work and the time of year.

In addition to heat stress, overexposure to UV radiation in sunlight can result in sunburn to exposed skin. The use of a high protection sunscreen (SPF15 or greater) on all exposed skin is recommended. Hats (including hard hats in specified areas) will also provide additional sun protection during the peak (i.e. 10:00 am to 3:00 PM) sun period. Sunglasses should be worn (where appropriate) to protect eyes from effects of UV exposure.

Underground Services

There are known underground services (electricity, natural gas lines, water, telephone, sewer, and stormwater) to be present beneath the work area. The remediation contractor shall ensure that appropriate procedures will be taken to minimise the risk associated with excavation near services.

Aboveground Electrical Hazards

All electrical plant and equipment must comply with the requirements of Australian Standard AS 3000. Hand held portable tools shall comply with AS/NZS 3160 "hand-held portable electric tools" and shall be double insulated. Cord connected portable hand lamps shall comply with AS/NZS 3118. A Residual Current Device (RCD) shall protect plug-in portable equipment, which is connected to a supply above Extra Low Voltage - 12-24volts (including equipment supplied from a generator or welding set). RCD protection shall be provided during maintenance of portable electrical equipment at all times while the equipment is connected to a power supply above Extra Low Voltage, irrespective of whether power is switched ON or OFF. RCD's shall comply with AS 3190 and shall be type II units, rated to trip at or below 30 milliamps within 40 milliseconds.

No excavator, drill rig or crane may work within 6 m of overhead distribution power lines.

Manual Handling

When lifting or handling heavy objects, use correct lifting techniques, bending the knees not the back. If the item to be lifted is too heavy or awkward for one person to lift, seek assistance from other company employees or use mechanical help.

Noise

Long-term exposure to high levels of noise is unlikely during this project. However, operating machinery may cause significant noise exposures for short periods. Earplugs or earmuffs should be worn in any situation where noise levels make normal conversation difficult.

9.3 Personal Protective Equipment

All workers who may come into direct contact with contaminated soil will wear the following minimum personal protective equipment (PPE):

- Overalls or long sleeved collared shirt;
- Heavy duty outer gloves (e.g. leather) where there is a risk of cuts or abrasions, otherwise PVC outer gloves if in direct contact with contaminated soil;
- Steel capped boots;
- Safety glasses;
- High visibility vest or jacket; and
- Hard hat.

9.4 Asbestos Air Monitoring Procedures

Friable and non-friable ACM has been identified at the site. As discussed in **Section 8.5.1**, monitoring is required for movement and removal of friable asbestos. Air monitoring for asbestos removal work can be beneficial as the results can be used:

- To identify failures in containment;
- To identify poor work practices; and
- To provide proof of containment for occupiers and regulatory authorities and to provide evidence of good work practices for both present and future needs.

Where undertaken, monitoring will be conducted in accordance with the National Occupational Health & Safety Commission (NOHSC) membrane filter method as approved by NATA.

The appropriate TWA (NOHSC) levels are:

- Amosite - 0.1 fibre/mL;
- Chrysotile – 0.1 fibre/mL;
- Crocidolite - 0.1 fibre/mL;
- Other forms of asbestos - 0.1 fibre/mL; and
- Any mixture of these, or where the composition is unknown - 0.1 fibre/mL.

With consideration to these levels the following trigger levels have been developed:

- If airborne fibre levels reach 0.01 fibres/mL the source of fibre release is to be found and rectified. Work in the affected area does not have to stop; and
- If airborne fibre levels reach 0.02 fibres/mL work in the work area should stop and additional controls measures employed. This will involve additional water spraying during excavations.

Air monitoring results will be obtained within 24 hours of sample collection. While this precludes "real time" monitoring, inspections will be made during excavation works and, if there are any visible dusts, light water spays will be used to wet the excavation and prevent the release of any airborne asbestos fibres.

9.5 Decontamination Procedures

The decontamination procedures specified below will be followed whenever personnel, plant or equipment leave the site.

Personnel

The following steps should be taken to ensure personnel do not leave the site with potentially contaminated clothing:

1. Disposal of coveralls and respirator;
2. Wash boots in clean water;
3. Remove outer gloves and store for reuse;
4. Remove overalls (if used) and store for reuse;
5. Remove respirator and goggles (if used) and store clean for reuse or decontamination, as appropriate; and
6. Thoroughly wash hands and face.

If any part of a worker's body comes into direct contact with any potentially contaminated material, the affected part(s) should be immediately washed with clean water.

Vehicle, Plant and Equipment

All equipment, including personal protective equipment, will be washed or otherwise cleaned to ensure that contaminated soil, water or dust is removed before it leaves the Site. All plant and equipment will have their outer bodies thoroughly cleaned of soil and sediment before moving off the site.

9.6 Asbestos Management

Notwithstanding any part of the proposed requirements for occupational health and safety as outlined here – all works on the remedial site must be undertaken in accordance with a Construction Asbestos Management Plan.

9.7 Emergency Response

The remediation contractor will be responsible for preparing an emergency response plan, which will provide details on appropriate action and evacuation procedures in the event of an emergency.

In the event of an emergency arising on the site, appropriate action should be taken. Site evacuation procedures should be followed, as necessary.

In the event of an accident: evaluate the seriousness of the injury, and contact emergency services, if necessary; provide first aid, as appropriate, and if safe to do so evacuate the injured person via the Decontamination Zone; make the area as safe as possible without jeopardising safety.

If a serious accident occurs, do not disturb the scene, except to make safe and prevent further injury or damage, and keep all unauthorised people out, and report all accidents to the Project Manager.

10. Regulatory Approvals/Licensing

10.1 Remediation of Land - State Environment Planning Policy (Resilience and Hazards) 2021

Development consent requirements for remediation works is addressed by reference to SEPP R&H and associated SEPP Planning Guidelines.

To identify whether the works fall within Category 1, works requiring consent, or Category 2 works not requiring consent, consideration is required to be given to a list of potential triggers for classification as Category 1 Remediation Works as discussed following. Should none of the triggers be activated, the works would fall into Category 2. Triggers for Category 1 works comprise remediation work that is:

- Designated development; or
- Carried out or to be carried out on land declared to be a critical habitat; or
- Likely to have a significant effect on a critical habitat or a threatened species, population or ecological community; or
- Development for which another State environmental planning policy or a regional environmental plan requires development consent; or
- Carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:
    - coastal protection;
    - conservation or heritage conservation;
    - habitat area, habitat protection area, habitat or wildlife corridor;
    - environment protection;
    - escarpment, escarpment protection or escarpment preservation;
    - floodway;
    - littoral rainforest;
    - nature reserve;
    - scenic area or scenic protection;
    - wetland, or
    - carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Minister).

Triggers for Category 1 mentioned above have not been met, however, JBS&G expects the remediation works to still be classified as Category 1, given works are in preparation in relation to SEARs and consent for remediation will be sought as ancillary to redevelopment works.

10.2 Protection of the Environment Operations Act 1997 (POEO 1997)

The proposed remediation/validation activities are not required to be licensed under the *Protection of the Environment Operation Act 1997 with respect to the trigger of remediation activities*, which is based on the following:

- The proposed remediation works will not treat more than 1000 m^3 per year of contaminated soil received from off-site.

- The proposed remediation works will not involve the treatment of contaminated soil originating on-site with the capacity: (i) to incinerate more than 1000 m^3 per year of contaminated soil, or (ii) to treat (otherwise than by incineration) and store more than 30 000 m^3 of contaminated soil, or (iii) disturb an aggregate area of 3 hectares of contaminated soil.

10.3 Protection of the Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The Waste Regulation stipulates special transportation, reporting, re-use and recycling requirements relating to soil and asbestos waste and must be complied with regardless whether the activity is licensed.

The requirements for the transportation of asbestos waste include:

- Bonded asbestos material must be securely packaged at all times;
- Friable asbestos material must be kept in a sealed container;
- Asbestos-contaminated soils must be wetted down; and
- All asbestos waste must be transported in a covered, leak-proof vehicle.

The transporter of asbestos waste must cause the following information to be given to the EPA prior to the transportation of asbestos waste loads:

- Source site details including address, name and contact details;
- Date of proposed transportation commencement;
- Name, address and contact details of disposal site; and
- Approximate weight of each class of asbestos in each load.

The transporter of asbestos waste must ensure the following information is given to the disposal site before or at delivery:

- Unique consignment code issued by EPA in relation to that load; and
- Any other information specified in the Asbestos and Waste Tyres Guidelines (EPA 2015).

The requirements relating to the off-site disposal of asbestos waste are as follows:

- Asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste,
- When asbestos waste is delivered to a landfill site, the occupier of the landfill site must be informed by the person delivering the waste that the waste contains asbestos,
- When unloading and disposing of asbestos waste at a landfill site, the waste must be unloaded and disposed of in such a manner as to prevent the generation of dust or the stirring up of dust,
- Asbestos waste disposed of at a landfill site must be covered with virgin excavated natural material or other material as approved in the facility's environment protection licence.

The Waste Regulation requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded.

Provision is provided in the Regulation and EPA (2014) guidelines for the NSW EPA to approve the immobilisation of contaminants in waste (if required).

10.4 Waste Classification Guidelines (EPA 2014)

All wastes generated shall be assessed, classified and managed in accordance with EPA (2014) guideline. Where wastes require immobilisation prior to off-site disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline, or otherwise General Approvals for the immobilisation of wastes in soils as historically issued by the NSW EPA. Immobilisations are only anticipated to be potentially required with unexpected finds.

10.5 Asbestos Removal Regulations and Code of Practice

The removal and disposal of asbestos will be managed in accordance with the Work Health and Safety Act (2011) and Work Health and Safety Regulation (2017), *Code of Practice How to Safely Remove Asbestos* (SWNSW 2022a), *Code of Practice How to Manage and Control Asbestos in the Workplace* (SWNSW 2022b), NSW SafeWork Guidelines, the NSW EPA (2014) *Waste Classification Guidelines*, and requirements under the *Protection of the Environment Operations (Waste) Regulation* (2014) for asbestos waste monitoring.

Excavation, on-site remediation and removal of asbestos impacted soils are required to be conducted by a Class A (Friable) or B (Bonded) Asbestos Removal licensed contractor.

11. Conclusions

Subject to the successful implementation of the measures detailed in this RAP prepared in response to the relevant requirements outlined in section 19 (Contamination) within SEARs and subject to the limitations in **Section 12**, it is considered the site can be made suitable for the proposed land use.

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme* (3rd Edition) (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP, it is concluded that the Site can be made suitable for the intended uses and that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment.

Where any of the conditions assumed in development of this RAP are altered, by change of design plans, identification of alternate/distinct contamination conditions during works, additional investigation works, etc. the RAP should be revised as appropriate.

12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

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

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

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

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

Figures

Legend:

- Site Area
- Broader Site Area

JBS&G

Job No: 64669	
Client: Infrastructure NSW	
Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:5,000

0 100 200

metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SITE LOCATION

FIGURE 1

File Name: 64669_BanksStPark_R03_Rev1

Legend:

- Site Area
- Broader Site Area
- NSW Cadastre
- Building Footprint

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,250

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SITE LAYOUT

FIGURE 2A

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

Legend:

- Site Area
- Broader Site Area
- NSW Cadastre
- Impacted Material, CONSARA 2020a
- Extent of Marker Layer, CONSARA 2020a

Site Features

- Building Footprint
- AST
- Potential UST
- Shipping Containers
- Substation
- Vent
- Workshop

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,250

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SITE FEATURES

FIGURE 2B

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

Legend:

- Site Area
- Broader Site Area
- NSW Cadastre

Sample Locations - JBS&G (2015)

- Soil Sampling / Monitoring Well

Previous Sample Locations

- Sample Location - CDM (2012b)
- Sample Location - E3C (2012)
- Sample Location - RCA (2011)
- Sample Location - NAA (2010)

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Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,250

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

HISTORICAL SAMPLE LOCATIONS

FIGURE 3

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

2.4 Concept Plan

Legend

1	Glebe Island Bridge - potential pedestrian and cycle connection	7	Loading zone on Bank Street	13	Seating shelters amongst planting	19	Nature-based inclusive playspace for ages 2-12	25	Potential future kayak storage / kiosk	31	Sandstone blocks terracing into water to improve marine habitat
2	Existing vegetation retained and supplemented	8	Seating and planting in existing building 'ruins'	14	Outdoor seating area to cafe	20	Fitness equipment	26	Anzac Bridge pylon	32	Split level promenade with trees and seating
3	Stair access to Glebe Island Bridge	9	New building with community facilities cafe kiosk and marina facilities	15	Bank Street with parallel parking and separated cycleway	21	Multi-purpose court	27	Deck over dragon boat storage	33	Existing mature trees retained with embankment down to adjacent property
4	Widened verge	10	PV and planting on roof	16	Open lawn area	22	Edge seating and fence to court	28	Boardwalk	34	Future boardwalk and promenade connection (outside of scope)
5	Amenities and storage in adaptively re-used building	11	Graded walkway access to plaza	17	Primary pathway across park	23	Substation and bridge pylons	29	Kayak launch jetty	35	Pedestrian link as part of future development (outside of scope)
6	Plaza	12	Substation retained	18	Cycleway transition to street - to continue south as part of future works	24	Marina	30	Dragon boat ramp		

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,400

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

CONCEPT PLAN

FIGURE 4

File Name: 64669_BanksStPark_R03_Rev1
Reference: Client Provided | Bank Street Park Design Report (OCULUS, 2023)

Legend:

- Site Area
- Broader Site Area
- NSW Cadastre
- Soil Sample Location
- Groundwater Sample Location

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,200

0 10 20
metres

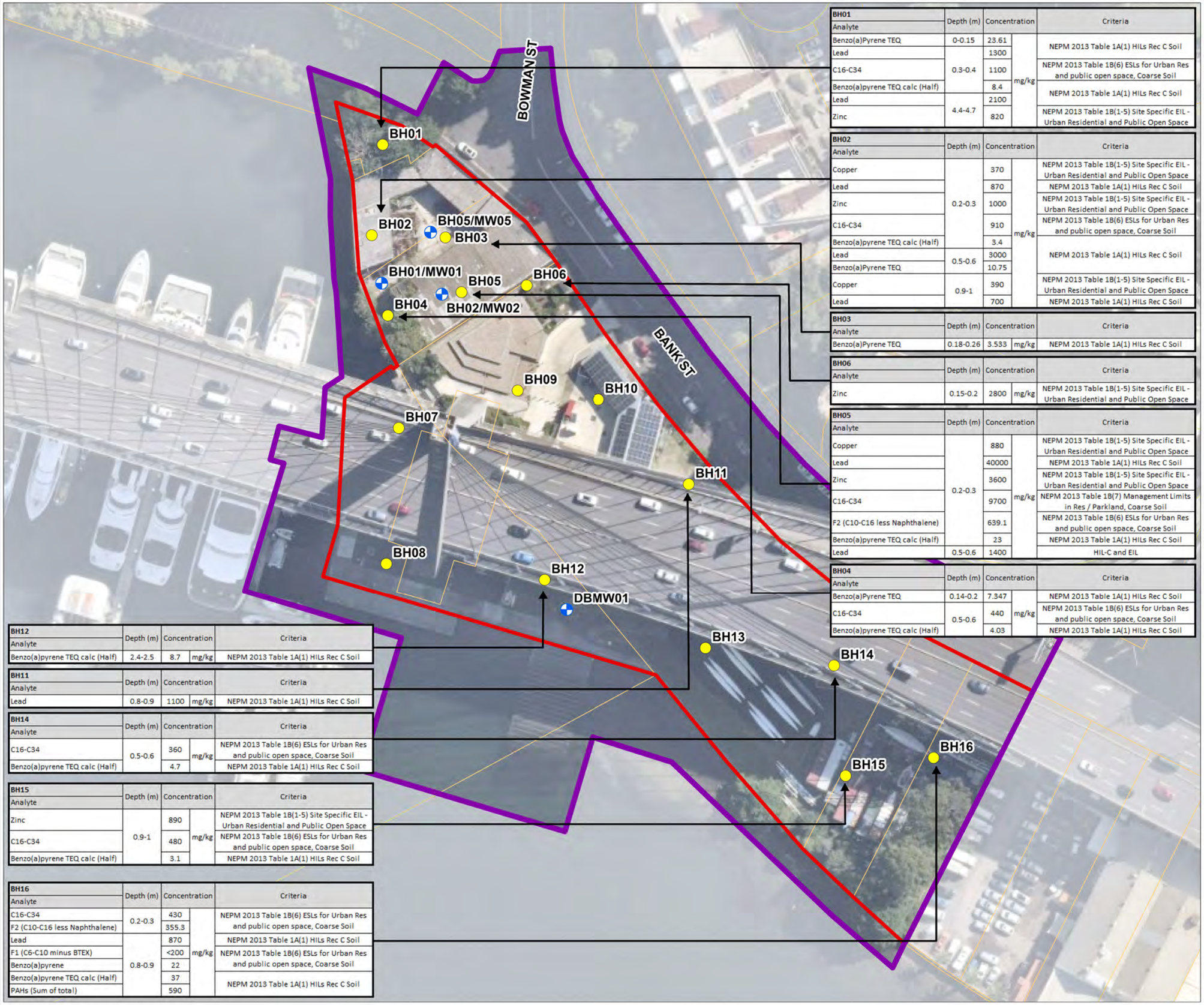
Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SAMPLING LOCATIONS

FIGURE 5

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316



BH01	Depth (m)	Concentration		Criteria
Analyte				
Benzo(a)Pyrene TEQ	0-0.15	23.61	mg/kg	NEPM 2013 Table 1A(1) HILs Rec C Soil
Lead	0.3-0.4	1300		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
C16-C34		1100		NEPM 2013 Table 1A(1) HILs Rec C Soil
Benzo(a)pyrene TEQ calc (Half)		8.4		NEPM 2013 Table 1A(1) HILs Rec C Soil
Lead	4.4-4.7	2100		NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
Zinc		820		

BH02	Depth (m)	Concentration		Criteria
Analyte				
Copper	0.2-0.3	370	mg/kg	NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
Lead		870		NEPM 2013 Table 1A(1) HILs Rec C Soil
Zinc		1000		NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
C16-C34		910		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene TEQ calc (Half)		3.4		NEPM 2013 Table 1A(1) HILs Rec C Soil
Lead	0.5-0.6	3000		
Benzo(a)Pyrene TEQ		10.75		
Copper	0.9-1	390		NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
Lead		700		NEPM 2013 Table 1A(1) HILs Rec C Soil

BH03	Depth (m)	Concentration		Criteria
Analyte				
Benzo(a)Pyrene TEQ	0.18-0.26	3.533	mg/kg	NEPM 2013 Table 1A(1) HILs Rec C Soil

BH06	Depth (m)	Concentration		Criteria
Analyte				
Zinc	0.15-0.2	2800	mg/kg	NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space

BH05	Depth (m)	Concentration		Criteria
Analyte				
Copper	0.2-0.3	880	mg/kg	NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
Lead		40000		NEPM 2013 Table 1A(1) HILs Rec C Soil
Zinc		3600		NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
C16-C34		9700		NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
F2 (C10-C16 less Naphthalene)		639.1		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene TEQ calc (Half)		23		NEPM 2013 Table 1A(1) HILs Rec C Soil
Lead	0.5-0.6	1400		HIL-C and EIL

BH04	Depth (m)	Concentration		Criteria
Analyte				
Benzo(a)Pyrene TEQ	0.14-0.2	7.347	mg/kg	NEPM 2013 Table 1A(1) HILs Rec C Soil
C16-C34	0.5-0.6	440		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene TEQ calc (Half)		4.03		NEPM 2013 Table 1A(1) HILs Rec C Soil

BH12	Depth (m)	Concentration		Criteria
Analyte				
Benzo(a)pyrene TEQ calc (Half)	2.4-2.5	8.7	mg/kg	NEPM 2013 Table 1A(1) HILs Rec C Soil

BH11	Depth (m)	Concentration		Criteria
Analyte				
Lead	0.8-0.9	1100	mg/kg	NEPM 2013 Table 1A(1) HILs Rec C Soil

BH14	Depth (m)	Concentration		Criteria
Analyte				
C16-C34	0.5-0.6	360	mg/kg	NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene TEQ calc (Half)		4.7		NEPM 2013 Table 1A(1) HILs Rec C Soil

BH15	Depth (m)	Concentration		Criteria
Analyte				
Zinc	0.9-1	890	mg/kg	NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space
C16-C34		480		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene TEQ calc (Half)		3.1		NEPM 2013 Table 1A(1) HILs Rec C Soil

BH16	Depth (m)	Concentration		Criteria
Analyte				
C16-C34	0.2-0.3	430	mg/kg	NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
F2 (C10-C16 less Naphthalene)		355.3		
Lead	0.8-0.9	870		NEPM 2013 Table 1A(1) HILs Rec C Soil
F1 (C6-C10 minus BTEX)		<200		NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil
Benzo(a)pyrene		22		
Benzo(a)pyrene TEQ calc (Half)		37		NEPM 2013 Table 1A(1) HILs Rec C Soil
PAHs (Sum of total)		590		

Legend:
- Site Area
- Broader Site Area
- NSW Cadastre
- Soil Sample Location
- Groundwater Sample Location

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1 | Date 26/10/2023

Drawn By: LJ | Checked By: MN

Scale 1:1,200

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SOIL CHEMICAL EXCEEDANCES

FIGURE 6A

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

BH01	Depth (m)	Concentration (%w/w)	Criteria
Analyte			
Asbestos from ACM in soil	0.0-0.4	0.35	HSL-C
Asbestos from FA & AF in soil		0.0019	

BH05	Depth (m)	Concentration (%w/w)	Criteria
Analyte			
Asbestos from FA & AF in soil	0.2-1.2	0.00016	AF/FA presence
Asbestos from FA 7 AF in soil	1.2-2.2	0.00050	AF/FA presence

BH09	Depth (m)	Concentration (%w/w)	Criteria
Analyte			
Asbestos from FA & AF in soil	0.0-0.3	0.00043	AF/FA presence

Legend:
- Site Area
- Broader Site Area
- NSW Cadastre
- Soil Sample Location
- Groundwater Sample Location

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1 | Date 26/10/2023

Drawn By: LJ | Checked By: MN

Scale 1:1,200

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

SOIL ASBESTOS EXCEEDANCES

FIGURE 6B

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

MW05	Concentration		Criteria
Analyte			
Perfluorooctanesulfonic acid (PFOS)	0.000013	mg/L	PFAS NEMP 2020 Table 5 Interim marine 99%

MW01	Concentration		Criteria
Analyte			
Zinc (Filtered)	0.16	mg/L	ANZG (2018) Marine water 95% toxicant DGVs
Perfluorooctanesulfonic acid (PFOS)	0.000053		PFAS NEMP 2020 Table 5 Interim marine 99%

MW02	Concentration		Criteria
Analyte			
Perfluorooctanesulfonic acid (PFOS)	0.00032	mg/L	PFAS NEMP 2020 Table 5 Interim marine 99%

DBMW01	Concentration		Criteria
Analyte			
Perfluorooctanesulfonic acid (PFOS)	0.000036	mg/L	PFAS NEMP 2020 Table 5 Interim marine 99%

Legend:
- Site Area
- Broader Site Area
- NSW Cadastre
- Soil Sample Location
- Groundwater Sample Location

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1 | Date 26/10/2023

Drawn By: LJ | Checked By: MN

Scale 1:1,200

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

GROUNDWATER EXCEEDANCES

FIGURE 7

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316

Legend:

- Site Area
- Broader Site Area
- NSW Cadastre
- Impacted Material, CONSARA 2020a
- Extent of Marker Layer, CONSARA 2020a
- Asbestos, Heavy Metals, TRH and PAH

Site Features

- Potential UST
- Vent

Sample Locations

- Groundwater Sample Location
- Soil Sample Location
- Hydrocarbon Odour

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Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 26/10/2023
Drawn By: LJ	Checked By: MN

Scale 1:1,250

0 10 20

metres

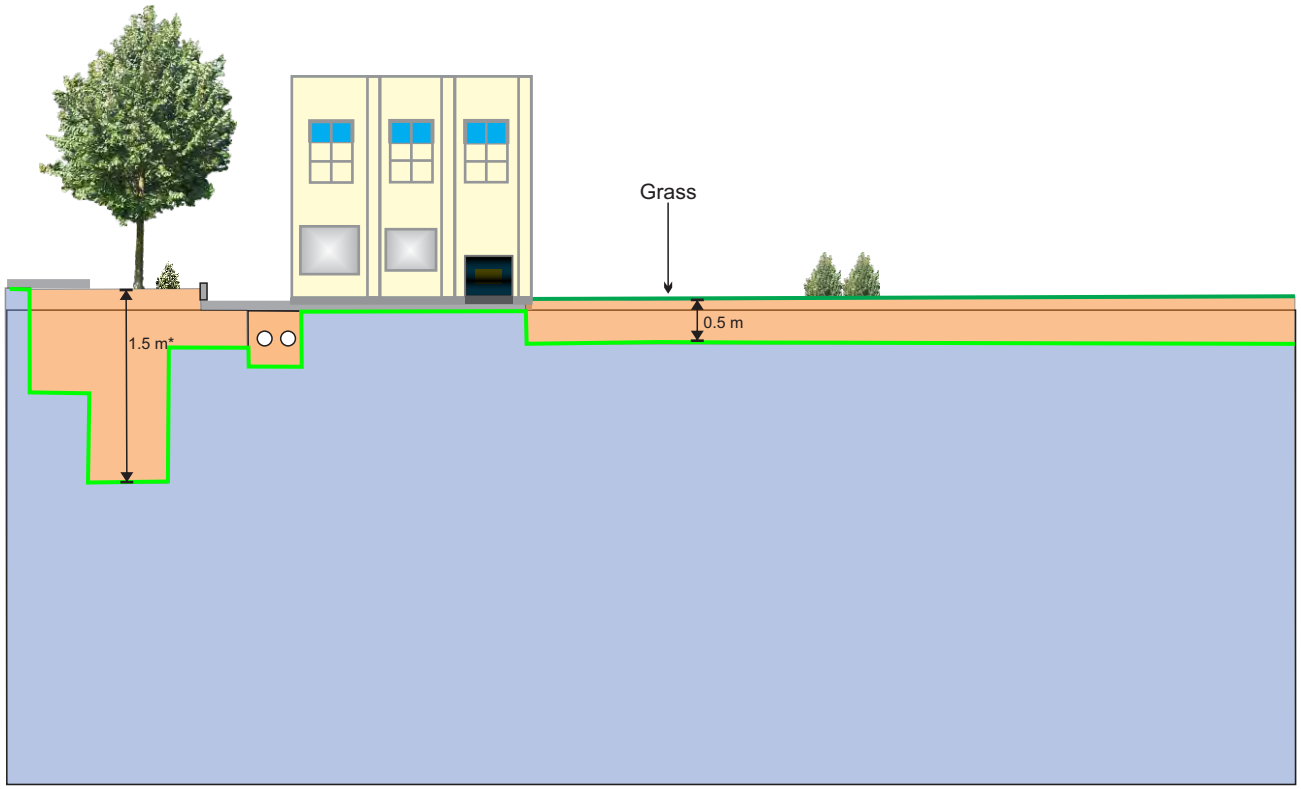
Coord. Sys. GDA 1994 MGA Zone 56

Bank St
Pyrmont, NSW

REMEDIATION EXTENT

FIGURE 8

File Name: 64669_BanksStPark_R03_Rev1
Reference: Nearmap www.nearmap.com 20230316



Legend:

- Services
- Marker Layer
- Capping Material
- Impacted Material

* Thickness may be reduced subject to arborist recommendations

JBS&G

Job No: 64669

Client: Infrastructure NSW

Version: R03 Rev 1	Date 19/10/2023
Drawn By: LJ	Checked By: MN

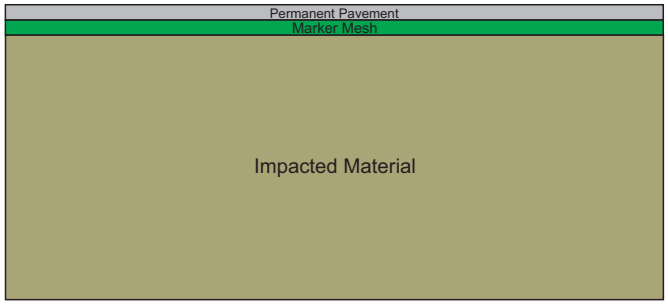
Bank St
Pyrmont, NSW

Capping Requirements

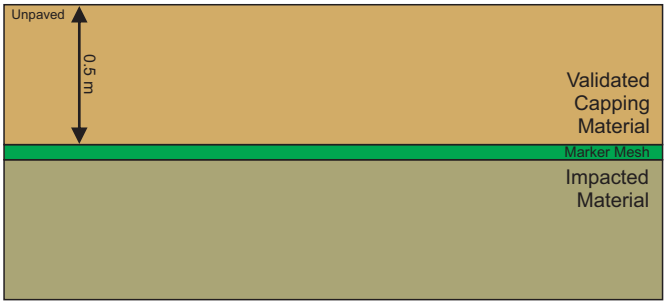
FIGURE 9A

File Name: N:\Projects\ADCO\57752 Qantas 297 King Street Mascot\GIS\Maps\R01 Rev A\57752_04_CappingRequirements.cdr

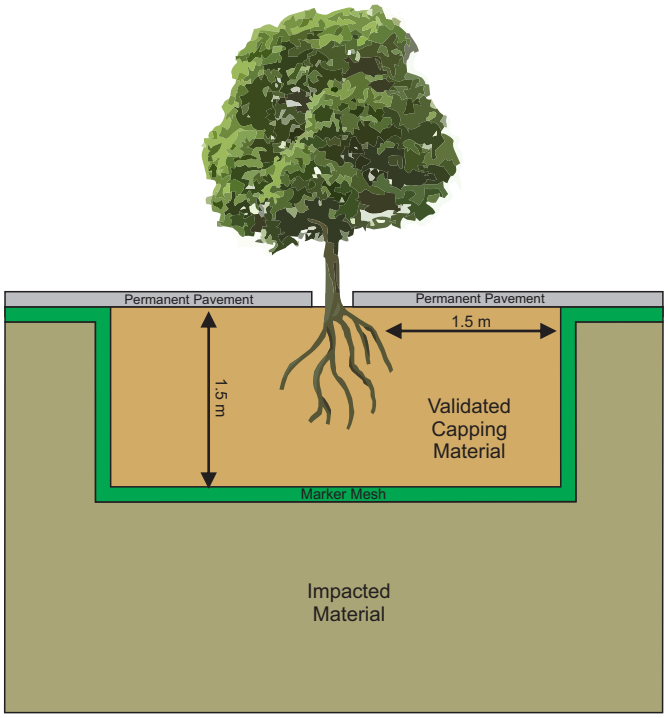
Capping Arrangement Under Permanent Pavement



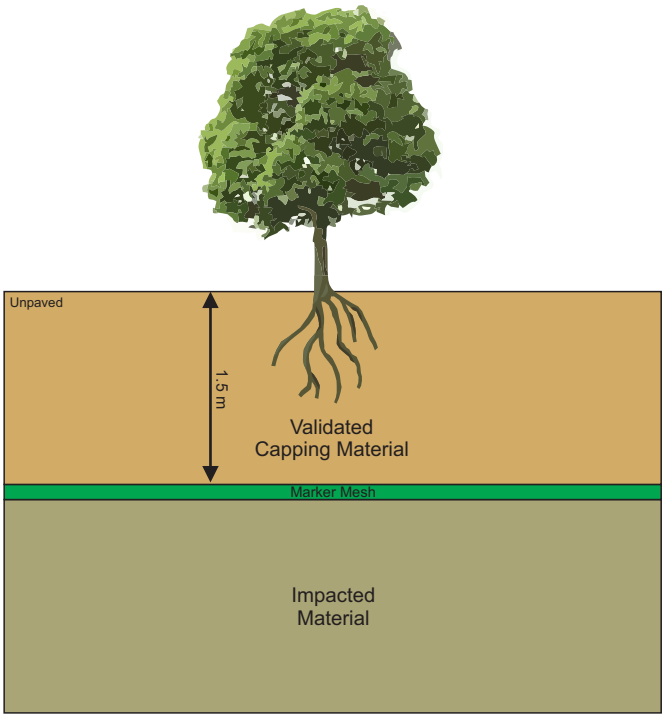
Capping Arrangement Under Landscaped Areas
(Shallow Rooted Plants)



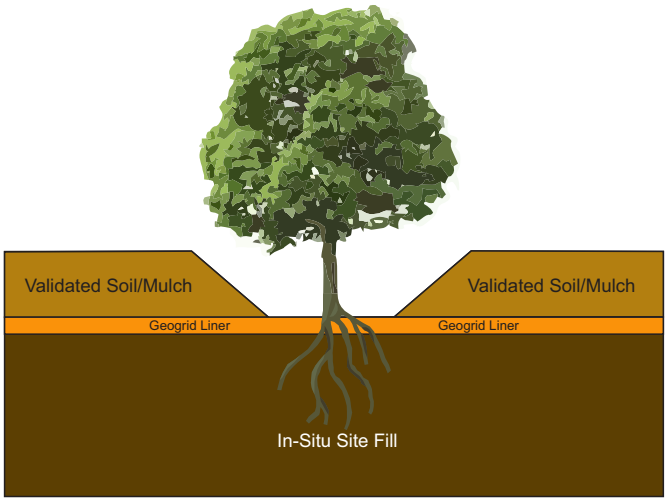
Capping Arrangement For Deep Rooted Trees
Under Permanent Pavement



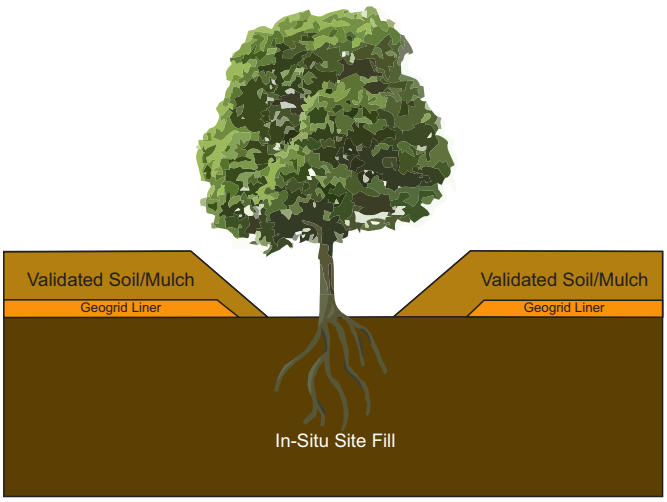
Capping Arrangement For Deep Rooted Trees
Under Landscaped Areas



Capping Arrangement For Existing Trees



Capping Arrangement For Existing Trees



Scale: Various

Rev	Description	Drn.	Date
A4			
0	Original Issue - R03	LJ	26/10/2023

JBS&G **Figure 9B: Capping Requirements**

Client: Infrastructure NSW

Project: Bank St Pyrmont, NSW

Job No: 64669 File Name: 09b_CappingRequirements

Appendix A Summary Tables

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

						Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN							
						Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)	C6-C10	C10-C16	C16-C34	C34-C40	C10-C40 (Sum of total)	F1 (C6-C10 minus BTEX)	F2 (C10-C16 less Naphthalene)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene_VOC
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						2	0.4	5	5	5	0.1	5	5	20	20	50	50	50	20	50	100	100	100	20	50	0.1	0.1	0.1	0.1	0.2	0.3	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil						300[#1]	90	300[#2]	17000	600[#3]	80[#4]	1200	30000																					
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space						100[#11]		410	220	1100		250	720																			170
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																					300[#16]	2800[#16]		180[#17]	120[#18]	50[#16]	85[#16]	70[#16]			105[#16]	
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																			700[#19]	1000[#19]	2500	10000											
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																	
0-1m																								NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
1-2m																								NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
2-4m																								NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
>4m																								NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																	
PFAS NEMP 2020 Table 2 Health Public open space																																	
PFAS NEMP 2020 Table 3 Interim EDE All land uses																																	
PFAS NEMP 2020 Table 3 Interim EIE All land uses																																	
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Lab_Report_**	**Matreial Type**																												
BH01 0.0-0.1	BH01	0-0.1	13/04/2023	981107	Fill	13	0.6	16	92	550	0.5	13	430	<20	<20	95	88	183	<20	<50	150	120	270	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH01 0.3-0.4	BH01	0.3-0.4	13/04/2023	981107	Fill	12	1.5	28	150	1300	0.3	19	450	<20	66	710	560	1336	<20	110	1100	450	1660	<20	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH02 0.2-0.3	BH02	0.2-0.3	14/04/2023	981107	Fill	21	1	7.4	230	870	0.9	27	1000	<20	28	260	250	538	<20	<50	450	140	590	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QA03 (duplicate)	BH02	0.2-0.3	14/04/2023	981107	Fill	12	0.6	6.7	360	570	0.9	22	690	<20	23	390	680	1093	<20	<50	910	570	1480	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QC03 (triplicate)	BH02	0.2-0.3	14/04/2023	320926	Fill	11	0.8	8	370	430	0.9	22	550	<25	<50	210	190	390	<25	<50	340	<100	340	<25	<50	<0.2	<0.5	<1	<1	<2	<1	<1
BH02 0.9-1.0	BH02	0.9-1	14/04/2023	981107	Fill	22	0.8	13	390	700	0.9	28	690	<20	24	170	150	344	<20	<50	290	<100	290	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH03 0.1-0.2	BH03	0.1-0.2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.5-0.6	BH03	0.5-0.6	13/04/2023	981107	Fill	12	<0.4	10	180	410	0.8	26	450	<20	25	140	93	258	<20	<50	200	<100	200	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH03 0.9-1.0	BH03	0.9-1	13/04/2023	981107	Fill	2	<0.4	11	18	20	<0.1	<5	31	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH03 1.9-2.0	BH03	1.9-2	13/04/2023	981107	Natural	2.1	<0.4	15	<5	14	<0.1	<5	21	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH04 0.5-0.6	BH04	0.5-0.6	13/04/2023	981107	Fill	3	<0.4	11	57	40	<0.1	7.1	70	<20	<20	240	280	520	<20	<50	440	200	640	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	0.9
BH04 1.5-1.6	BH04	1.5-1.6	13/04/2023	981107	Fill	95	<0.4	15	90	390	0.2	74	170	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH05 0.2-0.3	BH05	0.2-0.3	14/04/2023	981107	Fill	65	1.5	18	880	16,000	24	9.9	2000	<20	200	3500	1900	5600	<20	320	5100	1800	7220	<20	319.3	<0.1	<0.1	<0.1	0.1	0.3	0.5	0.7
BH05 0.2-0.3[#22]	BH05	0.2-0.3	14/04/2023	984766	Fill	82	3.3	52	480	40,000	39	15	3600	<20	360	8000	2900	11260	<20	640	9700	1900	12240	<20	639.1	-	-	-	-	-	-	-
BH05 0.5-0.6	BH05	0.5-0.6	14/04/2023	995084	Fill	-	-	-	-	1,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.1	BH05	2-2.1	14/04/2023	981107	Fill	11	<0.4	13	85	290	0.2	17	210	<20	<20	93	71	164	<20	<50	140	<100	140	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH06 0.5-0.6	BH06	0.5-0.6	5/05/2023	987142	Fill	5	<0.4	17	16	40	<0.1	14	76	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH06 0-0.1	BH06	0-0.1	5/05/2023	987142	Fill	12	<0.4	22	68	43	0.5	10	160	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	0.2	<0.2	<0.3	<0.5
BH07 0.5-0.6	BH07	0.5-0.6	5/05/2023	987142	Fill	4.9	<0.4	9.7	24	92	0.2	7.4	110	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH07 0.9-1.0	BH07	0.9-1	5/05/2023	987142	Fill	8.5	<0.4	8.2	35	260	0.3	7.5	160	<20	<20	120	120	240	<20	<50	210	<100	210	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH07 2-2.1	BH07	2-2.1	5/05/2023	987142	Fill	12	<0.4	11	23	230	0.3	6.7	100	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH08 0.2-0.3	BH08	0.2-0.3	5/05/2023	987142	Fill	3.8	<0.4	17	29	32	<0.1	9.5	60	<20	<20	81	110	191	<20	<50	150	160	310	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH08 0.9-1.0	BH08	0.9-1	5/05/2023	987142	Fill	6.9	<0.4	9.9	20	93	0.2	6.6	77	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH08 4.0-4.1	BH08	4-4.1	5/05/2023	987142	Fill	6.6	<0.4	8.6	31	100	0.1	6.1	72	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH08 6.0-6.1	BH08	6-6.1	5/05/2023	991398	Natural	3.8	<0.4	79	18	35	<0.1	15	31	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH09 0-0.1	BH09	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	0.2	0.4	0.6	<0.5
BH09 0.2-0.3	BH09	0.2-0.3	5/05/2023	987142	Fill	3.1	<0.4	15	32	54	<0.1	8.8	74	<20	<20	<50	59	59	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	0.2	0.6	1.1	1.6	<0.5
BH11 0.2-0.3	BH11	0.2-0.3	13/04/2023	981107	Fill	6.3	<0.4	26	36	340	0.1	21	120	<20	<20	<50	61	61	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QA01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	3	<0.4	14	25	25	<0.1	15	62	<20	<20	52	55	107	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QC01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	<4	<0.4	13	25	20	<0.1	10	50	<25	<50	<100	<100	<50	<25	<50	<100	<100	<50	<25	<50	<0.2	<0.5	<1	<1	<2	<1	<1
QAP01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCP01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.8-0.9	BH11	0.8-0.9	13/04/2023	981107	Fill	28	<0.4	9	93	1,100	1.1	22	240	<20	24	200	150	374	<20	<50	290	160	450	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH11 3.0-3.1	BH11	3-3.1	13/04/2023	981107	Natural	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH12 0.2-0.3	BH12	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-
BH12 0.5-0.6	BH12	0.5-0.6	5/05/2023	987142	Fill	6.5	<0.4	8.9	22	71	0.2	7.3	71	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH12 0.9-1	BH12	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 1.4-1.5	BH12	1.4-1.5	5/05/2023	987142	Fill	2	<0.4	<5	14	33	<0.1	<5	31	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	0.2	2.4	3.7	6.1	<0.5
BH12 2.4-2.5	BH12	2.4-2.5	5/05/2023	987142	Fill	3.2	<0.4	9.5	8.2	59	0.2	<5	46	<20	<20	97	78	175	<20	<50	150	<100	150	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH12 5.9-6.0	BH12	5.9-6	5/05/2023	991398	Fill	18	<0.4	13	120	76	0.1	13	120	<20	<20	65	54	119	<20	<50	100	<100	100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN						
	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)	C6-C10	C10-C16	C16-C34	C34-C40	C10-C40 (Sum of total)	F1 (C6-C10 minus BTEX)	F2 (C10-C16 less Naphthalene)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene_VOC
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2	0.4	5	5	5	0.1	5	5	20	20	50	50	50	20	50	100	100	100	20	50	0.1	0.1	0.1	0.1	0.2	0.3	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil	300[#1]	90	300[#2]	17000	600[#3]	80[#4]	1200	30000																			
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space	100[#11]		410	220	1100		250	720																			170
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																300[#16]	2800[#16]		180[#17]	120[#18]	50[#16]	85[#16]	70[#16]			105[#16]	
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil														700[#19]	1000[#19]	2500	10000										
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																											
0-1m																			NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
1-2m																			NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
2-4m																			NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
>4m																			NL[#8]	NL[#9]	NL[#10]	NL[#10]	NL[#10]			NL[#10]	NL[#10]
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																											
PFAS NEMP 2020 Table 2 Health Public open space																											
PFAS NEMP 2020 Table 3 Interim EDE All land uses																											
PFAS NEMP 2020 Table 3 Interim EIE All land uses																											

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type																								
BH13 0.0-0.1	BH13	0-0.1	13/04/2023	981107	Fill	3.9	<0.4	10	22	85	<0.1	9	38	<20	<20	<50	76	76	<20	<50	<100	140	140	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH13 2.0-2.1	BH13	2-2.1	13/04/2023	981107	Fill	3.2	<0.4	14	<5	<5	<0.1	<5	11	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH14 0.5-0.6	BH14	0.5-0.6	13/04/2023	981107	Fill	<2	<0.4	9	9	25	<0.1	6.1	29	<20	<20	310	130	440	<20	<50	360	120	480	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH14 1.5-1.6	BH14	1.5-1.6	13/04/2023	981107	Fill	3.4	<0.4	10	6.2	10	<0.1	6.5	13	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH15 0.9-1.0	BH15	0.9-1	13/04/2023	981107	Fill	22	<0.4	9.8	83	150	0.1	7.6	890	<20	<20	230	340	570	<20	<50	480	340	820	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH15 2.4-2.5	BH15	2.4-2.5	13/04/2023	981107	Fill	7	<0.4	11	110	93	<0.1	20	340	<20	<20	95	55	150	<20	<50	120	<100	120	<20	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH16 0.2-0.3	BH16	0.2-0.3	13/04/2023	981107	Fill	8.4	<0.4	15	20	41	<0.1	<5	45	<20	200	380	210	790	<20	360	430	310	1100	<20	355.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	4.7
BH16 0.8-0.9	BH16	0.8-0.9	13/04/2023	981107	Fill	37	<0.4	19	66	870	<0.1	10	150	<200	<20	<50	<50	<50	<200	<50	<100	<100	<100	<200	<50	<1	<1	<1	<1	<2	<3	66
BH16 1.9-2.0	BH16	1.9-2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	<20	50	100	94	244	<20	87	140	170	397	<20	87	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5

Env Stds Comments
#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#2:Trigger Value adopted from Chromium (VI)
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#6:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Derived soil HSL exceeds soil saturation concentraiton. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9:Derived soil HSL exceeds soil saturation concentraiton. To obtain F2 subtract naphthalene from the >C10-C16 fraction
#10:Derived soil HSL exceeds soil saturation concentraiton
#11:Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#12:Trigger Value taken for Chromium (III), Clay Content of 1%
#13:Trigger Value taken for pH 4.5
#14:Trigger Value taken for CEC 5
#15:Trigger Value taken for pH 4 and CEC 5
#16:ESLs are of low reliability.
#17:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#18:ESLs are of moderate reliability. To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#19:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#20:Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
#21:Only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.
#22: Sample reanalysed for heavy metals, TRH and PAHs to confirm results.

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

JBS&G

PAH

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b+j)fluoranthene	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil											3[#5]	3[#5]	3[#5]													300[#6]
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																							170			
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil										0.7[#16]																
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																										
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																										
0-1m																							NL[#10]			
1-2m																							NL[#10]			
2-4m																							NL[#10]			
>4m																							NL[#10]			
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																										
PFAS NEMP 2020 Table 2 Health Public open space																										
PFAS NEMP 2020 Table 3 Interim EDE All land uses																										
PFAS NEMP 2020 Table 3 Interim EIE All land uses																										
BH01 0.0-0.1	BH01	0-0.1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	1.1	1.1	2	1.7	1.5	0.8	-	<0.5	1.2	1.3	<0.5	2	<0.5	0.6	<0.5	1.3	2.5	12
BH01 0.3-0.4	BH01	0.3-0.4	13/04/2023	981107	Fill	<0.5	0.6	2.4	4.9	5.8	8.4	8.4	8.4	3.8	-	2.9	4.7	7.8	0.9	12	<0.5	2.5	<0.5	6.5	13	68
BH02 0.2-0.3	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	1.3	1	1.9	1.7	1.4	1	-	1.1	1.4	1.8	<0.5	2.4	<0.5	<0.5	<0.5	0.7	2.9	14
QA03 (duplicate)	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	0.6	1.6	1.8	2.9	2.7	2.4	1.7	-	2	1.6	2.5	<0.5	3.1	<0.5	1.1	<0.5	1.5	3.6	21
QC03 (triplicate)	BH02	0.2-0.3	14/04/2023	320926	Fill	<0.1	0.2	0.3	2.1	2.5	3.4	3.4	3.4	-	3.2	1.3	-	1.4	0.2	2.4	<0.1	1.7	<0.1	0.9	2.5	19
BH02 0.9-1.0	BH02	0.9-1	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	1	<0.5	1.3	0.8	<0.5	0.7	-	0.7	0.8	1.4	<0.5	1.8	<0.5	<0.5	<0.5	0.9	2	9.3
BH03 0.1-0.2	BH03	0.1-0.2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.5-0.6	BH03	0.5-0.6	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 0.9-1.0	BH03	0.9-1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 1.9-2.0	BH03	1.9-2	13/04/2023	981107	Natural	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04 0.5-0.6	BH04	0.5-0.6	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	1.9	3.1	4.6	4.3	4.1	2.4	-	3	3.3	3.3	<0.5	3.3	<0.5	1.5	<0.5	<0.5	4.8	27
BH04 1.5-1.6	BH04	1.5-1.6	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 0.2-0.3	BH05	0.2-0.3	14/04/2023	981107	Fill	0.6	<0.5	2.8	5.1	4.8	8.5	8.5	8.5	7	-	6.8	7.7	12	1.1	23	<0.5	4.5	2	20	21	120
BH05 0.2-0.3[#22]	BH05	0.2-0.3	14/04/2023	984766	Fill	<0.5	<0.5	4.3	13	9.3	23	23	23	20	-	17	18	29	7.1	57	<0.5	14	2	47	53	290
BH05 0.5-0.6	BH05	0.5-0.6	14/04/2023	995084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.1	BH05	2-2.1	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0.5-0.6	BH06	0.5-0.6	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0-0.1	BH06	0-0.1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH07 0.5-0.6	BH07	0.5-0.6	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH07 0.9-1.0	BH07	0.9-1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	0.7	0.6	1.3	1.1	0.8	0.5	-	0.6	0.6	0.7	<0.5	1.3	<0.5	<0.5	<0.5	0.6	1.1	6.7
BH07 2-2.1	BH07	2-2.1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH08 0.2-0.3	BH08	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.8	1.6
BH08 0.9-1.0	BH08	0.9-1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	0.6	<0.5	1.2	<0.5	<0.5	<0.5	0.6	1.1	3.5
BH08 4.0-4.1	BH08	4-4.1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH08 6.0-6.1	BH08	6-6.1	5/05/2023	991398	Natural	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	0.6	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	2
BH09 0-0.1	BH09	0-0.1	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH09 0.2-0.3	BH09	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11 0.2-0.3	BH11	0.2-0.3	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
QA01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	<0.1	<0.1	<0.1	0.1	0.1	<0.5	<0.5	<0.5	-	0.2	0.2	-	<0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.2	1
QAP01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCP01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.8-0.9	BH11	0.8-0.9	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	0.9	1	1.9	1.6	1.4	0.9	-	0.9	1.1	1.3	<0.5	3.1	<0.5	0.6	<0.5	1.3	2.7	14
BH11 3.0-3.1	BH11	3-3.1	13/04/2023	981107	Natural	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH12 0.2-0.3	BH12	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.5-0.6	BH12	0.5-0.6	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.5	1.1
BH12 0.9-1	BH12	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 1.4-1.5	BH12	1.4-1.5	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH12 2.4-2.5	BH12	2.4-2.5	5/05/2023	987142	Fill	0.5	<0.5	2.8	5.5	5.1	8.7	8.7	8.7	4.9	-	5.7	5.1	8.4	1.5	16	<0.5	3.9	<0.5	5.3	15	80
BH12 5.9-6.0	BH12	5.9-6	5/05/2023	991398	Fill	<0.5	<0.5	<0.5	0.6	0.5	0.7	1	1.3	<0.5	-	0.9	0.7	1.1	<0.5	0.9	<0.5	0.5	<0.5	<0.5	1.2	6.4

Organochlorine Pesticides

Field_ID	4,4-DDE	a-BHC	b-BHC	d-BHC	g-BHC (Lindane)	Aldrin	Dieldrin	Aldrin + Dieldrin	Chlordane	Chlordane (cis)	Chlordane (trans)	DDT	DDD	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Methoxychlor	Toxaphene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil								10	70					400				20			10		400	30
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space												180												
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																								
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																								
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																								
0-1m																								
1-2m																								
2-4m																								
>4m																								
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																								
PFAS NEMP 2020 Table 2 Health Public open space																								
PFAS NEMP 2020 Table 3 Interim EDE All land uses																								
PFAS NEMP 2020 Table 3 Interim EIE All land uses																								
BH01 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH01 0.3-0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	0.73	<0.5	0.73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH02 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
QA03 (duplicate)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
QC03 (triplicate)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
BH02 0.9-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH03 0.9-1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH03 1.9-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	3.4	4.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH04 1.5-1.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH05 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH05 0.2-0.3[#22]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH06 0-0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH07 0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 0.9-1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH07 2-2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH08 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 0.9-1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH08 4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 6.0-6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH11 0.2-0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
QA01 (duplicate)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
QC01 (triplicate)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
QAP01 (duplicate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCP01 (triplicate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.8-0.9	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH11 3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH12 0.9-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 1.4-1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH12 2.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 5.9-6.0																								

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

PAH

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b+j)fluoranthene	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil											3[#5]	3[#5]	3[#5]													300[#6]
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																							170			
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil										0.7[#16]																
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																										
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																										
0-1m																							NL[#10]			
1-2m																							NL[#10]			
2-4m																							NL[#10]			
>4m																							NL[#10]			
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																										
PFAS NEMP 2020 Table 2 Health Public open space																										
PFAS NEMP 2020 Table 3 Interim EDE All land uses																										
PFAS NEMP 2020 Table 3 Interim EIE All land uses																										
BH13 0.0-0.1	BH13	0-0.1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH13 2.0-2.1	BH13	2-2.1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH14 0.5-0.6	BH14	0.5-0.6	13/04/2023	981107	Fill	1.5	<0.5	4.8	3.1	2.7	4.7	4.7	4.7	3.8	-	5.1	4.4	5.5	0.5	14	1.3	2.9	0.6	13	13	76
BH14 1.5-1.6	BH14	1.5-1.6	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH15 0.9-1.0	BH15	0.9-1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	1.5	1.8	3.1	3.1	3.1	1.5	-	3.1	2.2	2.4	0.6	2.8	<0.5	1.7	<0.5	0.7	3.3	22
BH15 2.4-2.5	BH15	2.4-2.5	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH16 0.2-0.3	BH16	0.2-0.3	13/04/2023	981107	Fill	5.7	<0.5	2.4	1.2	0.8	1.8	1.6	1.3	1.5	-	1.4	1.5	1.9	<0.5	5	2.9	0.9	5.7	6.1	3.9	41
BH16 0.8-0.9	BH16	0.8-0.9	13/04/2023	981107	Fill	70	1.6	19	18	22	37	37	37	21	-	22	19	20	6.8	77	40	17	76	99	64	590
BH16 1.9-2.0	BH16	1.9-2	13/04/2023	981107	Fill	1.6	<0.5	0.7	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	0.6	<0.5	0.6	<0.5	1.5	0.8	<0.5	1.3	1.7	1.1	9.9

Organochlorine Pesticides

Field_ID	4,4-DDE	a-BHC	b-BHC	d-BHC	g-BHC (Lindane)	Aldrin	Dieldrin	Aldrin + Dieldrin	Chlordane	Chlordane (cis)	Chlordane (trans)	DDT	DDD	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Methoxychlor	Toxaphene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5
NEPM 2013 Table 1A(1) HILs Rec C Soil								10	70					400				20			10		400	30
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space												180												
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																								
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																								
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																								
0-1m																								
1-2m																								
2-4m																								
>4m																								
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																								
PFAS NEMP 2020 Table 2 Health Public open space																								
PFAS NEMP 2020 Table 3 Interim EDE All land uses																								
PFAS NEMP 2020 Table 3 Interim EIE All land uses																								
BH13 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH13 2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14 0.5-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH14 1.5-1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15 0.9-1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH15 2.4-2.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH16 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH16 0.8-0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH16 1.9-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Env Stds Comments

#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#2:Trigger Value adopted from Chromium (VI)
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#6:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Derived soil HSL exceeds soil saturation concentraiton. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9:Derived soil HSL exceeds soil saturation concentraiton. To obtain F2 subtract naphthalene from the >C10-C16 fraction
#10:Derived soil HSL exceeds soil saturation concentraiton
#11:Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#12:Trigger Value taken for Chromium (III), Clay Content of 1%
#13:Trigger Value taken for pH 4.5
#14:Trigger Value taken for CEC 5
#15:Trigger Value taken for pH 4 and CEC 5
#16:ESLs are of low reliability.
#17:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#18:ESLs are of moderate reliability. To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#19:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#20:Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
#21:Only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.
#22: Sample reanalysed for heavy metals, TRH and PAHs to confirm results.

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

						Chlorinated Alkanes																	Chlorinated Alkenes												Solvents	Polychlorinated Biphenyls								
						1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Acetone	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Rec C Soil																																											1[#7]
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																										
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																										
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PFAS NEMP 2020 Table 3 Interim EDE All land uses																																										
PFAS NEMP 2020 Table 3 Interim EIE All land uses																																										
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Lab_Report_**	**Matreial Type**																																						
BH01 0.0-0.1	BH01	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH01 0.3-0.4	BH01	0.3-0.4	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH02 0.2-0.3	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1
QA03 (duplicate)	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1
QC03 (triplicate)	BH02	0.2-0.3	14/04/2023	320926	Fill	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH02 0.9-1.0	BH02	0.9-1	14/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
BH03 0.1-0.2	BH03	0.1-0.2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.5-0.6	BH03	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH03 0.9-1.0	BH03	0.9-1	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH03 1.9-2.0	BH03	1.9-2	13/04/2023	981107	Natural	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
BH04 0.5-0.6	BH04	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH04 1.5-1.6	BH04	1.5-1.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05 0.2-0.3	BH05	0.2-0.3	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH05 0.2-0.3[#22]	BH05	0.2-0.3	14/04/2023	984766	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.5-0.6	BH05	0.5-0.6	14/04/2023	995084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.1	BH05	2-2.1	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.5-0.6	BH06	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH06 0-0.1	BH06	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH07 0.5-0.6	BH07	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 0.9-1.0	BH07	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH07 2-2.1	BH07	2-2.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH08 0.2-0.3	BH08	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 0.9-1.0	BH08	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH08 4.0-4.1	BH08	4-4.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 6.0-6.1	BH08	6-6.1	5/05/2023	991398	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0-0.1	BH09	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0.2-0.3	BH09	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1
BH11 0.2-0.3	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
QC01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QAP01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCP01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.8-0.9	BH11	0.8-0.9	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH11 3.0-3.1	BH11	3-3.1	13/04/2023	981107	Natural	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
BH12 0.2-0.3	BH12	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
BH12 0.5-0.6	BH12	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH12 0.9-1	BH12	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 1.4-1.5	BH12	1.4-1.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH12 2.4-2.5	BH12	2.4-2.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 5.9-6.0	BH12	5.9-6	5/05/2023	991398	Fill																																							

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

						Chlorinated Alkanes																Chlorinated Alkenes												Solvents	Polychlorinated Biphenyls							
						1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Acetone	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Rec C Soil																																										1[#7]
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																										
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																										
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																										
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																										
0-1m																																										
1-2m																																										
2-4m																																										
>4m																																										
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																										
PFAS NEMP 2020 Table 2 Health Public open space																																										
PFAS NEMP 2020 Table 3 Interim EDE All land uses																																										
PFAS NEMP 2020 Table 3 Interim EIE All land uses																																										
Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type																																						
BH13 0.0-0.1	BH13	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH13 2.0-2.1	BH13	2-2.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14 0.5-0.6	BH14	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH14 1.5-1.6	BH14	1.5-1.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15 0.9-1.0	BH15	0.9-1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
BH15 2.4-2.5	BH15	2.4-2.5	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH16 0.2-0.3	BH16	0.2-0.3	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1
BH16 0.8-0.9	BH16	0.8-0.9	13/04/2023	981107	Fill	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1	<1	<1	<1
BH16 1.9-2.0	BH16	1.9-2	13/04/2023	981107	Fill	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-

Env Stds Comments
#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#2:Trigger Value adopted from Chromium (VI)
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#6:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Derived soil HSL exceeds soil saturation concentraiton. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9:Derived soil HSL exceeds soil saturation concentraiton. To obtain F2 subtract naphthalene from the >C10-C16 fraction
#10:Derived soil HSL exceeds soil saturation concentraiton
#11:Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#12:Trigger Value taken for Chromium (III), Clay Content of 1%
#13:Trigger Value taken for pH 4.5
#14:Trigger Value taken for CEC 5
#15:Trigger Value taken for pH 4 and CEC 5
#16:ESLs are of low reliability.
#17:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#18:ESLs are of moderate reliability. To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#19:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#20:Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
#21:Only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.
#22: Sample reanalysed for heavy metals, TRH and PAHs to confirm results.

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

	PFAS																																				
	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (NMeFOSA)	N-Ethyl perfluorooctane sulfonamide (NEtFOSA)	N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H-1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	1H-1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	1H-1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	1H-1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	Sum of PFHxS and PFOS	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of WA DWER PFAS (n=10)*	Sum of PFAS	Perfluorononanesulfonic acid ion
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/KG	mg/kg	mg/kg
EQL	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.01	0.05	0.005
NEPM 2013 Table 1A(1) HILs Rec C Soil																																					
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																					
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																					
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																					
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																					
0-1m																																					
1-2m																																					
2-4m																																					
>4m																																					
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																					
PFAS NEMP 2020 Table 2 Health Public open space					10																	1		1						1						
PFAS NEMP 2020 Table 3 Interim EDE All land uses					10																			1												
PFAS NEMP 2020 Table 3 Interim EIE All land uses																								0.01												

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type																																		
BH01 0.0-0.1	BH01	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01 0.3-0.4	BH01	0.3-0.4	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.2-0.3	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
QA03 (duplicate)	BH02	0.2-0.3	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC03 (triplicate)	BH02	0.2-0.3	14/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.9-1.0	BH02	0.9-1	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.1-0.2	BH03	0.1-0.2	13/04/2023	981107	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH03 0.5-0.6	BH03	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 0.9-1.0	BH03	0.9-1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03 1.9-2.0	BH03	1.9-2	13/04/2023	981107	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 0.5-0.6	BH04	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04 1.5-1.6	BH04	1.5-1.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.2-0.3	BH05	0.2-0.3	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.2-0.3[#22]	BH05	0.2-0.3	14/04/2023	984766	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 0.5-0.6	BH05	0.5-0.6	14/04/2023	995084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05 2.0-2.1	BH05	2-2.1	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0.5-0.6	BH06	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06 0-0.1	BH06	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 0.5-0.6	BH07	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 0.9-1.0	BH07	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07 2-2.1	BH07	2-2.1	5/05/2023	987142	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH08 0.2-0.3	BH08	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 0.9-1.0	BH08	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 4.0-4.1	BH08	4-4.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08 6.0-6.1	BH08	6-6.1	5/05/2023	991398	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0-0.1	BH09	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09 0.2-0.3	BH09	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.2-0.3	BH11	0.2-0.3	13/04/2023	981107	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
QA01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAP01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
QCP01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	<0.0002	<0.0002	0.0004	0.0002	0.0007	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005	<0.0002	<0.0002	-	0.0001	0.0001	0.0008	<0.0001	0.0008	<0.0002	<0.0001	<0.0001	<0.0002	<0.0002	0.0016	-	0.0015	-	0.0032	-
BH11 0.8-0.9	BH11	0.8-0.9	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 3.0-3.1	BH11	3-3.1	13/04/2023	981107	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.2-0.3	BH12	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.5-0.6	BH12	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.9-1	BH12	0.9-1	5/05/2023	987142	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.0085[#2]	<0.005	<0.005	<0.01	<0.005	<0.005	0.0085	0.0085	0.0085	<0.01	<0.05	<0.005
BH12 1.4-1.5	BH12	1.4-1.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 2.4-2.5	BH12	2.4-2.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 5.9-6.0	BH12	5.9-6	5/05/2023	991398	Fill																																		

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

						PFAS																																		
						Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (NMeFOSA)	N-Ethyl perfluorooctane sulfonamide (NEtFOSA)	N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H-1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	1H-1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	1H-1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	1H-1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	Sum of PFHxS and PFOS	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of WA DWER PFAS (n=10)*	Sum of PFAS	Perfluorononanesulfonic acid ion
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/KG	mg/kg	mg/kg
EQL						0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.05	0.005
NEPM 2013 Table 1A(1) HILs Rec C Soil																																								
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																								
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																								
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																								
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																								
0-1m																																								
1-2m																																								
2-4m																																								
>4m																																								
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																								
PFAS NEMP 2020 Table 2 Health Public open space						10																				1		1						1						
PFAS NEMP 2020 Table 3 Interim EDE All land uses						10																						1												
PFAS NEMP 2020 Table 3 Interim EIE All land uses																												0.01												
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Lab_Report_**	**Matreial Type**																																			
BH13 0.0-0.1	BH13	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13 2.0-2.1	BH13	2-2.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14 0.5-0.6	BH14	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14 1.5-1.6	BH14	1.5-1.6	13/04/2023	981107	Fill	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005
BH15 0.9-1.0	BH15	0.9-1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15 2.4-2.5	BH15	2.4-2.5	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16 0.2-0.3	BH16	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16 0.8-0.9	BH16	0.8-0.9	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16 1.9-2.0	BH16	1.9-2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Env Stds Comments
#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#2:Trigger Value adopted from Chromium (VI)
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#6:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Derived soil HSL exceeds soil saturation concentraiton. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9:Derived soil HSL exceeds soil saturation concentraiton. To obtain F2 subtract naphthalene from the >C10-C16 fraction
#10:Derived soil HSL exceeds soil saturation concentraiton
#11:Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#12:Trigger Value taken for Chromium (III), Clay Content of 1%
#13:Trigger Value taken for pH 4.5
#14:Trigger Value taken for CEC 5
#15:Trigger Value taken for pH 4 and CEC 5
#16:ESLs are of low reliability.
#17:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#18:ESLs are of moderate reliability. To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#19:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#20:Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
#21:Only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.
#22: Sample reanalysed for heavy metals, TRH and PAHs to confirm results.

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

						MAH											Miscellaneous Hydrocarbons								Chlorinated Benzenes							Trihalomethanes				Organic Sulfur Compounds	Ionic Balance			Particle Size			Other		
						1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	Total MAH	Bromobenzene	Isopropylbenzene	1,2-dibromoethane	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	4-Methyl-2-pentanone	Methyl Ethyl Ketone	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Dibromochloromethane	Chloroform	Tribromomethane	Bromodichloromethane	Carbon disulfide	CEC	Conductivity (1:5 aqueous extract)	pH (aqueous extract)	% Clay*	<2mm Fraction	>2mm Fraction	Moisture Content (dried @ 103°C)	Analysed Material	Extraneous Material
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	MEQ/100G	US/CM	pH Units	%	%	%	%	%	%
EQL						0.5	0.5	1	1	1	1	0.5	1	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	1	1	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5	0.5	0.05	10	0.1	1	0.005	0.005	1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Rec C Soil																														10														
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																											
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																											
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																											
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																											
0-1m																																											
1-2m																																											
2-4m																																											
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NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																											
PFAS NEMP 2020 Table 2 Health Public open space																																											
PFAS NEMP 2020 Table 3 Interim EDE All land uses																																											
PFAS NEMP 2020 Table 3 Interim EIE All land uses																																											
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Lab_Report_**	**Matreial Type**																																						
BH01 0.0-0.1	BH01	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	12	130	7.8	<1	-	-	17	-	-
BH01 0.3-0.4	BH01	0.3-0.4	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	11	-	-
BH02 0.2-0.3	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	17	-	-
QA03 (duplicate)	BH02	0.2-0.3	14/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	9.3	-	-
QC03 (triplicate)	BH02	0.2-0.3	14/04/2023	320926	Fill	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<0.1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-
BH02 0.9-1.0	BH02	0.9-1	14/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	13	-	-
BH03 0.1-0.2	BH03	0.1-0.2	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
BH03 0.5-0.6	BH03	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	15	-	-
BH03 0.9-1.0	BH03	0.9-1	13/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	8.9	-	-
BH03 1.9-2.0	BH03	1.9-2	13/04/2023	981107	Natural	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	69	<0.005	4.8	100	<0.1
BH04 0.5-0.6	BH04	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-
BH04 1.5-1.6	BH04	1.5-1.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	2	140	7.5	<1	-	-	7.1	-	-
BH05 0.2-0.3	BH05	0.2-0.3	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	9.2	-	-
BH05 0.2-0.3[#22]	BH05	0.2-0.3	14/04/2023	984766	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-
BH05 0.5-0.6	BH05	0.5-0.6	14/04/2023	995084	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	-	-
BH05 2.0-2.1	BH05	2-2.1	14/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
BH06 0.5-0.6	BH06	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	43	99	8.5	3.4	-	-	13	-	-
BH06 0-0.1	BH06	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	37	-	-
BH07 0.5-0.6	BH07	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.5	-	-
BH07 0.9-1.0	BH07	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	8.9	-	-
BH07 2-2.1	BH07	2-2.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	18	-	-
BH08 0.2-0.3	BH08	0.2-0.3	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-
BH08 0.9-1.0	BH08	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	11	-	-
BH08 4.0-4.1	BH08	4-4.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	2900	8.3	6.2	-	-	20	-	-
BH08 6.0-6.1	BH08	6-6.1	5/05/2023	991398	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-
BH09 0-0.1	BH09	0-0.1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-
BH09 0.2-0.3	BH09	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	1.9	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	10	-	-
BH11 0.2-0.3	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	21	690	8.6	<1	-	-	7.4	-	-
QA01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	4.5	-	-
QC01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAP01 (duplicate)	BH11	0.2-0.3	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-
QCP01 (triplicate)	BH11	0.2-0.3	13/04/2023	320926	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.8-0.9	BH11	0.8-0.9	13/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	9.6	-	-
BH11 3.0-3.1	BH11	3-3.1	13/04/2023	981107	Natural	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	220	4.1	20	98	1.9
BH12 0.2-0.3	BH12	0.2-0.3	5/05/2023	987142	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	7.8	-	-
BH12 0.5-0.6	BH12	0.5-0.6	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-
BH12 0.9-1	BH12	0.9-1	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-
BH12 1.4-1.5	BH12	1.4-1.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-
BH12 2.4-2.5	BH12	2.4-2.5	5/05/2023	987142	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-
BH12 5.9-6.0	BH12	5.9-6	5/05/2023	991398	Fill																																							

Table A1: Soil Chemical Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

	MAH											Miscellaneous Hydrocarbons							Chlorinated Benzenes							Trihalomethanes				Organic Sulfur Compounds	Ionic Balance			Particle Size			Other		
	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	Total MAH	Bromobenzene	Isopropylbenzene	1,2-dibromoethane	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	4-Methyl-2-pentanone	Methyl Ethyl Ketone	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Dibromochloromethane	Chloroform	Tribromomethane	Bromodichloromethane	Carbon disulfide	CEC	Conductivity (1:5 aqueous extract)	pH (aqueous extract)	% Clay*	<2mm Fraction	>2mm Fraction	Moisture Content (dried @ 103°C)	Analysed Material	Extraneous Material
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	MEQ/100G	US/CM	pH Units	%	%	%	%	%	%
EQL	0.5	0.5	1	1	1	1	0.5	1	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	1	1	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5	0.5	0.05	10	0.1	1	0.005	0.005	1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Rec C Soil																									10														
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																							
NEPM 2013 Table 1B(6) ESLs for Urban Res and public open space, Coarse Soil																																							
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																							
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																																							
0-1m																																							
1-2m																																							
2-4m																																							
>4m																																							
NEPM 2013 Table 7 Rec C Soil HSL for Asbestos in Soil																																							
PFAS NEMP 2020 Table 2 Health Public open space																																							
PFAS NEMP 2020 Table 3 Interim EDE All land uses																																							
PFAS NEMP 2020 Table 3 Interim EIE All land uses																																							

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Lab_Report_	Matreial Type																																				
BH13 0.0-0.1	BH13	0-0.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	6.6	-	-
BH13 2.0-2.1	BH13	2-2.1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1	-	-
BH14 0.5-0.6	BH14	0.5-0.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	4.2	-	-
BH14 1.5-1.6	BH14	1.5-1.6	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	120	7.9	<1	-	-	6.8	-	-
BH15 0.9-1.0	BH15	0.9-1	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	8.7	-	-
BH15 2.4-2.5	BH15	2.4-2.5	13/04/2023	981107	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	6.5	-	-
BH16 0.2-0.3	BH16	0.2-0.3	13/04/2023	981107	Fill	<0.5	<0.5	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	8.8	-	-
BH16 0.8-0.9	BH16	0.8-0.9	13/04/2023	981107	Fill	<5	<5	-	-	-	-	<5	-	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<5	<5	<5	-	-	-	-	-	-	2.3	-	-
BH16 1.9-2.0	BH16	1.9-2	13/04/2023	981107	Fill	<0.5	<0.5	-	-	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	2.2	-	-

Env Stds Comments
#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#2:Trigger Value adopted from Chromium (VI)
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#6:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Derived soil HSL exceeds soil saturation concentraiton. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9:Derived soil HSL exceeds soil saturation concentraiton. To obtain F2 subtract naphthalene from the >C10-C16 fraction
#10:Derived soil HSL exceeds soil saturation concentraiton
#11:Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#12:Trigger Value taken for Chromium (III), Clay Content of 1%
#13:Trigger Value taken for pH 4.5
#14:Trigger Value taken for CEC 5
#15:Trigger Value taken for pH 4 and CEC 5
#16:ESLs are of low reliability.
#17:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#18:ESLs are of moderate reliability. To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#19:Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#20:Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
#21:Only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.
#22: Sample reanalysed for heavy metals, TRH and PAHs to confirm results.

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			Heavy Metals								TPH (NEPC 1999)					BTEX Compounds					
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	C6-C9	C10-C14	C15-C28	C29-C36	C10 -C36	Benzene	Toluene	Ethyl Benzene	Xylene (m & p)	Xylene (o)	Total Xylenes
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			4	0.5	1	1	1	0.1	1	1	25	50	100	100	100	0.5	0.5	1	2	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil			300	90	300	17000	600	80	1200	30000											
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																NL	NL	NL			NL
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																NL	NL	NL			NL
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																NL	NL	NL			NL
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																NL	NL	NL			NL
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space			100		410	220	1100		250	720											
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																					
EPA 1994											65				1000	1	1.4	3.1			14
Location	Depth (m)	Date																			
E3C (2012)																					
BH01	0.5-0.7	22/12/2011	<4	<0.5	7	84	24	<0.1	11	30	<25	<50	800	2400	3200	<0.2	<0.5	<1	<2	<1	<3
BH01	1.6-1.8	22/12/2011	150	1.7	11	120	880	1.1	13	490	<25	<50	370	140	510	<0.2	<0.5	<1	<2	<1	<3
BH02	1.2-1.4	22/12/2011	8	<0.5	27	91	49	0.2	11	73	<25	<50	<100	<100	NC	<0.2	<0.5	<1	<2	<1	<3
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	<4	<0.5	7	78	38	0.5	10	94	<25	<50	<100	<100	NC	<0.2	<0.5	<1	<2	<1	<3
BH02	2-2.2	22/12/2011	<4	<0.5	7	23	18	0.1	5	20	<25	<50	<100	<100	NC	<0.2	<0.5	<1	<2	<1	<3
BH03	0.4-0.6	22/12/2011	<4	<0.5	6	7	36	0.1	1	12	<25	<50	120	110	230	<0.2	<0.5	<1	<2	<1	<3
BH03	1.9-2.1	22/12/2011	<4	<0.5	15	7	14	<0.1	6	25	<25	<50	<100	<100	NC	<0.2	<0.5	<1	<2	<1	<3
CDM (2012a)																					
BH01	0-0.15	25/10/2012	6	<0.5	11	150	370	0.4	13	150	<25	<50	1300	1200	2500	<0.2	<0.5	<1	<2	<1	<3
BH01	4.4-4.7	25/10/2012	11	0.6	6	70	2100	0.4	16	820	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH02	0.5-0.6	25/10/2012	14	0.7	9	110	3000	2.5	14	540	<25	<50	1500	550	2050	<0.2	<0.5	<1	<2	<1	<3
BH02	3.4-3.7	25/10/2012	<4	<0.5	9	14	15	<0.1	6	24	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH03	0.18-0.26	25/10/2012	6	<0.5	5	190	86	0.2	17	120	<25	<50	190	990	1180	<0.2	<0.5	<1	<2	<1	<3
BH03	0.5-0.7	25/10/2012	4	<0.5	5	8	22	<0.1	4	13	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH04	0.14-0.2	25/10/2012	14	<0.5	21	76	190	0.9	18	160	<25	<50	210	200	410	<0.2	<0.5	<1	<2	<1	<3
BH04	0.5-0.7	25/10/2012	10	<0.5	4	38	71	2.3	14	110	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH05	1-1.1	25/10/2012	18	<0.5	14	83	500	0.2	24	330	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH05	3-3.2	25/10/2012	<4	<0.5	6	<1	11	<0.1	<1	6	<25	<50	1600	<100	1600	<0.2	<0.5	<1	<2	<1	<3
BH05	3.5-3.8	25/10/2012	<4	<0.5	4	<1	8	<0.1	<1	6	<25	550	1800	<100	2350	<0.2	<0.5	<1	<2	<1	<3
BH06	0.15-0.2	25/10/2012	19	1.7	6	75	110	0.5	19	2800	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH06	1.5-1.9	25/10/2012	<4	<0.5	7	<1	5	<0.1	<1	5	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
BH07	0.3-0.4	25/10/2012	17	0.6	19	63	210	0.8	23	290	<25	<50	<100	<100	<200	<0.2	<0.5	<1	<2	<1	<3
RCA (2011)																					
LOR			*1*	*0.1*	*2*	*2*	*2*	*0.05*	*1*	*5*	*10*	*50*	*100*	*100*	*100*	*0.5*	*0.5*	*0.5*	*1*	*0.5*	*0.15*
TP1A	0.3-0.4	29/04/2011	1.7	0.4	4.7	46	19	< 0.05	6.2	15	< 10	< 50	180	1500	1700	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP2A	0.1-0.2	29/04/2011	5.1	< 0.1	11	21	35	0.06	4.8	46	< 10	< 50	< 100	< 100	< 100	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP3A	0.2-0.3	29/04/2011	4.8	< 0.1	8.8	9.2	49	< 0.05	4.6	53	< 10	< 50	< 100	< 100	< 100	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP4A Soil	0.2-0.3	29/04/2011	3.3	< 0.1	40	11	29	< 0.05	25	35	< 10	< 50	< 100	< 100	< 100	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP5A	0.2-0.3	29/04/2011	3.2	0.1	7.4	15	31	< 0.05	9.1	57	< 10	< 50	140	110	250	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP6A	0.2-0.3	29/04/2011	3.8	< 0.1	9.2	14	19	< 0.05	4	47	< 10	< 50	110	190	300	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP7A	0.2-0.3	29/04/2011	5.4	0.1	6.1	20	43	< 0.05	8.9	80	< 10	< 50	< 100	140	140	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP8A	0.2-0.3	29/04/2011	5.1	0.1	5.8	16	73	0.06	4.6	80	< 10	< 50	< 100	120	120	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP11A	0.3-0.4	29/04/2011	3	< 0.1	6	16	42	0.13	5.9	88	< 10	< 50	< 100	< 100	< 100	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP11B	0.7-0.8	29/04/2011	3.1	< 0.1	9.9	21	42	< 0.05	12	63	< 10	< 50	3000	2000	5000	< 0.5	< 0.5	< 0.5	< 1	< 0.5	<1.5
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																					
LOR			*4*	*<0.5*	*1*	*1*	*1*	*0.1*	*1*	*1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*0.5*	*1*	-	-	*1*
TP01	0.2	18/06/2010	<4	<0.5	8	9	23	<0.1	5	45	<25	<50	<100	<100	<100	<0.5	<0.5	<1.0	-	-	<1.0
TP02	0.5	18/06/2010	6	<0.5	7	54	96	0.2	9	91	<25	<50	<100	<100	<100	<0.5	<0.5	<1.0	-	-	<1.0
TP03	0.6	18/06/2010	8	<0.5	8	45	89	1.2	7	130	<25	<50	140	100	290	<0.5	<0.5	<1.0	-	-	<1.0
TP04	0.1	18/06/2010	<4	<0.5	23	13	110	<0.1	6	96	<25	<50	<100	<100	<100	<0.5	<0.5	<1.0	-	-	<1.0
TP05	0.4	18/06/2010	<4	<0.5	3	39	21	<0.1	8	51	<25	<50	480	580	1110	<0.5	<0.5	<1.0	-	-	<1.0
TP06	0.5	18/06/2010	13	<0.5	4	46	97	<0.1	11	92	<25	<50	330	260	640	<0.5	<0.5	<1.0	-	-	<1.0
TP07	0.3	18/06/2010	<4	<0.5	11	27	61	<0.1	11	100	<25	<50	520	470	1040	<0.5	<0.5	<1.0	-	-	<1.0
TP08	0.3	18/06/2010	<4	<0.5	3	16	39	<0.1	5	170	<25	<50	300	280	630	<0.5	<0.5	<1.0	-	-	<1.0
BR01 (TP06)	0.5	18/06/2010	6	<0.5	4	24	80	<0.1	7	55	<25	<50	330	280	660	<0.5	<0.5	<1.0	-	-	<1.0

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			PAHs																		Phenol
			Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)Pyrene TEQ	Total PAHs	Phenolics
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	0.1
NEPM 2013 Table 1A(1) HILs Rec C Soil																		3	300	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																				
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil							0.7													
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																				
EPA 1994																				
Location	Depth (m)	Date																		
E3C (2012)																				
BH01	0.5-0.7	22/12/2011	<1	1	1.5	6.7	9.9	14	6.9	6.6	<1	11	<1	6.6	<1	3.1	14	13.3	81.3	-
BH01	1.6-1.8	22/12/2011	0.4	1.9	3	8.5	7.3	11	3.8	6.2	0.7	18	1.3	4.3	0.3	11	15	10.5	92.7	-
BH02	1.2-1.4	22/12/2011	<0.1	<0.1	0.4	1.9	2.3	3.8	1.9	2	0.2	5.5	<0.1	1.9	<0.1	2	4.8	3.3	26.7	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	<0.1	<0.1	<0.1	<0.1	0.09	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.09	-
BH02	2-2.2	22/12/2011	<0.1	<0.1	<0.1	0.3	0.31	0.5	0.3	0.3	<0.1	0.8	<0.1	0.2	<0.1	0.3	0.7	0.5	3.71	-
BH03	0.4-0.6	22/12/2011	0.2	<0.1	1.2	7.5	8.8	14	7	7.3	0.9	18	0.1	7.7	<0.1	4.1	17	12.8	93.8	-
BH03	1.9-2.1	22/12/2011	<0.1	<0.1	<0.1	0.2	0.17	0.3	0.2	0.2	<0.1	0.5	<0.1	0.1	<0.1	0.2	0.5	0.3	2.37	-
CDM (2012a)																				
BH01	0-0.15	25/10/2012	4	0.4	6	13	17	23	8.6	12	1.8	29	2.8	10	0.8	19	29	23.6	176	-
BH01	4.4-4.7	25/10/2012	<0.1	<0.1	<0.1	0.3	0.72	1.2	1.1	0.3	0.1	0.4	<0.1	1.3	<0.1	0.2	0.4	1.1	6.02	-
BH02	0.5-0.6	25/10/2012	0.5	0.7	1.6	6.1	7.5	11	4.5	6	0.9	13	0.6	5.3	0.4	6.9	12	10.7	77	-
BH02	3.4-3.7	25/10/2012	<0.1	<0.1	<0.1	0.1	0.17	0.3	<0.1	0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	0.2	0.3	1.17	-
BH03	0.18-0.26	25/10/2012	<0.1	0.2	0.3	1.6	2.4	3.8	1.5	1.8	0.4	2.5	<0.1	1.6	0.1	1	2.6	3.5	19.8	-
BH03	0.5-0.7	25/10/2012	<0.1	<0.1	<0.1	<0.1	0.06	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.06	-
BH04	0.14-0.2	25/10/2012	0.2	0.2	0.8	4.5	5.3	7.3	2.4	4.3	0.5	7.9	0.2	3	<0.1	2.9	8.6	7.3	48.1	-
BH04	0.5-0.7	25/10/2012	<0.1	<0.1	<0.1	0.1	0.13	0.2	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.2	0.2	0.2	1.13	-
BH05	1-1.1	25/10/2012	<0.1	<0.1	0.3	1.1	1.4	2.1	0.8	1	0.2	1.8	<0.1	1	<0.1	1	1.6	2.0	12.3	-
BH05	3-3.2	25/10/2012	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0	-
BH05	3.5-3.8	25/10/2012	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	0.1	-
BH06	0.15-0.2	25/10/2012	<0.1	<0.1	<0.1	0.3	0.35	0.6	0.3	0.3	<0.1	0.5	<0.1	0.4	<0.1	0.3	0.5	0.5	3.55	-
BH06	1.5-1.9	25/10/2012	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0	-
BH07	0.3-0.4	25/10/2012	<0.1	<0.1	<0.1	0.4	0.44	0.7	0.2	0.4	<0.1	0.7	<0.1	0.3	<0.1	0.4	0.8	0.6	4.34	-
RCA (2011)																				
LOR			*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*1*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*			
TP1A	0.3-0.4	29/04/2011	< 0.5	< 0.5	1.2	2.2	2.9	4.5	3	2.5	0.8	4.8	< 0.5	1.8	< 0.5	2.7	4.9	4.6	31.3	-
TP2A	0.1-0.2	29/04/2011	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0	-
TP3A	0.2-0.3	29/04/2011	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0	-
TP4A Soil	0.2-0.3	29/04/2011	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0	-
TP5A	0.2-0.3	29/04/2011	0.8	< 0.5	2.6	5.2	3.7	7.1	3.2	5.4	1.2	19	0.8	3	< 0.5	12	15	6.5	79	-
TP6A	0.2-0.3	29/04/2011	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0	-
TP7A	0.2-0.3	29/04/2011	< 0.5	< 0.5	< 0.5	1.1	1.3	2.4	1.8	1.4	0.6	2.7	< 0.5	1.5	< 0.5	0.8	2.3	2.4	15.9	-
TP8A	0.2-0.3	29/04/2011	< 0.5	< 0.5	< 0.5	1	1.2	2	1.3	1.1	0.6	2.1	< 0.5	1.2	< 0.5	< 0.5	1.9	2.2	12.4	-
TP11A	0.3-0.4	29/04/2011	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 1	0.6	0.5	< 0.5	1.2	< 0.5	0.5	< 0.5	< 0.5	1	0.9	4.3	-
TP11B	0.7-0.8	29/04/2011	9.6	1.4	40	150	120	220	110	130	41	490	7.8	96	1.1	170	450	210.0	2036.9	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																				
LOR			*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*		*0.1*	
TP01	0.2	18/06/2010	<0.1	<0.1	<0.1	0.2	0.2	0.4	0.2	0.2	<0.1	0.3	<0.1	0.2	<0.1	<0.1	0.3	0.3	2.7	-
TP02	0.5	18/06/2010	<0.1	<0.1	0.1	1	1.3	2.2	1	1	0.1	2.4	<0.1	1	<0.1	0.5	2.2	1.8	13.3	-
TP03	0.6	18/06/2010	0.2	0.1	1.3	6.1	7.5	11	4.6	5.6	0.5	17	0.2	4.6	<0.1	5.2	15	10.3	79	-
TP04	0.1	18/06/2010	<0.1	<0.1	<0.1	0.2	0.3	0.4	0.2	0.2	<0.1	0.4	<0.1	0.2	<0.1	0.2	0.4	0.4	3.1	-
TP05	0.4	18/06/2010	0.9	0.1	4	25	41	54	29	22	3	75	0.5	24	<0.1	18	66	54.8	362.6	-
TP06	0.5	18/06/2010	0.4	<0.1	3	14	22	30	15	15	1.8	47	0.4	14	<0.1	14	40	29.9	216.8	-
TP07	0.3	18/06/2010	2.4	0.1	8.5	24	34	47	21	24	3	69	2	20	0.3	36	63	46.6	333.3	-
TP08	0.3	18/06/2010	0.3	0.1	1.8	14	19	29	13	14	1.7	40	0.2	12	<0.1	7.1	37	26.5	189.3	-
BR01 (TP06)	0.5	18/06/2010	0.7	<0.1	2.8	14	21	30	16	15	2.4	46	0.4	14	<0.1	14	40	29.5	216.3	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			Organochlorine Pesticides																							PCBs								TBT
			Aldrin and Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	4,4-DDE	DDD	DDT	a-BHC	Aldrin	Dieldrin	b-BHC	Chlordane (trans)	g-BHC	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor epoxide	Methoxychlor	Hexachlorobenzene	OCPs (Total)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCBs	Tributyl Tin
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0000005
NEPM 2013 Table 1A(1) HILs Rec C Soil			10	70	400														20				400										1	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																																		
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space									180																									
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																																		
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																		
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																																		
EPA 1994																																		
Location	Depth (m)	Date																																
E3C (2012)																																		
BH01	0.5-0.7	22/12/2011	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																																		
BH01	0-0.15	25/10/2012	2.5	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	1.4	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3.5	-
BH01	4.4-4.7	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH02	0.5-0.6	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3.5	-
BH02	3.4-3.7	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH03	0.18-0.26	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH03	0.5-0.7	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH04	0.14-0.2	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH04	0.5-0.7	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH05	1-1.1	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH05	3-3.2	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH05	3.5-3.8	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH06	0.15-0.2	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH06	1.5-1.9	25/10/2012	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	-
BH07	0.3-0.4	25/10/2012	1.05	2	<0.3	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.9	<0.1	2.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.9	<0.1	<0.1	-	<1	<1	<1	<1	<1	<1	<1	<7	-
RCA (2011)																																		
LOR				*0.05*		*0.05*	*0.05*	*0.05*	*0.2*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.2*	*0.05*		*0.5*		*0.5*	*0.5*	*0.5*	*0.5*	*0.5*		
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	<0.0000005
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	<0.0000005
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	-	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<3	-
NAA (2010)																																		
LOR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	
TP01	0.2	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04	0.1	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			Asbestos	Volatile Organic Compounds																											
			Asbestos Fibres	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	CarbonTetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	VinylChloride
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil																															
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																															
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																															
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																															
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																															
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																															
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																															
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																															
EPA 1994																															
Location	Depth (m)	Date																													
E3C (2012)																															
BH01	0.5-0.7	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																															
BH01	0-0.15	25/10/2012	No Asbestos Detected	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH01	4.4-4.7	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	0.5-0.6	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	3.4-3.7	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.18-0.26	25/10/2012	No Asbestos Detected	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.5-0.7	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.14-0.2	25/10/2012	No Asbestos Detected	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.5-0.7	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	1-1.1	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3-3.2	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3.5-3.8	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	0.15-0.2	25/10/2012	No Asbestos Detected	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	1.5-1.9	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH07	0.3-0.4	25/10/2012	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
RCA (2011)																															
LOR																															
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																															
LOR			-	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
TP01	0.2	18/06/2010	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TP02	0.5	18/06/2010	No Asbestos Detected	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TP04	0.1	18/06/2010	No Asbestos Detected	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TP06	0.5	18/06/2010	No Asbestos Detected	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TP08	0.3	18/06/2010	No Asbestos Detected	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Trichlorofluoromethane	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	Cyclohexane	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	1-naphthylamine	2-naphthylamine	Diphenylamine	2-nitroaniline	3-nitroaniline	4-chloroaniline
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil																																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																																
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																																
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																																
EPA 1994																																
Location	Depth (m)	Date																														
E3C (2012)																																
BH01	0.5-0.7	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																																
BH01	0-0.15	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10
BH01	4.4-4.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	0.5-0.6	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	3.4-3.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.18-0.26	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.14-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	1-1.1	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3-3.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3.5-3.8	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	0.15-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	1.5-1.9	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH07	0.3-0.4	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
RCA (2011)																																
LOR																																
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																																
LOR			*0.5*	*0.5*	*1*	*2*	*1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01	0.2	18/06/2010	<0.5	<0.5	<1.0	<2.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	<0.5	<0.5	<1.0	<2.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04	0.1	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	<0.5	<0.5	<1.0	<2.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	<0.5	<0.5	<1.0	<2.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			4-nitroaniline	2-methyl-5-nitroaniline	Aniline	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	1,2,4,5-tetrachlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Hexachlorobenzene	Pentachlorobenzene	2,3,4,6-tetrachlorophenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	Dinoseb	1,3-Dinitrobenzene	2,6-dinitrotoluene	Nitrobenzene	Pentachloronitrobenzene	4,4-DDE	a-BHC	Aldrin	b-BHC	chlordane	Chlordane(trans)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil																																	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																																	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																																	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																																	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																																	
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																	
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																																	
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																	
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																																	
EPA 1994																																	
Location	Depth (m)	Date																															
E3C (2012)																																	
BH01	0.5-0.7	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																																	
BH01	0-0.15	25/10/2012	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
BH01	4.4-4.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	0.5-0.6	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	3.4-3.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.18-0.26	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.14-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	1-1.1	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3-3.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3.5-3.8	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	0.15-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	1.5-1.9	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH07	0.3-0.4	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	3
RCA (2011)																																	
LOR																																	
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																																	
LOR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01	0.2	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04	0.1	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			semi-Volatile Organic Compounds																															
			d-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	g-BHC (Lindane)	Heptachlor	HeptachlorEpoxide	Methoxychlor	EthylMethanesulfo'-te	Safrole	7,12-dimethylbenz(a)anthracene	2,4-dimethylphenol	2,4-dinitrophenol	2-chloro'-phthalene	2-methyl'-phthalene	2-methylphenol	2-nitrophenol	3-methylcholanthrene	4,6-Dinitro-2-methylphenol	4-methylphenol	4-nitrophenol	Acetophenone	Phenol	Bis(2-ethylhexyl)phthalate	ButylBenzylPhthalate	Diethylphthalate	DimethylPhthalate
LOR / PQL / EQL			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	1	1	10	2	10	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																																		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																																		
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																																		
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																																		
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																																		
EPA 1994																																		
Location	Depth (m)	Date																																
E3C (2012)																																		
BH01	0.5-0.7	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																																		
BH01	0-0.15	25/10/2012	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<10	<100	<20	<100	<10	<10	<10	<10	<10	<10	<10
BH01	4.4-4.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH02	0.5-0.6	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH02	3.4-3.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH03	0.18-0.26	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH03	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH04	0.14-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH04	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH05	1-1.1	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH05	3-3.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH05	3.5-3.8	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH06	0.15-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH06	1.5-1.9	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
BH07	0.3-0.4	25/10/2012	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<10	<2	<10	<1	<1	<1	<1	<1	<1	<1
RCA (2011)																																		
LOR																																		
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																																		
LOR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01	0.2	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04	0.1	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2: Historical Soil Analytical Results
Project Number: 64669
Project Name: Bank Street DSI 2023

			Di-n-butylPhthalate	Di-n-octylPhthalate	Isophorone	2-(acetylamino)fluorene	4-(dimethylamino)azobenzene	4-BromophenylPhenylEther	4-ChlorophenylPhenylEther	Azobenzene	BenzylAlcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl)ether	Carbazole	Dibenzofuran	Hexachloropropene	Isosafrole	Methapyrilene	N-nitrosomorpholine	N-nitrosopiperidine	Phe'-cetin	Pentachloroethane
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR / PQL / EQL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Rec C Soil																							
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 0-1m																							
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 1-2m																							
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand 2-4 m																							
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand >4																							
NEPM 2013 Table 1B(1-5) Site Specific EIL - Urban Residential and Public Open Space																							
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																							
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																							
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																							
EPA 1994																							
Location	Depth (m)	Date																					
E3C (2012)																							
BH01	0.5-0.7	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	1.6-1.8	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA01 (Intralab BH02 (1.2-1.4))	1.2-1.4	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	2-2.2	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0.4-0.6	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	1.9-2.1	22/12/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDM (2012a)																							
BH01	0-0.15	25/10/2012	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
BH01	4.4-4.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	0.5-0.6	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH02	3.4-3.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.18-0.26	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH03	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.14-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH04	0.5-0.7	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	1-1.1	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3-3.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH05	3.5-3.8	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	0.15-0.2	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH06	1.5-1.9	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH07	0.3-0.4	25/10/2012	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
RCA (2011)																							
LOR																							
TP1A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A	0.1-0.2	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4A Soil	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8A	0.2-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11A	0.3-0.4	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11B	0.7-0.8	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2A+TP6A (COMPOSITE)	0.1-0.3	29/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAA (2010)																							
LOR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01	0.2	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	0.6	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04	0.1	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0.3	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR01 (TP06)	0.5	18/06/2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3: Soil ASLP Leachate Results
Project Number: 64669
Project Name: Bank St DSI 2023

					Metals & Metalloids								PAH	Ionic Balance			
					Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzo(a)pyrene	pH of Leaching Fluid	pH (after HCL)	pH (Final)	pH (Initial)
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH Units	pH Units	pH Units	pH Units
EQL					0.01	0.005	0.05	0.05	0.01	0.001	0.01	0.05	0.001	0.1	0.1	0.1	0.1
ANZG (2018) Marine water 95% toxicant DGVs						0.0055	0.0044	0.0013	0.0044	0.0004	0.07	0.008	0.0002				
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Lab_Report_Number**													
BH05_0.2-0.3	BH05	0.2-0.3	14/04/2023	984766	0.01	<0.005	<0.05	0.09	1.4	0.006	<0.01	0.42	<0.001	6.6	2.3	6.3	6.5
BH11_0.8-0.9	BH11	0.8-0.9	14/04/2023	984766	-	-	-	-	<0.01	-	-	-	<0.001	6.6	2.3	6.5	6.4
BH16_0.8-0.9	BH16	0.8-0.9	14/04/2023	984766	-	-	-	-	0.12	-	-	-	<0.001	6.6	2.3	6.6	7

Table B: Acid Sulfate Soil Results
Project Number: 64669
Project Name: Bank Street DSI 2023

Soil Sample ID	Field Screening				SPOCAS											Material Description*	Interpretation^
	pH_i	pH_{ox15}	pH drop	Reaction	pH_{KCl}	pH_{ox}	TAA (mol H+/tonne)	TPA (mol H^+/tonne)	TSA (mol H+/tonne)	S_{KCl}%	S_{POS}%	a-ANC_E (mol H^+/tonne)	a-Net Acidity (mol H+/tonne)	Liming Rate ($kgCaCO_3/t$)			
ASSMAC (1998) Action Criteria (Coarse >1000 tonnes disturbed)								18	18		0.03						
ASSMAC (1998) Action Criteria (Coarse 1-1000 tonnes disturbed)								18	18		0.03						
ASSMAC (1998) Action Criteria (Medium >1000 tonnes disturbed)								18	18		0.03						
ASSMAC (1998) Action Criteria (Medium 1-1000 tonnes disturbed)								36	36		0.06						
ASS Characterisation (April-May 2023)																	
BH03 1.9-2.0	6.20	4.8	1.40	No Reaction	5.5	5.1	6.9	2.6	<2	0.008	<0.005	-	<10	<1		Natural: Grey/Yellow/Brown Sandstone	No ASS
BH04 5.9-6.0	6.30	5.6	0.70	No Reaction	9.1	8.3	<2	<2	<2	0.053	0.4	270	<10	<1		Natural: Brown/Red Gravelly Sand	PASS
BH05 3.5-3.6	7.20	6	1.20	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Yellow/White Sandstone	No ASS
BH05 4.1-4.2	7.20	6.2	1.00	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Yellow/White Sandstone	No ASS
BH07 5.4-5.5	6.50	5.5	1.00	No Reaction	9.4	8.2	<2	<2	<2	0.091	0.26	970	<10	<1		Fill: Dark Brown/Black Clayey Sand	PASS
BH08 6.0-6.1	6.50	5.9	0.60	Slight Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Red Sandstone	No ASS
BH08 7.0-7.1	8.40	6.7	1.70	Slight Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Red Sandstone	No ASS
BH11 3.0-3.1	7.70	5.50	2.20	Slight Reaction	9.3	7.7	<2	<2	<2	0.034	0.018	97	<10	<1		Natural: Brown/Grey/Red Sandstone	No ASS
BH11 4.0-4.1	6.60	5.50	1.10	Slight Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Brown/Grey/Red Sandstone	No ASS
BH11 5.0-5.1	6.70	5.20	1.50	Slight Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Brown/Grey/Red Sandstone	No ASS
BH12 3.5-3.6	7.40	5.30	2.10	No Reaction	-	-	-	-	-	-	-	-	-	-		Fill: Brown Weathered Sandstone	No ASS
BH12 4.0-4.1	6.40	5.30	1.10	No Reaction	-	-	-	-	-	-	-	-	-	-		Fill: Brown Weathered Sandstone	No ASS
BH12 4.6-4.7	6.20	5.40	0.80	No Reaction	3.4	5.9	3.5	<2	<2	0.012	<0.005	-	<10	<1		Fill: Brown Weathered Sandstone	No ASS
BH12 5.0-5.1	8.40	1.40	7.00	Strong Reaction	8.8	3.8	<2	88	88	0.13	0.92	-	250	19		Fill: Black Sand	PASS
BH12 5.9-6.0	6.90	3.20	3.70	Moderate Reaction	6.7	4.1	<2	41	41	0.035	0.05	-	38	2.8		Fill: Brown Clayey Gravelly Sand	PASS
BH13 4.0-4.1	6.40	5.80	0.60	Slight Reaction	6.4	6	3.2	<2	<2	0.023	<0.005	-	<10	<1		Natural: Light Brown/Light Grey Weathered Sandstone	No ASS
BH13 5.0-5.1	6.80	6.10	0.70	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Light Grey Weathered Sandstone	No ASS
BH14 1.9-2.0	7.20	5.60	1.60	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Grey Sandy Silty Clay	No ASS
BH14 2.9-3.0	7.00	6.10	0.90	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown Weathered Sandstone	No ASS
BH14 3.4-3.5	7.50	6.5	1.00	Moderate Reaction	7.6	7	<2	<2	<2	0.022	0.007	57	<10	<1		Natural: Light Brown/Red Sandstone	No ASS
BH15 3.9-4.0	7.40	6.5	0.90	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Light Grey Clayey Sand	No ASS
BH15 4.5-4.6	7.40	6.5	0.90	No Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Light Grey Clayey Sand	No ASS
BH15 4.9-5.0	7.50	2.3	5.20	Strong Reaction	8.9	7.9	<2	<2	<2	0.056	0.016	150	<10	<1		Natural: Light Brown/Light Grey Sandstone	No ASS
BH15 5.4-5.5	7.80	6.6	1.20	Slight Reaction	-	-	-	-	-	-	-	-	-	-		Natural: Light Brown/Light Grey Sandstone	No ASS

Table C: Asbestos Results
Project Number: 64669
Project Name: Bank St DSI 2023

Health Screening Level Asbestos Concentration in Soil (% w/w)	
Category	**HSL C**
Bonded ACM in soils	**0.02**
FA and AF in soils	**0.001**
Asbetsos Presence	**Bold**

Sample Information			Field Asbestos Quantification					Laboratory Analysis				
Sample ID	Date	>7 mm ACM observed during screening?	Approx. Volume of Soil (L)	Soil Mass (g)*	Mass ACM (g)	Mass Asbestos in ACM (g)**	Asbestos from ACM in soil (%w/w)	Sample Mass (g)	Asbestos from ACM in soil (%w/w)	Asbestos from FA in soil (%w/w)	Asbestos from AF in soil (%w/w)	Asbestos from FA & AF in soil (%w/w)
Data Gap Investigation												
BH01 0.0-0.4	13/04/2023	No	10	16250	0	0.0	0.000	**555**	**0.35**	**0**	**0.0019**	**0.0019**
BH02 0.2-1.0	14/04/2023	No	10	16250	0	0.0	0.000	692	0	0	0	0
QAB03	14/04/2023	-	-	-	-	-	-	660	0	0	0	0
QCB03	14/04/2023	-	-	-	-	-	-	719	0	0	0	0
BH03 0.1-1.1	13/04/2023	No	10	16250	0	0.0	0.000	709	0	0	0	0
BH03 1.1-1.5	13/04/2023	No	10	16250	0	0.0	0.000	710	0	0	0	0
BH03A 0.1-0.8	14/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH05 0.2-1.2	14/04/2023	No	10	16250	0	0.0	0.000	**627**	**0**	**0**	**0.00016**	**0.00016**
BH05 1.2-2.2	14/04/2023	No	10	16250	0	0.0	0.000	**769**	**0**	**0**	**0.0005**	**0.0005**
BH05 2.2-3.2	14/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH06-0.0-0.3	5/05/2023	No	10	16250	0	0.0	0.000	471	0	0	0	0
BH06-0.5-1.0	5/05/2023	No	10	16250	0	0.0	0.000	803	0	0	0	0
BH07-0.0-1.0	5/05/2023	No	10	16250	0	0.0	0.000	510	0	0	0	0
BH07-1.0-1.5	5/05/2023	No	10	16250	0	0.0	0.000	619	0	0	0	0
BH07-1.5-2.5	5/05/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH07-2.5-3.5	5/05/2023	No	10	16250	0	0.0	0.000	828	0	0	0	0
BH07-3.5-4.5	5/05/2023	No	10	16250	0	0.0	0.000	595	0	0	0	0
BH08-0.0-1.0	5/05/2023	No	10	16250	0	0.0	0.000	777	0	0	0	0
BH08-1.0-1.5	5/05/2023	No	10	16250	0	0.0	0.000	807	0	0	0	0
BH08-2.5-3.5	5/05/2023	No	10	16250	0	0.0	0.000	637	0	0	0	0
BH08-3.5-4.5	5/05/2023	No	10	16250	0	0.0	0.000	851	0	0	0	0
BH09-0.0-0.3	5/05/2023	No	10	16250	0	0.0	0.000	**938**	**0**	**0.00043**	**0**	**0.00043**
BH11 0.0-0.8	13/04/2023	No	10	16250	0	0.0	0.000	887	0	0	0	0
BH11 0.8-1.0	13/04/2023	No	10	16250	0	0.0	0.000	718	0	0	0	0
QAB01	13/04/2023	-	-	-	-	-	-	845	0	0	0	0
QCB01	13/04/2023	-	-	-	-	-	-	848	0	0	0	0
BH11 2.0-2.5	13/04/2023	No	10	16250	0	0.0	0.000	765	0	0	0	0
BH12-1.2-1.7	5/05/2023	No	10	16250	0	0.0	0.000	899	0	0	0	0
BH12-1.7-2.7	5/05/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH13 0.0-0.9	13/04/2023	No	10	16250	0	0.0	0.000	834	0	0	0	0
BH13 1.1-1.4	13/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH13 1.4-1.7	13/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH13 1.7-2.5	13/04/2023	No	10	16250	0	0.0	0.000	865	0	0	0	0
BH14 0.0-0.6	13/04/2023	No	10	16250	0	0.0	0.000	852	0	0	0	0
BH14 0.6-1.6	13/04/2023	No	10	16250	0	0.0	0.000	1028	0	0	0	0
BH15 0.0-1.0	13/04/2023	No	10	16250	0	0.0	0.000	851	0	0	0	0
BH15 1.0-1.5	13/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH15 1.5-2.5	13/04/2023	No	10	16250	0	0.0	0.000	-	-	-	-	-
BH15 2.5-3.5	13/04/2023	No	10	16250	0	0.0	0.000	1032	0	0	0	0
BH16 0.0-0.8	13/04/2023	No	10	16250	0	0.0	0.000	773	0	0	0	0
BH16 0.8-1.0	13/04/2023	No	10	16250	0	0.0	0.000	920	0	0	0	0

* Soil mass based on soil densities provided within CRC Care 2011: Technical Report 10
Soil Mass (g) = Soil Density (1.625 kg/L) * 10 L = 16.25 kg

** Mass Asbestos in ACM = 0.15 * Mass ACM (g) - per ASC NEPM
*** Asbestos from ACM in Soil = Mass Asbestos in ACM / Soil Mass - per ASC NEPM
**** Asbestos weight adjusted to include ACM detected in laboratory analytical sample

Table D1: Groundwater Analytical Results
Project Number: 64669
Project Name: Bank St DSI 2023

	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN						
	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)	C6-C10	C10-C16	C16-C34	C34-C40	C10-C40 (Sum of total)	F1 (C6-C10 minus BTEX)	F2 (C10-C16 less Naphthalene)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene_VOC
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.001	0.0002	0.001	0.001	0.001	0.0001	0.001	0.005	0.02	0.05	0.1	0.1	0.1	0.02	0.05	0.1	0.1	0.1	0.02	0.05	0.001	0.001	0.001	0.001	0.002	0.003	0.01
ANZG (2018) Marine water 95% toxicant DGVs		0.0055[#9]	0.0044[#10]	0.0013[#11]	0.0044[#12]	0.0004[#13]	0.07[#13]	0.008[#14]													0.7[#15]	0.18[#16]	0.08[#16]		0.075[#17]		0.07[#18]
NEPM 2013 Table 1C GILs, Marine Waters		0.0007[#23]	0.0044[#24]	0.0013[#25]	0.0044[#25]	0.0001[#26]	0.007[#25]	0.015[#27]													0.5[#28]						0.05[#28]
PFAS NEMP 2020 Table 1 Health Recreational Water																											
PFAS NEMP 2020 Table 5 Interim marine 95%																											
PFAS NEMP 2020 Table 5 Interim marine 99%																											
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																			NL	NL	NL	NL	NL			NL	

Field_ID	Location_Code	Well	Sampled_Date_Time	Lab_Report_Number																								
DBMW01	DBMW01	DBMW01	14/04/2023	981895	<0.001	<0.0002	<0.001	0.002	<0.001	<0.0001	<0.001	0.012	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01
MW01	MW01	MW01	13/04/2023	981895	0.001	<0.0002	<0.001	0.003	0.005	<0.0001	<0.001	0.031	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01
QAW01	MW01	MW01	14/04/2023	981895	0.002	<0.0002	<0.001	0.003	0.004	<0.0001	<0.001	0.031	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01
QCW01	MW01	MW01	18/04/2023	321252	0.001	<0.0001	0.001	0.004	0.005	<0.00005	0.001	0.051	<0.01	<0.05	<0.1	<0.1	<0.05	<0.01	<0.05	<0.1	<0.1	<0.05	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.002	-	<0.001
MW02	MW02	MW02	13/04/2023	981895	<0.001	<0.0002	<0.001	0.002	0.018	<0.0001	<0.001	0.023	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01
MW05	MW05	MW05	13/04/2023	981895	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	<0.001	0.008	<0.02	0.13	0.4	0.1	0.63	<0.02	0.06	0.4	<0.1	0.46	<0.02	0.06	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01

Table D1: Groundwater Analytical Results
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													PAH								
						Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ	Benzo(b+j)fluoranthene	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						0.00001	0.00001	0.00001	0.00001	0.00001	0.0005	0.00001	0.0002	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
ANZG (2018) Marine water 95% toxicant DGVs								0.0004[#19]		0.0002[#19]								0.0014[#19]			0.07[#18]	0.002[#19]		
NEPM 2013 Table 1C GILs, Marine Waters																					0.05[#28]			
PFAS NEMP 2020 Table 1 Health Recreational Water																								
PFAS NEMP 2020 Table 5 Interim marine 95%																								
PFAS NEMP 2020 Table 5 Interim marine 99%																								
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																					NL			
Field_ID	**Location_Code**	**Well**	**Sampled_Date_Time**	**Lab_Report_Number**																				
DBMW01	DBMW01	DBMW01	14/04/2023	981895		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
MW01	MW01	MW01	13/04/2023	981895		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
QAW01	MW01	MW01	14/04/2023	981895		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
QCW01	MW01	MW01	18/04/2023	321252		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	-	<0.0002	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001
MW02	MW02	MW02	13/04/2023	981895		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
MW05	MW05	MW05	13/04/2023	981895		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001

Table D1: Groundwater Analytical Results
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					Chlorinated Alkanes																	Chlorinated Alkenes												Solvents
					1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Acetone
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ANZG (2018) Marine water 95% toxicant DGVs						0.27[#16]	0.4[#16]	1.9[#20]				1.9[#16]	0.9[#16]	1.1[#16]			0.24[#16]				4[#16]		0.7[#16]							0.07[#16]				0.33[#16]	0.1[#16]	
NEPM 2013 Table 1C GILs, Marine Waters								1.9																											
PFAS NEMP 2020 Table 1 Health Recreational Water																																			
PFAS NEMP 2020 Table 5 Interim marine 95%																																			
PFAS NEMP 2020 Table 5 Interim marine 99%																																			
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																																			
Field_ID	**Location_Code**	**Well**	**Sampled_Date_Time**	**Lab_Report_Number**																															
DBMW01	DBMW01	DBMW01	14/04/2023	981895	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
MW01	MW01	MW01	13/04/2023	981895	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
QAW01	MW01	MW01	14/04/2023	981895	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
QCW01	MW01	MW01	18/04/2023	321252	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	-	<0.01	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	-
MW02	MW02	MW02	13/04/2023	981895	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
MW05	MW05	MW05	13/04/2023	981895	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005

Table D1: Groundwater Analytical Results
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																				PFAS
					Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (NMeFOSA)	N-Ethyl perfluorooctane sulfonamide (NEtFOSA)	N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	N-ethyl-perfluorooctanesulfonamidoxetic acid (NEtFOSAA)
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL					0.000005	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
ANZG (2018) Marine water 95% toxicant DGVs																							
NEPM 2013 Table 1C GILs, Marine Waters																							
PFAS NEMP 2020 Table 1 Health Recreational Water									0.01[#30]														
PFAS NEMP 2020 Table 5 Interim marine 95%									0.22														
PFAS NEMP 2020 Table 5 Interim marine 99%									0.019														
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																							
Field_ID	**Location_Code**	**Well**	**Sampled_Date_Time**	**Lab_Report_Number**																			
DBMW01	DBMW01	DBMW01	14/04/2023	981895	0.000014	0.00003	0.000032	0.000009[#1]	0.000008[#1]	0.000003	0.000009	0.000001	<0.000001	<0.000001	<0.000001	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
MW01	MW01	MW01	13/04/2023	981895	<0.000005	0.000006	0.000019	0.000005[#1]	0.000005[#1]	<0.000001	0.000003	<0.000001	<0.000001	<0.000001	<0.000001	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
QAW01	MW01	MW01	14/04/2023	981895	<0.000005	0.000007	0.000021	0.000006[#1]	0.000006[#1]	<0.000001	0.000003	0.000001	<0.000001	<0.000001	<0.000001	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
QCW01	MW01	MW01	18/04/2023	321252	0.000006	0.00001	0.000023	0.000008	0.000017	0.000001	0.000003	<0.000002	<0.000005	<0.00001	<0.00005	<0.00001	<0.00005	<0.0001	<0.00005	<0.0005	<0.000002	<0.000002	
MW02	MW02	MW02	13/04/2023	981895	0.000012	0.000021	0.000073	0.000022[#1]	0.000022[#1]	0.000002	0.000009	0.000003	<0.000001	<0.000001	<0.000001	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
MW05	MW05	MW05	13/04/2023	981895	0.000093	0.00012	0.0001	0.000072[#1]	0.00004[#1]	0.000008	0.000011	<0.000001	<0.000001	<0.000001	<0.000001	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005

Table D1: Groundwater Analytical Results
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	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	Sum of PFHxS and PFOS	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of WA DWER PFAS (n=10)*	Sum of PFAS	Perfluorononanesulfonic acid ion
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	UG/L	mg/L	mg/L
EQL	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000005	0.000001	0.000001	0.000001	0.000001	0.000001	0.005	0.000005	0.000001
ANZG (2018) Marine water 95% toxicant DGVs																	
NEPM 2013 Table 1C GILs, Marine Waters																	
PFAS NEMP 2020 Table 1 Health Recreational Water				0.002[#30]		0.002[#30]						0.002[#30]					
PFAS NEMP 2020 Table 5 Interim marine 95%						0.00013											
PFAS NEMP 2020 Table 5 Interim marine 99%						0.00000023											
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																	
Field_ID **Location_Code** **Well** **Sampled_Date_Time** **Lab_Report_Number**																	
DBMW01 DBMW01 DBMW01 14/04/2023 981895	<0.000001	0.000006	0.000005[#1]	0.00006[#1]	0.000002[#1]	0.000036[#1]	<0.000001	<0.000001	<0.000005	<0.000001	<0.000001	0.000096	0.000104	0.000044	0.195	0.000215	<0.000001
MW01 MW01 MW01 13/04/2023 981895	0.000001	0.000008	0.000009[#1]	0.000095[#1]	0.000003[#1]	0.000047[#1]	<0.000001	<0.000001	<0.000005	<0.000001	<0.000001	0.000142	0.000147	0.000052	0.185	0.000201	<0.000001
QAW01 MW01 MW01 14/04/2023 981895	0.000001	0.000005	0.000006[#1]	0.00009[#1]	0.000002[#1]	0.000051[#1]	<0.000001	<0.000001	<0.000005	<0.000001	<0.000001	0.000141	0.000147	0.000057	0.186	0.000199	<0.000001
QCW01 MW01 MW01 18/04/2023 321252	-	0.000011	0.000012	0.000056	0.000003	0.000053	<0.000002	<0.000001	<0.000001	<0.000002	<0.000002	0.00011	-	0.000069	-	0.00021	-
MW02 MW02 MW02 13/04/2023 981895	0.000005	0.00002	0.000026[#1]	0.00048[#1]	0.000014[#1]	0.00032[#1]	<0.000001	<0.000001	<0.000005	<0.000001	<0.000001	0.0008	0.000822	0.000342	0.97	0.001029	<0.000001
MW05 MW05 MW05 13/04/2023 981895	<0.000001	0.000047	<0.000001	0.00002[#1]	0.000001[#1]	0.000013[#1]	<0.000001	<0.000001	0.000005	<0.000001	<0.000001	0.000033	0.000073	0.000053	0.51	0.00053	<0.000001

Table D1: Groundwater Analytical Results
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	MAH											Miscellaneous Hydrocarbons							Chlorinated Benzenes						Trihalomethanes				Organic Sulfur Compounds	Major Cations		Ionic Balance			Chlorinated Hydrocarbons	Other
	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	Total MAH	Bromobenzene	Isopropylbenzene	1,2-dibromoethane	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	4-Methyl-2-pentanone	Methyl Ethyl Ketone	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Dibromochloromethane	Chloroform	Tribromomethane	Bromodichloromethane	Carbon disulfide	Calcium	Magnesium	Electrical Conductivity (Lab)	Hardness as CaCO3	pH_	Hexachlorobutadiene	TDS
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	pH Units	mg/L	mg/L
EQL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.001	0.001	0.005	0.001	0.001	0.001	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.001	0.001	0.001	0.5	0.5	10	1	0.1	0.001	10
ANZG (2018) Marine water 95% toxicant DGVs											0.03[#16]									0.08[#21]				0.055[#16]		0.77[#22]										
NEPM 2013 Table 1C GILs, Marine Waters																				0.02[#26]																
PFAS NEMP 2020 Table 1 Health Recreational Water																																				
PFAS NEMP 2020 Table 5 Interim marine 95%																																				
PFAS NEMP 2020 Table 5 Interim marine 99%																																				
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																																				
Field_ID	**Location_Code**	**Well**	**Sampled_Date_Time**	**Lab_Report_Number**																																
DBMW01	DBMW01	DBMW01	14/04/2023	981895	<0.001	<0.001	-	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	<0.005	-	<0.001	<0.001	<0.005	<0.005	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	380	1100	40,000	5300	7.5	-	27,000
MW01	MW01	MW01	13/04/2023	981895	<0.001	<0.001	-	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	<0.005	-	<0.001	<0.001	<0.005	<0.005	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	380	1100	45,000	5600	7.7	-	30,000
QAW01	MW01	MW01	14/04/2023	981895	<0.001	<0.001	-	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	<0.005	-	<0.001	<0.001	<0.005	<0.005	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
QCW01	MW01	MW01	18/04/2023	321252	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	-
MW02	MW02	MW02	13/04/2023	981895	<0.001	<0.001	-	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	<0.005	-	<0.001	<0.001	<0.005	<0.005	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	380	1100	43,000	5500	7.8	-	32,000
MW05	MW05	MW05	13/04/2023	981895	<0.001	<0.001	-	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	<0.005	-	<0.001	<0.001	<0.005	<0.005	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	54	18	850	210	6.5	-	600

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		Heavy Metals								TPHs (NEPC 1999)					TRHs (NEPC 2013)						BTEX					
		Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Nickel (Filtered)	Zinc (Filtered)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	C6-C10 Fraction	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	C6 - C10 less BTEX (F1)	>C10 - C16 less Naphthalene (F2)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Total)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.001	0.000	0.001	0.001	0.001	0.00005	0.001	0.001	0.010	0.050	0.100	0.100	0.100	0.010	0.050	0.100	0.100	0.010	0.050	0.001	0.001	0.001	0.002	0.001	0.003
ANZG (2018) Marine water 95% toxicant DGVs			0.0055	0.0044	0.0013	0.0044	0.0004	0.07	0.008												0.7	0.18	0.08	0.075		
NEPM 2013 Table 1C GILs, Marine Waters			0.0007 [#23]	0.0044 [#24]	0.0013 [#25]	0.0044 [#25]	0.0001 [#26]	0.007 [#25]	0.015 [#27]												0.5					
PFAS NEMP 2020 Table 1 Health Recreational Water																										
PFAS NEMP 2020 Table 5 Interim marine 99%																										
NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand, 2m to <4m																										
Sample ID	**Sample Date**																									
E3C (2012)																										
BH03	17/01/2012	<0.001	<0.0001	<0.001	0.046	<0.001	<0.00005	0.002	0.068	<0.01	<0.05	<0.1	<0.1	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.002	<0.001	-
CDM (2012)																										
MW1	11/06/2012	0.001	0.0001	<0.001	0.004	0.006	<0.00005	0.001	0.16	<0.01	<0.05	<0.1	<0.1	<0.2	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.002	<0.001	-
MW2	11/06/2012	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW5	11/06/2012	0.005	<0.0001	<0.001	<0.001	<0.001	<0.00005	<0.001	0.009	0.32	0.81	2.5	<0.1	3.31	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.002	<0.001	-
JBS&G (2015)																										
DBMW01	11/09/2015	<0.005	<0.0003	-	<0.005	<0.005	<0.0001	<0.005	0.026	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.02	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.003

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Polycyclic Aromatic Hydrocarbons																			
Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (WHO)	Benzo(b,j)fluoranthene	Benzo(b,k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Total)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.001	0.001	0.001	0.001	0.0000		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.00001	0.001	0.001	0.001
		0.0004		0.0002								0.0014			0.07			
															0.05			
<0.001	<0.001	<0.001	<0.001	<0.001			<0.002	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.002	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NC
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.002	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NC
<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Chlorinated Alkanes																													
1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	bromodichloromethane	Carbon tetrachloride	Chloroethane	Chloroform	Chloromethane	dibromochloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.001	0.001	0.001	0.001	0.001	0.001		0.001	0.001	0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	0.27	0.4	1.9				1.9	0.9	1.1			0.24						4	
			1.9																
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.001	<0.001	0.005	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001

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Chlorinated Alkenes											
1,1,2,2-tetrachloroethylene	1,1-Dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.001	0.001			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
0.07	0.7									0.33	0.1
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Chlorinated Benzenes				
1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
mg/L	mg/L	mg/L	mg/L	mg/L
		0.001	0.001	0.001
	0.08			
	0.02			
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	<0.001	<0.001	<0.001

Monocyclic Aromatic Hydrocarbons										
1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Bromobenzene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.001	0.001		0.001	0.001				0.001	
				0.03					
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-

Miscellaneous Hydrocarbons									
1,2-dibromoethane	2-Butanone (MEK)	2-Propanone (Acetone)	4-Methyl-2-pentanone (MIBK)	Bromoform	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	Carbon disulfide
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.001	0.001	1.000	0.001	0.001	0.001		0.001	0.001	0.001
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.005	<0.001	<0.001

Field Measurements				
Dissolved oxygen	Redox potential	pH	Conductivity	Temperature ©
ppm	mV		mS/cm	C
-	-	-	-	-
4.54	12.1	-	42.54	20.7
4.30	78	7.35	45237	19.2
-	-	-	-	-
1.69	-62.4	6.42	809	20.5
-	-	-	-	-

Miscellaneous Inorganics
pH
0.1
6.72
-
-
-
-

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Electrical Conductivity
(mS/cm)
0.001
-
-
-
-
-

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