RAMBOLL

ENVIRONMENT
& HEALTH

19 June 2024

Coombes Group Property
Level 5, Grosvenor Street
Bondi Junction, NSW 2022
Attn: Nellie O'Keefe

By email: nellie@coombesgroup.com.au

Dear Nellie,

RE: INTERIM AUDIT ADVICE LETTER NO. 1 - REVIEW OF REMEDIATION ACTION PLAN, 2-4 HALE STREET, BOTANY NSW

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Ref: 318002056

Audit Number: LW-057

1. INTRODUCTION

1.1 Background and Objective

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, I am conducting an Audit (LW-057) under the NSW *Contaminated Land Management Act 1997* (CLM Act) in relation to the proposed redevelopment at 2-4 Hale Street, Botany New South Wales (NSW) (the site) for its intended commercial/industrial land use.

The audit was requested by the Department of Planning, Housing and Infrastructure (DPHI) in the adequacy review of the State Significant Development (SSD) Application (SSD-62855708). The audit is currently non-statutory.

This initial review has been undertaken to provide an independent review of the suitability and appropriateness of a Remediation Action Plan (RAP).

1.2 Scope of IAA1

The scope of IAA1 included review of the following reports:

- 'Detailed Site Investigation Report, 2-4 Hale Street, Botany NSW', 25 March 2024, JBS&G Australia Pty Ltd (JBS&G) (***the DSI***).
- 'Remediation Action Plan, 2-4 Hale Street, Botany NSW', 25 March 2024, JBS&G (***the RAP***).

The Auditor reviewed the key documents against the requirements of guidelines made or approved under Section 105 of the CLM Act, including:

- Chapter 4 Remediation of Land in the Resilience and Hazards State Environment Planning Policy (SEPP) 2021 (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (2008) *'Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land'*.

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- National Environment Protection Council (NEPC) *'National Environment Protection (Assessment of Site Contamination) Measure 1999'*, as Amended 2013 (NEPM, 2013).
- NSW EPA (2017) *'Guidelines for the NSW Site Audit Scheme (3rd Edition)'.*
- NSW EPA (2020) *'Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'.*
- NSW EPA (2022) *'Sampling design part 1 – application'*.
- Australia and New Zealand Heads of EPAs (HEPA, 2020) *'PFAS National Environmental Management Plan, Version 2.0'* (PFAS NEMP).

2. SITE DETAILS

2.1 Location

The site details are as follows:

Street address:	2-4 Hale Street, Botany NSW
Identifier:	Lot 1, Deposited Plan (DP) 562374
Local Government:	Bayside Council (Council)
Site Area:	7,439.3 square metres (m^2)
Zoning:	IN1 General Industrial

The boundaries of the site are defined by fence lines or walls. The site is accessed from Hale Street which forms the southern boundary.

The site location and site boundaries are shown on **Attachment 1** and **Attachment 2**, respectively.

2.2 Adjacent Uses

The site is located within an area of commercial/industrial land uses. The surrounding land uses include:

North: A stormwater canal, beyond which is Mill Stream, M1 Motorway and Sydney Airport.

East: A sewage culvert and commercial/industrial buildings and warehouses beyond.

South: Hale Street with commercial/industrial buildings and warehouses beyond.

West: A sewage culvert, beyond which is a forested parkland, Foreshore Road, Mill Stream and Sydney Airport.

The nearest surface water body to the site is Mill Stream located approximately 30 m to the north and 100 m to the west of the site. Mill Stream flows south and discharges into Botany Bay located approximately 1.2 kilometres (km) from the site.

2.3 Site Condition

JBS&G conducted a site visit in March 2022 during the DSI and noted that:

- Most of the site (approximately 95%) was covered in concrete hardstand. The remaining 5% of the site was unpaved ground or garden beds.
- The site is largely occupied by three large warehouse buildings comprising multiple units with an access way from Hale Street and a carpark area in the central portion. An electrical transformer box was located on the eastern boundary of the site. The unpaved areas were located within the central portion and along the western and eastern boundaries of the site.
- The site was leased by multiple tenants including Frontline Fabrications, Ripe Providores, Powder Coaters and onsite activities included mechanic workshop, meat storage, smash repairs, timber workshop and goods storage.

- Two underground storage tanks (USTs) were identified at the site, one on the eastern boundary and one in the central portion through identification of fill points. JBS&G report in the DSI that during underground service location, a ground penetrating radar (GPR) was used to confirm the area and size of the USTs. Both USTs were estimated to be 10,000 litre tanks. It was unclear if the USTs had previously been decommissioned. A former bowser base and vent were observed adjacent to the UST in the central portion of the site.
- Multiple intermediate bulk containers (IBCs) and storage drums were located in the northern portion of the site. Dangerous goods including gas bottles, paints, lubricants, lacquers and oils were noted to be stored in various locations at the site.
- Fragments of bonded asbestos were observed on the ground surface in unpaved areas along the western boundary and as cement sheeting in the north-eastern portion of the site.

Key site features identified by JBS&G are shown on **Attachment 2**.

The Auditor has not completed a site inspection but has reviewed NearMap high-resolution aerial imagery from April 2024 and site photographs included in the DSI report to confirm the site layout.

2.4 Proposed Development

The site is proposed to be demolished and redeveloped as a construction and demolition waste management facility.

For the purposes of this audit, the 'commercial/industrial' land use exposure scenario has been assumed.

3. SITE HISTORY

The DSI provided a summary of the site history based on aerial photographs (1943 to 2021), certificates of title (CT), NSW EPA records and planning certificates sourced from Council.

The Auditor provides the following summary relating to the site history:

- The site has been used for commercial/industrial purposes since at least 1955.
- From 1952 to 1972, the site, except for the northern end of the site, was owned by Geigy Australasia (Pty) Ltd which manufactured moth proof woollen textile. The northern end of the site was formerly part of Bay Street and was acquired by Geigy Australasia (Pty) Ltd in 1961.
- The site ownership was transferred to 195 Crown Street Pty Ltd between 1972 and 1988, and then to private owners (Peter Szorenyi and Eva Szorenyi).
- There have been no significant changes to the site layout since the 1980s.
- Council's Section 10.7 Planning Certificate indicated that the site was not significantly contaminated, was not subject to a management order, a voluntary management proposal or an ongoing maintenance order and was not the subject of a site audit statement (SAS).
- The site and immediate surrounds were not subject to contaminated land record of notices, was not notified to the EPA as a contaminated site and was not subject to licensing agreements/notices/programs under *the Protection of the Environment Operations Act 1997* (POEO Act).
- The site was not listed on the NSW Government per- and polyfluoroalkyl substances (PFAS) investigation program. Botany Industrial Park located 1.8 km to the southeast and Alexandria Fire and Rescue located 4.6 km to the north were on the list.

3.1 Auditor's Opinion

In the Auditor's opinion, the site history provides an adequate indication of past activities. Previous site uses with the most significant potential to cause contamination include historical uncontrolled filling,

hazardous building materials (HBM) from the former and existing building structures and poor demolition practices, and historical industrial/commercial activities onsite (including smash repairs, mechanic workshop and fuel storages) and in immediate surrounds.

The Auditor notes that the Sydney Airport located approximately 200 m to the north and west is also listed on the NSW Government PFAS investigation program (under 'Botany Bay area').

In summary, the Auditor is of the opinion that the site history is adequately understood for identification of potential contaminants of concern (**Section 4**).

4. CONTAMINANTS OF CONCERN

JBS&G provided a list of areas of environmental concern (AECs) and associated contaminants of concern. These have been reproduced in **Figure 4.1**.

Figure 4.1: AECs and Associated Contaminants of Concern (Source: the DSI)

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Fill materials of unknown origin	Common COPCs such as heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), and asbestos.
On site storage of motor oils, fuels, car fluids, paints, and lacquers	Heavy metals, volatile organic compounds (VOCs), PAHs, and TRHs.
Former building structures	Asbestos, lead and PCBs.
Historical and current commercial / industrial activities (stored chemicals)	Heavy metals, per- and polyfluoroalkyl substances (PFAS)TRH, BTEX, PAHs, PCBs, phenols, OCPs and VOCs.
Offsite sources (e.g. current and former industry surrounding the site)	VOC, TRH, heavy metals, PFAS, BTEX, PAHs, PCBs and phenols.
Underlying natural soil	Potential acid sulfate soils (ASS).

JBS&G also noted that Quality Building Management Pty Ltd (QBM) prepared an Asbestos Materials Report and Register for the site in 2017, which recorded asbestos within the warehouse building materials across the site.

4.1 Auditor's Opinion

The Auditor considers that the AECs and analyte list identified in the DSI adequately reflects the site history and condition.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1 Stratigraphy

JBS&G reviewed the ESPADE 2.1 tool, which provides access to soil profile and soil map information published by the NSW Department of Planning, Industry and Environment. JBS&G reported that the site exists on disturbed terrain of the previous swamps, wetlands and estuaries of Port Jackson and local geology consists of artificial fill, including dredged estuarine sand and mud, demolition rubble, industrial waste and household waste.

JBS&G reviewed the 1:25,000 Botany Bay Acid Sulfate Soil (ASS) Risk Map and ESPADE Spatial Viewer ASS risk mapping, which indicates possibility for ASS to be present beneath the site.

During the DSI, JBS&G completed 11 soil bores (MW01 to MW03 and SB01 to SB08) in accessible locations (i.e., outside the warehouse building footprints). A review of the relevant borehole logs indicated the subsurface profile typically consisted of fill to depths of between 0.2 and 1 m below ground level (mbgl), followed by natural sands and/or clayey sands to 6 mbgl (maximum depth of investigation). Thicker fill was noted in MW03 (3 m), SB06 (>1.3 m) and SB07 (1.9 m), noting that SB06 was terminated at 1.3 mbgl in fill soils due to refusal on large rock inclusions.

The DSI investigation locations are shown on **Attachment 3**.

5.2 Hydrogeology

JBS&G installed three groundwater monitoring wells (MW01, MW02 and MW03) and undertook one groundwater monitoring event (GME) in the DSI. The groundwater monitoring locations are shown on **Attachment 3**.

The site-specific hydrogeology is summarised in **Table 5.1**.

Table 5.1: Site-Specific Hydrogeology

Aspect	Details
Aquifers Identified	Water bearing units were encountered between 2 and 4 mbgl in natural sands (MW01 and MW02) or in the lower fill and upper natural sands layers (MW03).
Depth to Water	1 to 1.2 m below top of casing (mBTOC).
Interpreted Flow Direction	The groundwater monitoring wells were not surveyed. However, based on the location of the nearest surface water receptor (**Section 2.2**), the site groundwater was anticipated to flow to the north/northwest towards Mill Stream.
Groundwater Quality	Groundwater physiochemical parameters measured during the GME are as follows: • Electrical conductivities (EC) ranged from 268 to 873 microsiemens per centimetre (µS/cm). • pH values between 6.4 and 6.5. • Dissolved oxygen (DO) from 0.01 to 0.1 milligrams per litre (mg/L). • Field redox between -205 and 255 millivolts. The field parameters indicated that the groundwater in the groundwater monitoring wells was fresh with slightly acidic and reducing conditions.

JBS&G also noted that the site is located within "*Prohibition Area 2 of the Botany Sands Groundwater Aquifer, where abstraction of groundwater for the purposes of domestic, recreation or irrigation uses is banned*".

5.3 Auditor's Opinion

The Auditor considers the subsurface profile outside the warehouse building footprints has been adequately characterised.

Additional investigation points, however, are required to better characterise the soil and groundwater conditions under the existing buildings. This has been identified as a data gap in the RAP (**Section 12**) to be addressed following demolition of site buildings.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the DSI. The scope of works completed in the DSI are summarised in **Table 6.1**. The DSI sampling locations are shown on **Attachment 3**.

Table 6.1: Summary of DSI

Investigations	Field Investigations	Analytical Data Obtained
The DSI (JBS&G, 2024)	Soil: 11 soil bores (MW01 to MW03, and SB01 to SB08). Groundwater: 3 groundwater samples (MW01 to MW03).	Soil: Metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), VOCs, PFAS, suspension peroxide

	Soil vapour: 11 sub-slab vapour monitoring points (SV01 to SV11).	oxidation combined acidity sulfur (SPOCAS) and asbestos (10 L and 500 mL). Groundwater: Metals (dissolved), TRH, BTEX, PAH (trace level), VOCs and PFAS. Soil Vapour: VOCs including chlorinated hydrocarbons, TRH (F1 and F2) and BTEXN.

The Auditor's assessment of data quality follows in **Table 6.2** and **Table 6.3**.

Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Data Quality Objectives (DQO) JBS&G defined specific DQOs in the DSI in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013). The following decisions were identified in the DQOs: • Are there any unacceptable risks to likely future onsite receptors from soils? • Are there any issues relating to local area background soil concentrations that exceed the appropriate soil criteria? • Are there any unacceptable human health and ecological risks present in groundwater underlying the site? • Are there any potential vapours present within the sub-surface that could present an unacceptable risk to future site receptors? • Are there any impacts of chemical mixtures? • Are there any aesthetic issues at the site? • Is there any evidence of, or potential for, migration of contaminants from the site? • Is a site management strategy required?	Appropriate.
Sampling pattern, locations and density *Soil:* Investigation consisted of 11 sampling points over accessible outdoor areas of the site. The sampling density (11 locations over approximately 0.75 ha) was lower than the minimum number of samples for systematic sampling recommended in the EPA (2022) *Sampling design part 1 – application* (17 sample locations for a site with a size of 0.7 ha and 19 samples for a site with a size of 0.8 ha). *Groundwater*: Three locations including assumed down gradient of USTs, chemical storage area and warehouse buildings (MW01 and MW02), and the down gradient boundary of the site (MW03). *Soil Vapour*: 11 monitoring points within the existing warehouse buildings where soil sampling could not be performed.	Adequate given access constraints due to site infrastructure and use. Groundwater wells were position to target the two USTs and down gradient groundwater conditions which is appropriate. The Auditor notes that soil and groundwater conditions under the existing buildings were not investigated due to accessibility. This has been identified as a data gap in the RAP.
Well construction *Groundwater:* The monitoring wells were installed to depths of 4 or 6 mbgl, with screen intervals of 3 m placed in gravel. Wells were constructed of 50 mm uPVC. Bentonite seals of 0.5 m thickness were placed above the screens and the wells were backfilled with soil cuttings to the ground surface. *Sub-slab vapour monitoring points*: The vapour monitoring points were installed in areas with hardstand by drilling a 16 millimetres (mm) diameter hole through the concrete slab and inserting the VapourPin metallic probes with silicone sleeves (to ensure air-tight seal) into the drilled holes to the depth of the encountered slab thickness.	Appropriate.
Sample depths and collection method *Soil*: Soil samples were collected from directly underneath the hardstand and then generally at 0.5-1 m intervals to a maximum depth of 6 m (for groundwater monitoring wells) or at least 0.3 m into natural soils or prior to refusal. Soil samples were collected via hand auger and directly from hollow flight augers. 14 fill and 8 natural soil samples were selected for laboratory tests with the deepest sample analysed being from 5.0 mbgl at MW01.	Soil sample collection from the auger flights is not ideal as it can result in loss of volatiles and sample cross contamination. Soil sampling was completed through borehole sampling due to access constraints which does not allow for good visual assessment of the subsurface profile, hence there is the

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
At selected locations, 10 litres (L) soil samples were prepared and field screened for asbestos in accordance with NEPM (2013) (Schedule B1). The samples were collected over the depth of fill. *Groundwater*: The groundwater monitoring wells were purged and sampled using a low-flow methodology (peristaltic pump) with high density polyethylene (HDPE) tubing. Purging was undertaken to ensure the samples collected were representative of groundwater conditions. Field filtering using a 0.45 micrometres (µm) filter was undertaken for metals/metalloid samples. *Soil vapour:* The samples were collected as follows: • A GFM 435 gas detector was used to purge each monitoring point for a period of approximately 30 seconds. Gas readings were monitored until oxygen and photo-ionisation detector (PID) readings became stable. • Following that, a leak detection evaluation was completed via placement of an isopropyl alcohol soaked rag within an air tight box containing the sample train located on top of the probe. Elevated PID readings (in excess of previously established and stabile PID recordings) on the gas detector was assumed to indicate a leaking probe. Any leaking monitoring points were required to be re-installed and re-checked prior to sampling using the same method. • Following preliminary confirmation of the absence of significant leaks, the sub-slab vapour samples were collected onto SKC-anasorb carbon tubes. An isopropyl alcohol saturated rag was maintained in an air-tight box (sealed container containing sample train) throughout purging and sampling for laboratory confirmation of potential leaks. At all sample locations, a 6 L volume was collected using a calibrated pump at a flow rate of 200 mL/min (30 min sample time) onto a carbon tube.	potential for a greater quanitity of asbestos and other anthropogenic inclusions to be present in fill than suggested by the investigation results. The volumes of two 500 mL asbestos samples AQ01/0.2-0.6 mbgl (485 g) and AQ03/0-0.2 mbgl (490 g) were lower than the quantity recommended in the NEPM Schedule B1. As the outlier was marginal, this is not considered to be a significant data gap. The Sample Receipt Advice (SRA) prepared by Eurofins indicated that appropriate preserved containers were not used for samples included in batch 872222. Whilst not clarified in the laboratory report or discussed in the DSI, the Auditor considers the non-compliance is most likely to be related to the field blank and/or rinstate blank prepared for this sample batch, which will not alter the outcome of the current audit. Overall, the sample collection method was found to be acceptable.
Decontamination procedures Soil: Non-disposable sampling equipment, including augers, was cleaned with a water/ detergent spray, followed by rinsing with potable water. The equipment was then inspected to ensure that no soil, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works. Sampling equipment was subsequently decontaminated using the above process between each location. *Groundwater*: Before and between sampling each well, the interface probe and other non-disposable equipment was decontaminated in line with project/PFAS specific wash-down procedures. The wash-down involved the use of PFAS free products such as Liquinox.	Adequate.
Sample handling and containers *Soil*: Samples were immediately transferred to laboratory supplied sample jars (additional 500 mL plastic bags were used where asbestos analysis was required). The sample jars/bags were then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. *Groundwater*: Collected groundwater samples were immediately transferred to laboratory supplied sample bottles in the order of most-volatile to least volatile contaminants. The sample containers were then transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. Samples for metals analysis were filtered in the field. *Sub-slab vapour:* Following sample collection, the carbon tubes were removed and capped and stored in a cool dry and dark container.	Appropriate.
Chain of Custody (COC) Completed COC forms were provided in the DSI.	Appropriate.
Detailed description of field screening protocols *Soil:* Field screening for volatiles was undertaken using a PID. *Groundwater:* Field parameters were measured during well sampling.	Appropriate.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Soil vapour: A PID and GFM 435 gas detector were used during vapour sampling. The GFM 435 was used to assess concentrations of methane, oxygen, carbon dioxide and low explosive limit (LEL).	
Calibration of field equipment Calibration records were not provided in the DSI.	The omission of provision of calibration records is not considered to be material and will not alter the outcome of this audit.
Sampling logs Borehole logs were provided within the DSI, indicating PID readings and lithology. Groundwater field sampling records were provided, indicating standing water levels (SWLs), field parameters, methodology and observations. Soil vapour field sampling records were provided, including purge time and methane, oxygen, carbon dioxide, LEL and PID readings.	Acceptable.

Table 6.3: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Auditor's Opinion
Field quality control samples Field quality control samples included: • Soils: Two field duplicates, two field triplicates, one rinsate blank, one field blank, one trip blank and one trip spike. • Groundwater: One field duplicate, one field triplicate, one rinsate blank, one field blank, one trip blank and one trip spike. • Sub-slab soil vapour: One duplicate and one field blank sample. Leak testing using isopropanol.	Acceptable.
Field quality control results The results of field quality control samples were within appropriate limits, except for minor elevated relative percentage difference (RPD) results between the primary and intra-/inter- laboratory duplicates for some metals. Isopropanol was not detected above the PQL in any vapour sampling indicating that the soil vapour sample chain was not influenced by leaks.	In the context of the dataset reported, the limited RPD outliers are not considered significant. Concentrations were below the adopted assessment criteria. The field quality control results are acceptable for the purposes of remediation planning.
NATA registered laboratory and NATA endorsed methods Laboratories used were Eurofins (primary laboratory) and Envirolab (secondary laboratory). Laboratory certificates were NATA stamped.	Acceptable.
Analytical methods Analytical methods were included in the laboratory test certificates. The engaged laboratories provided brief method summaries of in-house NATA accredited methods used. Asbestos identification was conducted by Eurofins using polarised light microscopy with dispersion staining by method AS4964-2004 *Method for the Qualitative Identification of Asbestos Bulk Samples*.	Acceptable.
Holding times Review of laboratory certificates indicated that the samples were analysed within the recommended holding time.	Acceptable.
Practical Quantitation Limits (PQLs) PQLs in isolated soil samples were raised for some OCPs and/or PCBs due to matrix interference. The calculated PQL for trichloroethene (TCE) for soil vapour samples was 0.0833 milligrams per cubic metre	Acceptable. As the calculated PQL for TCE was only marginally greater than the corresponding threshold criterion, this is not considered to be a significant data gap and will not alter the proposed remedial strategy.

Field and Lab QA/QC	Auditor's Opinion
(mg/m^3), slightly higher than the corresponding threshold criterion of 0.08 mg/m^3.	
Laboratory quality control samples Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks and duplicates were undertaken by the laboratory.	Acceptable.
Laboratory quality control results The results of laboratory quality control samples were within appropriate limits.	Acceptable.
Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy) Predetermined data quality indicators (DQIs) were set for laboratory analyses including blanks, replicates, duplicates, laboratory control samples, matrix spikes, surrogate spikes and internal standards. These were discussed with regard to the five category areas. JBS&G concluded in the DSI that "*On the basis of the results of the field and laboratory QA/QC program, the soil, groundwater and vapour data are of an acceptable quality in order to achieve the objectives of the assessment*."	An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.

6.1 Auditor's Opinion

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

- The data is likely to be largely representative of the overall conditions in areas assessed. However, the Auditor notes that soil sample collection from the auger flights is not ideal as it may have resulted in loss of volatiles and sample cross contamination. The Auditor also notes that the potential for asbestos to be present in fill may have been underestimated due to the adopted sampling methodology (boreholes). These warrant consideration when planning for future investigation/remediation works.
- The data is not complete as soil and groundwater sampling beneath the existing building footprints has not been feasible due to accessibility. This data gap is recognised in the RAP.
- There is a high degree of confidence that data is comparable for each sampling and analytical event.
- The testing laboratory provided sufficient information to conclude that data is of sufficient precision.
- The data is likely to be accurate. The Auditor notes that sample analysis receipt relating to Eurofins sample batch 872222 indicated that appropriate preserved containers were not used for samples included in this sample batch. Whilst not clarified in the laboratory report or discussed in the DSI, the Auditor considers the non-compliance is most likely to be related to the field QA/QC samples (field blank and/or rinstate blank), which will not alter the outcome of the current audit.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the analytical results against Tier 1 criteria from NEPM (2013). Other guidance has been adopted where NEPM (2013) is not applicable or criteria are not provided. Based on the proposed development, the human health and ecological criteria appropriate for 'commercial/industrial' land use exposure scenario were adopted.

7.1 Soil Assessment Criteria

Human Health Assessment Criteria

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

- NEPM (2013) Health Investigation Levels (HILs) for 'Commercial/Industrial' (HIL D) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'Commercial/Industrial' (HSL D) land use and assuming sand soil type. Depth to source adopted was <1 m as an initial screen.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Commercial/Industrial' land use and assuming coarse soil texture. Criteria are relevant when decommissioning industrial and commercial sites.
- NEPM (2013) HSLs for Asbestos Contamination in Soil for 'Commercial/Industrial' (HSL D) land use.
- PFAS NEMP (2020) HILs for 'Commercial/Industrial' (HIL D) land use for perfluorooctanesulfonic acid/perfluorohexanesulfonic acid (PFOS/PFHxS) and perfluorooctanoic Acid (PFOA).

Ecological Assessment Criteria

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

- NEPM (2013) Ecological Screening Levels (ESLs) for 'Commercial/Industrial' land use, assuming coarse soil.
- NEPM (2013) Ecological Investigation Levels (EILs) for 'Commercial/Industrial' land use. In the absence of site-specific soil data on pH, clay content and background concentrations in fill, the EILs were calculated using the most conservative soil-specific added contaminant limits (ACL) for aged contaminants and added background concentration (ABC) referenced from Olszowy et al (1995) (background concentration for high traffic, old suburbs in NSW).
- Canadian Council of Ministers of the Environment (CCME) (2010) Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs) soil quality guideline (SQG) for benzo(a)pyrene for 'Commercial/Industrial' land use. The SQG has been adopted in place of the NEPM (2013) ESL as it is based on a larger and more up-to-date toxicity database than the low reliability NEPM (2013) ESL.
- PFAS NEMP (2020) for ecological indirect and direct exposures for PFOS/PFHxS and PFOA.

Soil Aesthetic Considerations

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

7.2 Groundwater Assessment Criteria

Human Health Assessment Criteria

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

- NEPM (2013) HSLs for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a sand soil type and a depth to groundwater of 2 to <4 m.
- National Health and Medical Research Council (NHMRC) (2011) *National Water Quality Management Strategy, Australian Drinking-Water Guidelines* (ADWG), Version 3.5 Updated August 2018 for initial screening of risk from direct contact by site users and where groundwater is at depths <2 mbgl and HSLs do not apply. The Auditor notes that the SWLs in the existing groundwater monitoring wells were shallower than 2 mbgl. It is also noted that abstraction of groundwater is not permitted within

Area 2 of the Botany Sands Groundwater Aquifer for the purposes of domestic, recreation or irrigation uses. Industrial use requires testing and approval.

- NHMRC (2008) *Guidelines for Managing Risks in Recreational Water* (GMRRW). The GMRRW indicates that a qualitative assessment of recreational use can be undertaken using 10 times the concentrations of chemicals stipulated in the ADWG. This is based on an assumed contribution for swimming equivalent to 10% of drinking water consumption. This adjustment only accounts for a reduced intake of groundwater, and therefore can only be applied to criteria derived based on health considerations and cannot be applied to criteria derived for aesthetic reasons (e.g. copper). The adjustment should also not be applied to volatile compounds (e.g. benzene) where inhalation is the primary pathway of concern. Where a 'health-based' and an 'aesthetic-based' criteria is provided, the 'health-based' criteria was adopted.
- PFAS NEMP (2020) criteria for drinking water and for recreational water for PFOS/PFHxS and PFOA as an initial screening assessment.

Ecological Assessment Criteria

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

- Australian & New Zealand Guidelines (ANZG) (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (www.waterquality.gov.au/anz-guidelines). Groundwater investigation levels (GILs) for marine water and 95% level of species protection were adopted.
- PFAS NEMP (2020) for PFOS/PFHxS and PFOA 'interim marine' criteria developed for the protection of 95% species protection for slightly to moderately disturbed systems. The Auditor notes that the nearest surface water receptor (Mill Stream) is a highly disturbed system and hence is not of high ecological conservation value. Therefore, adoption of the HEPA (2020) criteria for 95% species protection to assess the PFAS concentrations in groundwater is likely to be sufficiently conservative.

7.3 Soil Vapour Assessment Criteria

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

- NEPM (2013) HSLs for 'Commercial/Industrial' land use (HSL D) were adopted assuming a sand soil type.
- NEPM (2013) interim soil vapour HILs for volatile organic chlorinated compounds. Interim HILs for 'Commercial/Industrial' land use (HIL D) were adopted.

7.4 Auditor's Opinion

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

- JBS&G adopted the low reliability NEPM (2013) ESL value when assessing the BaP concentrations in soils.
- Drinking water related criteria including ADWG were not considered by JBS&G as the site is situated within the Botany Sands Aquifer Prohibition Area. The Auditor has considered the ADWG for initial assessment of direct contact and vapour inhalation risks by site users as the SWLs measured in the existing groundwater monitoring wells were less than 2 mbgl and therefore HSLs are not applicable.

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

The Auditor notes that JBS&G adopted the ASS action criteria published in the NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC) 1998 *Acid Sulfate Soil Manual* to assess the SPOCAS analytical data. This is considered appropriate.

8. EVALUATION OF SOIL RESULTS

8.1 Field Results

Fill was detected at all locations to depths of up to 3 mbgl. Fill comprised clayey, gravelly sand and sandy clay with anthropogenic inclusions including brick and/or roadbase gravels, sandstone fragments and slag. Plastic sheets and paint fragments were observed at locations SB01 at 0.6 to 1.0 mbgl.

Fragments of asbestos containing materials (ACMs) were observed in fill at locations MW01 and MW02. These foreign inclusions were within the top metre of the fill layers. The DSI also noted that fragments of ACM were observed on unsealed ground surfaces along the western boundary and central portion garden bed (**Attachment 4**).

Elevated PID readings from field screening of soil samples were detected in MW01 (23.9 to 86.4 parts per million (ppm), between 3 and 6 mbgl) and MW03 (22.6 to 27 ppm, between 2 and 4 mbgl). PID readings in the remaining locations were typically lower than 10 ppm.

No olfactory or visual indicators of contamination were observed in any of the investigation locations, including MW01 and MW03 where the elevated PID readings were reported.

Slight to moderate sulfur odours were observed between 3 and 4 mbgl within MW03, indicating the potential for ASS to be present within the formation.

8.2 Analytical Results

The soil analytical results have been assessed against the environmental quality criteria and summarised in **Table 8.1**. Sampling locations are presented in **Attachment 3**.

Table 8.1: Evaluation of Soil Analytical Results – Summary Table (mg/kg)

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
AF/FA (500 mL samples)	9	0	Not detected	0 above HSL 0.001%	-
ACM (10 L samples)	14	2	0.037% (w/w)	0 above HSL 0.05%	-
BTEX	20	0	<PQLs	0 above HSLs D (commercial/industrial)	0 above ESLs (commercial/industrial)
F1 (TRH C_6–C_{10} minus BTEX)	20	0	<PQL	0 above HSL D 0-1 m, sand 260 mg/kg	0 above ESL (commercial/industrial) (coarse) 215 mg/kg
F2 (TRH >C_{10}–C_{16} minus naphthalene)	20	1	140	0 above HSL D 0-1 m, sand NL	-
TRH C_6–C_{10}	20	0	<PQL	0 above ML (commercial/ industrial) (coarse) 700 mg/kg	-
TRH >C_{10}–C_{16}	20	1	140	0 above ML (commercial/ industrial) (coarse) 1000 mg/kg	0 above ESL (commercial/industrial) (coarse) 170 mg/kg
TRH >C_{16}-C_{34}	20	5	170	0 above ML (commercial/industrial) (coarse) 3500 mg/kg	0 above ESL (commercial/industrial) (coarse) 1700 mg/kg
TRH >C_{34}-C_{40}	20	0	<PQL	0 above ML (commercial/industrial) (coarse) 10,000 mg/kg	0 above ESL (commercial/industrial) (coarse) 3300 mg/kg

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Naphthalene	20	0	<PQL	0 above HSL D 0-1 m, sand NL	0 above EIL (commercial/industrial) 370 mg/kg
Benzo(a)pyrene	20	2	2.3	-	0 above CCME SQG (commercial/industrial) 72 mg/kg
Benzo(a)pyrene TEQ	20	2	3.3	0 above HIL D 40 mg/kg	-
Total PAHs	20	6	22.4	0 above HIL D 4000 mg/kg	-
Arsenic	16	14	12	0 above HIL D 3000 mg/kg	0 above EIL (commercial/industrial) of 160 mg/kg
Cadmium	16	5	2.6	0 above HIL D 900 mg/kg	-
Chromium	16	16	110	0 above HIL D 3600 mg/kg	0 above most conservative ACL (commercial/industrial) 310 mg/kg
Copper	16	15	**5,700**	0 above HIL D 240,000 mg/kg	**2 above most conservative ACL (commercial/industrial) 85 mg/kg**
Lead	16	16	560	0 above HIL D 1500 mg/kg	0 above generic ACL (commercial/industrial) 1800 mg/kg
Mercury	16	16	24	0 above HIL D 730 mg/kg	-
Nickel	16	12	**83**	0 above HIL D 6000 mg/kg	**3 above most conservative ACL (commercial/industrial) 55 mg/kg**
Zinc	16	16	**1,100**	0 above HIL D 400,000 mg/kg	**11 above most conservative ACL (commercial/industrial) 110 mg/kg**
PCB	11	0	<PQL	0 above HIL D 7 mg/kg	-
OCP (DDD+DDT+DDE)	11	3	3.36	0 above HIL D 3600 mg/kg	0 above ESL (commercial/industrial) (coarse) 640 mg/kg
OCP (Aldrin & Dieldrin)	11	5	2.4	0 above HIL D 45 mg/kg	-
VOCs	11	0	<PQLs	-	-
PFOA	6	0	<PQL	0 above HIL D 50 mg/kg	0 above ESL (commercial/industrial) 10 mg/kg (directly exposure)
PFOS and PFHxS	6	1	0.0053	0 above HIL D 20 mg/kg	0 above ESL (commercial/industrial) 0.01 mg/kg (indirect exposure) 1 mg/kg (directly exposure)

n number of samples
- No criteria available/used
NL Non-limiting

<PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- Bonded ACM was observed in two 10 L bulk samples MW01_AQ/0-1.0 mbgl and MW02_AQ/0-1.0 mbgl. The calculated asbestos in soil concentrations were below the adopted HSL-D of 0.05% w/w.
- Metals were detected in the soil samples analysed and the reported copper, nickel and zinc concentration in some samples exceeded the most conservative EILs adopted by the Auditor.
- Concentrations of TRH, BTEX, PAHs, OCPs, PCBs and PFAS were below the laboratory detection limits and/or below the adopted assessment criteria.
- Whilst not listed in **Table 8.1**, four natural soil samples were analysed for SPOCAS. The associated analytical results indicated presence of ASS and/or potential ASS (PASS) in one sample.

8.3 Auditor's Opinion

In the Auditor's opinion, the soil analytical results are consistent with field observations and do not suggest widespread chemical contamination in fill and natural soils in the areas assessed.

Metal concentrations in some soil samples are above the most conservative screening criteria for protection of terrestrial ecology. Based on the proposed future commercial/industrial land use exposure scenario, the potential ecological risk associated with these exceedances is considered to be low.

Bonded ACM was observed on the site surfaces and detected in fill. As the sample locations were completed using boreholes, which limits the opportunity for visual assessment of the subsurface, there is the potential for fill soils to contain a greater proportion of anthropogenic inclusions including asbestos.

The Auditor is satisfied that soils in accessible areas of the site have been adequately characterised. However, the potential for wider presence of asbestos in soils and for localised sources of soil and groundwater contamination to be present under the existing warehouse buildings requires further assessment in future investigation/remediation works. These data gaps are considered in the RAP discussed in **Section 12**.

9. EVALUATION OF SUB-SLAB SOIL VAPOUR RESULTS

JBS&G installed and sampled 11 sub-slab vapour pins (SV1–SV11) as part of the DSI. The vapour samples were collected onto carbon tubes after leak testing and purging. The sub-slab soil vapour analytical results have been assessed against the environmental quality criteria and are summarised in **Table 9.1**.

Table 9.1: Maximum Sub-Slab Soil Vapour Results

Chemical of Concern in Soil Vapour	Soil Vapour Screening Criteria ($\mu g/m^3$)	Maximum Soil Vapour Concentration (Location) ($\mu g/m^3$)	Screening Criteria Reference
Benzene	4,000	<PQL	NEPM (2013) HSL D
Toluene	4,800,000	267 (SV08)	NEPM (2013) HSL D
Ethylbenzene	1,300,000	283 (SV05)	NEPM (2013) HSL D
Xylene	840,000	317 (SV08)	NEPM (2013) HSL D
Naphthalene	3,000	<PQL	NEPM (2013) HSL D
F1 (TRH C_6-C_{10} - BTEX)	680,000	4830 (SV08 and SV11)	NEPM (2013) HSL D
F2 (TRH >C_{10}-C_{14} – Naphthalene)	500,000	<PQL	NEPM (2013) HSL D

Chemical of Concern in Soil Vapour	Soil Vapour Screening Criteria (µg/m³)	Maximum Soil Vapour Concentration (Location) (µg/m³)	Screening Criteria Reference
Tetrachloroethene (PCE)	8,000	<PQL	NEPM (2013) Interim Soil Vapour HIL D for volatile organic chlorinated compounds
Trichloroethene (TCE)	**80**	**750 (SV10)**	NEPM (2013) Interim Soil Vapour HIL D for volatile organic chlorinated compounds
Cis-1,2-Dichloroethene	300	<PQL	NEPM (2013) Interim Soil Vapour HIL D for volatile organic chlorinated compounds
1,1,1-Trichloroethane	230,000	<PQL	NEPM (2013) Interim Soil Vapour HIL D for volatile organic chlorinated compounds
Vinyl Chloride	100	<PQL	NEPM (2013) Interim Soil Vapour HIL D for volatile organic chlorinated compounds

µg/m³ micrograms per cubic metre

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

- Soil vapour concentrations are lower than the adopted environmental quality criteria, except for the TCE concentration in SV10. SV10 is located in the existing building on the northern end of the site. Concentrations of other chlorinated hydrocarbons, including degradation products from TCE (DCE and vinyl chloride) were not detected in this vapour sample above the PQL.
- In addition to those listed in in **Table 9.1**, 1,2,4-trimethylbenzene was detected in SV04 and SV10 albeit at low concentrations.
- As noted in **Table 6.3**, the calculated PQL for TCE (83.3 µg/m³) was marginally greater than the corresponding threshold criterion. In the Auditor's opinion, this is not considered to be a significant data gap and will not alter the outcome of the audit.

9.1 Auditor's Opinion

Based on the data summarised in **Table 9.1**, widespread contamination by volatile contaminants does not appear to be present at the site. However, the source and extent of the TCE concentration detected in the sub slab vapour sample from SV10, and the associated risk, warrant further assessment. This data gap is considered in the RAP discussed in **Section 12**.

10. EVALUATION OF GROUNDWATER RESULTS

10.1 Field Results

Three groundwater monitoring wells (MW01, MW02 and MW03) were installed and subsequently sampled in the DSI. SWLs and field observation made during the DSI are showing in **Table 10.1**, extracted from the DSI.

Table 10.1: Monitoring Well Gauging Results (Source: DSI)

Well Reference	Odour	Sheen	Turbidity	Non-aqueous phase liquid (NAPL)	Standing Water Level (m bTOC)	Total Depth (m bTOC)
MW01	Moderate sulfur	None	Low	None detected	1.20	6.00
MW02	None	None	Low	None detected	0.97	6.00
MW03	Slight sulfur	None	Very Low	None detected	1.05	4.00

10.2 Analytical Results

Groundwater analytical results are summarised in **Table 10.2**.

Table 10.2: Evaluation of Groundwater Analytical Results

Analyte	n	Detections	Maximum (µg/L)	n > Human Health	n > GIL Marine ANZG (2018)
TRH C_6-C_{10} less BTEX (F1)	3	0	<PQL	0 above HSL D, sand 2-<4 m (6,000 µg/L)	-
TRH >C_{10}-C_{16} less naphthalene (F2)	3	0	<PQL	0 above HSL D sand 2-<4 m (NL)	-
TRH C_6-C_{10}	3	0	<PQL	-	-
TRH >C_{10}-C_{16}	3	0	<PQL	-	-
TRH >C_{16}-C_{34}	3	0	<PQL	-	-
TRH >C_{34}-C_{40}	3	0	<PQL	-	-
Benzene	3	0	<PQL	0 above ADWG (2011) 1 µg/L	0 above GIL 500 µg/L
Toluene	3	0	<PQL	0 above ADWG (2011) 800 µg/L	-
Ethylbenzene	3	0	<PQL	0 above ADWG (2011) 300 µg/L	-
Xylenes	3	0	<PQL	0 above ADWG (2011) 600 µg/L	-
Naphthalene	3	0	<PQL	-	0 above GIL 50 µg/L
Benzo(a)pyrene	3	0	<PQL	0 above ADWG (2011) 0.01 µg/L	-
Arsenic	3	3	7	0 above ADWG (2011) 10 µg/L	-
Cadmium	3	0	<PQL	0 above ADWG (2011) 2 µg/L	0 above GIL 0.7 µg/L
Chromium	3	1	2	0 above ADWG (2011) 50 µg/L	0 above GIL 4.4 µg/L
Copper	3	0	<PQL	0 above ADWG (2011) 2,000 µg/L	0 above GIL 1.3 µg/L
Lead	3	0	<PQL	0 above ADWG (2011) 10 µg/L	0 above GIL 4.4 µg/L
Mercury	3	2	**0.2**	0 above ADWG (2011) 1 µg/L	**1 above GIL 0.1 µg/L**
Nickel	3	1	4	0 above ADWG (2011) 20 µg/L	0 above GIL 7 µg/L
Zinc	3	2	13	-	0 above GIL 15 µg/L
VOCs	3	0	<PQLs	0 above ADWG (2011)	0 above GIL
PFOS/PFHxS	3	3	**0.11**	**3 above NEMP PFAS (2020) 0.07 µg/L (drinking water)** 0 above NEMP PFAS (2020) 2 µg/L (recreational)	-

Analyte	n	Detections	Maximum (µg/L)	n > Human Health	n > GIL Marine ANZG (2018)
PFOS	3	3	0.08	-	0 above NEMP PFAS 95% (2020) 0.13 µg/L
PFOA	3	1	0.02	0 above NEMP PFAS (2020) 0.56 µg/L (drinking water) 0 above NEMP PFAS (2020) 10 µg/L (recreational)	0 above NEMP PFAS 95% (2020) 220 µg/L

In assessing the most recent groundwater analytical results, the Auditor makes the following observations:

- Concentrations of organic compounds including TRH, BTEXN, VOCs and PAHs were below the laboratory detection limits in the three groundwater samples analysed.
- Concentration of mercury in MW01 exceeded the adopted ecological based criterion. As the exceedance was minor and was limited to MW01 (assumed up gradient monitoring well), the associated risk is considered to be low.
- PFOS/PFHxS were detected in the three groundwater monitoring wells and the reported concentrations exceeded the adopted quality criterion for drinking water purposes. As the site is situated within the Botany Sands Aquifer Prohibition Area where abstraction of groundwater for the purposes of domestic, recreation or irrigation uses is prohibited, the associated risk is considered to be low. It is further noted that the reported PFOS/PFHxS concentrations may be representative of a background condition given that the concentration levels were consistent between the well locations and the site is located in an industrialised area.

10.3 Auditor's Opinion

The groundwater analytical results indicate that widespread groundwater contamination is unlikely to be present beneath the site. As noted in **Section 6.1**, additional investigation points are required under the existing buildings to better characterise the site groundwater conditions.

11. EVALUATION OF CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. **Table 11.1** provides the Auditor's review of the CSM developed by JBS&G and presented in the RAP.

Table 11.1: Review of the Conceptual Site Model

Element of CSM	Consultant	Auditor Opinion
Contaminant source and mechanism	Contaminants of concern: – Soil: asbestos and metals. – Groundwater: None. – Soil vapour: TCE. JBS&G also noted that there is the potential for additional asbestos impacts in soils than previously reported.	The identified contaminants of concern are appropriate in consideration of the DSI results. However, the Auditor notes that the DSI only targeted accessible areas and there is the potential for other contamination/contaminants to be present under the existing buildings, including the potential for chlorinated hydrocarbons to be present in groundwater in the north-western portion of the site where TCE was detected in soil vapour. Potential sources of contamination are not discussed in the RAP. The Auditor considers that key potential contamination sources

Element of CSM	Consultant	Auditor Opinion
		include historical uncontrolled filling, HBM from the building structures, poor demolition practices, and historical industrial/commercial activities onsite (including smash repairs, mechanic workshop and fuel storages) and in the immediate surrounds. There is the potential for unidentified point sources such as additional USTs, sumps or pits to be present.
Affected media	Soil, groundwater and soil vapour.	The potentially affected media have been appropriately identified. The RAP recognises that there are data gaps associated with site soil, groundwater and soil vapour conditions, and have provided frameworks to address these data gaps in the RAP.
Receptor identification	Onsite: Construction workers, intrusive maintenance workers, future commercial site users and ecological receptors (vegetation to be established as part of site development). Offsite: Offsite commercial users, recreational users of Mill Stream and Botany Bay, and ecological receptors in Mill Stream and Botany Bay.	Acceptable. It is noted that Mill Stream is unlikely to be utilised for recreational purposes.
Exposure pathways and SPR linkages requiring remediation or management	Potential exposure pathways relevant to the human receptors include oral ingestion, dermal contact, and inhalation of dust/vapours. The RAP noted that complete exposure pathways were associated with inhalation of TCE in vapour by future site users, construction workers and intrusive maintenance workers and exposure to asbestos in soils. The RAP further noted that based on the results of the DSI, "*it is considered unlikely that there are any unacceptable risks to downgradient receptors associated with environmental impact sourced from the site*".	Acceptable, however, several data gaps have been identified that require additional assessment. Subject to the findings of the data gap assessment, additional complete SPR linkages may be identified, including off-site migration of groundwater contamination. The RAP includes remediation strategies that would be applicable to point sources of groundwater contamination.
Presence of preferential pathways for contaminant movement	Given that the site geology comprises of permeable sands (both within fill and natural soils) with groundwater present in a shallow unconfined aquifer, it is considered unlikely that contaminants will substantially migrate via preferential pathways (service trenches or similar) at the site.	Acceptable, however, the Auditor notes that preferential pathways for vapour migration may exist through service conduits or areas of more permeable fill.
Evaluation of data gaps	The RAP identified the following data gaps: - The extent of asbestos in soil. - The lateral extent of TCE impacts in soil vapour in the	The Auditor agrees with the identified data gaps.

Element of CSM	Consultant	Auditor Opinion
	north-western portion of the site. - The extent of petroleum hydrocarbon impacts in proximity of the USTs. - Soil and groundwater conditions within previously inaccessible areas. The RAP also noted that site specific EILs should be derived for heavy metals via collection of physiochemical properties for soils in future landscaping areas.	

11.1 Auditor's Opinion

The Auditor is of the opinion that the CSM is a reasonable representation of the known contamination at the site and data gaps are adequately identified. The CSM is considered appropriate for this stage of remediation planning.

12. EVALUATION OF THE RAP

12.1 Data Gap Investigation

The RAP requires a data gap investigation (DGI) to address the data gaps listed in **Table 11.1** and inform the final extent of remediation/management at the site.

The RAP has the following requirements relating to the DGI:

- Preparation of a Sampling, Analytical and Quality Plan (SAQP) prior to the DGI.
- Preparation of a factual report documenting the DGI results, including a tier 2 human health risk assessment (primarily for TCE), if required, considering the proposed development design.
- Preparation of a Remedial Work Plan (RWP) that follows the remedial framework established in the RAP confirming the final extent of remediation/management.

Auditor's Opinion

The Auditor agrees with the proposed framework for the DGI. The Auditor notes that:

- A second sampling round targeting the existing groundwater wells and sub-slab vapour monitoring point should be considered prior to building demolition to confirm the analytical results from the DSI.
- The DGI should be conducted post-demolition of the existing warehouse buildings to allow access.
- The proposed RWP should be prepared based on the outcomes of the DGI and the development design.
- The SAQP, DGI report and RWP should be reviewed and approved by a Site Auditor as proposed at the relevant hold points – i.e., prior to additional site investigation and prior to commencement of remediation works.

12.2 Remediation Required

The Auditor has summarised the issues identified as requiring remediation and the preferred options considered in the RAP in **Table 12.1**. The Auditor's comments on the proposed remediation strategies are provided in **Section 12.3**. The anticipated extents of remediation based on the current data set are shown on **Attachment 4**.

The RAP notes that the final remediation extent is to be confirmed following completion of the DGI.

Table 12.1: Remediation Required and Preferred Options Identified in the RAP

Description	Preferred Options
The existing USTs.	Remove from the site where possible or decommission in situ if the USTs cannot be removed.
Petroleum hydrocarbon impacted soils in proximity of the existing USTs (if any).	Bioremediation/landfarming and validation for reuse on site.
Chlorinated hydrocarbon (TCE) impacted soils posing a potential vapour intrusion risk.	Excavation and stockpiling on-site for treatment via soil vapour extraction (SVE) techniques prior to validation and reuse on-site.
Asbestos/metal impacted fill soils.	Onsite retention beneath a physical barrier and ongoing management through an environmental management plan (EMP).

Auditor's Opinion

The Auditor considers the remediation strategy proposed for the site to be reasonable based on the available data set. The strategy of capping and containment will require ongoing management of the containment system.

The Auditor notes that remediation may be required to mitigate contamination migrating off-site in groundwater if identified during the DGI. However, the current data set suggests that any groundwater contamination is likely to be localised and related to point sources that can be remediated through the options outlined in **Table 12.1** (excavation and off-site disposal or treatment on-site through bioremediation or SVE). The final remediation requirements are to be documented in the proposed RWP following the DGI for review and approval by the Auditor. It is noted that the final remediation requirements and timeframes required for remediation and validation will need to be incorporated into the development program to ensure hold points are considered.

12.3 Evaluation of the RAP

The Auditor has assessed the RAP by comparison with the checklist included in NSW EPA (2020) *Contaminated Land Guidelines, Consultants Reporting on Contaminated Land*. The Revised RAP was found to address the required information, as detailed in **Table 12.2**, below.

Table 12.2: Evaluation of the RAP

Remedial Action Plan	Auditor Comments
Remedial Goal Section 5.2 of the RAP discusses the objective of the RAP is *"to remove/manage potential risks posed by the identified contamination issues, such that the site is made suitable for the proposed development. It is a further objective to undertake works, in accordance with applicable guidelines and legislation, in a manner which is consistent with the principles of ecologically sustainable development (ESD)."* Data quality objectives (DQOs) are defined in the RAP with the following decision rules identified to confirm successful remediation and validation: 1. Have the underground petroleum storage system (UPSS) been appropriately decommissioned in accordance with UPSS (2020)? 2. Are there any unacceptable risks to future human site receptors, associated with TCE and potential TRH impacts in soil, following the remediation of soils? 3. Are impacted fill materials appropriately contained to control potential future exposures of human and ecological receptors to impacted material? 4. Have all aesthetic issues been addressed?	The goal of the RAP and the DQOs are appropriate. The Auditor notes that further contamination may be identified as requiring remediation following the DGI, however the RAP framework is adequate to manage remediation and validation of unexpected contamination.

Remedial Action Plan	Auditor Comments
5. Were surplus materials classified and disposed off-site to a facility licensed to accept the classified waste, or where relevant, appropriately recycled for beneficial re-use? 6. Where material is imported to site for development purposes is it considered environmentally suitable for use? 7. Have remedial and validation works met the requirements of the RAP? 8. Is the site suitable for the proposed land use?	
Discussion of the Extent of Remediation Required Remediation required on the site was discussed within Section 5.4 of the RAP and is summarised in **Table 12.1**. As discussed in **Section 12.1**, the final extent of remediation/management is to be confirmed following the DGI.	Appropriate. A RWP is to be prepared following completion of the DGI to define the extent of remediation required.
Remedial Options Remedial options were assessed in Section 5.5 of the RAP and included offsite disposal, onsite treatment, offsite treatment and onsite capping. Rationale was provided for selected options through inclusion of a screening matrix.	The Auditor considers that an appropriate range of remediation options have been considered.
Selected Preferred Option and Rationale The preferred remediation options were discussed in Section 5.5 and Section 5.6 of the RAP and are summarised in **Table 12.1**. Treatment of soils impacted by petroleum hydrocarbons through bioremediation was assessed in the RAP and considered feasible based on volume of soils anticipated as requiring treatment (<1,000 m^3) and total concentrations of TRH (<40,000 mg/kg) and the location and size of the site. Detailed methodology for treating soils impacted by TCE through SVE was not provided in the RAP and would need to be documented in a RWP. Capping and containment is the preferred option for asbestos and metal impacted fill materials.	Appropriate. The Auditor notes that the selected remediation strategies are technically achievable. Remediation strategies for impacted groundwater are not specifically identified, however, the current data set suggests that any groundwater contamination is likely to be localised and related to point sources that can be remediated through excavation and off-site disposal or treatment on-site. The final remediation strategy will be documented in the RWP which will be prepared based on the findings of the DGI and considering the final development design and will be reviewed and approved by the Auditor prior to implementation.
Description of Remediation to be Undertaken Section 6 of the RAP outlined procedures for remediation/management. Anticipated tasks included site establishment, completion of the DGI including hardstand removal and surface inspection to identify additional potential sources of contamination, decommissioning and excavation of the USTs and removal of surrounding petroleum hydrocarbon impacted soils, excavation of TCE impacted soils, and treatment of petroleum hydrocarbon and TCE impacted soils through bioremediation or SVE prior to validation for onsite reuse. During excavation, natural saturated soils (if encountered) would be stockpiled separately, and field screened for the presence of ASS/PASS conditions. Where such conditions are encountered, the soils will be managed under an ASS Management Plan (ASSMP). For onsite capping and containment of asbestos/heavy metal impacted fill soils, the minimum requirements for the physical separation included: - Beneath permanent concrete structures: Installation of a marker layer over contaminated fill material with capping layer consisting of a minimum thickness of 0.1 m environmentally suitable materials below the permanent concrete slab. - Beneath permanent hardstand structures (i.e., concrete slabs, pile caps or asphaltic concrete or similar	The description of remediation works provided in the RAP is adequate for this stage of remediation planning. Further remediation requirements will be determined based on the findings of the DGI and are required to be documented in a RWP. Excavation backfilling (if any) must also use VENM, ENM, materials produced under a resource recovery order (RRO) or material from onsite that has been validated as suitable for reuse.

Remedial Action Plan	Auditor Comments
footpaths, but not bricks or pavers): Installation of a marker layer overlying potentially contaminated material followed by sub-grade material validated as environmentally suitable materials. - Mass planting/shallow landscaping areas: Installation of a marker layer at a minimum depth of 500 mm below the final finished site levels, with a capping layer consisting of environmentally suitable materials. - New tree pit zones/deep landscaping zones: Installation of a marker layer at a minimum depth of 1.5 m below the final finished site levels, with a capping layer consisting of environmentally suitable materials. - Within underground services trenches / services: Service infrastructure will require remediation to 150 mm below the depth of services, with a marker layer and capping layer installed consisting of environmentally suitable materials. The marker layer should consist of a bright orange coloured non-woven polyester continuous filament or similar with a minimum density of approximately 150 grams per square metre (g/m^2) 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). • Maintain integrity during remedial/civil works such as capping layer installation and road/building construction. • Meet geotechnical and civil specifications where required. Material to be used as a capping layer (other than concrete pavement) must be validated by the Environmental Consultant to be environmentally suitable, consisting of virgin excavated natural material (VENM), excavated natural material (ENM), suitable on-site materials (i.e., materials from another portion of the development site that are non-impacted) or material considered suitable for beneficial reuse via a resource recovery order (RRO) and exemption (RRE) issued by NSW EPA.	
Proposed Validation Criteria The validation criteria proposed in the RAP include NEPM (2013) criteria for 'Commercial/Industrial' land use including HSL-D, HIL D and MLs. In addition, consideration of ecological criteria was required in areas proposed to be landscaped. The RAP noted that the soil vapour validation data would be compared to the site-specific risk criteria to be established as part of the DGI. Prior to the completion of remedial works and following placement of the marker layer, the ground surface of the site was to be thoroughly inspected by the environmental consultant to confirm the absence of visual ACM which may have been incidentally deposited during remediation earthworks. Should any observable ACM be identified, the area should be emu-picked prior to reinspection by the environmental consultant.	The soil and soil vapour validation criteria proposed in the RAP are adequate for this stage of remediation planning. The final validation criteria must be specified in future RWP. Validation criteria relating to imported materials are not discussed in the RAP and must be incorporated into the RWP. The Auditor notes that imported material must either be VENM, ENM or be classified under a RRO/RRE. All imported materials are to be free of staining, odours and anthropogenic inclusions.
Proposed Validation Testing In addition to the proposed validation testing outlined in **Table 12.3** below, photographic records and survey plans detailing the final thicknesses, and the vertical and lateral extends of the installed capping layer are also required.	The proposed validation testing is appropriate for this stage of remediation planning. The Auditor notes that a detailed validation testing regime is required to be documented in future RWP based on the findings of the DGI. Verification testing of imported materials by the consultant will be required if the supporting documentation is not sufficient. The frequency of

Remedial Action Plan	Auditor Comments
	sampling would depend on the source of the material and supplied documentation. Any imported recycled materials, including for use in civil construction works, should be assessed and sampled for asbestos at a frequency commensurate with the volume imported.
Contingency Plan if Selected Remedial Strategy Fails An unexpected finds protocol (UFP) is included in Section 8 of the RAP. The UFP requires the sampling strategy for unexpected finds to be designed by a suitably qualified environmental consultant in accordance with guidelines made or endorsed by EPA.	In the Auditor's opinion, the procedure for handling unexpected finds is appropriate and practical and can be implemented within the proposed remediation strategy. Contingencies for failure of the remedial strategy are not specifically defined. In the Auditor's opinion, the remedial strategy has a low risk of failure based on the current data set as contamination will either be excavated and treated or disposed offsite or contained insitu and subject to ongoing management controls. The Auditor should be informed of any unexpected finds or changes in remediation strategies.
Interim Site Management Plan (before remediation) Not documented in the RAP.	The site is primarily covered by hardstand. Therefore, the site in its current status presents a low risk to receptors.
Site Management Plan (operation phase) including stormwater, soil, noise, dust, odour and OH&S A site management plan (SMP) was discussed in Section 9 of the RAP. The SMP outlines requirements for soil and water management, traffic management, and dust and odour control. Section 10 of the RAP also required preparation of a health and safety plan for the remediation works.	Adequate. The Auditor anticipates that detailed plans and a construction environmental management plan (CEMP) will be prepared by the appointed Remediation Contractor prior to the remedial works commencing. The CEMP should consider the requirements of the site management plan presented in the RAP, including management controls for asbestos impacted soils.
Remediation Schedule and Hours of Operation The RAP stated that '*works hours will be subject to requirements of any development approval conditions provided by the consent authority*.'	Appropriate.
Contingency Plans to Respond to Site Incidents The RAP required an emergency response plan to be developed by the Remediation Contractor. The plan should provide details on appropriate action and excavation procedures in the event of an emergency.	Acceptable.
Licence and Approvals The RAP considered that the proposed remediation works is classified as Category 2 remediation under SEPP (2021), which requires notification of Council at least 30 days before commencement of the proposed remediation work. The RAP also noted that: • Waste materials will be transported by appropriately licensed contractor and disposed at appropriately licensed waste facilities. • Bayside Council (2022) Development Control Plan (DCP) should be adopted as minimum standards for the environmental management of the proposed remediation works. • Should dewatering be required for construction purposes, a dewatering approval may be required from the NSW Department of Primary Industry (DPI).	Acceptable. The Auditor notes that: • Demolition works are to be undertaken by a contractor holding an appropriate SafeWork NSW demolition licence. • Appropriately licensed contractor/s should be engaged for the removal of the existing USTs and asbestos. • Asbestos removal works are to be notified to SafeWork NSW at least five days prior to work commencing. • Discharging of excavation pump-out water to stormwater requires pre-approval from Council. Discharge to sewer, as industrial trade wastewater, requires prior approval from Sydney Water.

Remedial Action Plan	Auditor Comments
Contacts/Community Relations Section 9 of the RAP included a contact details table, which is to be confirmed during remediation works. Roles and responsibilities of relevant parties were also outlined in the RAP (Section 10.1). The RAP noted that during remediation works, temporary fencing would be installed which will restrict access to remedial areas on the site and a sign would be displayed adjacent to the site access throughout the duration of the works with the contact details of the remediation contractor and project manager.	Adequate.
Staged Progress Reporting The RAP indicated that preparation of: • A SAQP prior to the DGI. • A DGI report including a site-specific human health risk assessment post the DGI. • A RWP following the DGI confirming the final extent of remediation/management. Post completion of the remediation works, a Validation Report and a long-term EMP would be prepared.	Appropriate. The Auditor notes that the RWP should detail the final remediation/management requirements at the site and should include a detailed Validation SAQP. Deliverables should be reviewed by an EPA accredited Site Auditor.
Long Term Environmental Management Plan An EMP has been proposed in the RAP to document ongoing management of the installed cap and contain system.	Appropriate. The site will remain a commercial/industrial facility and implementation of an EMP for passive management of a capping system is technically feasible and practical. It is recommended that implementation of the EMP be made a condition of consent to ensure there is a mechanism for making the EMP legally enforceable.
Waste Management Waste management is discussed in the RAP. Removal of wastes from the site for offsite disposal will be undertaken with reference to the relevant provisions of *POEO (Waste) Regulation 2014* and *NSW EPA (2014) Waste Classification Guidelines*. The Validation Report requires reporting on waste tracking and disposal information.	Adequate.

Table 12.3: Proposed Validation Testing (Source: the RAP)

Item	RAP Sampling Density			Analytical Suite
Source Removal Excavation Validation				
	Excavation Floors	Excavation Walls	Materials	
Excavations formed to remove USTs	1 / 100 m² (10 m grid) Minimum 2 samples per excavation. Minimum 2 samples per UST removed.	1 / 4 m (from each distinct horizon or material type or 1 m vertical soil profile)	N/A	TRHs, BTEXN, PAHs and lead (all excavations) in soil samples
Excavations formed by the removal of TCE contaminated soils	1 / 100 m² (10 m grid) Minimum 2 samples per excavation where the excavation is terminated above groundwater	1 / 4 m (from each distinct horizon or material type or 1 m vertical soil profile)	N/A	VOCs 8260 in soil vapour samples
Excavations formed by the removal of impacted materials (if identified as part of an unexpected find)	1 / 100 m² (10 m grid) Minimum 2 samples	1 / 10 m (from each distinct horizon or material type or 1 m vertical soil profile) Minimum 4 samples	N/A	As determined by the nature of the impact
Petroleum Hydrocarbon Impacted Soils Remediation				
Bioremediated Soils / Landfarm pile(s)	1 sample per 25 m³, minimum 3 samples per pile.			Soil Samples: TRH BTEXN
SVE Treated Soils	1 sample per 25 m³, minimum 3 samples per pile.			Soil Vapour Samples: VOCs 8260
Materials Importation				
Imported VENM	Minimum of 3 samples per source site / material type to 500 m³ then 1 sample per 500 m³ thereafter			TRH/BTEX PAH Heavy Metals OCP/PCBs Asbestos (500 ml)
Quarry VENM Materials (e.g. blue metal, sandstone, shale)	Confirmation that the material is quarried rock (VENM) prior to importation, and visual confirmation.			Site Inspection required.
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 m³ then 1 sample per 500 m³ thereafter, prior to importation			TRH/BTEX PAH Heavy Metals OCP/PCBs Asbestos (500 ml)
Export of Materials				
Surplus waste materials for off-site disposal are to be classified in accordance with EPA (2014b).	Stockpiled materials for off-site disposal require a minimum of 5 samples (up to 75 m³) or a sample density of 1/25 m³ to 200 m³ (whichever is greater) Decreased sampling frequency to be justified on basis of stockpile homogeneity and risk of contaminants present.			Heavy metals TRH/BTEXN PAHs OCP/PCBs Asbestos SPOCAS (ASS) TCLP (Heavy metals and PAHs) at the Environmental Consultant's discretion.

12.4 Overall Auditor's Opinion

In the Auditor's opinion, the RAP generally meets the guidelines prepared or endorsed by NSW EPA in particular the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)* and the NSW EPA (2020) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land*. The proposed remediation strategy is practical, technically feasible and appropriate for the contamination identified.

The extent of remediation required is to be defined based on the results of the DGI completed following demolition of site buildings and removal of hardstand surfaces. However, the RAP provides an adequate framework for assessment and remediation of contamination and validation to ensure the site is suitable for the proposed use.

The Auditor notes that remediation may be required to mitigate contamination migrating off-site in groundwater. However, the current data set suggests that any groundwater contamination is likely to be localised and related to point sources that can be remediated through the options outlined in the RAP (excavation and off-site disposal or treatment on-site through bioremediation or SVE). The final remediation extents are to be documented in a RWP following the DGI for review and approval by the Auditor. The RWP should also confirm the remediation strategy adopted for each area of concern and the validation sampling regime. It is noted that timeframes required for remediation and validation will need to be incorporated into the development program to ensure hold points for review of the DGI data and the RWP are adequately considered.

13. CONCLUSIONS AND RECOMMENDATIONS

The proposed remedial approach for the site includes removal of the existing USTs, excavation and onsite treatment of petroleum hydrocarbon and TCE impacted soils and validation for reuse, and cap and containment of the fill soils impacted by asbestos and metals and ongoing management via an EMP. JBS&G concludes that "*the proposed actions outlined in this RAP conform to the requirements of the Contaminated Sites 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*" and subject to the successful implementation of the measures detailed in this RAP, the site can be made suitable for the proposed commercial/industrial land use.

In the Auditors opinion, the proposed remediation strategy is practical, technically feasible and appropriate for the contamination identified. The final remediation extents are to be documented in a RWP following the DGI for review and approval by the Auditor.

Based on the information presented in the reviewed reports, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the site can be made suitable for the purposes of 'commercial/industrial' land use if the framework presented in following RAP is followed:

- 'Remediation Action Plan (RAP), 2-4 Hale Street, Botany NSW', 25 March 2024, JBS&G.

subject to compliance with the following conditions:

1. Development of a SAQP for the DGI. Review and approval of the SAQP by an EPA Accredited Site Auditor.
2. Completion of the DGI and associated investigation report. Review and approval of the investigation report by an EPA Accredited Site Auditor.
3. Preparation of a RWP that considers existing data, the results of the data gap assessment and the final development plan. The RWP should confirm the validation sampling regime, validation criteria and the preferred remediation option. The RWP is to be reviewed and approved by an EPA Accredited Site Auditor.
4. Validation of the remediation works is required to be documented in a Validation Report confirming that the works have been undertaken in accordance with the future RWP and certifying the suitability of the site for the proposed development. The Validation Report is to be reviewed and approved by an EPA Accredited Site Auditor.
5. Preparation of an EMP for the management of contamination remaining onsite. The EMP is to be reviewed and approved by an EPA Accredited Site Auditor.

6. Preparation of a Section A Site Audit Statement and Site Audit Report by a NSW EPA Accredited Site Auditor reviewing the above information and confirming the suitability of the site for the intended use.

To ensure the site remediation and development is completed in accordance with the RAP and to allow for future enforceability of an ongoing EMP, it is recommended that the Consent Authority include conditions of consent that require:

- Completion of a Section A SAS prior to occupation of the development.
- The site owner/operator to comply with the obligations of the EMP during site occupation.

14. LIMITATIONS

This interim audit advice was conducted on behalf of Coombes Group Property for the purpose of assessing the suitability and appropriateness of a remedial action plan (RAP). This summary report may not be suitable for other uses.

The Auditor has relied on the documents referenced in Section 1 in preparing the Auditor's opinion. The consultants included limitations in their reports. This interim audit advice must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check. If the Auditor is unable to rely on any of those documents, the conclusions of this interim audit advice could change.

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

* * *

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

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

Yours faithfully
Ramboll Australia Pty Ltd

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EPA Accredited Site Auditor 1903

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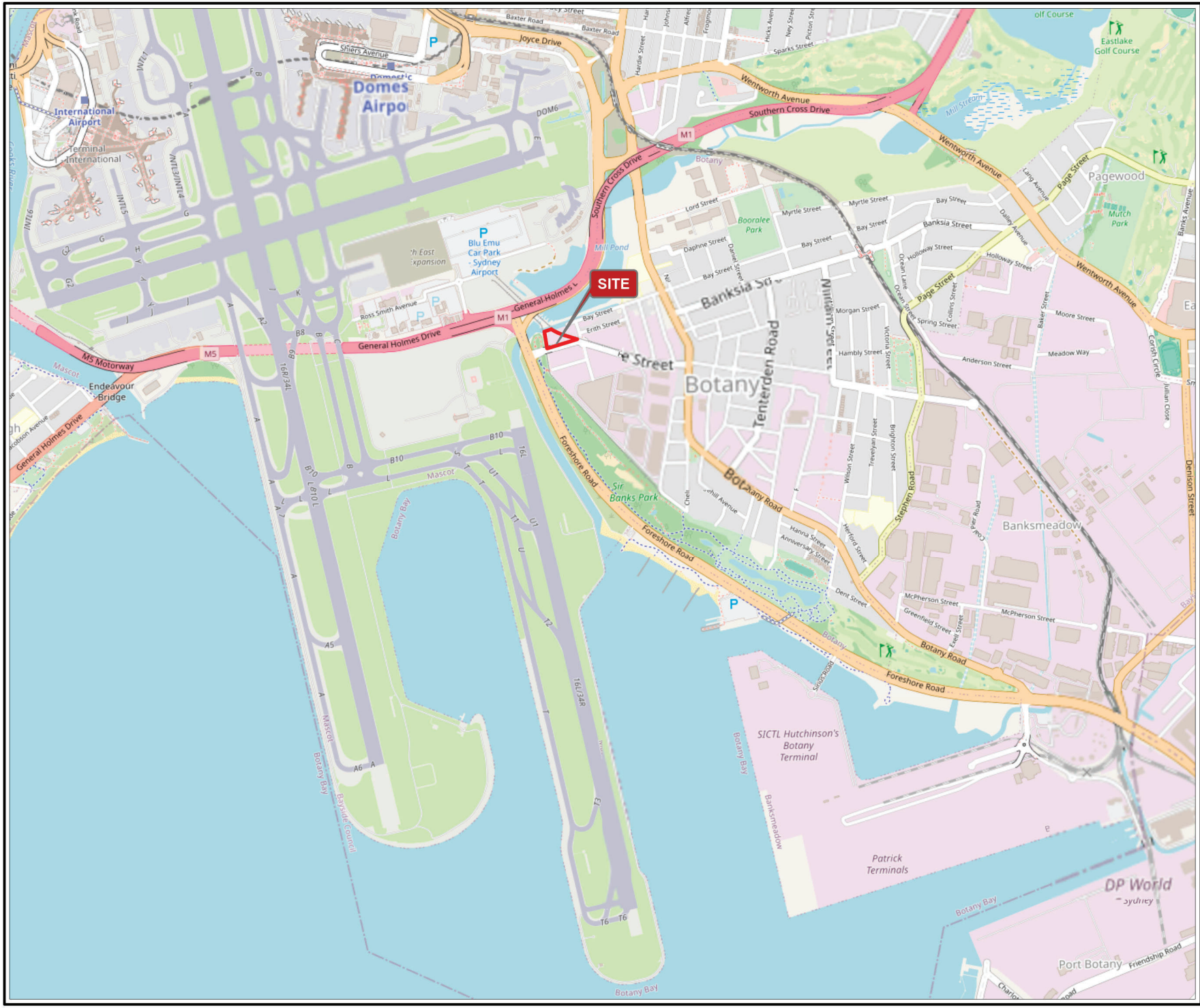
Attachments: 1 Site Location
2 Site Boundary and Key Site Features
3 The DSI Investigation Locations
4 Anticipated Extents of Remediation

Attachment 1: Site Location



File Name: 65803_CoombesPropertyGroupBotanty_R01_RevA
Reference: © OpenStreetMap (and) contributors, CC-BY-SA

Attachment 2: Site Boundary and Key Site Features

Legend

- Approximate Site Boundary
- NSW Cadastre
- Stream
- ACM on ground Surface

JBS&G

Job No: 65803	
Client: Coombes Property Group	
Version: R01 Rev A	Date 17/01/2024
Drawn By: JL	Checked By: CB
Scale 1:1,750	

0 20 40
metres

Coord. Sys. GDA 1994 MGA Zone 56

2-4 Hale Street
Botany, NSW

SITE LAYOUT

FIGURE 2

File Name: 65803_CoombesPropertyGroupBotanty_R01_RevA
Reference: Nearmap - www.nearmap.com (Capture Date: 03/01/2024)

Attachment 3: The DSI Investigation Locations

Legend

- Approximate Site Boundary
- NSW Cadastre

Proposed Sample Location

- Soil Bores, JBS&G 2022
- Monitoring Well (JBS&G 2022)
- Soil Vapour (JBS&G 2022)

JBS&G

Job No: 65803	
Client: Coombes Property Group	
Version: R01 Rev A	Date 17/01/2024
Drawn By: JL	Checked By: CB
Scale 1:1,000	

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

2-4 Hale Street
Botany, NSW

SAMPLE LOCATIONS

FIGURE 3

File Name: 65803_CoombesPropertyGroupBotanty_R01_RevA
Reference: Nearmap - www.nearmap.com (Capture Date: 03/01/2024)

Attachment 4: Anticipated Extents of Remediation

Legend

Approximate Site Boundary

NSW Cadastre

Sample Locations

Soil Bores, JBS&G 2022

Monitoring Well (JBS&G 2022)

Soil Vapour (JBS&G 2022)

Remedial Extents

ACM Remedial Extent

UST Remedial Extent

TCE Remedial Extent

JBS&G

Job No: 65803	
Client: Coombes Property Group	
Version: R01 Rev A	Date 23/01/2024
Drawn By: JL	Checked By: CB
Scale 1:1,000	

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

2-4 Hale Street
Botany, NSW

INFERRED REMEDIAL EXTENT

FIGURE 7

File Name: 65803_CoombesPropertyGroupBotanty_R01_RevA
Reference: Nearmap - www.nearmap.com (Capture Date: 03/01/2024)