Our Ref:240303
Department Ref: DA 22/6312

20 September 2022

Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

ATTENTION: KEIRAN THOMAS

Dear Keiran,

RE: RESPONSE TO REQUEST FOR INFORMATION - DA 22/6312
106 BOURKE STREET, CARRINGTON

Thank you for your letter dated 12 July 2022 providing the Departments request for additional information in relation to the above application following further assessment. Please accept this submission as our formal response to the matters raised.

Department of Planning and Environment

1. Contamination

The Department has considered the information submitted with the application as well as the further information provided post lodgement. The Department advises that this information does not meet the requirements of clause 4.6 of the State Environmental Planning Policy (Resilience and Hazards) 2021 (being the former State Environmental Planning Policy No. 55 – Remediation of Land). The Department acknowledges that no land use is proposed as part of the development, however undertaking the further investigations would be prudent at this stage prior to further works taking place to understand the nature of the contamination prior to construction works commencing.

The Department requires an assessment that meets the requirements of the NSW EPA document: Consultants reporting on contaminated land: Contaminated Land Guidelines (copy enclosed). Given the known contaminant within the building it is strongly recommended that the assessment comprise a Detailed Site Investigation as described within the above guidelines. The investigation should be prepared by a contaminated land consultant certified under one of the two schemes recognised by the NSW EPA. Further details can be obtained here: https://www.epa.nsw.gov.au/your-environment/contaminated-land/managing-contaminated-land/engaging-consultant

ADW JOHNSON PTY LIMITED
ABN 62 129 445 398

Sydney
Level 35 One International Towers
100 Barangaroo Avenue
Sydney NSW 2000
02 8046 7411
sydney@adwjohnson.com.au

Central Coast
5 Pioneer Avenue, Tuggerah NSW 2259
PO Box 3717, Tuggerah NSW 2259
02 4305 4300
coast@adwjohnson.com.au

Hunter
7/335 Hillsborough Road,
Warners Bay NSW 2282
02 4978 5100
hunter@adwjohnson.com.au

www.adwjohnson.com.au

Response

As requested, a Detailed Site Investigation has been prepared by Nation Partners and is provided within **Appendix A.**

City of Newcastle

1. Heritage

The application proposes remediation works to address a significant asbestos hazard present in the subfloor area of the heritage listed building. The SEE states that friable asbestos fibres are stuck to/embedded within the original cast iron floor grates of the engine room and embedded asbestos material is present in the ground surface of the subfloor cavity. The stability of the floor structure of the engine room is also compromised, with significant corrosion having occurred at the base of the steel columns supporting the floor.

It is noted in the application that Heritage NSW requested a detailed options analysis of potential remediation methodologies:

> *'From previous consultation and from the information you have presented to us, the structural integrity and sub floor asbestos contamination are clearly hazards that need to be addressed to assisting in attracting and securing an end user for the adaptive re-use of the engine house. We agree that remediation works proposed for the sub floor are required and advise that a S60 application for these works is submitted. An options analysis of potential stabilisation and remediation works should also be submitted with your application. This analysis should demonstrate what options have been considered and discounted and why the actions/works proposed are most appropriate. Where specialist advice (industrial hygienist, structural engineer, etc) has been sought it should be submitted as part of your application.'*

The Options Analysis report (prepared by EJE) presents 10 options to address the asbestos and stability issues present within the building. These are ranked with regard to heritage impacts, budgetary constraints, engineering considerations, end user viability etc. The proposed methodology is to encapsulate the asbestos hazard under a floating concrete slab, with interpretive colouring in the slab to mark out the former location of machinery, and glass inserts to provide select views to the subfloor below.

From a heritage perspective, Option 5 (encapsulation within a glass floor) would provide additional heritage benefits to visitors by reducing physical impacts to heritage fabric and illuminating the area below the glass floor surface attractively. However, it is noted that this limits end user practicality which is essential for the long-term management of the building.

Introduction of the floating concrete slab will have a physical and visual impact in relation to heritage fabric associated with the original engine room, including the cast iron floor grates, concrete engine buttress, and other componentry, and the visual/spatial qualities of the room afforded to visitors. Additionally, removal of masonry elements, steel and timber beams in the engine room will impact the integrity of the heritage item. However, it is considered that the approach presented in the Options Analysis Report and assessed in the HIS is reasonable and will ensure longevity of the building, facilitate development of a new adaptive use, and assist with conservation of the building long term which is an

overall positive outcome. The proposed interpretive measures will assist in mitigating this impact by communicating the significance of those removed features.

It is recommended that a condition is included on any consent issued ensuring that a heritage architect is engaged to oversee the proposed works and provide ongoing advice, including an induction session to all contractors prior to commencement of works to highlight the heritage significance of the site. A photographic archival record should be undertaken prior to works commencing and periodically during the construction to document the works. Any building fabric to be removed that is capable of reuse within the building should be retained and reused on the guidance of the project heritage consultant.

It is also recommended that detailed design of the proposed accessible ramp is undertaken in such a way that the ramp is an independent structure, fully reversible and minimises any physical intervention to the exterior of the heritage building.

Response

EJE Heritage acknowledges the City of Newcastle's summary response regarding the heritage context of the proposed works within the significant historic building. We believe the City of Newcastle has thoroughly interpreted the complexities of the project, balancing heritage conservation with safety, useability and commercial considerations. EJE Heritage has a long history working with Port of Newcastle (PoN) on staged conservation works at The Carrington Hydraulic Engine House and we believe that the proposed works of this stage will be the catalyst for active negotiation around not too distant future re-use of the building, which will be a benefit for the cultural heritage of Carrington and the broader Newcastle area. PoN have no objection to the proposed consent conditions for the works related to heritage, including the requirements for supervision of the works by a heritage architect, the undertaking of an archival photographic record, the re-use of building fabric where appropriate, and the independent structure of the entry ramp.

2. Flood Management

According to CN's records the subject land is identified as being flood prone land. This risk has not been addressed in the SEE. It is recommended the Applicant is required to consider the flood risk to the proposal. In this regard, while it is acknowledged that the provisions of the Newcastle Development Control Plan 2012 do not apply to land inside the Port of Newcastle Lease Area under the abovementioned State policy, it has been previously referred to by the Department in its consideration of some development applications on land within the lease area. Accordingly, it is recommended the Applicant is also required to have regard to any relevant requirements of Section 4.01-Flood Management of the DCP.

Response

Newcastle Development Control Plan provides detailed provisions relating to matters of environmental planning significance for Newcastle to be taken into consideration by City of Newcastle when exercising its environmental assessment and planning functions under the EP&A Act. The DCP relates to land which the NLEP applies or land outside of the Port of Newcastle Lease Area and therefore is not applicable to the proposed development. Notwithstanding this, as requested by Council, consideration has been given to the relevant requirements of Section 4.01 Flood Management.

The aims of this section are as follows:

- *To guide the development of flood prone land, applying balanced strategies to economically, socially and environmentally manage risk to life and property.*
- *To set aside appropriate areas to convey and/or store flood waters.*
- *To ensure development, when considered both individually and as an instance of cumulative development trends, will not cause unreasonable adverse flooding impacts in other locations.*
- *To implement the principles of The NSW Government Floodplain Development Manual (2005) to new development as applicable.*

As identified on City of Newcastle's interactive flood map, the site is identified as low risk of flooding and is not within a floodway.

As shown on the architectural plans submitted with the DA, the proposed new engine room floor level is RL3.700M (AHD), which is well above the minimum floor level of RL2.3M (AHD) previously identified and required by Condition 5.10 of DA07/1496 issued by the City of Newcastle for the adaptive reuse of the building.

Below the slab all required electronics and mechanical components are proposed to be at RL2.3m (AHD). As such, it is considered all required electrical fixtures are located above the flood planning level, which is consistent with Section 4.01.03 of the DCP 2012.

Any works below this are structural in nature, columns and footings are all flood resistant structures.

It is considered that the proposal remains consistent with Conditions 5.10 and 5.11 of DA 07/1496 previously imposed by Council for the adaptive reuse of the Carrington Engine House and in turn the relevant sections of Section 4.01 Flood Management of CoN DCP.

3. Section 7.12 Development Contributions

CN's Section 7.12 Development Contribution Plan (Commenced Jan 2022) applies to the subject land. A maximum levy of 1% applies to developments having a cost of the development of more than $200,000. According to the SEE (Pg 5), the 'estimated costs of the works is $1,500,000.' It is recommended that the Applicant be required to provide a cost summary report in support of the application. In this regard, it is noted that sub-clause 208(4) of the Environmental Planning and Assessment Regulation 2021 provides that.' …the costs of any development that is the adaptive reuse of a heritage item. ' are excluded from any estimate or determination of the proposed cost of carrying out development.

Response

CN is not the consent authority for this application. The Minister, as consent authority, is not required to impose a condition of consent that is determined in accordance with Council's Section 7.12 Development Contributions Plan, commenced 1 January 2022 (**Contributions Plan**). The Minister must, however, have regard to the Contributions Plan (see Section 7.13 of the EP&A Act).

A cost report as requested by CN has been prepared by Rider Levett Bucknall and is provided within **Appendix B**. Notwithstanding, for the reasons set out below, there is no justification for imposing a condition requiring payment of development contributions for the proposed development.

(a) The proposed development involves repairs and alterations and additions to the building only and will not result in any increased demand for public amenities or services.

(b) CN (if it were the consent authority) would not be entitled to impose a condition requiring payment of contributions, in accordance with the *Environmental Planning and Assessment (Local Infrastructure Contributions – Port of Newcastle) Direction 2014*. It is clear from this direction and the proposed infrastructure contribution reforms that development within the Port Lease area should be excluded from any requirement to pay development contributions under Section 7.11 or Section 7.12 of the EP&A Act. The Explanatory Paper for the *Proposed Environmental Planning and Assessment Amendment (Infrastructure Contributions) Regulation 2021* provides that the regulation will be amended to exclude certain development from local infrastructure contributions, including "development in the Port Botany Lease Area, Port Kembla Lease Area and Port of Newcastle Lease Area under *State Environmental Planning Policy (Three Ports) 2013*" [now *State Environmental Planning Policy (Transport and Infrastructure) 2021]*. The Contributions Plan further confirms that no contributions may be imposed by Council for development on land within the "Port of Newcastle Lease Area".

(c) The proposed works are conservation works to a heritage listed item, involving the safe and responsible removal and disposal of asbestos and will have a public social and environmental benefit in themselves. It is therefore inappropriate to require additional development contributions on the grant of consent for those works.

If the consent authority considers, contrary to the above, that it is appropriate to impose a condition requiring the payment of contributions as requested by Council, the costs of the works to the engine house and the construction of the accessible entry ramp cannot be included when determining the cost of the development for a condition under Section 7.12 of the EP&A Act.

Clause 208 of the *Environmental Planning and Assessment Regulation 2021* (**EP&A Regulation**) relevantly provides that the following costs and expenses must not be included in an estimate or determination of the proposed cost:

(a) The costs of repairs to a building or works on the land that will be kept in connection with the development.
(b) The costs of fittings and furnishings, including refitting or refurbishing, associated with the development, except if the development involves an enlargement, expansion, or intensification of a current use of land.
(c) The costs of enabling access by people with disability to the development.
(d) The costs of development for adaptive reuse of a heritage item.

Repair of existing floor structures and other components of the building and installation of services constitute repair and refitting works that will not result in an enlargement, expansion or intensification of the use of the land. The proposed new access ramp will allow access by people with a disability to the building. The works proposed will also facilitate, and are for the purposes of, adaptive reuse of the heritage building.

The only costs that may be considered for the purposes of determining a condition under Section 7.12 of the EP&A Act are the costs of carrying out the landscaping and interpretative signage works. Arguably, those works should also be excluded from the determination of costs because they could otherwise be carried out as exempt development. Those works are included in the development application only for completeness.

In any event, based on the costs report attached, the estimated cost of carrying out the development in accordance with Clause 208 of the EP&A Regulation taking into account landscaping and interpretative signage works, is $30,401. The contribution payable in accordance with the Contributions Plan on that development cost is nil (0% for development up to and including $100,000).

Given the above, we consider that a condition requiring payment of any development contributions would be unreasonable in the circumstances.

CONCLUSION

We trust that the additional information provided is satisfactory and allows the Department to finalise its assessment of the application.

Should you have any questions in relation to the contents of this submission or would like to arrange a meeting to discuss any of the above matters further, please do not hesitate to contact the undersigned on (02) 4978 5100 or via email at zacs@adwjohnson.com.au.

Yours sincerely,

ZAC SMURTHWAITE
SENIOR PLANNER
ADW JOHNSON PTY LTD
HUNTER OFFICE

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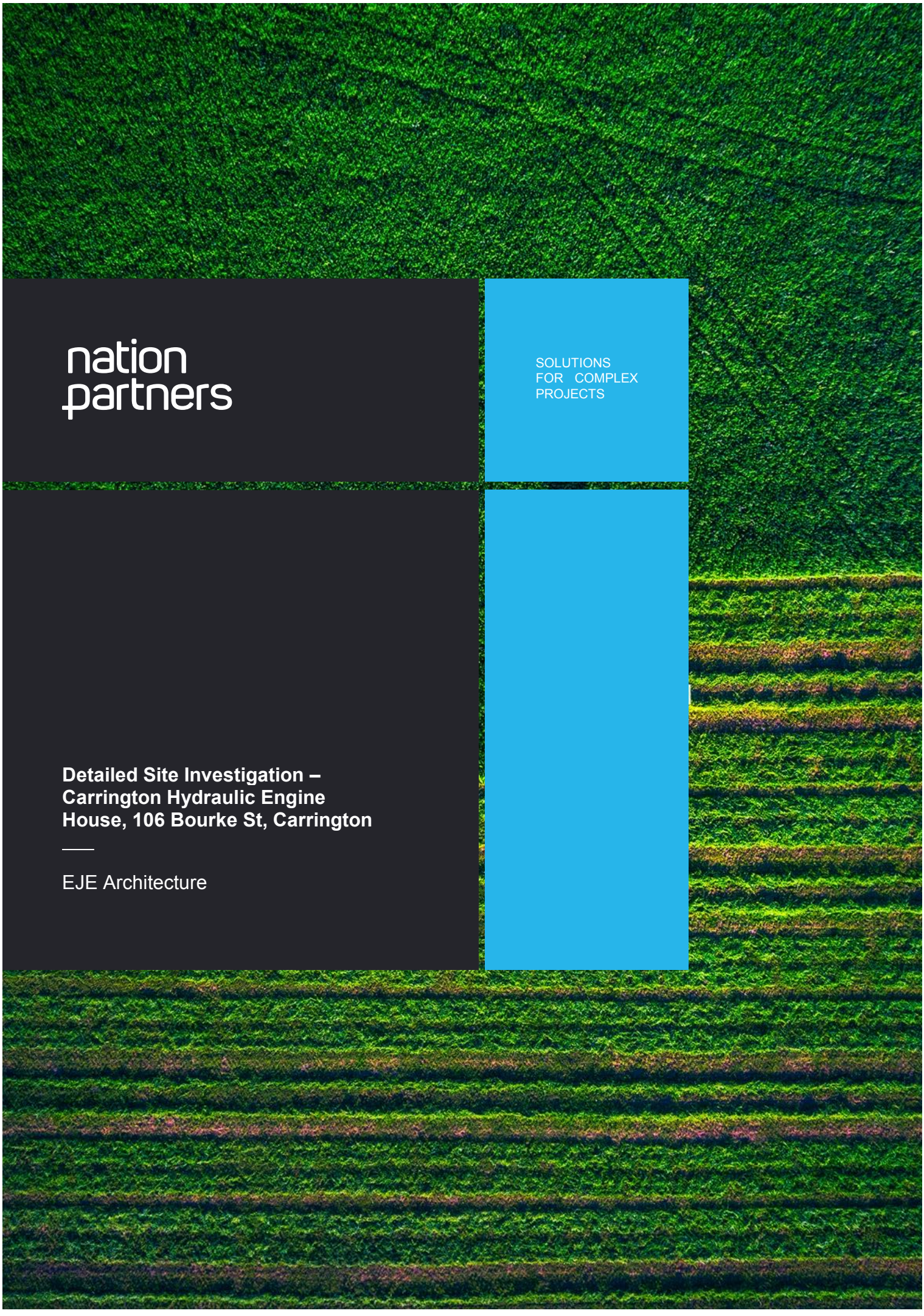
Appendix A

SITE INVESTIGATION REPORT (NATION PARTNERS)



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Detailed Site Investigation – Carrington Hydraulic Engine House, 106 Bourke St, Carrington

EJE Architecture

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Document title
Detailed Site Investigation – Carrington Hydraulic Engine House, 106 Bourke St, Carrington

Version
V1.0

Date
September 2022

Prepared by
Nelson Phillips, Laura Martinez

Approved by
Luke Clements (CEnvP-SC)

File name
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Nation Partners Pty Ltd
ABN 96 166 861 892

Suite 306, 50 Holt St
Surry Hills NSW 2010

1300 876 976
info@nationpartners.com.au
nationpartners.com.au

Executive Summary

Nation Partners Pty Ltd (Nation Partners) was engaged by EJE Architecture (EJE) to conduct a detailed site investigation (DSI) of 106 Bourke Street, Carrington (hereafter referred to as the "site"). The DSI has been requested by the Department of Planning and Environment to EJE as part of the Development Application (DA) submitted for the proposed restoration works at the site. These comprise encapsulation works in the Carrington Hydraulic Engine House (CHEH) main hydraulic engine room, installation of a new accessible entry ramp and new interpretative landscape features (not within the building).

The site's location is shown on the attached **Figure 1**. The scope of the intrusive DSI is limited to investigation areas of the site, which are potentially being disturbed by the works (refer to **Figure 2**).

Objectives

The objectives of this DSI were to:

- Identify whether contamination may be present at the site as a result of current or historical activities; and
- If contamination is suspected to be present, to characterise the nature and extent of contamination at the site.
- Assess the potential for contamination (if present) to migrate offsite and adversely impact sensitive receptors.
- Assess the risks to human health and the environment under the site's land use.

Nation Partners understands that no changed land use is proposed as part of the development and that the site is zoned SP1 Special Activities in accordance with former Three Ports State Environmental Planning Policy (SEPP), now SEPP (Transport and Infrastructure, 2021). Nation Partners adopted a commercial/ industrial land use as the target land use for the investigation.

Scope of Work

To meet the above objectives, the following scope of work was completed:

- **Desktop Assessment**
  - Reviewed historical and publicly available information for the site, including public databases and registers, and existing reports held by Port of Newcastle (PON) that provide information and data regarding the contamination conditions of the site. A sampling plan was prepared and provided to EJE with proposed sampling locations; and
  - Reviewed previous investigation reports provided by PON, these are listed below:

    Carrington Hydraulic Engine House Sub-floor Remediations Assessment (AIS, 2022);

    Port of Newcastle Baseline Contamination Site Assessment -Stage 1 Summary Report (GHD, 2015):

    *Port of Newcastle Baseline Contamination Assessment - Vacant and Operational Lands – Stage 2 Summary Report (*GHD, 2017*): and*

    Statement of Environmental Effects – Proposed Stage 3 Restoration Works to the Carrington Hydraulic Engine Room (ADW Johnson, 2022).
- **Job Safety and Environmental Analysis**
  - Preparation of a job safety and environmental analysis (JSEA) covering specific health, safety, and environmental hazards associated with the site investigation works;
  - Performed a Before You Dig Australia (BYDA) search to inform potential sampling constraints and preferential pathways; and
  - Reviewed underground services location plan provided by PON.

- **Investigation Works**
  - Identified sampling locations and located underground services in collaboration with PON prior to ground disturbance;
  - Collection of 14 soil samples from 8 different locations within the main engine room, the proposed external ramp area, adjacent to the façade and the western side of the building. Sampling locations are detailed in **Figure 2**;
  - Implemented decontamination and quality control procedures in accordance with relevant guidelines and standards, see **Section 6.2** for details; and
  - Submission of soil samples for analysis by a National Association of Testing Authorities (NATA) accredited laboratory.
- **DSI Reporting**
  - Preparation of this DSI report in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* and the *Contaminated Land Guidelines – Consultants Reporting on* Contaminated *Land* (NSW EPA, 2020).

Conclusions

Based on the review of available information for the site and its history, site observations, and the results from data collection activities undertaken for this DSI, Nation Partners presents the following conclusions with respect to the assessment of contamination at the site:

- Fill material surrounding the CHEH in the investigation area was shown to have no exceedances of both health and ecological investigation criteria.
- Soil material within the main engine room as shown to be contaminated by lead, with concentrations exceeding health investigation levels. Further exceedances of total recoverable hydrocarbons and benzo(a)pyrene were observed when compared with ecological screening levels.
- Groundwater at the site historically did not record concentrations of contaminants that would indicate linkage to the contamination present at the site. Exceedances noted in previous investigations (GHD, 2017) were considered a result of historical commercial and industrial land use in the area.
- No potential asbestos containing material was observed within the investigation area, nor was asbestos reported in soil samples submitted for analysis, but past assessments noted that asbestos was still present within the floor grates and sub-floor cavity floor surface of the main engine room of the building. Therefore, the investigation cannot disregard the potential for asbestos to be present.
- The nature and extent of contamination at the site corresponds to the depth and extent of fill material present at the site. The data available is limited and not sufficient to assess the vertical extent of contamination at the site. Still, based on the desktop review it appears that vertical contamination is potentially limited to the depth of fill material present at the site.
- Based on the results of the DSI, the revised conceptual site model (CSM) for the site indicates viable source-pathway-receptor (SPR) linkages for current and future site workers, visitors, and trespassers who may be accessing the site and disturbing soils at the main engine room. PON is currently mitigating the risk posed by the existing contamination by requiring visitors to follow a set of health and safety protocols. Additionally, the contamination will be contained as part of the proposed stage 3 restoration works, mitigating the risks to receptors. On this basis the potential risks to human health and ecological receptors, and to PON as the land manager of the sit, are considered low.

Recommendations

Based on the conclusions presented above, Nation Partners provides the following recommendations to EJE for the management of contamination at the site:

- If contamination remains beneath the proposed encapsulation concrete slab in the main engine room, the land manager should prepare a long-term Environmental Management Plan (EMP) to ensure the ongoing protection of receptors. The EMP should be prepared in accordance with NSW EPA (2020) and shall, as a minimum, include controls to be implemented during any future maintenance activities on the site, including excavations; and
- If soils within the main engine room were to be removed, these should be managed following the NSW EPA waste classification guidelines and disposed to an approved licensed facility.

Acronyms and Abbreviations

ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
B(a)P	Benzo(a)pyrene
BTEX	Benzene, Toluene, Ethylbenze and Xylene
CoC	Chain Of Custody
CLM	Contaminated Land Management
CSM	Conceptual Site Model
DA	Development Application
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DP	Deposited Plan
DBYD	Dial Before You Dig
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DTW	Depth To Water
EIL	Environmental Investigation Level
EPA	Environment Protection Authority
GPS	Global Positioning System
HCB	Hexachlorobenzene
HIL	Health Investigation Level
HSL	Health Screening Level
JSEA	Job Safety And Environmental Analysis
LCS	Laboratory Control Sample
LOR	Limit Of Reporting
m	Metre
mAHD	Metres Above Australian Height Datum
mBGL	Metres Below Ground Level
MGA	Map Grid of Australia
µm	Micrometres
mg/kg	Milligram Per Kilogram
mm	Millimetres
NATA	National Association Of Testing Authorities

NEPC	National Environmental Protection Council
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticide
OPP	Organophosphorous Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PID	Photo-Ionisation Detector
ppm	Parts Per Million
POEO	Protection Of The Environment Operations
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
SPR	Source-Pathway-Receptor
TEQ	Toxic Equivalence Quotient
TRH	Total Recoverable Hydrocarbons

Table of Contents

1 Introduction

1.1 Background

EJE Architecture (EJE) was commissioned by PON to manage stage 3 restoration works at the Carrington Hydraulic Engine House (CHEH), 106 Bourke Street, Carrington (hereafter referred to as 'the site'). The Department of Planning requested further contamination information to inform the Development Application (DA) for the aforementioned restoration works, Nation Partners was engaged by EJE to undertake a DSI of the site to fulfill this request.

The site is located on Lot 30 of Deposited Plan (DP) 11900075 and the investigation area affected by restoration works featured the main engine room and soils on the western edge and southern façade as detailed in **Figure 2**. The site is owned by the NSW Treasury through a holding company named Port of Newcastle Lessor Pty Ltd (Port Lessor). Port Lessor subsequently granted a 98 year lease of their land, including the site, to Port of Newcastle (PON) who is responsible for the operations and management of the CHEH. The site covers an area of approximately 800 square metres (m^2) and is zoned SP1 Special Activities under the State Environmental Planning Policy (SEPP) (Three Ports) under the *Newcastle Local Environmental Plan (2012)*.

Based on the information provided by EJE, the CHEH building is currently vacant, and the main engine room is not accessible to the public due to asbestos contamination identified within the floor grates and sub-floor cavity floor surface of room. The building has gone through two conservation projects, a large masonry conservation repair to the south façade and the accumulator tower during 2018 to 2019 and masonry conservation works to the north, east and west facades during 2021. Lead paint was removed during the 2021 works. Additionally, extensive asbestos removal works were undertaken internally, with most parts of the building now free of asbestos with the exception of the main engine room. It is also understood that the steel floor framing of the main engine room presents poor structural integrity with almost all the columns supporting the cast-iron grates being corroded more than 90% of their sectional area at their base.

PON engaged Verico Asset Integrity Services (AIS) to conduct a remediation options analysis which concluded that the encapsulation of asbestos hazards underneath a floating concrete slab was the best overall option to remediate the asbestos contamination. As a state regulatory requirement, EJE engaged ADW Johnson Pty Ltd to prepare and lodge DA 22/6312 for the proposed stage 3 restoration works on 5 May 2022 to the Department of Planning and Environment. The DA comprised a statement of Environmental Effects (SOEE) which described the Stage 3 restoration works, including the asbestos encapsulation, the installation of a new accessible entry ramp at the site and new landscape features at other locations within the port (not within the building) considered exempt development in accordance with SEPP, 2012.

This DSI will address the source, nature and extent of contamination within the investigation areas of the site and assess potential risks to the environment and human health under the site's current land use.

1.2 Objectives

The objectives of this DSI were to:

- Identify whether contamination may be present at the site as a result of current or historical activities; and
- If contamination is suspected to be present, to characterise the nature and extent of contamination at the site.
- Assess the potential for contamination (if present) to migrate offsite and adversely impact sensitive receptors.
- Assess the risks to human health and the environment under the site's land use.

1.3 Scope of Work

To meet the above objectives, the following scope of work was completed:

- **Desktop Assessment**
  - Reviewed historical and publicly available information for the site, including public databases and registers, and existing reports held by PON that provide information and data regarding the contamination conditions of the site. A sampling plan was prepared and provided to EJE showing proposed sampling locations; and
  - Reviewed previous investigation reports provided by PON, and these are listed below:

    Carrington Hydraulic Engine House Sub-floor Remediations Assessment (Verico AIS, 2022);

    Port of Newcastle Baseline Contamination Site Assessment - Stage 1 Summary Report (GHD, 2015);

    *Port of Newcastle Baseline Contamination Assessment - Vacant and Operational Lands – Stage 2 Summary Report (*GHD, 2017*); and*

    Statement of Environmental Effects – Proposed Stage 3 Restoration Works to the Carrington Hydraulic Engine Room (ADW Johnson, 2022).
- **Job Safety and Environmental Analysis**
  - Preparation of a job safety and environmental analysis (JSEA) covering specific health, safety, and environmental hazards associated with the site investigation works;
  - Performed a Before You Dig Australia (BYDA) search to inform potential sampling constraints and preferential pathways; and
  - Reviewed underground services location plan provided by PON.
- **Investigation Works**
  - Identified sampling locations and located underground services in collaboration with PON prior to ground disturbance;
  - Collection of 14 soil and asbestos samples from 8 different locations within the main engine room, the proposed external ramp area, adjacent to the façade and the western side of the building;
  - Implemented decontamination and quality control procedures in accordance with relevant guidelines and standards; and
  - Submission of soil samples for analysis by a National Association of Testing Authorities (NATA) accredited laboratory.
- **DSI Reporting**
  - Preparation of this DSI report in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* and the *Contaminated Land Guidelines – Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

1.4 Legislation, Standards and Guidelines

Relevant guidelines and standards made by the NSW Environment Protection Authority (EPA) have been adopted in undertaking this DSI. The documents are listed on the NSW EPA website (https://www.epa.nsw.gov.au/your-environment/contaminated-land/statutory-guidelines) and, as of August 2022, comprise:

- *Consultants reporting on contaminated land: Contaminated land guidelines* (NSW EPA, 2020);
- *Guidelines for the NSW Site Auditor Scheme, 3rd edition* (NSW EPA, 2017);

- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (NSW EPA, 2015); and
- *Sampling design guidelines* (NSW EPA, 1995)[1].

Another guideline approved by the NSW EPA and adopted for this DSI include:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 No. 1* (NEPM; NEPC, 2013).

Other relevant standards and guidelines considered in the development and implementation of this DSI include:

- *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soils – Non-Volatile and Semi-Volatile Compounds* (Australian Standard AS 4482.1-2005);

[1] It is noted that the Sampling Design Guidelines were recently updated by NSW EPA. However, the investigation works for the site were scoped prior to release of the updated guidelines.

2 Site Information

2.1 Site Location and Description

Table 2.1 summarises location and legal identification information for the site.

Table 2.1 : Site Location and Identification

Current Site Owner:	Port of Newcastle
Current Site Occupier:	None, the site is currently vacant
Physical Address:	106 Bourke Street, Carrington
Coordinates:	384910.57 m Easting, 6357465.21 m Northing (approximate centre of site) Map Grid of Australia (MGA) Zone 56
Legal Identification:	Part Lot 30 DP 1190075
Site Area:	Approximately 800 m^2
Local Government Area:	City of Newcastle
Zoning:	SP1 Special activities in accordance with SEPP (Transport and Infrastructure)

The site is comprised of the Carrington hydraulic main engine room, and the soils adjacent to the façade and the western perimeter of the CHEH. The location of the site is shown on **Figure 1**, with the layout shown on **Figure 2**.

The land adjacent to the site is characterised by:

- North: Engine House Road, followed by TOLL Express;
- East: PON Dyke Berths 1 and 2;
- South: PON rail tracks, followed by the West Berth; and
- West: Bourke Street, followed by residential properties.

The surrounding land is characterised primarily by commercial and industrial land use to the north, south and east. Land use to the west was characterised by mostly low density residential.

2.2 Current and Historical Land Use

The CHEH is currently vacant, and the main Engine Room sealed off from human access due to an asbestos hazard present within this room. The public plaza is open and in use for casual public visitors.

Historically, the CHEH was built in 1877 and housed the first large scale hydraulic power system to be established in Australia, providing power for the original coal loading cranes along Dyke Point. The CHEH was in operation from its construction in 1877-1878 until its decommissioning in 1967, when the Basin Coal Loader replaced all hydraulic and electric cranes.

Currently vacant, limited original equipment still exists within the CHEH, with one small remnant motor in the generator room, some metal fixtures, gangways and ladders mounted to the internal walls, and various pipework and fragments of industrial archaeology extant in the main engine room sub-floor cavity.

The CHEH is located on the north side of Newcastle Harbour and is situated approximately 100m west of dyke 1. The building is orientated to face Honeysuckle and is prominently viewed from this

hospitality precinct to the south across the water. To the south of the building are PON operational railway lines followed by wharf frontage.

The building is situated approximately 50 south west of the main personnel entry to the PON district and features an open grassy patch surrounded by landscaped gardens and a hardstand section directly in front of the front entrance.

2.3 Environmental Setting

2.3.1 Topography and Hydrology

Topographic contours for the local area indicate that the site elevation is approximately 2 metres (m) Australian Height Datum (AHD). The site itself is generally flat, and currently drains into existing stormwater systems.

2.3.2 Soils, Geology and Hydrogeology

The site is mapped in the NSW 1:100,000 State-wide Geological Series as being man-made fill on Quaternary deposits.

The subsurface conditions at the site are characterised as uncontrolled fill comprising of a mixture of fine sand, gravel and cobble sized particles overlying firm to stiff clays encountered between at about 4-5m depth overlying medium dense sands. Groundwater has previously been encountered at approximately 1.5m depth. (ADW Johnson, 2022)

Based on the GHD, 2017 report, Groundwater depth within the Carrington precinct ranges from 0.5 – 3 metres below ground level (mBGL), and is tidally influenced due to its close proximity to the foreshore. Groundwater flow direction appears to fluctuate dominated by the three main bodies of water: Throsby Creek, the Basin and the Hunter River.

2.3.3 Sensitive Environmental Receptors

The primary sensitive receptors at and adjacent to the site are the residential properties to the east, visitors, workers and trespassers to the site.

Stormwater is potentially discharged into Hunter River, located approximately 200m south of the site. Groundwater potentially migrates towards Throsby Creek, the Basin and the Hunter River.

2.3.4 Acid Sulfate Soils

NSW Planning Portal Acid Sulphate Soils Mapping (2022) indicates that the site is not identified as being affected by acid sulphate soils (ADW Johnson, 2022)..

3 Site History and Condition

3.1 Historical Business Directories

A search of GHD's *Stage 1 Baseline Contamination Summary* (2015) and *Google Maps* (2022) revealed the following potentially contaminating sites:

Table 3.1 : Registered Businesses with Historical Contamination Issues within the Carrington Precinct (Google Maps, 2022)

Location	Business Activity	Contaminants of Concern[2]
117 – 121 Bourke Street and 92 Hill Street, Carrington	Civil Infrastructure – Historical filling in the Carrington precinct including furnace slag and dredge materials. Former use of the site as engineering works.	Soils - elevated copper, lead, BaP, PAHs, TRH. Groundwater - elevated copper, lead and zinc, TRH and PAHs (incl BaP) Extent of impacts not fully assessed
Dyke Point Containment Cell and Pasminco Ship Loader (Dyke Berth 2) Dyke Road, Carrington	Historic filled/reclaimed area of Dyke Point. Capped landfill cell – Comprises contaminated soils from former dockyard bridge abutments in a containment cell. Spills and leaks around fuel filling manifolds and leaks from underground gas pipeline (Dyke Point Berths) and mobile fuelling tank (Bradken Resources) Current and historical railway use	Soils – elevated TPH above guidelines. Asbestos over HILs, zinc above EILs and TRH above ESLs. Groundwater – elevated TPH, PAHs. Arsenic, copper and zinc above ANZECC (2000) marine water guidelines. Investigations limited to date.
Forgacs Dockyard, 81 Denison Street, Carrington	Historical filling in the Carrington precinct including furnace slag and dredge materials. Former use by Forgacs as a ship maintenance facility. Current/ historical bulk and non-bulk storage – leaks, spills from diesel and USTs/pipework. Historical filling in the Carrington precinct including furnace slag and dredge materials. Denison Street portion used for ship maintenance facility. Waste management – spilt grit blasting sand Wastewater and stormwater management - leaks and spills of contaminated wastewater into underlying soils/groundwater.	Previous investigations identified TPH, PAHs, lead, TBT across the rest of the Forgacs site.
NAT vacant land, Bourke Street, Carrington	Use of historical fill. Historical ore handling practices and use as a rail yard. Historical coal tar pavement along western boundary. Storage of fuels and oils in ASTs and drums.	Soil – elevated heavy metals. Groundwater – elevated copper, lead, cadmium, nickel and zinc above ANZECC (2000) marine water guidelines.

[2] Underground Storage Tanks (USTs) Above Ground Storage Tank (AST), benzo(a)pyrene (BaP), polycyclic aromatic hydrocarbons (PAHs), Total Recoverable Hydrocarbons (TRH) Total Petroleum Hydrocarbons (TPH), Health Investigations Levels (HILs), Ecological Investigation Levels (EILs), Ecological Screening Levels (ESLs) Australian and New Zealand Environment and Conservation Council (ANZZECC), tributyltin (TBT)

3.2 Historical Maps and Aerial Photography

A review of historical documents provided in GHD's *Baseline Contamination Site Assessment Vacant and Operational Lands Stage 2 Summary Report* (2017) provided the following summary of historical site uses for the Carrington precinct:

- The Carrington precinct was formed in the 1800s upon land reclaimed utilising ballast and dredged sand and was complete by 1874;
- Historically, the precinct has been utilised for coal exports until 1989, when the Basin Coal Loader ceased operations. Port Waratah Coal Services (PWCS) continues to utilise the precinct for these purposes;
- In 1968, the northern portion of the precinct housed coal stockpiling facilities, these activities remained until 1976 when PWCS acquired operations and expanded their coal exporting capacity through the construction of Dyke Berths 4 and 5;
- The southern section of the precinct has historically been dominated by ship building activities, and the export of coal, metals and ores;
- The eastern basin was historically used for coal loading;
- The western basin was initially dominated by railway until 1975, where it was replaced by its current configuration;
- Commercial Metals Company (CMC) site has been utilised for engineering and iron founding from 1903 to present; and
- The Dyke 2 original wharf (located at the northern end of Dyke Point) was historically used for coal storage until 1982 when it was utilised as a mineral ore storage facility and loader. In 2003, Carrington Facilities Pty Ltd occupied the wharf, and then Conports. Both utilised the wharf for receipt, storage and ship loading facilities for bulk mineral concentrates.

Historical imagery provided by Metromap (2022) from 2007 to present illustrates no obvious construction within the precinct.

3.3 Government and Regulatory Searches

Seven sites were identified within the list of NSW contaminated sites notified to EPA where regulation under the *Contaminated Land Management Act 1997* (CLM Act) was not required (Lotsearch, 2022):

- CMC Australia Pty Ltd, 100 m west of the site;
- Carrington Redevelopment Site, 600 m northwest of the site;
- Forgacs Dockyard, 700 m southwest of the site;
- NAT Vacant Land, 220 m east of the site;
- Dyke Point Containment Cell, approximately 400m southeast of the site;
- Carrington Coal Tar Pavements, 100 m northeast of the site; and
- Pasminco Ship Loader, 280 m northeast of the site.

3.4 Previous Investigations and Assessments

- **Statement of Environmental Effects (ADW Johnson 2022)**

Verico AIS completed a hazardous materials survey within the CHEH during June 2018. This survey analysed 87 dust, dirt and debris samples collected from areas within the CHEH, 22 of these samples contained asbestos fibre (Ampcontrol Report – Port of Newcastle, Carrington Engine House, Dust Sampling Report Rev 3, June 2018).

PON undertook extensive internal asbestos removal works, clearing all parts of the building of an asbestos hazard, except for the main engine room. The main engine room has been cleaned of asbestos from the ceiling down to the level of the floor grates, however, inspections have found there were asbestos fragments embedded in the sub-floor surface and potentially contaminated dirt and debris was present within the cast iron floor grates.

Decontaminating the floor grates and removing the embedded asbestos fragments from the floor surface was considered impractical and work was ceased to consider alternative options.

The main engine room has been sealed, and access only allowed under controlled conditions and using appropriate personal protective equipment.

Asbestos cement fragments embedded in the sub-floor surface are bound in a solid bituminous like material and were considered a bonded asbestos material. As such, they will only become a health hazard if acted upon by a mechanical action to disturb the asbestos fibres.

Asbestos fibre within the dirt and debris associated with the cast iron floor grates will not be bonded and can be liberated into the air if disturbed. This material can be considered as friable asbestos containing material.

Through a rigorous options analysis process, Stage 3 Restoration Works to encapsulate the asbestos hazard underneath a floating concrete slab has been selected as the best overall solution to the current issues the building faces (as opposed to removal of the asbestos material from the site entirely), however there is no proposed remediation of land associated with the development.

The previous restoration works also identified lead paint within the building, but this was removed as part of the Stage 2 works.

The SOEE concluded that the proposed restoration works illustrates that the proposal will satisfy both statutory and merit-based planning considerations.

- **FID1016 – Port of Newcastle – AEST96642 – Verico-Final Report (Verico AIS, 2021)**

Australian Safter Environment & Technology Pty. Ltd. (ASET) tested two samples for analysis for asbestos. The samples were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method. Both samples consisted of a fragment of hard cement material that was used as packing between sandstone blocks and columns. Neither sample had asbestos detected.

- **CHEH Ext Brick Mortar report (Verico Ais, 2021a)**

Representative sampling of the mortar between the bricks on the west, east and north sies of the CHEH was carried out in January 2021. Eight samples were collected. No asbestos was detected in the samples collected.

- **Baseline Contamination Study (GHD, 2015 & 2017)**

PON commenced its 98-year lease of the Port Lands from the NSW Government on 30 May 2014. In relation to clauses in the lease, PON required an understanding of the contamination status of the Port Lands to inform contamination provisions in the lease. Further to this, PON had approximately 200 hectares of vacant land available to lease, and required an understanding of the potential risks to lessees (and their operations) and to be able to understand if lessee activities have exacerbated existing contamination or generated new contamination. These investigations culminated in a Baseline Contamination Study and featured two stages:

- Stage 1 – Desktop Study and Gap Analysis
- Stage 2 – Field Investigations

Seven soil samples were collected from the site as a part of these field investigations and exceedances were observed in three of these samples when compared to the NEPM 2013 EIL - Commercial/Industrial criteria. CAH_MW02_0.0-0.2 saw exceedances of copper and zinc (453 mg/kg and 2500 mg/kg respectively), CAH_MW2_1.5-2.0 saw exceedances in nickel (61 mg/kg) and CAH01_0.05-0.2 saw an exceedance in zinc (653 mg/kg). Asbestos was below the limit of reporting (LOR) in one sample

(CAH01_0.05-0.2) and above the LOR in another sample (CAH01_0.5-0.7.) Soil samples from deeper soils (1.5m – 2.2m) were collected at locations CAH_MW01 and CAH_MW02, concentrations of heavy metals such as arsenic, copper, lead and zinc were below the relevant criteria.

Three groundwater samples were collected from the site as part of these field investigations, and samples were analysed for heavy metals, TRH, BTEXN, PAHs, pesticides and, polychlorinated biphenyls (PCBs). Only concentrations of heavy metals were detected. Exceedances were observed in two of the samples when compared to the NEPM 2013 Table 1C GILS, Marine Waters criteria. CAH_MW1 saw exceedances in arsenic, copper, nickel and zinc (0.048, 0.002, 0.01 and 0.112 mg/L respectively) and CAH_MW02 saw exceedances in copper (0.003 mg/L). Lead concentrations were below the laboratory LOR.

The report concluded that despite exceedances of the GILs for metals across all precincts, these impacts were considered to be associated with historical filling and industrial use and were not considered to be an issue for commercial/industrial land use. Asbestos impacts were considered to pose a low risk to human health based on the low concentrations and limited site usage.

4 Assessment Methodology

4.1 Potential Contamination Sources

Based on the information summarised in **Section 3**, the following onsite areas were identified as primary sources of potential contamination:

- Contamination associated with historical activities inside the main engine room, primarily the hydraulic power system which was operational from its construction in 1877-1878 until its decommissioning in 1967;
- Asbestos and lead within the main engine room, although the main engine room has been cleaned from the ceiling down to the level of the floor grates, inspections have found asbestos fragments embedded in the sub-floor surface and potentially contaminated dirt and debris was present within the cast iron floor grates; and
- Fill material surrounding the main engine room.

Based on the information available, potential offsite sources of contamination were identified as widespread activities associated with extensive historical industrial use, including coal handling and stockpiling, railway activities, exportation of coal, metals, ores and minerals.

4.2 Potential Contaminants of Concern

Based on the potential contamination sources described above, in **Section 4.1**, the following contaminants of concern were identified for the DSI:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury);
- TRH and BTEX;
- PAH;
- Organochlorine pesticide (OCP) and organophosphorus pesticides (OPP)
- PCBs; and
- Presence / absence of asbestos in soil;

4.3 Potential Receptors

Based on the condition, environmental setting and proposed remediation of the site, the following potential receptors to contamination at the site (if present) were identified:

- Visitors, maintenance and construction workers and trespassers; and
- Throsby Creek, the Basin and Hunter River

4.4 Preliminary Conceptual Site Model

A conceptual site model (CSM) describes the contamination sources, impacted media, receptors and linkages between the sources and receptors (NEPC, 2013). A CSM is an essential element for contaminated site assessments as it details the potential mechanisms by which contamination can migrate in the environment and impact human and environmental receptors, and the corresponding need for remediation and/or management activities. The NEPM (NEPC, 2013) provides guidance on the development of CSMs for contaminated sites, noting that the purpose of the CSM is to identify existing or potential complete pathways between known or potential contamination sources and receptors. Essential elements required in a site contamination conceptual model include (NEPC, 2013):

- Known and potential sources of contamination and contaminants of concern;
- Environmental media known or potentially impacted by contamination;

- Contaminant migration and exposure pathways; and
- Existing or potential future human and environmental receptors.

A critical concept in the development and application of contamination CSMs is the source – pathway – receptor relationship informed by known and potential sources of contamination, the environmental media impacted by contamination, potential migration and exposure pathways, and the receptors that may be exposed to contamination. In situations where the source – pathway – receptor (SPR) relationship is incomplete there can be no risk to receptors from contamination, and as a result remediation and/or management is not required.

Table 4.1 presents the potential SPR linkages identified for the site from information on the site's history and current conditions and setting and used to develop the preliminary CSM for the site. The data collected through the DSI will be used to refine the preliminary CSM presented in **Table 4.1**.

Table 4.1 : Preliminary CSM

Contaminant Source and Media	Migration / Exposure Pathway	Receptors
Main Engine Room		
Contamination of surface and sub-surface soils and groundwater from historical activities / contaminated fill material / offsite contamination	Dermal contact / ingestion	Current and future site workers
	Dust / odour / vapour inhalation	Current and future site workers
	Offsite migration via regional groundwater to aquatic receiving environments	Aquatic ecosystems associated with Throsby Creek, the Basin and the Hunter River.
Area adjacent to the building façade and the western perimeter		
Contamination of surface and sub-surface soils and groundwater from historical activities / contaminated fill material / offsite contamination	Dermal contact / ingestion	Current and future visitors, site workers and trespassers
	Dust / odour / vapour inhalation	Current and future visitors, site workers and trespassers
	Offsite migration via stormwater runoff and regional groundwater to aquatic receiving environments	Aquatic ecosystems associated with Throsby Creek, the Basin and the Hunter River.

4.5 Data Quality Objectives

The DSI was designed using the Data Quality Objective (DQO) process endorsed by the NSW EPA and described in the *Guidelines for the NSW Site Auditor Scheme (3rd Edition)* (NSW EPA, 2017) and Australian Standard AS4482.1-2005. The DQO process is a seven-step planning approach to sampling design for data collection activities that support decision making.

The approach taken by Nation Partners in accordance with the DQO process is presented below.

Step 1. Define the Problem

This step defines and describes the problem, identifies the planning team, develops the CSM and identifies the data needed, resources, constraints and deadlines of the project.

Objective:	Gather sufficient data to: • Identify whether contamination may be present at the site as a result of current or historical activities; • If contamination is suspected to be present, to characterise the nature and extent of contamination at the site; • Assess the potential for contamination (if present) to migrate offsite and adversely impact sensitive receptors. • Assess the risks to human health and the environment under the site's land use.
Contamination Issue:	Current and former uses of the site may have resulted in contamination of soils and/or groundwater at or adjacent to the site. Based on site information provided by PON, previous investigations by Verico AIS (2022) and GHD (2017) and Nation Partners' field work investigation, possible sources of contamination at the site are summarised in **Section 4.1**.
Project Driver:	EJE wishes to understand the contamination condition of the site and satisfy the Department of Planning and Environment's request for a DSI with regard to the DA for the proposed restoration works at the CHEH.
Project Team:	Nation Partners Project Director: Luke Clements Nation Partners Project Manager: Laura Martinez Nation Partners Environmental Consultant: Nelson Phillips
CSM:	The CSM is included in **Section 4.4** of this report.
Resources and Project Timeframes:	The project resources/personnel have been listed above. The fieldwork investigation was completed in August 2022. Site investigation activities targeted the areas to be disturbed as part of the Stage 3 Restoration works and included the collection of soil samples. The landscape features work's area was not assessed as these are not located within or near the building and these have been exempted in accordance with SEPP, 2012.
Community Concerns:	No particular concerns, however due to the heritage status of the CHEH, intrusive internal works are limited.
Approvals Requirements:	No approval was required from any external regulatory authorities to undertake the DSI. Nation Partners liaised with PON as the land manager.

Step 2. Identify the Decision

This step identifies the key questions and objectives of the study, alternative actions or outcomes that may result based on the outcomes.

Decision Statements	The output of the investigation must be suitable to answer the following questions with regards to the media of concern: • Is contamination present at the site, and to what extent? • What media are potentially contaminated that could represent a risk to human or environmental receptors, to PON as the land manager, or to future development? • What risks, if any, does the contamination represent to human health or the environment in the context of the site's land use?
Guidelines	The relevant guidelines have been described in **Section 1.4** and environmental and human health criteria have been outlined in **Section 4.6**.

Step 3. Identify Information Inputs

This step is used to determine the types and sources of information needed to inform the study, specify performance or acceptance criteria, and determine the availability of appropriate sampling and analyses methods.

Types and Sources of Information	• Information contained in the proposal (Nation Partners, 2022) • Land use history (refer **Section 2**) • Previous environmental assessments and investigation data for the site (refer **Section 3.4)** • Use of field investigation techniques to assess the presence of contamination (soil sampling) • Visual observations of waste materials and condition of soils • Screening with a photo-ionisation detector (PID) to assess the potential presence of volatile contaminants • Observations, descriptions, photographs, logging, and sample data to describe the type, extent, volume, distribution, and speciation of contamination
Target Media	Soil (groundwater to be assessed via desktop review of existing data)
Contaminants of Concern	The contaminants of concern to be investigated are: • 8 metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury); • TRH/ BTEX; • PAH; • OCP/ OPP; • PCB; and • Presence / absence of asbestos in soil;
Receptors of Concern:	Potential receptors that were considered by the study include: • Current and future visitors; • Workers / contractors associated with the remediation of the main engine room; • Maintenance workers; and • Nearby bodies of water such as Throsby Creek, the Basin and Hunter River.
Assessment Criteria:	The soil quality criteria have been outlined in **Section 4.6.1**
Sampling and Analysis Methods:	Appropriate sampling and analysis methods were identified for the investigation and are described in **Section 5.2**.

Step 4. Define the Boundaries of the Study

This step identifies the spatial and temporal boundaries and access constraints for the investigation.

Spatial Limit:	The spatial boundary of the site is shown in **Figure 1**. The vertical limit of the investigation was the depth of sampling locations described in **Section 5.**
Temporal Limit:	The temporal boundary of the investigation was the period in which sampling was conducted (August 2022).
Access Constraints:	The site is managed by PON and access to the site for sampling was guaranteed.

Step 5. Develop the Analytic Approach

A decision rule based on both qualitative and quantitative information describing the condition of the site with measurable evaluation criteria.

Decision Rules	The decision rules have been developed based on the underlying project drivers and the corresponding objectives of the site investigation program. The decisions required include:

	• Whether contamination exists in soil at the site that could present a risk to human or environmental receptors, or to PON as the land manager; and • If there is potential for contamination (if present) to migrate offsite and adversely impact sensitive receptors. The site will be considered to not pose a risk if analytical results, considered in the context of the site observations and field screening protocols, for the media sampled and analysed are less than the assessment criteria adopted for the investigation (refer **Section 4.6**). Where exceedances of the adopted site assessment criteria are identified, these will be assessed in the context of the current and projected future land use (commercial / industrial land use) to assess the potential risks to receptors.

Step 6. Specify Performance or Acceptance Criteria

This step aims to specify the performance or acceptance criteria for the data in order to minimise the possibility of making erroneous decisions or failing to keep uncertainty within acceptable limits, and to specify acceptable limits of uncertainty.

Documentation and Data Completeness:	• Appropriate sampling locations are selected that target areas of potential contamination • Sampling locations are adequately documented • Completion of field records, chain of custody forms, lab test certificates from National Association of Testing Authorities (NATA) registered laboratories • Samples analysed for appropriate contaminants of concern
Data Comparability:	• Use of a NATA certified laboratory using NEPM procedures • Use of a NATA certified check laboratory • Use of appropriate sampling, storage and transportation of samples
Data Representativeness:	• Collection of representative samples from each sampling location • Collection of representative samples from targeted locations and ensuring that targeted sampling is considered in the correct context (i.e. representative of the area of environmental concern (AEC) and not necessarily of the broader site) • Use of appropriate techniques for the sampling, storage and transportation of samples
Precision and Accuracy:	• Use of appropriately trained experienced and qualified field consultants • Collection of QA and QC samples at a minimum rate of 10% • Achieve laboratory QC criteria • Matrix and surrogates return acceptable results • Laboratory duplicates are within acceptable ranges • Blind field duplicates are within acceptable ranges • Laboratory limits of reporting (LORs) or practical quantification limits (PQLs) are within acceptable ranges

Step 7. Develop the Detailed Plan for Obtaining Data

This step combines all the information and outputs to design a sampling and analysis program to obtain the data required to achieve the performance or acceptance criteria and achieve the objectives of the investigation. The investigation approach and methodology are presented in **Section 5**.

4.6 Assessment Criteria

The following section outlines the assessment criteria adopted for this DSI based on the commercial/industrial characteristics of site and its surrounds. The criteria have been sourced from the NEPM (NEPC, 2013) or derived from guidance identified in **Section 1.4.**

4.6.1 Soil Assessment Criteria

For the purposes of this DSI soil assessment criteria were adopted from the NEPM *Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater* (NEPC, 2013), which have been

endorsed by the NSW EPA. The NEPM guidelines (NEPC, 2013) provide investigation levels and screening levels for the protection of human health (Health Investigation Levels [HILs] and Health Screening Levels [HSLs]) and for the protection of ecosystems (Ecological Investigation Levels [EILs] and Ecological Screening Values [ESL]) for a range of contaminants and land use scenarios.

Health investigation levels (HILs) are generic and apply across Australia to all soil types generally to a depth of 3 m below surface. Health screening levels (HSLs) for petroleum hydrocarbons depend on physicochemical properties of soil as it affects hydrocarbon vapour movement in soil and the characteristics of building structures. They apply to different soil types, land uses and depths below surface to >4 m and have a range of limitations. Ecological investigation levels (EILs) depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2m of soil, which corresponds to the root and habitat zone of most ecological species. Ecological screening levels (ESLs) for petroleum hydrocarbon materials broadly apply to coarse and fine grained soils and various land uses. They are applicable to the top 3m of soil.

Investigation and screening levels provide the basis for a Tier 1 assessment as defined in the NEPM (NEPC, 2013), which involves the comparison of representative site data for concentrations of contaminants with generic investigation and screening levels for nominated land use scenarios to determine the need for further assessment or management.

The land use scenario applicable to the site is ***commercial/industrial land use***, so the soil criteria adopted for this DSI were HIL(D) and HSL(D).

EILs have been developed for selected metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. The EILs adopted, as shown in **Table 4.2**, are based on generic criteria and soil-specific criteria.

Table 4.2 summarises the soil assessment criteria adopted for this DSI.

Table 4.2 : Adopted Soil Assessment Criteria (mg/kg)

Contaminant of Concern	Human Health	Ecological	Criteria Derivation Notes
Heavy Metals			
Arsenic	3000	170	• Adopted human health criteria based on HIL(D)prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013); and • Adopted ecological criteria based on the EIL prescribed in the NEPM Schedule B(1), Table 1B(5) (NEPC, 2013), generic EIL in soils and a land use of 'commercial/industrial'.
Cadmium	800	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
Chromium (IV)	3000	-	• Value for chromium (VI) used for health-based criteria as a conservative measure; value for chromium(III) used for EIL; • Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial (NEPC, 2013); and
Copper	250000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) commercial/industrial land use (NEPC, 2013);
Lead	1500	1800	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013); and • Adopted ecological criteria based on the EIL prescribed in the NEPM Schedule B(1), Table 1B(4) (NEPC, 2013), generic EIL in soils and a land use of 'commercial/industrial'.
Mercury	4000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
Nickel	4000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
Zinc	400000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
OCPs and OPPs			
DDT + DDE + DDD	4000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
DDT	-	640	• Adopted ecological criteria based on the EIL prescribed in the NEPM Schedule B(1), Table 1B(6) (NEPC, 2013), soil-specific contaminant limits for a land use of 'commercial/industrial'.
Aldrin and Dieldrin	50	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
Chlordane	560	-	
Endrin	100	-	
Hexachloroben zene (HCB)	85	-	
Endosulfan	2,000	-	
Heptachlor	50	-	
Methoxychlor	2,700	-	
PCBs			
PCB	8	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
BTEX			
Benzene	3	95	

Contaminant of Concern	Human Health	Ecological	Criteria Derivation Notes
Toluene	-	135	• Adopted human health criteria based on HSL(D) for vapour intrusion prescribed in the NEPM Schedule B(1), Table 1A(3) for commercial/industrial land use in silt at depths 0 m to < 1 m (NEPC, 2013). • Adopted ecological criteria based on the EIL prescribed in the NEPM Schedule B(5), Table 1B(5) (NEPC, 2013), soil-specific criteria for fine soil and land use of 'Commercial and industrial'.
Ethylbenzene	-	185	
Total Xylenes	-	95	
TRH			
F1 Fraction (TRH C_6-C_{10} minus BTEX)	250	215	• Adopted human health criteria based on HSL(D) for vapour intrusion prescribed in the NEPM Schedule B(1), Table 1A(3) commercial and industrial land use in silt at depths 0 m to < 1 m (NEPC, 2013). • Adopted ecological criteria based on the ESL prescribed in the NEPM Schedule B(1), Table 1B(5) (NEPC, 2013), soil-specific criteria for fine soil and land use of 'commercial and industrial'.
F2 Fraction (TRH >C_{10}-C_{16} minus naphthalene)	-	170	
F3 Fraction (TRH C_{16}-C_{34})	-	2500	• Adopted ecological criteria based on the ESL prescribed in the NEPM Schedule B(1), Table 1B(6) (NEPC, 2013), soil-specific criteria for fine soil and land use of 'commercial and industrial'.
F4 Fraction (TRH C_{35}-C_{40})	-	6600	
PAHs			
Benzo(a)pyrene	40	1.4	• There is no separate HIL for benzo(a)pyrene in the NEPM therefore the adopted human health criteria is based on the benzo(a)pyrene toxic equivalence quotient (TEQ) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013). • The benzo(a)pyrene TEQ provides a toxicity- weighted sum of analyte concentrations for a specific list of PAHs in order to provide a single, objective concentration as an HIL; • Adopted ecological criteria based on the ESL prescribed in the NEPM Schedule B(1), Table 1B(6) (NEPC, 2013), soil-specific criteria for fine soil and land use of 'Urban residential and public open space'.
Total PAHs	4000	-	• Adopted human health criteria based on HIL(D) prescribed in the NEPM Schedule B(1), Table 1A(1) for commercial/industrial land use (NEPC, 2013).
Naphthalene	-	370	• Adopted human health criteria based on HSL(D) for vapour intrusion prescribed in the NEPM Schedule B(1), Table 1A(3) for commercial and industrial land use in silt at depths 0 m to < 1 m (NEPC, 2013). • Adopted ecological criteria based on the EILs prescribed in the NEPM schedule table 1B(4) for commercial and industrial land use (NEPC, 2013)

This DSI did not include the quantitative assessment of the percentage of asbestos in soils, and as such the criteria from the NEPM were not adopted for this assessment. Where potential asbestos is identified, the presence or absence of asbestos will be confirmed via laboratory analysis and the results discussed in the context of the NEPM criteria.

5 Investigation Approach and Methodology

This section describes the sampling plan undertaken by Nation Partners for the DSI. The investigation targeted the Stage 3 restoration works: the main engine room and proposed accessed entry ramp.

5.1 Investigation Scope

Nation Partners undertook soil hand augering and collection of samples on 24 August 2022.

PON service drawings were used to identify potential underground assets in conjunction with BYD plans obtained prior to the site investigation and valid for the dates of the investigation.

Sample types and locations are presented on the attached **Figure 2**. The location and number of samples collected, and the rationale for each sampling location, is described in **Table** 5.1**.** Photographs of the works are provided in **Appendix A – Photo Appendix.**

Table 5.1 : Summary of Sampling Program

Sample Media and Method	Number of Locations and Sample Identification	Rationale
Soil - Surface Sample (hand tools)	2 Locations (SB01-SB02)	• Given the nature of the soil material, accessibility and heritage issues in the main engine room, drilling was not possible • Two surface soils samples were taken using a trowel • Sample locations were chosen where sampling was possible and to best reflect the nature of contamination in the room
Soil – Hand Auger	6 locations (SB03-SB08)	• Six bore holes were excavated until refusal, to a depth of between 0.35 and 0.8 mBGL using a hand auger • Locations were chosen to best reflect the nature of the fill material that will be affected by restoration works surrounding the CHEH and to cover areas immediately adjacent to the main engine room.

5.2 Fieldwork Procedures

5.2.1 Health and Safety

A task specific JSEA, was prepared and implemented for the works. Personnel working in the field on the project were required to read, understand, sign and conform to the JSEA prior to and during the investigation.

5.2.2 Soil Sampling

The drilling works were conducted using a hand auger. Soil bores intended to achieve 1 mBGL depth or until natural material was encountered. Due to the nature of fill material, refusal due to large gravel pieces or geofabric material was encountered at depths between 0.35 and 0.8 mBGL. Surface soil sampling works using a trowel were conducted in the main engine room.

The following general procedures were adopted during soil sampling:

- Lithological soil logging was completed at each location, with bore logs included in **Appendix B – Bore Logs**;
- The presence of anthropogenic materials or indicators of contamination was recorded by the field consultant, and a photographic record of soils was taken (refer to **Appendix A – Photo Appendix**);
- Samples were placed in laboratory-supplied containers, filled to reduce headspace and transferred to an iced cooler for transport to the project laboratory under chain-of-custody (CoC) documentation;

- Reusable sampling equipment, including hand augers and trowels, was decontaminated between the collection of each sample and rinsate blank samples were collected to demonstrate decontamination;
- Investigation locations were recorded by Global Positioning System (GPS); and
- Investigation locations were reinstated by returning excavated spoil to the borehole.

5.2.3 Decontamination

The decontamination of re-usable sampling equipment, including hand augers and trowels, was undertaken between sampling locations. Decontamination was achieved by scrubbing equipment in a solution of Liquinox (PFAS-free detergent) and tap water. Rinsate samples were collected to demonstrate decontamination.

5.2.4 Data Review and Verification

All field data and laboratory analytical data was compiled and evaluated against the project DQOs upon completion of the site investigation. Laboratory results were checked for missing or incorrect data. Data was also checked and validated using ESdat online, **see Appendix D - Field QA/QC Assessment.**

5.3 Laboratory Analysis

Analytical laboratories accredited by NATA were engaged for the analyses of primary and secondary samples from site investigation activities as described in **Table 5.2.** The primary analytical laboratory was ALS Environmental (Newcastle, NSW) and the secondary analytical laboratory was Eurofins (Girraween, NSW).

Table 5.2 : Laboratory Analytical Schedule

Sample Type	Number of Primary Samples	Analytical Schedule
Soil (fill material)	10	TRH, BTEX, PAH, 8 metals, OCP/OPPs and PCBs, asbestos

6 Investigation Results

The results of the sampling and data collection activities undertaken for this investigation are described in this section, including field observations and laboratory results.

6.1 Field Observations

Observations and data collected during fieldworks are provided below. Photographs are provided in **Appendix A – Photo Appendix.** Calibration records for the PID used during the investigations are provided in **Appendix C – Calibration Certificates**.

6.1.1 Soil

The description and condition of soils encountered during the investigation were recorded in the bore logs included in **Appendix B – Bore Logs.** Three distinct soil sequences were encountered as described below.

- Due to the nature of the soils and heritage significance within the main engine room, drilling was impractical. Surface soils were taken where possible using a trowel to clear the area of faeces and then samples were scraped and collected. The soils were observed to be a brown silty clay with white flecks of potentially asbestos containing material, the soil had solidified over time and was generally covered by a black oily material.
- External boreholes SB03, SB04, SB05 and SB08 encountered fill material until refusal at depths of between 0.35 and 0.6 mBGL. These soils were categorised as a mix of silt and sand, black with traces of yellow sand, some gravel and coal inclusions, and moist. PID levels for these soils ranged from 2.1 – 1.6 ppm.
- Boreholes SB06 and SB07 encountered a different fill material that had noticeably fewer visual contaminants than other boreholes and was confirmed by a PON representative to be a different fill material. These boreholes ranged from a depth of 0.5 to 0.8 mBGL and had PID levels of 1.6 ppm. The fill from these boreholes was categorised as sandy silt, black with traces of yellow sand and gravel.

A subset of the soil samples collected were selected for laboratory analysis following a review of field observations.

PID readings were generally low, indicative of low volatile contamination levels, and are shown on the bore logs (refer **Appendix B – Bore Logs**).

6.2 Laboratory Analytical Results

Laboratory results are described in the following sections, including comparison to the adopted investigation levels detailed in **Section 4.6.1**. Summary tables of laboratory results are provided in **Tables A** to **C**. Complete laboratory analysis certificates are included in **Appendix E – Laboratory Certificates.**

6.2.1 Soil Results

Laboratory results for soil samples submitted for analysis are summarised and compared with the adopted soil assessment criteria in **Table A**. Results were below the adopted human health criteria except for the following:

- Lead concentrations exceeded the human health assessment criterion (1500 mg/kg) in the two samples from the main engine room SB01_0.0 and SB02_0.0 (3880 and 11600 mg/kg respectively).

Results were below the adopted ecological assessment criteria except for the following:

- C10-C16 (F2 minus Naphthalene) and C10-C16 exceeded the ecological screening level (both 170 mg/kg) in one sample SB02_0.0;

- C16-C34 (F3) concentrations exceeded the ecological assessment criterion (2500 mg/kg) in two samples SB01_0.0 and SB02_0.0 (3340 and 3290 mg/kg respectively); and
- The BaP concentration exceeded the ecological screening limit criterion (1.4 mg/kg) in sample SB02_0.0 (18 mg/kg).

No detections were observed during analysis for the presence / absence of asbestos and results are summarised in **Table B**.

Exceedances of the human health and ecological soil assessment criteria adopted for this investigation are presented on **Figure 3**.

7 Assessment of Site Contamination

This section provides discussion and analysis of the observations and analytical results with reference to the objectives of this investigation and presents the revised CSM.

7.1 Nature and Extent of Contamination

7.1.1 Fill Material

Soils surrounding the main engine room and proposed entry ramp.

As described in **Section 6.1.1**, two distinct fill materials were observed to surround the southern façade and western edge of the CHEH, this was confirmed by a PON representative. The first fill type is understood to be older and was encountered in soil bores SB03, SB04, SB05 and SB08 to a depth of at least 0.6 mBGL. Material excavated from these locations was described as a mix of sand and silt, black with traces of yellow sand and gravel, and displayed visual contaminants such as coal, various forms of aggregate and geofabric pieces.

The second type of fill was encountered at boreholes SB06 and SB07 to a depth of at least 0.8 mBGL. Material excavated from these locations was described as sandy silt, black with traces of yellow sand and gravel, and displayed no odour or visual contaminants.

Both fill materials exhibited concentrations of heavy metals, TRH and PAHs which are typically found within a commercial/industrial land use, with no exceedances of health and ecological investigation levels. Based on the historical land use of the site and its surrounds, the concentrations of contaminants observed are likely associated with the fill material present at the site and/or from onsite and offsite historical activities, such as ship maintenance facilities, bulk and non-bulk storage of petroleum/diesel including USTs, dockyard operations, fuel filling manifolds, underground gas pipelines, mobile refuelling tanks, coal and rail yard operations.

Soils within the main engine room

Soils within the main engine room saw over 100 years of various oil and other mechanical discharges being deposited on its surface. As a result, soils have solidified, and in conjunction with its heritage significance, drilling was impractical. Surface samples were taken at two locations within the main engine room, and analytical results indicated that soils contain concentrations of heavy metals, TRH, and PAHs and saw HIL D exceedances for lead at both locations, SB01 and SB02. Environmental screening exceedances were encountered at both SB01 and SB02 for C16-C34 (F3). Concentrations of C10-C16 and BaP exceeded the ecological criteria at SB02.

The elevated lead concentrations are likely caused by chipping or peeling paint used within the heritage building. Data reviewed from previous investigations in deeper soils (1.5m – 2.2m) showed lower concentrations of lead to the southwest of the main engine room, and no concentrations of lead were detected to the north of the room. Lead is also known to be immobile and to have low solubility in soils reducing the potential for lead contamination to have reached deeper soils and/or groundwater at levels that could pose a significant risk to human health and/or the environment, see **Section 7.1.3.** Still, the existing lead levels detected in surface soils within the main engine room are likely to pose a risk to workers accessing the area.

PON currently requires health and safety protocols to be followed by everyone accessing the site, including the need to wear asbestos protective gear, additionally managing any risk posed by the existing lead contamination. Further, the proposed Stage 3 restoration works includes the encapsulation of asbestos under a floating concrete slab, which will address the pathway for future visitors, workers and/or trespassers to be exposed to risks caused by the presence of lead within the soils of the main engine room.

7.1.2 Asbestos

Asbestos was not detected in the samples collected for this investigation, and this could potentially be due to the asbestos removal works conducted as part of previous restoration works (2020). Despite asbestos not being detected, past assessments identified asbestos currently present within the floor grates and sub-floor cavity floor surface of the main engine room of the building. Therefore, the investigation cannot disregard the potential for asbestos to be present.

A remediation options analysis has already been completed and concluded that the best remedial option was encapsulating the asbestos hazard beneath a floating concrete slab. These works will contain the asbestos contamination and address the pathway for potential asbestos exposure for those accessing the site.

7.1.3 Groundwater

Although groundwater samples were not collected as part of this investigation, historical contamination data were reviewed to assess the potential for lead to infiltrate sub-surface soils to deeper soils and impact the groundwater of the area. Based on the *Stage 2 Summary Report* (GHD, 2017) findings, lead concentrations were not detected in the three samples collected, indicating that onsite lead soil concentrations have not impacted groundwater. The investigations saw exceedances of arsenic, copper, nickel, and zinc concentrations in two of the three samples when compared to the NEPM 2013 Table 1C GILS, Marine Waters criteria. These were attributed to background conditions associated with the industrial use of the precinct.

7.2 Revised CSM

Table 7.1 presents the revised CSM for the site based on the SPR linkages identified in the preliminary CSM (refer **Table 4.1**) and updated with the findings from investigations and data collection activities undertaken for this DSI. The revised CSM provides an assessment of the viability of the SPR linkages identified.

Table 7.1 : Revised CSM

Contaminant Source and Media	Migration / Exposure Pathway	Receptors	Source-Pathway-Receptor Assessment
The Main Engine Room			
Contamination of surface and sub-surface soils from historical activities / contaminated fill material	Dermal contact / ingestion	*Current and future site workers and trespassers*	*Current land use:* **Complete,** as site workers would potentially be exposed to contaminated fill material. The site is currently unoccupied and secured from access. PON is aware of the contamination and has placed health and safety protocols mitigating the risk to human receptors. No access to groundwater. *Projected future land use:* **Incomplete unless soils disturbed**, future visitors and site workers will not be exposed to contaminated fill material due to the proposed asbestos encapsulation works. However, contamination remains, and if soils were to be disturbed, linkage to receptors would be present. No access to groundwater. The remaining contamination will require long-term management.
	Dust / odour / vapour inhalation	*Current and future site workers and trespassers*	*Current land use:* **Complete,** as site workers would potentially be exposed to contaminated fill material. The site is currently unoccupied and secured from access. PON is aware of the contamination and has placed health and safety protocols mitigating the risk to human receptors. *Projected future land use:* **Incomplete unless soils disturbed**, despite future visitors and site workers will not be exposed to contaminated fill material due to the proposed asbestos encapsulation works. However, contamination remains, and if soils were to be disturbed, linkage to receptors would be present. The remaining contamination will require long-term management.
	Offsite migration via regional groundwater to aquatic receiving environments	*Aquatic ecosystems associated with Throsby Creek, the Basin and the Hunter River.*	Current and future land use: **Incomplete,** as sample results from previous investigations did not record concentrations of contaminants that would indicate linkage to the existing contamination of the site. There were no concentrations of lead, TRH and benzo (a) pyrene detected in nearby locations.
Area adjacent to the building façade and the western perimeter			

Contamination of surface and sub-surface soils and groundwater from historical activities / contaminated fill material / offsite contamination	Dermal contact / ingestion	*Current and future visitors, site workers and trespassers*	*Current and future land use:* ***Incomplete,*** as sample results for SB03 – SB08 did not record concentrations of contaminants above the adopted site assessment criteria under the commercial and industrial land use, indicating that the source is unlikely to pose a risk to human and ecological receptors. No access to groundwater.
	Dust / odour / vapour inhalation	*Current and future visitors, site workers and trespassers*	
	Offsite migration via stormwater runoff and regional groundwater to aquatic receiving environments	*Aquatic ecosystems associated with Throsby Creek, the Basin and the Hunter River.*	Current and future land use: **Incomplete,** as sample results from previous investigations did not record concentrations of contaminants that would indicate linkage to the existing contamination of the site.

Based on the results of the DSI, the revised CSM for the site presented in **Table 7.1** indicates viable SPR linkage for current and future site workers, visitors, and trespassers who may be accessing the site and disturbing soils at the main engine room. PON is currently mitigating the risk posed by the existing contamination by requiring visitors to follow a set of health and safety protocols, including the need to wear protective gear. Additionally, the contamination will be contained as part of the proposed stage 3 restoration works, mitigating the risks to receptors. Although, if contamination were to remain beneath the concrete slab and to manage land appropriately and achieve positive environmental outcomes, additional management would be required to mitigate potential risks to these receptors.

Nation Partners recommends that the land manager (PON) prepares a long-term Environmental Management Plan (EMP) for the site to ensure the ongoing protection of receptors. The EMP should be prepared in accordance with NSW EPA (2020) and shall, as a minimum, include controls to be implemented during any future maintenance activities on the site, including excavations.

8 Conclusions and Recommendations

8.1 Conclusions

The available information for the site and its history, site observations, and the results from data collection activities undertaken for this DSI, Nation Partners presents the following conclusions with respect to the assessment of contamination at the site:

- Fill material surrounding the CHEH in the investigation area was shown to have no exceedances of both health and ecological investigation criteria.
- Soil material within the main engine room as shown to be contaminated by lead, with concentrations exceeding health investigation levels. Further exceedances of total recoverable hydrocarbons and benzo(a)pyrene were observed when compared with ecological screening levels.
- Groundwater at the site historically did not record concentrations of contaminants that would indicate linkage to the contamination present at the site. Exceedances noted in previous investigations (GHD, 2017) were considered a result of historical commercial and industrial land use in the area.
- No potential asbestos containing material was observed within the investigation area, nor was asbestos reported in soil samples submitted for analysis, but past assessments noted that asbestos was still present within the floor grates and sub-floor cavity floor surface of the main engine room of the building. Therefore, the investigation cannot disregard the potential for asbestos to be present.
- The nature and extent of contamination at the site corresponds to the depth and extent of fill material present at the site. The data available is limited and not sufficient to assess the vertical extent of contamination at the site. Still, based on the desktop review it appears that vertical contamination is potentially limited to the depth of fill material present at the site.
- Based on the results of the DSI, the revised conceptual site model (CSM) for the site indicates viable source-pathway-receptor (SPR) linkages for current and future site workers, visitors, and trespassers who may be accessing the site and disturbing soils at the main engine room. PON is currently mitigating the risk posed by the existing contamination by requiring visitors to follow a set of health and safety protocols. Additionally, the contamination will be contained as part of the proposed stage 3 restoration works, mitigating the risks to receptors. On this basis the potential risks to human health and ecological receptors, and to PON as the land manager of the sit, are considered low.

Recommendations

Based on the conclusions presented above, Nation Partners provides the following recommendations to EJE for the management of contamination at the site:

- If contamination remains beneath the proposed encapsulation concrete slab in the main engine room, the land manager should prepare a long-term Environmental Management Plan (EMP) to ensure the ongoing protection of receptors. The EMP should be prepared in accordance with NSW EPA (2020) and shall, as a minimum, include controls to be implemented during any future maintenance activities on the site, including excavations; and
- If soils within the main engine room were to be removed, these should be managed following the NSW EPA waste classification guidelines and disposed to an approved licensed facility.

9 Limitations

The sole purpose of this document is to present the Detailed Site Investigation (DSI) for the target investigation area as defined in this DSI. This DSI has been prepared by Nation Partners for the sole use of EJE Architecture (the 'Client') and in accordance with the scope of services developed and agreed between Nation Partners and the Client.

All detail and conclusions that deal with sub-surface conditions are based on interpretation and judgement of site conditions at the time site investigations were designed and conducted, and as a result the description of site conditions have inherent uncertainty attached to them. Conditions at the site may have changed due to natural forces and/or operations on or near the site.

Any decisions based on the findings of the DSI must consider any subsequent changes in site conditions and/or developments in legislative and regulatory requirements. Nation Partners accepts no liability to the Client for any loss and/or damage incurred as a result of a change in the site conditions and/or regulatory/legislative framework since the date of the DSI.

This DSI should only be presented in full and should not be used to support any objective other than those detailed in the DSI. In particular, the DSI does not contain sufficient information to enable it to be used for any use other than the project specific requirements for which the DSI was carried out. Nation Partners accepts no liability to the Client for any loss and/or damage incurred as a result of changes to the usage, size, design, layout, location or any other material change to the intended purpose contemplated under this Agreement.

The DSI is based on an interpretation of factual information available and the professional opinion and judgement of Nation Partners. Unless stated to the contrary, Nation Partners has not verified the accuracy or completeness of any information received from the Client or a third party for the purposes of preparing the DSI. Nation Partners accepts no liability to the Client for any loss and/or damage incurred as a result of any inaccurate or incomplete information. Any reliance on this DSI by a third party shall be entirely at such party's own risk. Nation Partners provides no warranty or guarantee to any third party, express or implied, as to the information and/or professional advice indicated in the DSI and accepts no liability for or in respect of any use or reliance upon the DSI by a third party.

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Verico AIS (2022) *Carrington Hydraulic Engine House Sub-floor Remediation Assessment. Prepared by Verico Asset Integrity Services*, dated June 2022.

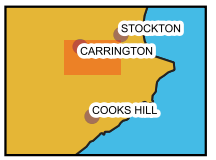
Figures

Figure 1: Site Location

Carrington Hydraulic Engine House
106 Bourke Street, Carrington

Legend

Lot Boundary



DATA SOURCES
Imagery: Nearmaps, 2022
SCALE
0 50 100 m

N

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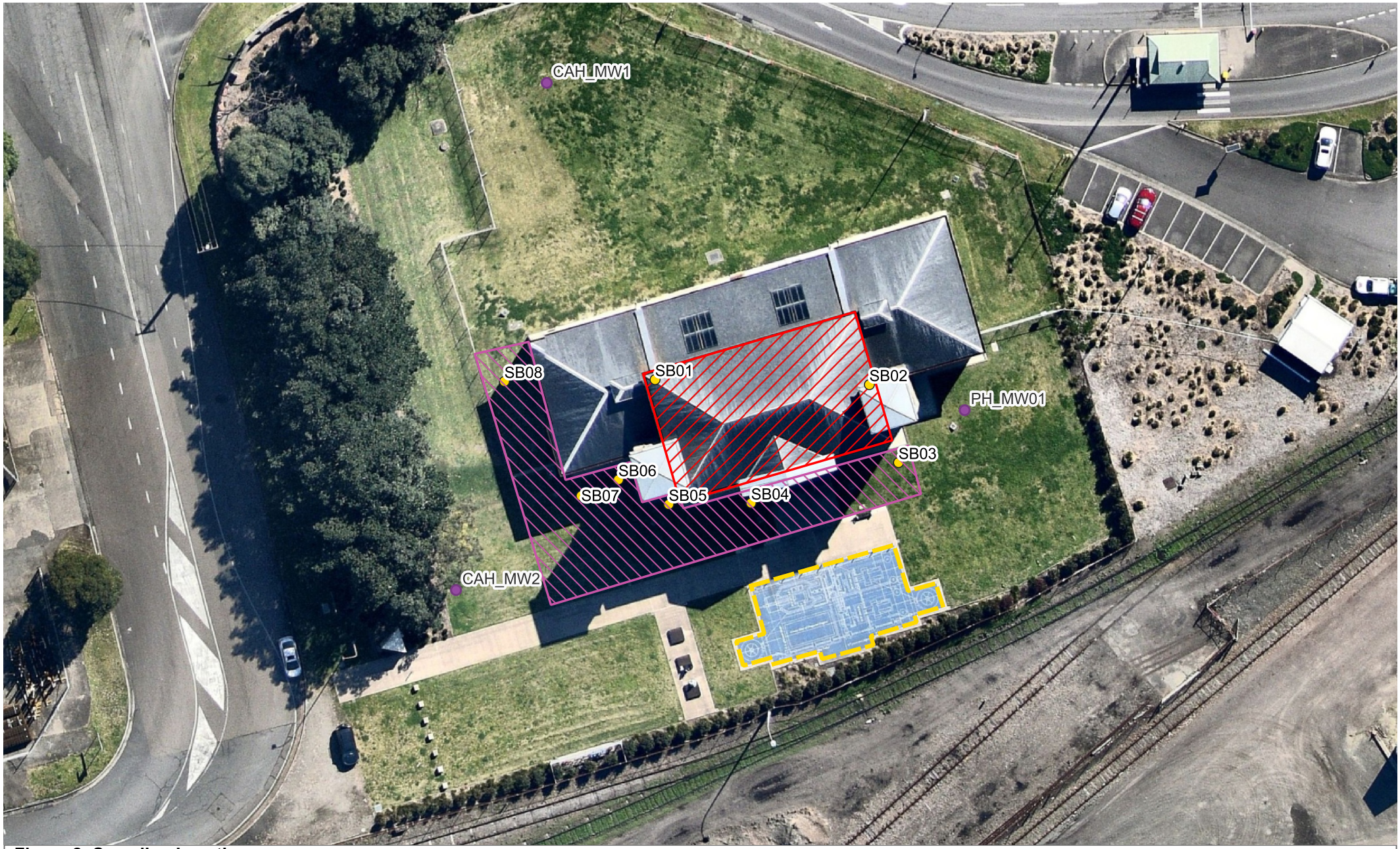
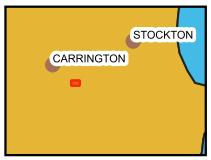


Figure 2: Sampling Locations

Carrington Hydraulic Engine House
106 Bourke Street, Carrington

Legend

- Internal Investigation Area (Hydraulic Engine Room)
- External Investigation Area
- Plaza Area
- Soil Bore Locations
- GHD 2017 Sampling Locations



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SCALE
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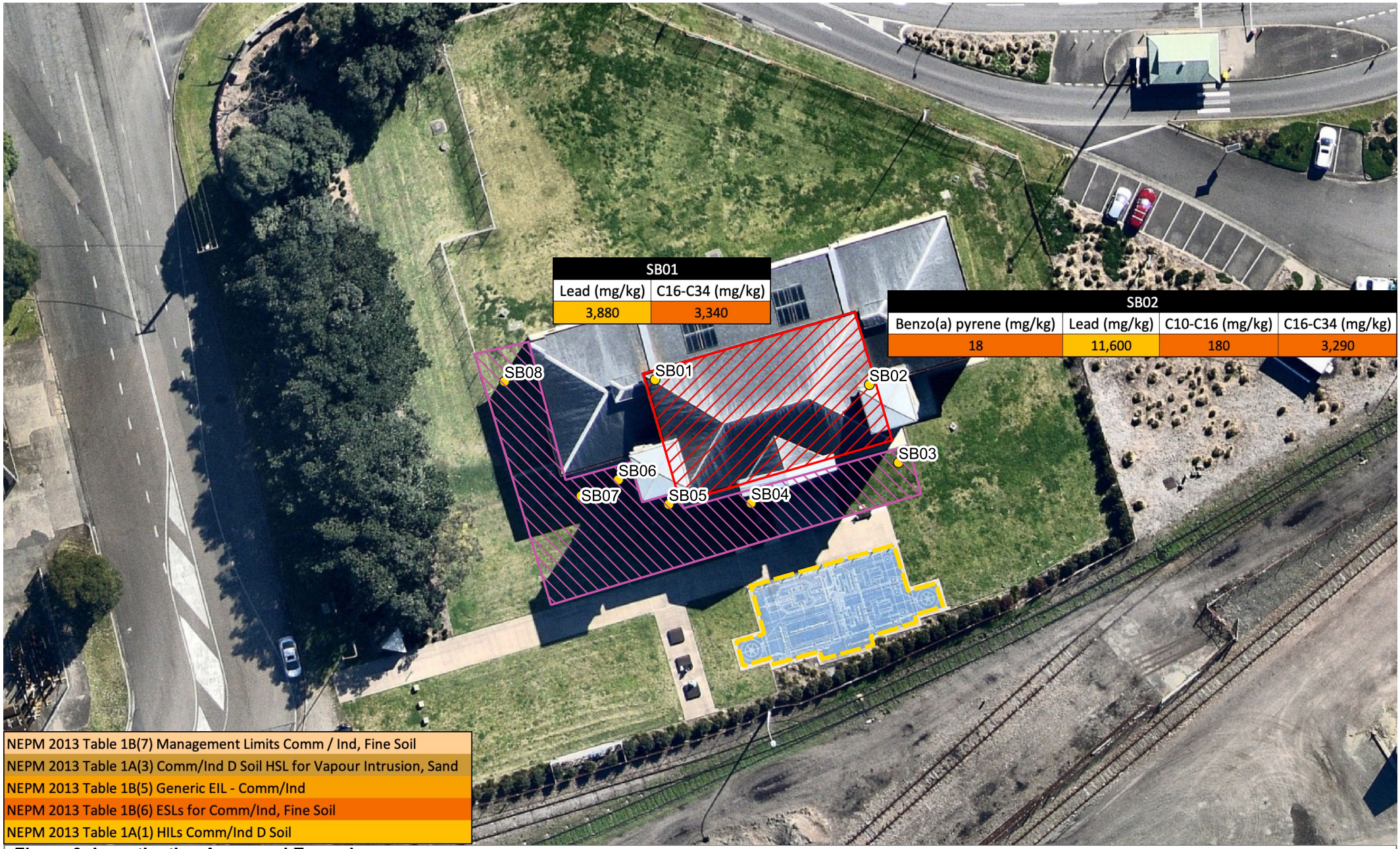
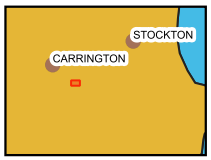


Figure 3: Investigation Areas and Exceedances

Carrington Hydraulic Engine House
106 Bourke Street, Carrington

Legend

- Internal Investigation Area (Hydraulic Engine Room)
- External Investigation Area
- Soil Bore Locations
- Plaza Area



DATA SOURCES
Imagery: Nearmaps, 2022
SCALE
0 5 10 m

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Tables

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	Moisture Content	PAH/Phenols (SIM)															
	Moisture Content	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)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
	%	mg/kg	mg/kg	mg/kg	mg/kg	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	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	0.5	0.5	0.5	0.5
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																	
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																	
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															370		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil						1.4											
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																	
Field ID	**Date**	**Matrix Type**	**Sample Type**														
SB01_0.0	**24/8/22**	**Soil**	**Normal**	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB02_0.0	**24/8/22**	**Soil**	**Normal**	2.2	2.0	1.5	10.9	28.0	18.0	27.4	6.6	8.9	27.3	2.2	54.3	2.0	6.2	1.4	29.8	57.9
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	14.2	<0.5	<0.5	<0.5	0.6	<0.5	0.6	<0.5	<0.5	0.5	<0.5	1.2	<0.5	<0.5	<0.5	0.9	1.0
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	10.0	<0.5	<0.5	<0.5	0.6	<0.5	0.7	<0.5	<0.5	0.6	<0.5	1.3	<0.5	<0.5	<0.5	0.9	1.3
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	13.2	<0.5	<0.5	0.6	1.5	1.2	1.9	<0.5	0.6	1.8	<0.5	3.4	<0.5	<0.5	<0.5	2.7	3.4
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	14.2	<0.5	<0.5	<0.5	0.8	<0.5	0.6	<0.5	<0.5	0.8	<0.5	1.6	<0.5	<0.5	<0.5	1.7	1.4
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	18.6	<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	<0.5	<0.5	<0.5
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	17.6	<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	<0.5	<0.5	<0.5
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	10.2	<0.5	<0.5	<0.5	0.6	<0.5	0.7	<0.5	<0.5	0.6	<0.5	1.4	<0.5	<0.5	<0.5	0.9	1.3
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	9.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

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																			Pesticides by GCI
				Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Zero)	PAHs (Sum of total)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	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	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																				
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																				
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																		640		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																				
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil				40	40	40	4,000				50		560						4000	
Field ID	**Date**	**Matrix Type**	**Sample Type**																	
SB01_0.0	**24/8/22**	**Soil**	**Normal**	0.6	1.2	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB02_0.0	**24/8/22**	**Soil**	**Normal**	27.6	27.6	27.6	284	<0.25	<0.25	<0.25	0.74	<0.25	<0.08	<0.25	<0.25	<0.25	<0.25	<0.2	<0.08	0.74
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.7	1.2	<0.5	4.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.7	1.2	<0.5	5.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	1.9	2.2	1.6	17.1	<0.05	<0.05	<0.05	0.31	<0.05	0.54	0.24	0.30	<0.05	<0.05	<0.2	<0.05	0.31
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.7	1.2	<0.5	6.9	0.27	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	0.27	<0.05
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.6	1.2	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	0.6	1.2	<0.5	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.7	1.2	<0.5	5.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	0.6	1.2	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

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	MS												Polychlorinated Biphenyls (PCB)	Total Mercury by FIMS		
	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	PCBs (Sum of total)	Mercury	Arsenic	Cadmium
	mg/kg	mg/kg	mg/kg	mg/kg	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	0.05	0.05	0.05	0.2	0.1	0.1	5	1
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															160	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	2,000				100				50		85	2700	8	730	4,000	800
Field ID	**Date**	**Matrix Type**	**Sample Type**													
SB01_0.0	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	2.8	13	2
SB02_0.0	**24/8/22**	**Soil**	**Normal**	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2	<0.2	1.0	59	15
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	0.2	11	4
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	0.2	12	<1
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	0.4	25	<1
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	0.3	9	2
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.1	<5	<1
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.1	<5	1
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.1	8	2
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.1	6	<1

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

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				Total Metals by ICP-AES					TRH - Semivolatile Fraction											
				Chromium (III+VI)	Copper	Lead	Nickel	Zinc	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	Naphthalene (VOC)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	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	5	5	2	5	50	50	100	100	50	50	100	100	50	1	10	10
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil									1,000		5,000	10,000							800	
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																				260 | 370 | 630
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																		370		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil									170	170	2,500	6,600								215
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil					250,000	1,500	4,000	400,000												
Field ID	**Date**	**Matrix Type**	**Sample Type**																	
SB01_0.0	**24/8/22**	**Soil**	**Normal**	12	340	3,880	12	1,600	<50	<50	3,340	1,400	4,740	<50	1,430	2,440	3,870	<1	<10	<10
SB02_0.0	**24/8/22**	**Soil**	**Normal**	56	1,590	11,600	43	2,570	180	180	3,290	1,500	4,970	90	2,110	1,930	4,130	<1	<10	<10
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	11	314	733	14	1,090	<50	<50	340	<100	340	<50	260	140	400	<1	<10	<10
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	7	81	180	15	278	<50	<50	440	250	690	<50	280	270	550	<1	<10	<10
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	8	117	495	16	385	110	110	1,130	370	1,610	50	790	570	1,410	<1	<10	<10
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	7	152	326	9	515	130	130	1,000	210	1,340	60	770	380	1,210	<1	<10	<10
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	4	356	250	4	276	<50	<50	130	<100	130	<50	<100	<100	<50	<1	<10	<10
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	3	87	171	3	379	<50	<50	120	<100	120	<50	<100	<100	<50	<1	<10	<10
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	8	102	192	6	437	<50	<50	190	<100	190	<50	120	110	230	<1	<10	<10
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	6	173	125	6	259	<50	<50	160	<100	160	<50	<100	<100	<50	<1	<10	<10

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

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	TRH Volatiles/BTEX							
	C6-C9 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	0.2	0.5	0.5	0.5	0.5	0.5	0.2
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil								
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand		3 | 3 | 3 | 3					230	
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind								
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil		95	135	185			95	
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil								

Field ID	Date	Matrix Type	Sample Type								
SB01_0.0	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB02_0.0	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2

Environmental Standards
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Table B - Asbestos Results

				Mass	Particulates	Asbestos				
				weight of sample	Organic Fibre	Asbestos (Trace)	Synthetic Mineral Fibre	Asbestos Type	Asbestos fibres	APPROVED IDENTIFIER:
				g	g/kg	Fibres	g/kg	Detect	g/kg	-
EQL				0.01	0.1	5	0.1			
Field ID	**Date**	**Matrix Type**	**Sample Type**							
SB01_0.0	**24/8/22**	**Soil**	**Normal**	37.3	No	No	No		No	Brendan Schrader
SB02_0.0	**24/8/22**	**Soil**	**Normal**	45.2	No	No	No		No	Brendan Schrader
SB03_0.0-0.2	**24/8/22**	**Soil**	**Normal**	44.2	No	No	No		No	Brendan Schrader
SB04_0.0-0.2	**24/8/22**	**Soil**	**Normal**	33.3	No	No	No		No	Brendan Schrader
SB04_0.4-0.6	**24/8/22**	**Soil**	**Normal**	55.6	No	No	No		No	Brendan Schrader
SB05_0.0-0.2	**24/8/22**	**Soil**	**Normal**	46.0	No	No	No		No	Brendan Schrader
SB06_0.0-0.2	**24/8/22**	**Soil**	**Normal**	28.6	No	No	No		No	Brendan Schrader
SB06_0.4-0.6	**24/8/22**	**Soil**	**Normal**	36.3	No	No	No		No	Brendan Schrader
SB07_0.0-0.2	**24/8/22**	**Soil**	**Normal**	48.1	No	No	No		No	Brendan Schrader
SB08_0.0-0.2	**24/8/22**	**Soil**	**Normal**	30.1	No	No	No		No	Brendan Schrader

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				BTEX								TRH							Halogenated Benzenes	Inorganics	
				Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Hexachlorobenzene	Moisture Content	Moisture Content (dried @ 103°C)
				mg/kg	mg/kg	mg/kg	mg/kg	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	0.1	0.1	0.1	0.2	0.1	0.3	0.2	10	10	50	50	100	100	50	0.05	1	1
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																		
ES2230446	SB03_0.0-0.2	Soil	24/8/22	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	340	<100	340	<0.05	14.2	
ES2230446	QAQC01	Soil	24/8/22	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	320	<100	320	<0.05	19.6	
RPD				0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	32	
ES2230446	SB03_0.0-0.2	Soil	24/8/22	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	340	<100	340	<0.05	14.2	
918696	QAQC2	Soil	24/8/22	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3		<20	<20	90	90	630	160	880	<0.5		16
RPD				0	0	0	0	0	0	0		0	0	57	57	60	46	89	0		

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

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				Metals																	
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Organochlorine pesticides EPA Vic	Other organochlorine pesticides EPA Vic	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	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	2	5	5	0.1	2	5	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																			
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	11	4	11	314	733	0.2	14	1,090			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
ES2230446	**QAQC01**	**Soil**	**24/8/22**	12	4	11	252	695	0.2	12	1,020			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RPD				9	0	0	22	5	0	15	7			0	0	0	0	0	0	0	0	0
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	11	4	11	314	733	0.2	14	1,090			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
918696	**QAQC2**	**Soil**	**24/8/22**	11	4.6	13	260	650	0.2	12	970	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<1			<0.5
RPD				0	14	17	19	12	0	15	12			0	0	0	0	0	0			0

***RPDs have only been considered where a concentration is greater**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acce**
*****Interlab Duplicates are matched on a per compound basis as me**

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				Organochlorine Pesticides																	
				DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene	Acenaphthene	Acenaphthylene	Anthracene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	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	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.5	0.5	0.5
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																			
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	<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	<0.2		<0.5	<0.5	<0.5
ES2230446	**QAQC01**	**Soil**	**24/8/22**	<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	<0.2		<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	<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	<0.2		<0.5	<0.5	<0.5
918696	**QAQC2**	**Soil**	**24/8/22**	<0.5	<0.5	<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	<0.5	<0.5	<0.5
RPD				0	0	0	0		0	0	0	0	0	0	0	0	0	0		0	0	0

***RPDs have only been considered where a concentration is greater**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acce**
*****Interlab Duplicates are matched on a per compound basis as me**

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				PAH														PCBs					
				Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)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)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	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	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																			
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	0.6	<0.5	0.6	<0.5	<0.5	0.5	<0.5	1.2	<0.5	<0.5	<0.5	0.9	1.0	4.8					
ES2230446	**QAQC01**	**Soil**	**24/8/22**	0.6	<0.5	0.7	<0.5	<0.5	0.6	<0.5	1.6	<0.5	<0.5	<0.5	0.8	1.6	5.9					
RPD				0	0	15	0	0	18	0	29	0	0	0	12	46	21					
ES2230446	**SB03_0.0-0.2**	**Soil**	**24/8/22**	0.6	<0.5	0.6	<0.5	<0.5	0.5	<0.5	1.2	<0.5	<0.5	<0.5	0.9	1.0	4.8					
918696	**QAQC2**	**Soil**	**24/8/22**	1.1	0.6	0.7	<0.5	0.7	1.2	<0.5	1.4	<0.5	<0.5	<0.5	1.3	1.2	8.2	<1	<1	<1	<1	<1
RPD				59	18	15	0	33	82	0	15	0	0	0	36	18	52					

***RPDs have only been considered where a concentration is greater**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acce**
*****Interlab Duplicates are matched on a per compound basis as me**

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							TPH					Asbestos				
				Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	Weight of Samples	Organic Fibre	Asbestos Trace	Synthetic Mineral Fibre	Asbestos Fibres
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg	g/kg	g/kg	g/kg	g/kg
EQL				0.1	0.1	0.1	10	20	50	50	50	0.01	0.1	5	0.1	0.1
Lab Report Number	**Field ID**	**Matrix Type**	**Date**													
ES2230446	SB03_0.0-0.2	Soil	24/8/22			<0.1	<10	<50	260	140	400	44.2	NO	NO	NO	NO
ES2230446	QAQC01	Soil	24/8/22			<0.1	<10	<50	220	150	370	54	NO	NO	NO	NO
RPD						0	0	0	17	7	8					
ES2230446	SB03_0.0-0.2	Soil	24/8/22			<0.1	<10	<50	260	140	400					
918696	QAQC2	Soil	24/8/22	<1	<1	<1	<20	59	460	270	789					
RPD						0	0	17	56	63	65					

*RPDs have only been considered where a concentration is greater
**Elevated RPDs are highlighted as per QAQC Profile settings (Acce
***Interlab Duplicates are matched on a per compound basis as me

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			PAH/Phenols (GC/MS - SIM)														
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)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
			µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			1	1	1	1	0.5	0.001	1	1	1	1	1	1	1	1	1	1
Field ID	**Matrix Type**	**Date**																
RIN_01	**Water**	**24/8/22**	<1.0	<1.0	<1.0	<1.0	<0.5	<0.0010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

			TRH Volatiles/BTEX										
			Naphthalene (VOC)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	C6-C9 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			1	10	10	10	0.2	0.5	0.5	0.5	0.5	0.5	0.2
Field ID	**Matrix Type**	**Date**											
Trip Blank	**Soil**	**24/8/22**	<1	<10	<10	<10	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2

					Pesticides by GCMS														
			Acenaphthene	PAHs (Sum of total)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5
Field ID	**Matrix Type**	**Date**																
RIN_01	**Water**	**24/8/22**	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5

	Naphthalene (VOC)
	mg/kg
EQL	1

Field ID	Matrix Type	Date	
Trip Blank	**Soil**	**24/8/22**	<1

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			Acenaphthene	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Polychlorinated Biphenyls (PCB)	Total Mercury by FIMS	Total Me		
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	PCBs (Sum of total)	Mercury	Arsenic	Cadmium	Chromium (III+VI)
														µg/L	mg/L	mg/L	mg/L	mg/L
EQL			1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	1	0.0001	0.001	0.0001	0.001
Field ID	**Matrix Type**	**Date**																
																0	0	67
RIN_01	**Water**	**24/8/22**	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<1	<0.0001	<0.001	<0.0001	<0.001
															0			

			Naphthalene (VOC)
			mg/kg
EQL			1
Field ID	**Matrix Type**	**Date**	
Trip Blank	**Soil**	**24/8/22**	<1

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			tals by ICP-MS - Suite A					TRH - Semivolatile Fraction										
			Acenaphthene	Copper	Lead	Nickel	Zinc	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	Naphthalene (VOC)	C6-C10 Fraction (F1)
			µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L
EQL			1	0.001	0.001	0.001	0.005	100	100	100	100	100	50	100	50	50	0.005	20
Field ID	**Matrix Type**	**Date**																
				0	0	0	0											
RIN_01	**Water**	**24/8/22**	<1.0	<0.001	<0.001	<0.001	<0.005	<100	<100	<100	<100	<100	<50	<100	<50	<50	<0.005	<20

	Naphthalene (VOC)
	mg/kg
EQL	1

Field ID	Matrix Type	Date	
Trip Blank	**Soil**	**24/8/22**	<1

			TRH Volatiles/BTEX									
			Acenaphthene	C6-C10 (F1 minus BTEX)	C6-C9 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			1	20	20	1	2	2	2	2	2	1
Field ID	**Matrix Type**	**Date**										
RIN_01	**Water**	**24/8/22**	<1.0	<20	<20	<1	<2	<2	<2	<2	<2	<1

		Naphthalene (VOC)
		mg/kg
EQL		1
Field ID	**Matrix Type**	**Date**
Trip Blank	**Soil**	**24/8/22**	<1

Appendix A – Photo Appendix

Photo 1: Inside the CHER from an eastern aspect – 24 August 2022

Photo 2: Internal image of the façade within the CHER – 24 August 2022

Photo 3: Surface soil material from SB02 – 24 August 2022

Photo 4: Example of sub-floor space within CHER – 24 August 2022

Photo 5: CHER floor surface with oily material deposited on surface – 24 August 2022

Photo 6: SB03 and associated fill material – 24 August 2022

Photo 7: SB03 and excavated coal fill – 24 August 2022

Photo 8: Fill material from SB05 – 24 August 2022

Photo 9: Suspected coal chunk from SB05 fill material - 24 August 2022

Photo 10: Excavated fill material from SB06 - 24 August 2022

Photo 11: SB07 and excavated fill material - 24 August 2022

Photo 12: Excavated fill material from SB08 - 24 August 2022

Appendix B – Bore Logs

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Boring Log

Project Name: Carrington Hydraulic Engine House		**Client:** EJE Architecture	**Boring No:** SB01
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** ---
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** ---
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:**	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0	S, A	SB01_0.0		Brown, silty clay, extremely stiff	Rat faeces, surface discolouration - likely oil, white chalky flecks

Notes: Soil had solidified over time likely due to engine discharge deposited on surface.
Samples were scraped from the surface using a trowel.
Insufficient soil for PID reading
S = Soil Sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine Room		**Client:** EJE Architecture	**Boring No:** SB02
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** ---
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** ---
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:**	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0	S, A	SB02_0.0		Silty clay, brown, extremely stiff	Rat faeces, surface discolouration - likely oil, white chalky flecks

Notes: Soil had solidified over time likely due to engine discharge deposited on surface.
Samples were scraped from the surface using a trowel.
Insufficient soil for PID reading.
S = Soil Sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine House		**Client:** EJE Architecture	**Boring No:** SB03
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.35m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID (ppm)	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0	S, A, QA/ QC	SB03_0.0-0.2	2.1	FILL - Silty sand, black with traces of yellow sand, some gravel, moist	Different types of aggregate, solidified hydrocarbon material - likely coal
				Refusal @ 0.35m	

Notes:
S = Soil sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine Room		**Client:** EJE Architecture	**Boring No:** SB04
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.6m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID (ppm)	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0	S, A	SB04_0.0-0.2	1.6	FILL - Silty sand, black with traces of yellow sand, some gravel, moist	Different types of aggregate, solidified hydrocarbon material - likely coal, geofabric
	S, A	SB04_0.4-0.6	1.7	FILL - Same fill material as above	As above
				Refusal @ 0.6m	

Notes:
S = Soil sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine House		**Client:** EJE Architecture	**Boring No:** SB05
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.6m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID (ppm)	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0.2	S, A	SB05_0.0-0.2	1.6	FILL - Sandy SILT, black with traces of yellow sand, some gravel, moist	Different types of aggregate, solidified hydrocarbon material - likely coal
0.4					
0.6	S, A	SB05_0.4-0.6	1.6	Getting darker with depth	As above
				Refusal @ 0.6m	

Notes:
S = Soil sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine Room		**Client:** EJE Architecture	**Boring No:** SB06
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.8m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0.2	S, A	SB04_0.0-0.2	1.6	FILL - Sandy SILT, black with traces of yellow sand and gravel, moist	Different types of aggregate, geofabric
0.4					
0.6	S, A	SB04_0.4-0.6	1.7	FILL - Same fill material as above	As above
0.8	S, A	SB06_0.7-0.8	1.6	Silty SAND, white, sandstone pieces, moist	None Observed
				Refusal @ 0.8m	

Notes: Different fill material to previous soil bore locations, confirmed by PoN representative
S = Soil sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine House		**Client:** EJE Architecture	**Boring No:** SB07
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.6m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID (ppm)	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0.2	S, A	SB07_0.0-0.2	1.6	FILL - Sandy SILT, black with traces of yellow sand, some gravel, moist	Some aggregate, geofabric
0.4					
0.6	S, A	SB07_0.4-0.6	1.6	Fill - Same fill material as above	As above
				Refusal @ 0.6m	

Notes: Same fill material as SB06
S = Soil sample
A = Asbestos sample

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Boring Log

Project Name: Carrington Hydraulic Engine Room		**Client:** EJE Architecture	**Boring No:** SB08
Project No: NP22013	**Date drilled:** 24/8/2022		**Drill Rig Type:** HA
Site Address: 106 Bourke Street, Carrington	**Groundwater Depth:** ---	**Drilling Contractor:** ---	**Diameter:** 150mm
	Elevation: ---		**Hammer Type:** ---
Logged By: Nelson Phillips	**Total Depth:** 0.5m	**Bit Type:** ---	**Drill Crew:** ---

Depth (m)	Sample Type	Sample ID	PID (ppm)	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors	Contaminant Indicators
0.2	S, A	SB04_0.0-0.2	1.6	FILL - Sandy SILT, black with traces of yellow sand and gravel, moist	Different types of aggregate, solidified hydrocarbon material, likely coal, geofabric
0.4					
0.5	S,A	SB04_0.3-0.5	1.6	FILL - Same fill material as above	As above
				Refusal @ 0.5m	

Notes: Same fill material as SB03, 04 & 05, confirmed by PoN representative
S = Soil sample
A = Asbestos sample

Appendix C – Calibration Certificates

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-118251**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation	✓	
	Filter	✓	
	Flow	✓	
	Valves, Diaphragm	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	PID	✓	10.6 ev
Alarms	Beeper	✓	Low: 50ppm; High: 100ppm; TWA: ; STEL:
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		93ppm Isobutylene	NATA	SY361		92.8ppm

Calibrated by: **Alex Buist**

Calibration date: **19/08/2022**

Next calibration due: **15/02/2023**

Appendix D - Field QA/QC Assessment

Table F.0.1 provides an assessment of the field QA/QC protocols and procedures implemented during this investigation.

Table F.0.1 : Field QA/QC Assessment

Field Procedure	QA/QC Assessment
Sampling Team	The site inspection and sampling were undertaken by Nation Partners' qualified contaminated land professionals Nelson Phillips.
Field Protocols	All fieldwork was conducted in accordance with guidelines and standards endorsed by the NSW EPA. Soil samples were collected as grab samples using disposable nitrile gloves and trowels. Samples were collected directly from the hand auger directly into sample jars. Fresh gloves were used at each sample location. Groundwater samples were not collected All sampling locations were surveyed, and exact locations are shown in **Figure 2**.
Equipment Calibration	Equipment calibration certificates were provided with the PID and copies are included in **Appendix C – Calibration Certificates.**
Chain of Custody Forms	All samples were logged and transferred to the analytical laboratory using standard CoC documentation. A copy of the CoC is included in **Appendix E – Laboratory Certificates.**
Sample Preservation	All samples were submitted to the analytical laboratory in dedicated sample jars/bottles provided by the analytical laboratory. All samples were labelled with the sample ID, date, and sampler's name, and were submitted to the laboratory in eskies under ice.
Rinsate and Rinsate Blanks	One rinsate sample was collected and submitted to the analytical laboratory for analysis. Laboratory results for the rinsate samples are presented in **Table D**. Results indicated that not cross contamination occurred.
Trip Spikes and Trip Blanks	One trip blank with corresponding trip spike was analysed for BTEXN and TRH (Trip blank only), with results provided in **Table D**. No BTEXN, TRH or PFAS were reported above the LOR in trip blanks indicating that contaminants were not introduced to the samples as a result of cross contamination during transport. Concentrations of trip spikes were within acceptable limits indicating there was no loss of analyte concentrations as a result of site works and sample transport.
Field Duplicates (Intra- and Inter- Laboratory Duplicates.	Laboratory results for the blind field duplicates are presented in **Table F**. The QA/QC criteria adopted for this investigation was based on the relative percentage difference (RPD) between the original and duplicate samples are summarised below: • Result between 1 – 10 times LOR: < 81% • Result between 10 and 30 times LOR : < 50% • Result >30 times LOR: < 30% <u>Soil</u> A total of one intra-laboratory (blind) duplicates and one inter-laboratory (split) duplicates were analysed from a total of 10 primary samples. The frequency of duplicate samples collected met recommended rates provided in the Australian Standard AS4482.1-2005. The field RPD acceptance criteria were exceeded for four contaminants is not considered to impact the usability of the results and the conclusion of the investigation as results were still below the adopted screening criteria.

Laboratory QA/QC Assessment

Table F.0.2 provides an assessment of the laboratory QA/QC protocols and procedures implemented during the investigations

Table F.0.2 : Laboratory QA/QC Assessment

Protocol	Description
Sample Analysis	The analytical laboratories used for the investigation were ALS Environmental (Smithfield, NSW) and Eurofins (Lane Cove West, NSW). Both laboratories are NATA accredited for the analysis required
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. No exceedances occurred.
Laboratory Duplicates	Laboratory duplicates were analysed a rate greater than the required frequency of 1 in 20 samples, with a minimum of one laboratory duplicate analysed per analytical batch The QA/QC criteria adopted for this investigation was based on the following RPD calculations: ○ <10 times LOR: No limit ○ Result between 10 and 20 times LOR: 0-50% ○ Result >20 times LOR: 0-20% Two laboratory duplicate samples exceed the adopted RPD criteria: • SB08_0.2: Lead (22.1%) 20% • SB08_0.0: Copper (29.2%)20% Exceedances for lead and copper are minor (<5%) and not considered to impact the usability of the results and the conclusion of the investigation.
Laboratory Control Samples	A laboratory control standard (LCS) is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. The frequency and QC criteria for LCS samples were met in all cases.
Matrix Spikes / Matrix Spike Duplicates (MS/MSD)	MS/MSDs are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70% to 130%, and duplicates should have RPDs of less than 50%. MS recoveries did not exceed the criteria in any circumstances.
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 50 to 150%. All surrogate recoveries fell within the nominated acceptance criteria.
Laboratory QA/QC Assessment	The QA/QC indicators either all complied with the required QA/QC acceptance criteria or showed variations that were not considered to significantly affect the quality of the data. For the purposes of this study, the QA/QC results are adequate, and the quality of the data is deemed acceptable for use in this investigation.

DQI Compliance

Table F.0.3 provides and evaluation of the field and laboratory QA/QC outputs against the DQI criteria.

Indicator	Evaluation Criteria	Assessment
Documentation completeness	• DQO process properly described • Site description and history and environmental setting adequately known and appropriately described • Potential contamination sources are known to a high level of confidence • All relevant field and laboratory documentation completed and provided, including site notes, Chain of Custody (COC) documentation and laboratory test certificates	The DQO process followed in the design of the investigation program is presented in **Section 5.** The site description, history and environmental setting are summarised in **Section 2** and potential sources of contamination and contaminants of concern are identified in **Section 4**. Relevant field and laboratory documentation is found in **Appendix B**, **Appendix C** and **Appendix D**.
Data completeness	• Samples are collected from all areas affected by the potential contamination	Sampling locations and frequencies were based on professional judgement and targeted those areas potentially affected by the identified potential

Indicator	Evaluation Criteria	Assessment
	sources, and samples are analysed for all potential contaminants of concern • Sufficient samples are collected to appropriately represent all areas possibly affected by potential contamination sources	contamination sources. All samples were analysed for the identified potential contaminants of concern.
Data comparability	• The use of appropriately trained and qualified contaminated site personnel • The use of appropriate techniques and documentation for the collection, storage and transportation of environmental samples • The use of NATA-accredited analytical laboratories	Appropriately trained and qualified contaminated site personnel undertook the investigations program. Sampling procedures and techniques were in general accordance with NSW EPA-endorsed guidelines and standards, and the analytical laboratories used are NATA-accredited.
Data representativeness	• Samples are collected from targeted areas potentially affected by contamination sources, and samples are analysed for all potential contaminants of concern • Targeted samples are collected to represent areas possibly affected by potential contamination sources • The use of appropriate sampling techniques for the collection of representative environmental samples	Sampling locations and frequencies were based on professional judgement and targeted those areas potentially affected by the identified potential contamination sources. All samples were analysed for the identified potential contaminants of concern. Sampling procedures and techniques were in general accordance with NSW EPA-endorsed guidelines and standards.
Data precision and accuracy	• The use of appropriately trained and qualified contaminated site personnel • The collection of blind field duplicate samples • Relative percentage differences (RPD's) for blind field duplicates are 70% to 130% in all samples • Achievement of laboratory QA/QC criteria • Exceedances of the nominated criteria not considered to adversely impact the quality of the data	Appropriately trained and qualified contaminated site personnel undertook the investigations program. The majority of field and laboratory QA/QC criteria were achieved, and the exceedances identified were not considered to adversely affect the quality of the data.

Data Quality Assessment

Based on the review and assessment of field and laboratory QA/QC protocols and procedures, whilst elements of the QA/QC program did not meet the proposed data quality criteria, Nation Partners considers that these discrepancies do not adversely impact the quality of the data collected or its use for the objectives of this DSI. The data collected is considered of sufficient quality to achieve the objectives of this DSI.

Appendix E – Laboratory Certificates

CHAIN OF CUSTODY

ALS Laboratory please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
GLADSTONE 45 Commercial Drive Clinton QLD 4680 Ph: 07 4971 6300 E: gladstone@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 6209 7500 E: samples.perth@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: Nation Partners	TURNAROUND REQUIREMENTS : (Standard TAT)	FOR LABORATORY USE ONLY (Circle)	
OFFICE:		Custody Seal Intact?	Yes / No / N/A
PROJECT: NP22013	ALS Q	Free ice/frozen ice bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: NP22013_1	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt	2.8 °C
PROJECT MANAGER: Laura Martinez	CONTACT PH: 0410	Other comments:	
SAMPLER: NP	SAMPLER MOBILE:	RELINQUISHED BY: N Phillips	RECEIVED BY: VS 24/8/22
COC emailed to ALS? Yes	ESDAT FORMAT	DATE/TIME:	DATE/TIME: 1pm
Email Reports to (will default to PM if no other addresses are listed): lmartinez@nationpartners.com.au & nphillips@nationpartners.com.au>		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): accounts@nationp	24-08-2022	DATE/TIME: 25/8/22 17.00	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: COC Sent 25/8/22 4pm

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	S-08 TRHBTEXNPAH/O CPCB/8 Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)	EA200G - Asbestos	BTEXETRHC6-C10					On Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
1	SB01_0.0	24/08/2022	S	x	x							
2	SB02_0.0	24/08/2022	S	x	x							
3	SB03_0.0-0.2	24/08/2022	S	x	x							
4	SB04_0.0-0.2	24/08/2022	S	x	x							
5	SB04_0.4-0.6	24/08/2022	S	x	x							
6	SB05_0.0-0.2	24/08/2022	S	x	x							
7	SB05_0.4-0.6	24/08/2022	S	x	x						x	
8	SB06_0.0-0.2	24/08/2022	S	x	x							
9	SB06_0.4-0.6	24/08/2022	S	x	x							
10	SB06_0.7-0.8	24/08/2022	S	x	x						x	
11	SB07_0.0-0.2	24/08/2022	S	x	x							
12	SB07_0.4-0.6	24/08/2022	S	x	x						x	
13	SB08_0.0-0.2	24/08/2022	S	x	x							
14	SB08_0.3-0.5	24/08/2022	S	x	x						x	
15	RIN_01	24/08/2022	S	x	x							
16	RIN_02	24/08/2022	S									
17	QAQC01	24/08/2022	S	x	x							
	QAQC02	24/08/2022	S	x	x							Please forward to Eurofin
18	TB_24-8-22	24/08/2022	S			x						
19	TS_24-8-22	24/08/2022	S			x						

Environmental Division Sydney
Work Order Reference
ES2230446

Telephone : +61-2-8784 8555

RECEIVED

PM 25/8/22 2140

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2230446**	Page	: 1 of 21
Client	: **NATION PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Laura Martinez	Contact	: Customer Services ES
Address	:	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: NP22013	Date Samples Received	: 25-Aug-2022 16:23
Order number	: NP22013_1	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 01-Sep-2022 15:43
Sampler	: NP		
Site	:		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005T: Poor precision was obtained for Copper and Lead on sample ES2230446# 013. Confirmed by re-digestion and reanalysis.
- EP068: Positive results have been confirmed by re-extraction and re-analysis.
- EG035: Positive Mercury results ES2230446 #1 and #2 have been confirmed by reanalysis.
- EP080: The trip spike (Not ALS Spike) have been analysed for volatile TPH and BTEXN only .
- EP068: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP066 : Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.

- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01_0.0	SB02_0.0	SB03_0.0-0.2	SB04_0.0-0.2	SB04_0.4-0.6
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	ES2230446-001	ES2230446-002	ES2230446-003	ES2230446-004	ES2230446-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	<1.0	2.2	14.2	10.0	13.2
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	37.3	45.2	44.2	33.3	55.6
APPROVED IDENTIFIER:	----	-	--	B.SCHRADER	B.SCHRADER	B.SCHRADER	B.SCHRADER	B.SCHRADER
Synthetic Mineral Fibre	----	0.1	g/kg	No	No	No	No	No
Organic Fibre	----	0.1	g/kg	No	No	No	No	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	13	59	11	12	25
Cadmium	7440-43-9	1	mg/kg	2	15	4	<1	<1
Chromium	7440-47-3	2	mg/kg	12	56	11	7	8
Copper	7440-50-8	5	mg/kg	340	1590	314	81	117
Lead	7439-92-1	5	mg/kg	3880	11600	733	180	495
Nickel	7440-02-0	2	mg/kg	12	43	14	15	16
Zinc	7440-66-6	5	mg/kg	1600	2570	1090	278	385
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	2.8	1.0	0.2	0.2	0.4
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.2	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.08	<0.05	<0.05	0.54
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	0.30
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.25	<0.05	<0.05	0.24

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB01_0.0	SB02_0.0	SB03_0.0-0.2	SB04_0.0-0.2	SB04_0.4-0.6
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		ES2230446-001	ES2230446-002	ES2230446-003	ES2230446-004	ES2230446-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg		<0.05	**0.74**	<0.05	<0.05	**0.31**
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.15	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.25	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	**0.74**	<0.05	<0.05	**0.31**
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.08	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	**1.4**	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	**1.5**	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	**2.0**	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	**2.0**	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	**29.8**	**0.9**	**0.9**	**2.7**
Anthracene	120-12-7	0.5	mg/kg		<0.5	**10.9**	<0.5	<0.5	**0.6**
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	**54.3**	**1.2**	**1.3**	**3.4**
Pyrene	129-00-0	0.5	mg/kg		<0.5	**57.9**	**1.0**	**1.3**	**3.4**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	**28.0**	**0.6**	**0.6**	**1.5**
Chrysene	218-01-9	0.5	mg/kg		<0.5	**27.3**	**0.5**	**0.6**	**1.8**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	**27.4**	**0.6**	**0.7**	**1.9**
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	**8.9**	<0.5	<0.5	**0.6**
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	**18.0**	<0.5	<0.5	**1.2**
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	**6.2**	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	**2.2**	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	**6.6**	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	**284**	**4.8**	**5.4**	**17.1**
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	**27.6**	<0.5	<0.5	**1.6**
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**27.6**	**0.7**	**0.7**	**1.9**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**27.6**	**1.2**	**1.2**	**2.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01_0.0	SB02_0.0	SB03_0.0-0.2	SB04_0.0-0.2	SB04_0.4-0.6
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	ES2230446-001	ES2230446-002	ES2230446-003	ES2230446-004	ES2230446-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	90	<50	<50	50
C15 - C28 Fraction	----	100	mg/kg	1430	2110	260	280	790
C29 - C36 Fraction	----	100	mg/kg	2440	1930	140	270	570
^ C10 - C36 Fraction (sum)	----	50	mg/kg	3870	4130	400	550	1410
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	180	<50	<50	110
>C16 - C34 Fraction	----	100	mg/kg	3340	3290	340	440	1130
>C34 - C40 Fraction	----	100	mg/kg	1400	1500	<100	250	370
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	4740	4970	340	690	1610
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	180	<50	<50	110
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	111	100	65.7	70.3	79.6
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	121	95.8	66.9	80.3	93.7
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	106	98.3	102	120	133
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	91.6	96.1	87.8	96.9	91.8
2-Chlorophenol-D4	93951-73-6	0.5	%	96.2	100	90.1	102	94.6
2.4.6-Tribromophenol	118-79-6	0.5	%	89.3	86.7	90.9	86.0	88.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB01_0.0	SB02_0.0	SB03_0.0-0.2	SB04_0.0-0.2	SB04_0.4-0.6
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		ES2230446-001	ES2230446-002	ES2230446-003	ES2230446-004	ES2230446-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**92.2**	**89.8**	**86.4**	**85.1**	**89.9**
Anthracene-d10	1719-06-8	0.5	%		**101**	**93.4**	**95.0**	**94.5**	**92.9**
4-Terphenyl-d14	1718-51-0	0.5	%		**100**	**111**	**110**	**108**	**97.5**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**100**	**97.9**	**98.3**	**97.3**	**88.2**
Toluene-D8	2037-26-5	0.2	%		**106**	**109**	**107**	**106**	**96.6**
4-Bromofluorobenzene	460-00-4	0.2	%		**99.6**	**104**	**97.7**	**101**	**90.1**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB05_0.0-0.2	SB06_0.0-0.2	SB06_0.4-0.6	SB07_0.0-0.2	SB08_0.0-0.2
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	ES2230446-006	ES2230446-008	ES2230446-009	ES2230446-011	ES2230446-013
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	14.2	18.6	17.6	10.2	9.4
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	46.0	28.6	36.3	48.1	30.1
APPROVED IDENTIFIER:	----	-	--	B.SCHRADER	B.SCHRADER	B.SCHRADER	B.SCHRADER	B.SCHRADER
Synthetic Mineral Fibre	----	0.1	g/kg	No	No	No	No	No
Organic Fibre	----	0.1	g/kg	No	No	No	No	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	<5	<5	8	6
Cadmium	7440-43-9	1	mg/kg	2	<1	1	2	<1
Chromium	7440-47-3	2	mg/kg	7	4	3	8	6
Copper	7440-50-8	5	mg/kg	152	356	87	102	173
Lead	7439-92-1	5	mg/kg	326	250	171	192	125
Nickel	7440-02-0	2	mg/kg	9	4	3	6	6
Zinc	7440-66-6	5	mg/kg	515	276	379	437	259
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB05_0.0-0.2	SB06_0.0-0.2	SB06_0.4-0.6	SB07_0.0-0.2	SB08_0.0-0.2
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		ES2230446-006	ES2230446-008	ES2230446-009	ES2230446-011	ES2230446-013
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		**0.27**	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		**0.27**	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		**1.7**	<0.5	<0.5	**0.9**	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		**1.6**	<0.5	**0.5**	**1.4**	<0.5
Pyrene	129-00-0	0.5	mg/kg		**1.4**	<0.5	<0.5	**1.3**	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		**0.8**	<0.5	<0.5	**0.6**	<0.5
Chrysene	218-01-9	0.5	mg/kg		**0.8**	<0.5	<0.5	**0.6**	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**0.6**	<0.5	<0.5	**0.7**	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		**6.9**	<0.5	**0.5**	**5.5**	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.7**	**0.6**	**0.6**	**0.7**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB05_0.0-0.2	SB06_0.0-0.2	SB06_0.4-0.6	SB07_0.0-0.2	SB08_0.0-0.2
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		ES2230446-006	ES2230446-008	ES2230446-009	ES2230446-011	ES2230446-013
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		**60**	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		**770**	<100	<100	**120**	<100
C29 - C36 Fraction	----	100	mg/kg		**380**	<100	<100	**110**	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		**1210**	<50	<50	**230**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		**130**	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**1000**	**130**	**120**	**190**	**160**
>C34 - C40 Fraction	----	100	mg/kg		**210**	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		**1340**	**130**	**120**	**190**	**160**
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		**130**	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**80.4**	**80.4**	**69.4**	**70.9**	**83.1**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**90.1**	**81.0**	**75.4**	**70.2**	**95.1**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**112**	**74.3**	**65.0**	**66.4**	**86.5**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**84.9**	**99.1**	**99.0**	**95.8**	**89.7**
2-Chlorophenol-D4	93951-73-6	0.5	%		**88.2**	**103**	**91.2**	**92.4**	**91.5**
2.4.6-Tribromophenol	118-79-6	0.5	%		**102**	**99.2**	**84.4**	**91.6**	**88.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB05_0.0-0.2	SB06_0.0-0.2	SB06_0.4-0.6	SB07_0.0-0.2	SB08_0.0-0.2
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		ES2230446-006	ES2230446-008	ES2230446-009	ES2230446-011	ES2230446-013
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**85.7**	**84.5**	**104**	**91.5**	**85.6**
Anthracene-d10	1719-06-8	0.5	%		**84.0**	**101**	**98.3**	**96.7**	**93.8**
4-Terphenyl-d14	1718-51-0	0.5	%		**90.0**	**98.6**	**97.4**	**95.2**	**92.4**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**92.9**	**103**	**102**	**97.0**	**98.3**
Toluene-D8	2037-26-5	0.2	%		**95.5**	**106**	**108**	**103**	**106**
4-Bromofluorobenzene	460-00-4	0.2	%		**87.5**	**100**	**104**	**99.2**	**101**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QAQC01	TB_24-8-22	TS_24-8-22	----	----
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2230446-017	ES2230446-018	ES2230446-019	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**19.6**	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	----	----	----	----
Sample weight (dry)	----	0.01	g	**54.0**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**B.SCHRADER**	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	----	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**12**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	**4**	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**11**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**252**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**695**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**12**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**1020**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.2**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QAQC01	TB_24-8-22	TS_24-8-22	----	----
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2230446-017	ES2230446-018	ES2230446-019	--------	--------
				Result	Result	Result	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	**0.8**	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	**1.6**	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	**1.6**	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	**0.6**	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	**0.6**	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	**0.7**	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	**5.9**	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.7**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QAQC01	TB_24-8-22	TS_24-8-22	----	----
			Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2230446-017	ES2230446-018	ES2230446-019	--------	--------
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	**220**	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	**150**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**370**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	**320**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**320**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	**3.5**	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	**2.8**	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	**4.2**	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	**1.8**	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	**12.3**	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	**6.0**	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**90.4**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**85.9**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**104**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**86.4**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**91.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**95.2**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QAQC01	TB_24-8-22	TS_24-8-22	----	----
				Sampling date / time	24-Aug-2022 00:00	24-Aug-2022 00:00	24-Aug-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2230446-017	ES2230446-018	ES2230446-019	--------	--------
					Result	Result	Result	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		90.5	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		97.2	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		97.0	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		98.4	99.8	88.7	----	----
Toluene-D8	2037-26-5	0.2	%		101	104	96.8	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		96.1	104	91.9	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RIN_01	----	----	----	----
				Sampling date / time	24-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2230446-015	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RIN_01	----	----	----	----
			Sampling date / time	24-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2230446-015	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RIN_01	----	----	----	----
				Sampling date / time	24-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2230446-015	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**77.6**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**72.8**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		**63.9**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**23.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**48.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**42.5**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**56.6**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**71.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**73.6**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**113**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**118**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**110**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	SB01_0.0 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB02_0.0 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB03_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB04_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB04_0.4-0.6 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB05_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB06_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB06_0.4-0.6 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB07_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	SB08_0.0-0.2 - 24-Aug-2022 00:00	A soil sample.
EA200: Description	QAQC01 - 24-Aug-2022 00:00	A soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	45	134
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates - Continued			

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2230446**	Page	: 1 of 14
Client	: **NATION PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Laura Martinez	Contact	: Customer Services ES
Address	:	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: NP22013	Date Samples Received	: 25-Aug-2022
Order number	: NP22013_1	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 01-Sep-2022
Sampler	: NP		
Site	:		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4544368)									
ES2230276-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	9	16.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	24	8.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	20	17.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	94	92	1.8	0% - 50%
ES2230446-003	SB03_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	4	6	23.6	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	14	24.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	14	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	13	17.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	314	347	10.2	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	733	860	16.0	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	1090	1290	16.3	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4544370)									
ES2230446-013	SB08_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	173	# 129	29.2	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	125	# 157	22.1	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	259	316	19.8	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4544374)									
ES2230278-001	Anonymous	EA055: Moisture Content	----	0.1	%	58.2	58.5	0.5	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4544374) - continued									
ES2230446-006	SB05_0.0-0.2	EA055: Moisture Content	----	0.1	%	14.2	16.4	14.6	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4544375)									
ES2230446-017	QAQC01	EA055: Moisture Content	----	0.1	%	19.6	15.5	23.4	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4544369)									
ES2230446-003	SB03_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.3	0.0	No Limit
ES2230446-013	SB08_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 4543030)									
ES2230282-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2230446-008	SB06_0.0-0.2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4543029)									
ES2230282-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2230446-008	SB06_0.0-0.2	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4543029) - continued									
ES2230446-008	SB06_0.0-0.2	EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4543028)									
ES2230282-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2230446-008	SB06_0.0-0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4543028) - continued									
ES2230446-008	SB06_0.0-0.2	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4543027)									
ES2230282-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2540	2880	12.4	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	2250	2570	13.5	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	690	780	12.0	0% - 50%
ES2230446-008	SB06_0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4543663)									
ES2230185-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2230446-010	SB06_0.7-0.8	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4543027)									
ES2230282-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	3940	4290	8.4	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	1330	1720	25.6	0% - 50%
		EP071: >C10 - C16 Fraction	----	50	mg/kg	1010	1150	13.4	0% - 20%
ES2230446-008	SB06_0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	130	110	17.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4543663)									
ES2230185-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2230446-010	SB06_0.7-0.8	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 4543663)									
ES2230185-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4543663) - continued									
ES2230185-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2230446-010	SB06_0.7-0.8	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4549761)									
ES2230365-125	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2230446-015	RIN_01	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.006	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4549781)									
ES2226967-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2230415-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4546889)									
ES2230398-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2230571-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4546889)									
ES2230398-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2230571-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4546889)									
ES2230398-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 4546889) - continued									
ES2230398-001	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2230571-013	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4544368)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	93.8	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	104	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	102	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	103	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	94.6	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	92.2	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	86.4	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4544370)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	107	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	112	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	111	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	111	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	108	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	99.2	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	95.4	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4544369)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	90.2	70.0	125
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 4543030)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	100	62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543029)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.4	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	67.0	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543029) - continued								
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	84.2	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	83.2	54.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4543028)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	95.6	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.8	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.1	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	89.6	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.2	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	91.4	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	90.9	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	104	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	88.7	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	86.0	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	85.4	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	86.9	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	86.0	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	78.5	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	75.8	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	75.9	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4543027)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	96.6	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	94.9	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	90.2	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4543663)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	118	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4543027)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	98.2	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	91.8	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	90.4	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4543663)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	125	68.4	128
EP080: BTEXN (QCLot: 4543663)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 4543663) - continued								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.5	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	108	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	108	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	109	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63.0	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 4549761)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.4	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4549781)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.8	77.0	111
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 4543163)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	89.4	68.9	113
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543160)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	85.9	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	82.2	58.3	111
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	91.8	69.0	117
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	92.0	70.0	112
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	103	68.9	110
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	92.7	65.2	108
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	92.3	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	97.3	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	96.6	64.1	110
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	95.7	66.7	112
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	95.6	63.2	111
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	95.7	65.2	113
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	95.2	66.0	112
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	97.9	65.2	113
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	94.8	67.3	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543160) - continued								
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	95.4	72.0	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	85.3	66.9	109
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	103	65.2	112
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	102	65.2	112
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	103	63.8	110
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	105	61.1	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4543162)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	66.9	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	68.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	87.9	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	72.5	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	69.6	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	69.4	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	82.0	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	81.9	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	73.9	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	77.4	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	75.4	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	74.7	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	76.3	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	68.5	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	68.9	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	74.6	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4543161)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	83.9	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	71.0	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	81.0	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4546889)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	83.0	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4543161)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	55.2	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	76.3	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	96.4	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4546889)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.7	75.0	127
EP080: BTEXN (QCLot: 4546889)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	90.2	70.0	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 4546889) - continued								
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	92.4	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.8	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	94.3	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.8	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	107	70.0	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4544368)							
ES2230282-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	106	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.4	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	109	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	94.0	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	112	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4544370)							
EW2203916-014	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	92.1	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.5	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	99.2	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.9	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	94.3	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.0	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4544369)							
ES2230282-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	98.5	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 4543030)							
ES2230282-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	94.9	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543029)							
ES2230282-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	80.7	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	79.8	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	91.2	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 4543029) - continued							
ES2230282-001	Anonymous	EP068: Dieldrin	60-57-1	0.5 mg/kg	110	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	86.7	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	74.0	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4543028)							
ES2230282-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	92.1	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4543027)							
ES2230282-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	88.4	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	86.6	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	93.1	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4543663)							
ES2230185-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	123	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4543027)							
ES2230282-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	83.0	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	91.2	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	95.4	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4543663)							
ES2230185-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	124	70.0	130
EP080: BTEXN (QCLot: 4543663)							
ES2230185-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.0	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	99.1	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	99.6	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	98.0	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	80.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4549761)							
ES2230372-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.3	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	120	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.3	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4549761) - continued							
ES2230372-001	Anonymous	EG020A-T: Zinc	7440-66-6	1 mg/L	97.6	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4549781)							
ES2226967-011	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	90.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4546889)							
ES2230398-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	85.3	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4546889)							
ES2230398-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	85.7	70.0	130
EP080: BTEXN (QCLot: 4546889)							
ES2230398-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	78.9	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	86.5	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	91.0	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	90.7	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.6	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	99.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2230446**	Page	: 1 of 10
Client	: **NATION PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Laura Martinez	Telephone	: +61-2-8784 8555
Project	: NP22013	Date Samples Received	: 25-Aug-2022
Site	:	Issue Date	: 01-Sep-2022
Sampler	: NP	No. of samples received	: 18
Order number	: NP22013_1	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	ES2230446--013	SB08_0.0-0.2	**Copper**	7440-50-8	29.2 %	0% - 20%	**RPD exceeds LOR based limits**
EG005(ED093)T: Total Metals by ICP-AES	ES2230446--013	SB08_0.0-0.2	**Lead**	7439-92-1	22.1 %	0% - 20%	**RPD exceeds LOR based limits**

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP068T: Organophosphorus Pesticide Surrogate	ES2230446-015	RIN_01	**DEF**	78-48-8	63.9 %	66.5-111 %	**Recovery less than lower data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**----**	----	----	**26-Aug-2022**	07-Sep-2022	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**----**	----	----	**26-Aug-2022**	20-Feb-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**27-Aug-2022**	20-Feb-2023	✓	**29-Aug-2022**	20-Feb-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**27-Aug-2022**	21-Sep-2022	✓	**30-Aug-2022**	21-Sep-2022	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**29-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	08-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**29-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	08-Oct-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**29-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	08-Oct-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01, TB_24-8-22	**24-Aug-2022**	**26-Aug-2022**	07-Sep-2022	✓	**27-Aug-2022**	07-Sep-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**29-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	08-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01, TB_24-8-22	**24-Aug-2022**	**26-Aug-2022**	07-Sep-2022	✓	**27-Aug-2022**	07-Sep-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01	**24-Aug-2022**	**29-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	08-Oct-2022	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
SB01_0.0, SB02_0.0, SB03_0.0-0.2, SB04_0.0-0.2, SB04_0.4-0.6, SB05_0.0-0.2, SB06_0.0-0.2, SB06_0.4-0.6, SB07_0.0-0.2, SB08_0.0-0.2, QAQC01, TB_24-8-22, TS_24-8-22	**24-Aug-2022**	**26-Aug-2022**	07-Sep-2022	✓	**27-Aug-2022**	07-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
RIN_01	**24-Aug-2022**	**31-Aug-2022**	20-Feb-2023	✓	**31-Aug-2022**	20-Feb-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
RIN_01	**24-Aug-2022**	**----**	----	----	**31-Aug-2022**	21-Sep-2022	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
RIN_01	**24-Aug-2022**	**29-Aug-2022**	31-Aug-2022	✓	**31-Aug-2022**	08-Oct-2022	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068)							
RIN_01	**24-Aug-2022**	**29-Aug-2022**	31-Aug-2022	✓	**31-Aug-2022**	08-Oct-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
RIN_01	**24-Aug-2022**	**29-Aug-2022**	31-Aug-2022	✓	**31-Aug-2022**	08-Oct-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
RIN_01	**24-Aug-2022**	**29-Aug-2022**	31-Aug-2022	✓	**31-Aug-2022**	08-Oct-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RIN_01	**24-Aug-2022**	**30-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	07-Sep-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
RIN_01	**24-Aug-2022**	**29-Aug-2022**	31-Aug-2022	✓	**31-Aug-2022**	08-Oct-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RIN_01	**24-Aug-2022**	**30-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	07-Sep-2022	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
RIN_01	**24-Aug-2022**	**30-Aug-2022**	07-Sep-2022	✓	**30-Aug-2022**	07-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	7	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	4	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	4	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: Nation Partners	TURNAROUND REQUIREMENTS : (Standard TAT)	FOR LABORATORY USE ONLY (Circle)	
OFFICE:		Custody Seal Intact?	Yes / No / N/A
PROJECT: NP22013	ALS Q	Free ice / frozen ice bricks present upon receipt:	Yes / No / N/A
ORDER NUMBER: NP22013_1	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 2.8 °C	
PROJECT MANAGER: Laura Martinez	CONTACT PH: 0410	Other comments:	
SAMPLER: NP	SAMPLER MOBILE:	RELINQUISHED BY: N Phillips	RECEIVED BY: KS 24/8/22
COC emailed to ALS? Yes	ESDAT FORMAT	DATE/TIME	DATE/TIME: 1pm
Email Reports to (will default to PM if no other addresses are listed): lmartinez@nationpartners.com.au & nphillips@nationpartners.com.au		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): accounts@nationp 24-08-2022		DATE/TIME	DATE/TIME
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	COC Sent 25/8/22 4pm		

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	5-08 TRH/BTEX/PAH/OCP/OPP/8 Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)	EA200G - Asbestos	BTEXNTRH05-C10				On Hold	Comments on likely contaminant levels (dilutions, or samples requiring specific QC analysis etc)
1	SB01 0.0	24/08/2022	S	x	x						
2	SB02 0.0	24/08/2022	S	x	x						
3	SB03 0.0-0.2	24/08/2022	S	x	x						
4	SB04 0.0-0.2	24/08/2022	S	x	x						
5	SB04 0.4-0.6	24/08/2022	S	x	x						
6	SB05 0.0-0.2	24/08/2022	S	x	x						
7	SB05 0.4-0.6	24/08/2022	S	x	x						
8	SB06 0.0-0.2	24/08/2022	S	x	x						
9	SB06 0.4-0.6	24/08/2022	S	x	x						
10	SB06 0.7-0.8	24/08/2022	S	x	x						
11	SB07 0.0-0.2	24/08/2022	S	x	x						
12	SB07 0.4-0.6	24/08/2022	S	x	x						
13	SB08 0.0-0.2	24/08/2022	S	x	x						
14	SB08 0.3-0.5	24/08/2022	S	x	x						
15	RIN 01	24/08/2022	S	x	x						
16	RIN 02	24/08/2022	S								
17	QAQC01	24/08/2022	S	x	x						
	QAQC02	24/08/2022	S	x	x						
18	TB 24-8-22	24/08/2022	S			x					
19	TS 24-8-22	24/08/2022	S			x					

Please forward to Eurofin

Environmental Division Sydney
Work Order Reference
ES2230446

Telephone : – 61-2-8784 8555

#918696

Nation Partners
306 / 50 Holt Street,
Surry Hills
NSW 2010

Attention: **Laura Martinez**

Report **918696-S**
Project name NP22013
Project ID NP22013_1
Received Date Aug 29, 2022

Client Sample ID			[G01] **QAQC2**
Sample Matrix			**Soil**
Eurofins Sample No.			**S22-Au0067209**
Date Sampled			**Aug 24, 2022**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	59
TRH C15-C28	50	mg/kg	460
TRH C29-C36	50	mg/kg	270
TRH C10-C36 (Total)	50	mg/kg	789
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	90
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	90
TRH >C16-C34	100	mg/kg	630
TRH >C34-C40	100	mg/kg	160
TRH >C10-C40 (total)*	100	mg/kg	880
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.9
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.1
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.4
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	1.1
Benzo(a)pyrene	0.5	mg/kg	0.6
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	0.7
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	0.7
Chrysene	0.5	mg/kg	1.2
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5

Client Sample ID			G01 QAQC2
Sample Matrix			Soil
Eurofins Sample No.			S22-Au0067209
Date Sampled			Aug 24, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.5	mg/kg	1.4
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	1.3
Pyrene	0.5	mg/kg	1.2
Total PAH*	0.5	mg/kg	8.2
2-Fluorobiphenyl (surr.)	1	%	106
p-Terphenyl-d14 (surr.)	1	%	121
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 1
4.4'-DDD	0.05	mg/kg	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.5
a-HCH	0.05	mg/kg	< 0.5
Aldrin	0.05	mg/kg	< 0.5
b-HCH	0.05	mg/kg	< 0.5
d-HCH	0.05	mg/kg	< 0.5
Dieldrin	0.05	mg/kg	< 0.5
Endosulfan I	0.05	mg/kg	< 0.5
Endosulfan II	0.05	mg/kg	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.5
Endrin	0.05	mg/kg	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.5
Endrin ketone	0.05	mg/kg	< 0.5
g-HCH (Lindane)	0.05	mg/kg	< 0.5
Heptachlor	0.05	mg/kg	< 0.5
Heptachlor epoxide	0.05	mg/kg	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.5
Methoxychlor	0.05	mg/kg	< 0.5
Toxaphene	0.5	mg/kg	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1
Dibutylchlorendate (surr.)	1	%	82
Tetrachloro-m-xylene (surr.)	1	%	99
Polychlorinated Biphenyls			
Aroclor-1016	0.1	mg/kg	< 1
Aroclor-1221	0.1	mg/kg	< 1
Aroclor-1232	0.1	mg/kg	< 1
Aroclor-1242	0.1	mg/kg	< 1
Aroclor-1248	0.1	mg/kg	< 1
Aroclor-1254	0.1	mg/kg	< 1
Aroclor-1260	0.1	mg/kg	< 1
Total PCB*	0.1	mg/kg	< 1
Dibutylchlorendate (surr.)	1	%	82
Tetrachloro-m-xylene (surr.)	1	%	99

Client Sample ID			G01 QAQC2
Sample Matrix			**Soil**
Eurofins Sample No.			**S22-Au0067209**
Date Sampled			**Aug 24, 2022**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	11
Cadmium	0.4	mg/kg	4.6
Chromium	5	mg/kg	13
Copper	5	mg/kg	260
Lead	5	mg/kg	650
Mercury	0.1	mg/kg	0.2
Nickel	5	mg/kg	12
Zinc	5	mg/kg	970
% Moisture	1	%	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	Aug 30, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Aug 30, 2022	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Aug 30, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Aug 30, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Company Name: Nation Partners Pty Ltd
Address: 306 / 50 Holt Street,
Surry Hills
NSW 2010

Project Name: NP22013
Project ID: NP22013_1

Order No.:
Report #: 918696
Phone: 0405 821 580
Fax:

Received: Aug 29, 2022 4:00 PM
Due: Sep 5, 2022
Priority: 5 Day
Contact Name: Laura Martinez

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	Moisture Set	Suite B10A:TRH/BTEXN/PAH/OCP/PCB/Metals8
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QAQC2	Aug 24, 2022		Soil	S22-Au0067209	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	80			70-130	Pass	
TRH C10-C14	%	91			70-130	Pass	
Naphthalene	%	97			70-130	Pass	
TRH C6-C10	%	80			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	107			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	102			70-130	Pass	
Xylenes - Total*	%	102			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	104			70-130	Pass	
Acenaphthylene	%	103			70-130	Pass	
Anthracene	%	100			70-130	Pass	
Benz(a)anthracene	%	114			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	117			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	111			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	%	96			70-130	Pass	
Fluoranthene	%	93			70-130	Pass	
Fluorene	%	105			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	97			70-130	Pass	
Naphthalene	%	104			70-130	Pass	
Phenanthrene	%	121			70-130	Pass	
Pyrene	%	105			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	92			70-130	Pass	
4.4'-DDD	%	100			70-130	Pass	
4.4'-DDE	%	100			70-130	Pass	
4.4'-DDT	%	93			70-130	Pass	
a-HCH	%	86			70-130	Pass	
Aldrin	%	96			70-130	Pass	
b-HCH	%	95			70-130	Pass	
d-HCH	%	86			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	98			70-130	Pass	
Endosulfan II	%	91			70-130	Pass	
Endosulfan sulphate	%	90			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	74			70-130	Pass	
Endrin ketone	%	81			70-130	Pass	
g-HCH (Lindane)	%	90			70-130	Pass	
Heptachlor	%	92			70-130	Pass	
Heptachlor epoxide	%	90			70-130	Pass	
Hexachlorobenzene	%	94			70-130	Pass	
Methoxychlor	%	80			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	77			70-130	Pass	
Aroclor-1260	%	71			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	116			80-120	Pass	
Cadmium	%	113			80-120	Pass	
Chromium	%	112			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	105			80-120	Pass	
Mercury	%	110			80-120	Pass	
Nickel	%	107			80-120	Pass	
Zinc	%	109			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S22-Au0071624	NCP	%	72			70-130	Pass	
TRH C10-C14	S22-Au0054102	NCP	%	86			70-130	Pass	
Naphthalene	S22-Au0071624	NCP	%	79			70-130	Pass	
TRH C6-C10	S22-Au0071624	NCP	%	74			70-130	Pass	
TRH >C10-C16	S22-Au0054102	NCP	%	84			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S22-Au0071624	NCP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	S22-Au0071624	NCP	%	88			70-130	Pass	
Ethylbenzene	S22-Au0071624	NCP	%	79			70-130	Pass	
m&p-Xylenes	S22-Au0071624	NCP	%	89			70-130	Pass	
o-Xylene	S22-Au0071624	NCP	%	88			70-130	Pass	
Xylenes - Total*	S22-Au0071624	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S22-Au0068380	NCP	%	91			70-130	Pass	
Acenaphthylene	S22-Au0068380	NCP	%	88			70-130	Pass	
Anthracene	S22-Au0068380	NCP	%	106			70-130	Pass	
Benz(a)anthracene	S22-Au0068380	NCP	%	90			70-130	Pass	
Benzo(a)pyrene	S22-Au0068380	NCP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	S22-Au0068380	NCP	%	92			70-130	Pass	
Benzo(g.h.i)perylene	S22-Au0068380	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	S22-Au0068380	NCP	%	101			70-130	Pass	
Chrysene	S22-Au0068380	NCP	%	99			70-130	Pass	
Dibenz(a.h)anthracene	S22-Au0068380	NCP	%	90			70-130	Pass	
Fluoranthene	S22-Au0068380	NCP	%	87			70-130	Pass	
Fluorene	S22-Au0068380	NCP	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S22-Au0068380	NCP	%	89			70-130	Pass	
Naphthalene	S22-Au0068380	NCP	%	92			70-130	Pass	
Phenanthrene	S22-Au0068380	NCP	%	90			70-130	Pass	
Pyrene	S22-Au0068380	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S22-Au0063102	NCP	%	86			70-130	Pass	
4.4'-DDD	S22-Au0063102	NCP	%	89			70-130	Pass	
4.4'-DDE	S22-Au0063102	NCP	%	94			70-130	Pass	
4.4'-DDT	S22-Au0063102	NCP	%	76			70-130	Pass	
a-HCH	S22-Au0063102	NCP	%	75			70-130	Pass	
Aldrin	S22-Au0063102	NCP	%	85			70-130	Pass	
b-HCH	S22-Au0063102	NCP	%	86			70-130	Pass	
d-HCH	S22-Au0063102	NCP	%	82			70-130	Pass	
Dieldrin	S22-Au0063102	NCP	%	75			70-130	Pass	
Endosulfan I	S22-Au0063102	NCP	%	90			70-130	Pass	
Endosulfan II	S22-Au0063102	NCP	%	80			70-130	Pass	
Endosulfan sulphate	S22-Au0063102	NCP	%	74			70-130	Pass	
Endrin	S22-Au0063102	NCP	%	73			70-130	Pass	
Endrin ketone	S22-Au0063102	NCP	%	76			70-130	Pass	
g-HCH (Lindane)	S22-Au0063102	NCP	%	74			70-130	Pass	
Heptachlor	S22-Au0063102	NCP	%	84			70-130	Pass	
Heptachlor epoxide	S22-Au0063102	NCP	%	81			70-130	Pass	
Hexachlorobenzene	S22-Au0063102	NCP	%	90			70-130	Pass	
Methoxychlor	S22-Au0057091	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	S22-Au0063102	NCP	%	70			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S22-Au0067310	NCP	%	125			75-125	Pass	
Cadmium	S22-Au0067310	NCP	%	113			75-125	Pass	
Chromium	S22-Au0067310	NCP	%	95			75-125	Pass	
Copper	S22-Au0067310	NCP	%	110			75-125	Pass	
Lead	S22-Au0067310	NCP	%	93			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	S22-Au0067310	NCP	%	110			75-125	Pass	
Nickel	S22-Au0067310	NCP	%	107			75-125	Pass	
Zinc	S22-Au0067310	NCP	%	103			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S22-Au0067095	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S22-Au0069916	NCP	mg/kg	35	36	1.00	30%	Pass	
TRH C15-C28	S22-Au0069916	NCP	mg/kg	520	580	12	30%	Pass	
TRH C29-C36	S22-Au0069916	NCP	mg/kg	1000	1200	15	30%	Pass	
Naphthalene	S22-Au0067095	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S22-Au0067095	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S22-Au0069916	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S22-Au0069916	NCP	mg/kg	1300	1500	14	30%	Pass	
TRH >C34-C40	S22-Au0069916	NCP	mg/kg	690	780	12	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S22-Au0067095	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S22-Au0067095	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S22-Au0067095	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S22-Au0067095	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S22-Au0067095	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S22-Au0067095	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S22-Au0068381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S22-Au0068381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S22-Au0068381	NCP	mg/kg	1.0	2.2	78	30%	Fail	Q15
Benz(a)anthracene	S22-Au0068381	NCP	mg/kg	3.4	5.5	49	30%	Fail	Q15
Benzo(a)pyrene	S22-Au0068381	NCP	mg/kg	4.4	7.6	53	30%	Fail	Q15
Benzo(b&j)fluoranthene	S22-Au0068381	NCP	mg/kg	4.0	7.4	59	30%	Fail	Q15
Benzo(g.h.i)perylene	S22-Au0068381	NCP	mg/kg	4.2	8.1	62	30%	Fail	Q15
Benzo(k)fluoranthene	S22-Au0068381	NCP	mg/kg	3.6	7.0	65	30%	Fail	Q15
Chrysene	S22-Au0068381	NCP	mg/kg	4.4	6.5	37	30%	Fail	Q15
Dibenz(a.h)anthracene	S22-Au0068381	NCP	mg/kg	0.9	1.5	51	30%	Fail	Q15
Fluoranthene	S22-Au0068381	NCP	mg/kg	8.0	14	57	30%	Fail	Q15
Fluorene	S22-Au0068381	NCP	mg/kg	< 0.5	0.7	61	30%	Fail	Q15
Indeno(1.2.3-cd)pyrene	S22-Au0068381	NCP	mg/kg	2.8	4.9	54	30%	Fail	Q15
Naphthalene	S22-Au0068381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S22-Au0068381	NCP	mg/kg	2.7	6.8	88	30%	Fail	Q15
Pyrene	S22-Au0068381	NCP	mg/kg	7.8	13	54	30%	Fail	Q15
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan sulphate	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S22-Au0063096	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S22-Au0063096	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S22-Au0063096	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S22-Au0067589	NCP	mg/kg	11	12	8.5	30%	Pass	
Cadmium	S22-Au0067589	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S22-Au0067589	NCP	mg/kg	27	30	11	30%	Pass	
Copper	S22-Au0067589	NCP	mg/kg	15	17	7.7	30%	Pass	
Lead	S22-Au0067589	NCP	mg/kg	29	30	2.9	30%	Pass	
Mercury	S22-Au0067589	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S22-Au0067589	NCP	mg/kg	9.4	9.7	2.9	30%	Pass	
Zinc	S22-Au0067589	NCP	mg/kg	34	34	1.6	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S22-Au0067309	NCP	%	24	22	8.2	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Robert Biviano	Analytical Services Manager
Chamath JHM Annakkage	Senior Analyst-Asbestos
Gabriele Cordero	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

eurofins | Environment Testing

Nation Partners
306 / 50 Holt Street,
Surry Hills
NSW 2010

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:	Laura Martinez
Report	918696-AID
Project Name	NP22013
Project ID	NP22013_1
Received Date	Aug 29, 2022
Date Reported	Sep 06, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name NP22013
Project ID NP22013_1
Date Sampled Aug 24, 2022
Report 918696-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
QAQC2	22-Au0067209	Aug 24, 2022	Approximate Sample 31g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Aug 30, 2022	Indefinite

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Company Name: Nation Partners Pty Ltd
Address: 306 / 50 Holt Street,
Surry Hills
NSW 2010

Project Name: NP22013
Project ID: NP22013_1

Order No.:
Report #: 918696
Phone: 0405 821 580
Fax:

Received: Aug 29, 2022 4:00 PM
Due: Sep 5, 2022
Priority: 5 Day
Contact Name: Laura Martinez

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	Moisture Set	Suite B10A:TRH/BTEXN/PAH/OCP/PCB/Metals8
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QAQC2	Aug 24, 2022		Soil	S22-Au0067209	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

nation partners

SOLUTIONS FOR
COMPLEX PROJECTS

Appendix B

COST SUMMARY REPORT (RIDER LEVETT BUCKNALL)

DA ESTIMATE REPORT

AUGUST 2022

CARRINGTON HYDRAULIC ENGINE HOUSE – STAGE 3

BOURKE STREET, CARRINGTON

PROJECT ID: 17763

RLB Rider Levett Bucknall

Rider Levett Bucknall NSW Pty Ltd
ABN 94 003 234 026

Suite 4, Level 1
101 Hannell Street
Wickham NSW 2293
Australia

T: +61 2 4940 0000
E: newcastle@au.rlb.com

jf:17763.2.ES-Rpts.kb.mwh

23 August 2022

EJE Architecture
412 King Street
NEWCASTLE NSW 2300

Attention: Dominic Warland
Email: DWarland@eje.com.au

Dear Dominic

CARRINGTON HYDRAULIC ENGINE HOUSE – STAGE 3
COST ESTIMATE REPORT

We have pleasure in enclosing our Cost Estimate Report for the above stated scheme.

We trust that our report is of assistance and will be pleased to provide any further information, which you may require upon request.

Yours sincerely

Mark Hocking
Director
Rider Levett Bucknall
mark.hocking@au.rlb.com

REPORTS ISSUED

Report	Date	Title Description	Released By
1	09.07.2021	Estimate Report – DRAFT	Director
2	14.07.2021	Estimate Report – DRAFT	Director
3	15.07.2021	Estimate Report	Director
4	29.07.2021	Estimate Report – Rev A	Director
5	09.08.2021	Estimate Report – Rev B	Director
6	12.08.2021	Estimate Report – Rev C	Director
7	23.08.2022	DA Estimate Report	Director

Prepared by:	Reviewed by:	Project Director:
Kai Rala McKinnon-Barbosa	Syidah Arnold	Mark Hocking
Senior Surveyor	Associate	Director
kai.barbosa@au.rlb.com	syidah.arnold@au.rlb.com	mark.hocking@au.rlb.com

Document No.:	TN-GO-0101	Version No.:	V2.0	Date Version Issued:	11-10-2021

TABLE OF CONTENTS

APPENDICES

1 EXECUTIVE SUMMARY

This report estimates a total cost of $1,165,607 excluding GST and $1,282,170 including GST. This report is based on the information received on 9 August 2022 via email received from Dominic Warland of EJE Architecture, please refer to Appendix D for details.

With a total Gross Floor Area of 294m2, the above estimate represents a cost of $3,965/m2 excluding GST and $4,361/m2 including GST.

Rates used in the formulation of this estimate are current as at August 2022. As we have not been provided with any program escalation has been excluded from the estimate. We have prepared this estimate based on the project being procured via a single stage competitive tender.

We refer you to the body of the report for the full summary, assumptions, clarifications, and detailed basis of the above estimate.

2 INTRODUCTION

2.1 PURPOSE OF REPORT

This DA Estimate Report has been prepared for the purpose of providing an indicative order of development cost suitable to fulfil the concept DA submission requirements for Council. The actual cost of the development will vary depending on numerous matters including but not limited to the method of contractual procurement, staging, quality of finishes and fitments, method of construction, calibre of contractor, timing and implementation of the works, utility provisions outside site boundaries, etc. Hence, this report is for the benefit of Council only and is not to be relied upon by third parties.

2.2 PROJECT DESCRIPTION

The project comprises of remediation works to the existing Carrington Hydraulic Engine House and construction of a new access ramp located at Bourke Street, Carrington. The project following scope of works:

- Remediation works to the existing Hydraulic Engine House including access ramp, alterations and additions, and services;
- Encapsulation of Engine Room subfloor; and
- External works including access ramp, landscaping, and connection to services.
- Crane base signage on reused sandstone plinth
- Stainless steel interpretation signage on reused sandstone plinth

3 PROJECT COSTS

3.1 COST ESTIMATE SUMMARY

The costs can be summarised as follows:

Description	Cost	Cost/m2	% Cost
Carrington Hydraulic Engine House	1,023,079	3,480	80%
Stainless Steel Interpretation Sign	12,084		1%
Access Ramp	112,127		9%
Crane Base Plaques	18,317		1%
TOTAL CONSTRUCTION COST	**1,165,607**	**3,965**	**91%**
Consultant Fees	Excl.		
Project Contingency - Carrington Hydraulic Engine House	Excl.		
Escalation	Incl.		
Staging / Phasing Costs	Excl.		
Design and Planning Fees	Excl.		
Authority Fees and Charges	Excl.		
Land and Legal Fees	Excl.		
Finance Cost and Interest Charges	Excl.		
Goods and Services Tax	116,563		
Rounding	Excl.		
TOTAL OTHER PROJECT COSTS	116,563	396	9%
TOTAL ESTIMATE	**1,282,170**	**4,361**	**100%**

A further breakdown of cost can be found in the Estimate in A**ppendix A** of this report.

4 BASIS OF ESTIMATE

4.1 BASIS OF QUANTIFICATION & PRICING

This cost report has been prepared to forecast the total cost of the project as currently detailed. It has been based on DA issue information.

This cost estimate is based on the documentation listed in Appendix B and does not, at this stage, provide a direct comparison with the tenders to be received at a future date.

4.2 BASIS OF PROCUREMENT

The costs in this report assumes that a competitive tender will be obtained from a suitably qualified contractor.

4.3 PROGRAMME

No programme information has been provided.

4.4 ESCALATION

Our estimate has been based on market rates current at the date of this report.

4.5 CLARIFICATIONS AND ASSUMPTIONS

- We have assumed works will take place in a single continuous stage.
- We have assumed the majority of decontamination has already occurred
- We have assumed that the site can be made safe during construction using commonly used safe work methodologies
- Existing machinery relocation is excluded
- Securing existing platform in Generator room is excluded
- We have assumed existing site infrastructure is suitable for the proposed project
- Allowances for building services have been made on benchmarked rates and lump sum allowances where applicable. These allowances are subject to future design and should be reviewed in conjunction with specialist services engineers.
- Builder's Preliminaries and Margin have been included.
- Design Consultant Fees have been excluded.
- Authority Fees have been excluded.
- We have excluded loose FF&E from our estimate

4.6 ITEMS SPECIFICALLY EXCLUDED

Site Works

- Demolition of existing buildings
- Rock excavation
- Piled foundations
- Removal and / or remediation of hazardous materials beyond specified
- Upgrades of existing services infrastructure
- Works outside site boundary
- Decontamination and removal of hazardous materials beyond specified
- Diverting existing services

Temporary Works

- Temporary staging space and decanting works
- Standby power generation

Structure

- Structural transfers

Fit-out and Interiors

- Fitout to office / retail / concessions, etc.
- Curtains and blinds
- Loose furniture fixtures and equipment
- Operating supplies and equipment
- Artwork
- Tenant fit-out

Building Services

- AV Equipment
- Active ICT equipment
- Specialised equipment, computer equipment, business machines (copiers, printers, etc.) or other 'plug-in' equipment

Sustainability

- Greenstar or NABERS certification

Authority Fees and Requirements

- Authority charges and contributions
- Planning Reform Fee (plan FIRST)
- Destructive testing
- Affordable Housing contributions
- Environmental impact studies

Other

- Development costs including land, approvals, legal fees, agent fees and lease incentives
- Phasing costs
- Contingencies
- Consultant fees
- Escalation
- Client direct costs
- Finance and interest charges
- Goods and Services Tax
- Prototypes
- Relocation costs
- Promotion and marketing costs
- Pre-opening budget
- Effect of foreign exchange currency fluctuations
- Work at penalty rates for "out of hours" or programme acceleration
- Changes in law, standards and codes

4.7 COVID-19 IMPACTS

Our estimate has been prepared to reflect the anticipated changed market conditions due to the impact of COVID-19.

Our estimate makes provisions for amended site requirements and head contractor preliminaries including items such as:

- Additional worker shed facilities
- Additional regular site cleaning of facilities
- Longer site operating times to facilitate movement of workers with restricted numbers in lifts and hoists

RLB advise our current estimate does not account for exacerbated risks such as:

- Imported material delivery delays
- Further tightening of social distancing rules impacting on programme
- Exchange rate fluctuations

RLB recommends that a project contingency provision is made for COVID-19 impacts dependent of the status of the design and delivery cycle of the project. We would be pleased to discuss suitable provisions.

RLB recommends undertaking a risk analysis of this issue and we would be pleased to assist in the preparation of an order of cost assessment and/or sensitivity analysis for the project based on defined criteria. Our recently added programming capability can also be of assistance in these matters.

RLB anticipate that the impact on the estimate may only be in the short to medium term and that long-term impacts may revert to normal circumstances hence this will be subject to ongoing monitoring.

APPENDIX A:
DA Estimate

CARRINGTON HYDRAULIC ENGINE HOUSE

DA ESTIMATE - STAGE 3

Rider Levett Bucknall

LOCATION SUMMARY

GFA: Gross Floor Area
Rates Current At August 2022

Ref	Location	GFA m²	GFA $/m²	Total Cost $
A	**CARRINGTON HYDRAULIC ENGINE HOUSE**			
A1	SITE PREPARATION AND DEMOLITION WORKS			263,761
A2	BUILDING WORKS	294	2,583	759,318
	A - CARRINGTON HYDRAULIC ENGINE HOUSE	**294**	**3,480**	**1,023,079**
B	**STAINLESS INTERPRETATION SIGN**			**12,084**
C	**ACCESS RAMP**			**112,127**
D	**CRANE BASE PLAQUES**			**18,317**
ESTIMATED NET COST		**294**	**3,965**	**1,165,607**
MARGINS & ADJUSTMENTS				
Consultant Fees				Excl.
Project Contingency - Carrington Hydraulic Engine House				Excl.
Escalation to Q4 2021				Excl.
Staging / Phasing Costs				Excl.
Design and Planning Fees				Excl.
Authority Fees and Charges				Excl.
Land and Legal Fees				Excl.
Finance Cost and Interest Charges				Excl.
Goods and Services Tax	10.0%			116,563
Rounding				Excl.
ESTIMATED TOTAL COST		**294**	**4,361**	**1,282,170**

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE

A1 SITE PREPARATION AND DEMOLITION WORKS

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
AR	**ALTERATIONS AND RENOVATIONS**				
112	Allowance to demolish non-original lightweight timber walkway, handrail and structure to Engine Room	m²	28	100	2,800
236	Allowance to treat all contaminated fabric with PVA spray sealant	m²	259	100	25,900
237	Allowance to clear light debris to base of Accumulator Tower	m²	25	100	2,500
247	Allowance to remove existing floor grates and place into sub-floor cavity	m²	11	150	1,650
254	Allowance to decontaminate and move existing grates	m²	10	650	6,500
255	Allowance to cut back existing steel support beams	m²	10	150	1,500
256	Allowance to decontaminate grates	m²	10		Incl.
293	Allowance to re-install original floor grates	m²	10	500	5,000
260	Allowance to grind down existing raised concrete plinth and make good	m²	3	500	1,500
115	Allowance to remove existing large timber beams	m	49	300	14,700
113	Allowance to demolish existing timber beams	m	14	200	2,800
238	Allowance to rake out mortar course and make good for new termimesh lining to Accumulator Tower	m	28	250	7,000
246	Allowance to remove existing beams and structure	m	13	350	4,550
248	Allowance to cut down top of brick dwarf wall to suit new ramp	m	20	300	6,000
249	Allowance to remove and disposed rotted timber beam	m	11	90	990
263	Allowance to demolish non-original timber balustrade	m	4	50	200
150	Allowance to demolish timber doorway, frame and jambs	No	2	250	500
3	Allowance to demolish masonry to existing door opening	No	2	300	600
28	Allowance to remove existing lintel	No	1	350	350
298	Seal existing opening around new services conduits	No	1	500	500
144	Allowance for temporary balustrade to wall opening	No	1	950	950
235	Allowance to demolish single steel column and leave remnants in cavity for permanent storage	No	1	200	200
239	Allowance to remove timber beam below first mortar course to Accumulator Tower	No	2	500	1,000
240	Allowance to clean debris from existing pipe penetration	No	2	500	1,000
241	Allowance to trim end of pipe protruding from wall	No	2	200	400
242	Allowance to cut sandstone in situ to enlarge vent opening; 650mm SQ	No	4	1,200	4,800
243	Allowance to move heavy rubble to clear base of columns for new plinth	No	2	500	1,000
244	Allowance to demolish brickwork and timber framing and make good	No	1	500	500
251	Allowance to remove internal downpipe and make good	No	2	350	700

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE

A1 SITE PREPARATION AND DEMOLITION WORKS (continued)

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
252	Allowance to cut portion of fixed guide rail for new door opening, retain piece of rail for interpretive display within tower. Including new fixings for remnant guide rail	No	1	750	750
253	Remove and dispose fixed timber column	No	1	150	150
258	Allowance to cut down small column below level of new floor slab	No	1	250	250
259	Allowance to remove existing rail and allow to decontaminate for re-installation	No	1	300	300
261	Allowance to remove steel plate to create opening	No	1	300	300
264	Allowance to to sort existing stack of disused heavy stone and identify pieces for re-use	No	1	6,500	6,500
271	Allowance for new 110dia trade waste and 2x 100dia conduits and make good	No	1	500	500
272	Allowance to permanently seal pipe opening and wall penetration	No	3	180	540
286	Allowance to create new opening in wall and salvage bricks for re-use	No	1	1,500	1,500
287	Allowance to remove loose plywood sheets over missing panels	No	4	50	200
289	Allowance to remove existing timber and pipe attachments and clear rubble for new plinth	No	1	500	500
295	Allowance to trim bottom edge of existing door leaves	No	1	200	200
296	Allowance to trim existing pipe penetration above proposed floor level	No	1	50	50
302	Allowance to trim pipe and conduit	No	2	75	150
303	Remove loose conduit	No	1	75	75
305	Allowance to remove timber beam below first mortar course	No	3	150	450
308	Remove portion of sandstone kerb for new ramp	No	1	500	500
310	Trim down single brick pier to below proposed floor level	No	1	150	150
311	Locally trim deck to suit pipe through wall and guide rail	No	2	150	300
277	Allowance for sundry clearance to sub floor prior to pouring plinths	Item			4,500
187	Allowance for cleaning and decontamination of existing floor grates to entry niche	Item			15,000
191	Termite maintenance - EXCLUDED	Item			Excl.
221	Chemical damp proof course- EXCLUDED	Item			Excl.
143	Allowance to remove temporary asbestos seals to openings	Item			3,600
25	Allowance to remove down pipes and make good	Item			1,500
26	Allowance for sundry patch and repair to wall penetrations	Item			5,000
15	Allowance for termite protection	Item			28,000
17	Allowance to secure and retain existing brackets, pipes and fixtures	Item			10,000
306	Allowance to seal deep weathering to stone with mortar where required	Item			15,000
250	Allowance for sundry demolition and make good	Item			10,000

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE

A1 SITE PREPARATION AND DEMOLITION WORKS (continued)

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
10	Secure corner platform to Generator Room - EXCLUDED	Item			Excl.
222	Salt removal to existing building - EXCLUDED	Item			Excl.
9	Remove machinery and relocate to external display - EXCLUDED	Item			Excl.
186	Removal of hazardous or contaminated materials - EXCLUDED	Item			Excl.
	AR - ALTERATIONS AND RENOVATIONS				**202,055**
XX	**EXTERNAL ALTERATIONS AND RENOVATIONS**				
69	Allowance to remove portion of sandstone kerb and make good	m	2	50	100
279	Allowance for temporary asphalt ramp from ground to new ramp	m²	3	500	1,500
	XX - EXTERNAL ALTERATIONS AND RENOVATIONS				**1,600**
XP	**SITE PREPARATION**				
224	Allowance for site clearance to proposed ramp including removal of vegetation and undergrowth	m²	35	3	105
326	Allowance for temporary midspan propping	m	24	150	3,600
331	Allowance to provide temporary propping and formwork to all sides of glass floor inserts	Item			Incl.
40	Temporary shoring, propping, strutting, underpinning etc to existing buildings other than localised propping to suit scope of works - EXCLUDED	Item			Excl.
39	Treatment of reactive soil and acid sulphate soils - EXCLUDED	Item			Excl.
41	Dealing with heritage, cultural and archaeological artifacts / findings - EXCLUDED	Item			Excl.
44	Rock excavation - EXCLUDED	Item			Excl.
46	Removal of contaminated soils and materials other than specified - EXCLUDED	Item			Excl.
47	Mine grouting and mine subsidence works - EXCLUDED	Item			Excl.
	XP - SITE PREPARATION				**3,705**
PR	**PRELIMINARIES**				
1	Builders Preliminaries (20%)	Item			43,960
	PR - PRELIMINARIES				**43,960**
BM	**BUILDERS MARGIN**				
2	Builders Margin (6%)	Item			12,441
	BM - BUILDERS MARGIN				**12,441**
SITE PREPARATION AND DEMOLITION WORKS					**263,761**

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE
A2 BUILDING WORKS

GFA: 294 m² Cost/m²: 2,583
Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
AR	**ALTERATIONS AND RENOVATIONS**				
274	Provisional sum allowance to arrange salvaged building fabric	Item			20,000
204	Allowance for general asbestos decontamination works to Engine Room including airlock and testing for duration of works	Item			60,000
33	Allowance to remove and relocate items for heritage interpretation display and dispose of remainder	Item			25,000
14	Allowance to make good of existing sandstone; assumed to 10% of wall surface	Item			40,000
	AR - ALTERATIONS AND RENOVATIONS			**493/m²**	**145,000**
SB	**SUBSTRUCTURE**				
269	Allowance for termimesh and geofabric	m²	31	75	2,325
270	Allowance for 20mm dia blue metal gravel to 200mm depth	m²	25	70	1,750
278	Allowance for ST.01 new sandstone to seal penetrations	No	11	950	10,450
329	Allowance for pad footing PF1; 450mm x 450mm x 350mm	No	6	300	1,800
330	Allowance for pad footing PF2; 450mm x 450mm x 350mm min.	No	15	400	6,000
275	Allowance for SA2; 150x90x8 UA	t	0.15	8,500	1,275
328	Allowance for loose and attached connections (15%)	t	0.03	8,500	255
122	Extra over allowance for sundry joints and sealants to seal subfloor to ensure permanent air-tight cavity	Item			50,000
	SB - SUBSTRUCTURE			**251/m²**	**73,855**
CL	**COLUMNS**				
325	Allowance for SC1; 89x89x3.5 SHS	t	0.15	8,500	1,275
327	Allowance for loose and attached connections - per column	No	8	150	1,200
18	Works to existing columns - EXCLUDED	Item			Excl.
	CL - COLUMNS			**8/m²**	**2,475**
UF	**UPPER FLOORS**				
120	Allowance for glass floor	m²	11	4,000	44,000
153	Allowance for structural upgrades to existing slab	m²	35	150	5,250
165	Allowance for structural updates to suit new slabs	m²	221	200	44,200
226	Allowance for Conc. 01; Honed concrete floor	m²	175	280	49,000
227	Allowance for Conc. 02; Honed and stained concrete floor	m²	47	330	15,510
228	Allowance for Conc. 03; Broom finish concrete floor	m²	31	290	8,990
232	Extra over concrete slab for slab turn down to entry	m	42	1,000	42,000
290	Allowance for glass panel over grates	m²	6	4,000	24,000
307	Seal base of existing lowered floor slab with concrete	m²	31	50	1,550
234	Floor finish to Accumulator Tower 2 - EXCLUDED	Item			Excl.
	UF - UPPER FLOORS			**798/m²**	**234,500**

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE
A2 BUILDING WORKS (continued)

GFA: 294 m² Cost/m²: 2,583
Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
SC	**STAIRCASES**				
231	Allowance for staircase to Engine Room including landings and balustrade	No	1	5,300	5,300
	SC - STAIRCASES			**18/m²**	**5,300**
RF	**ROOF**				
19	Allowance for make good works to roof relating to solar PV installation	Item			5,000
181	Works to existing roof other than specified - EXCLUDED	Item			Excl.
	RF - ROOF			**17/m²**	**5,000**
EW	**EXTERNAL WALLS**				
312	Replica heritage grille with woven steel security screen	No	4	5,000	20,000
147	Works to existing facade - EXCLUDED	Item			Excl.
	EW - EXTERNAL WALLS			**68/m²**	**20,000**
WW	**WINDOWS**				
145	Internal glazed window panels to Engine Room - EXCLUDED	Item			Excl.
149	Works to windows of base building - EXCLUDED	Item			Excl.
	WW - WINDOWS				**Excl.**
ED	**EXTERNAL DOORS**				
266	Allowance for secure access hatch to existing opening	No	4	150	600
288	Allowance for new wall vent to existing opening	No	2	850	1,700
301	Allowance for steel lintel above new door opening	t	0.10	8,500	850
148	Works to external doors of base building other than specified - EXCLUDED	Item			Excl.
	ED - EXTERNAL DOORS			**11/m²**	**3,150**
NW	**INTERNAL WALLS**				
282	Allowance for temporary barrier in timber studs to door opening	m	3	200	600
294	Allowance to re-install original rail on new slab	No	1	250	250
299	Allowance to brick infill original door opening	m²	3	550	1,650
297	BAL.02 - Industrial balustrade to edge of slab	m	19	650	12,350
	NW - INTERNAL WALLS			**51/m²**	**14,850**
ND	**INTERNAL DOORS**				
280	Allowance for stone threshold within new door opening	No	1	1,500	1,500
281	Allowance to reconstruct brick nibs and stone base course within new doorway	No	2	2,000	4,000
	ND - INTERNAL DOORS			**19/m²**	**5,500**
FF	**FLOOR FINISHES**				
229	Allowance for TGSI; Tactile ground surface indicator	m²	2	1,000	2,000

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE
A2 BUILDING WORKS (continued)

GFA: 294 m² Cost/m²: 2,583
Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
230	Allowance for MW.01; Matwell entrance matting	m²	5	500	2,500
	FF - FLOOR FINISHES			**15/m²**	**4,500**
CF	**CEILING FINISHES**				
16	Spray paint existing soffit and trusses - EXCLUDED	m²	747		Excl.
	CF - CEILING FINISHES				**Excl.**
HS	**HYDRAULIC SERVICES**				
163	Subfloor drainage - EXCLUDED	Item			Excl.
	HS - HYDRAULIC SERVICES				**Excl.**
MS	**MECHANICAL SERVICES**				
265	Allowance for subfloor supply and exhaust system including hepa filters, fans and ducts	Lot	1	18,000	18,000
338	Allowance for testing, commissioning, training, O/M manuals, etc	Item			2,500
332	Preventative maintenance - EXCLUDED	Item			Excl.
	MS - MECHANICAL SERVICES			**70/m²**	**20,500**
ES	**ELECTRICAL SERVICES**				
225	Alllowance for LST.01; Led light strip	m	49	350	17,150
223	Allowance for 2kW PV solar system including installation	No	1	5,000	5,000
267	Allowance to run new services through existing opening around pipe	No	1	500	500
268	Allowance for new electrical services mounted to wall	No	1	250	250
291	Allowance for FB; Recessed electrical floor box including 1 x DGPO and 3 x blank plates	No	9	1,250	11,250
292	Allowance for LSP; New light switch panel	No	1	400	400
317	Allowance for PWP1; LED Batten	No	10	350	3,500
318	Allowance for track spot	No	4	400	1,600
319	Allowance for LED spot light	No	6	900	5,400
320	Allowance for isolator	No	2	550	1,100
321	Allowance for BAT; Battery	No	1	2,500	2,500
322	Allowance for INV; Inverter	No	1	750	750
323	Allowance for Distribution Board	No	1	2,500	2,500
324	Allowance for testing, commissioning, training, O/M manuals, etc	Item			5,000
	ES - ELECTRICAL SERVICES			**194/m²**	**56,900**
BW	**BUILDERS WORK IN CONNECTION WITH SERVICES**				
198	Builders work in connection with services (7%)	Item			5,418
	BW - BUILDERS WORK IN CONNECTION WITH SERVICES			**18/m²**	**5,418**
PR	**PRELIMINARIES**				
1	Builders Preliminaries (20%)	Item			126,553
	PR - PRELIMINARIES			**430/m²**	**126,553**

LOCATION ELEMENT ITEM
A CARRINGTON HYDRAULIC ENGINE HOUSE
A2 BUILDING WORKS (continued)

GFA: 294 m² Cost/m²: 2,583
Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
BM	**BUILDERS MARGIN**				
2	Builders Margin (6%)	Item			35,817
	BM - BUILDERS MARGIN			**122/m²**	**35,817**
BUILDING WORKS				**2,583/m²**	**759,318**

LOCATION ELEMENT ITEM
B STAINLESS INTERPRETATION SIGN

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
XL	**LANDSCAPING AND IMPROVEMENTS**				
314	Stainless steel interpretive sign	No	1	5,500	5,500
315	Allowance for salvaged stone plinth	No	2	2,000	4,000
	XL - LANDSCAPING AND IMPROVEMENTS				**9,500**
PR	**PRELIMINARIES**				
1	Builders Preliminaries (20%)	Item			2,014
	PR - PRELIMINARIES				**2,014**
BM	**BUILDERS MARGIN**				
2	Builders Margin (6%)	Item			570
	BM - BUILDERS MARGIN				**570**
STAINLESS INTERPRETATION SIGN					**12,084**

LOCATION ELEMENT ITEM
C ACCESS RAMP

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
UF	**UPPER FLOORS**				
110	Extra over concrete floor slab for internal ramp including balustrade	m²	21	1,450	30,450
	UF - UPPER FLOORS				**30,450**
XR	**ROADS, FOOTPATHS AND PAVED AREAS**				
233	Allowance for SSD.01; Stainless steel decking	m²	35	650	22,750
335	Concrete footing: 600mm x 600mm x 400mm deep	No	14	525	7,350
337	BAL-01 - Balustrade assume stainless steel	m	34	500	17,000
333	B1: 150 x 75 x 6 channel GR316 SS	t	0.87	10,000	8,700
334	SC1: 80 x 3.0 CHS GR316 SS	t	0.05	10,000	500
336	Allowance for loose and attached connections (15%)	t	0.14	10,000	1,400
	XR - ROADS, FOOTPATHS AND PAVED AREAS				**57,700**
PR	**PRELIMINARIES**				
1	Builders Preliminaries (20%)	Item			18,688
	PR - PRELIMINARIES				**18,688**
BM	**BUILDERS MARGIN**				
2	Builders Margin (6%)	Item			5,289
	BM - BUILDERS MARGIN				**5,289**
ACCESS RAMP					**112,127**

LOCATION ELEMENT ITEM
D CRANE BASE PLAQUES

Rates Current At August 2022

Ref	Description	Unit	Qty	Rate $	Total Cost $
XL	**LANDSCAPING AND IMPROVEMENTS**				
313	Crane base interpretive plaques including salvaged sandstone plinth, concrete pad and mowing strip	No	4	3,600	14,400
	XL - LANDSCAPING AND IMPROVEMENTS				**14,400**
PR	**PRELIMINARIES**				
1	Builders Preliminaries (20%)	Item			3,053
	PR - PRELIMINARIES				**3,053**
BM	**BUILDERS MARGIN**				
2	Builders Margin (6%)	Item			864
	BM - BUILDERS MARGIN				**864**
CRANE BASE PLAQUES					**18,317**

APPENDIX B:
Schedule of Information

SCHEDULE OF INFORMATION

Architectural documentation prepared by EJE Architecture dated 8 April 2022:

- 11009 – DA – A000 – Coversheet & Site Plan – Rev A
- 11009 – DA –A101 – Sub Floor – Existing / Demolition Plan– Rev A
- 11009 – DA –A102 – Ground Floor – Existing / Demolition Plan– Rev A
- 11009 – DA –A111 – Sub-Floor – Proposed Plan– Rev A
- 11009 – DA –A112 – Ground Floor – Proposed Plan – Rev A
- 11009 – DA –A113 – Roof – Proposed Plan – Rev A
- 11009 – DA –A202 – Ground Floor – Slab Setout/Dimension Plan – Rev A
- 11009 – DA –A501 – South & West Elevations – Existing – Rev A
- 11009 – DA –A511 – South & West Elevations – Proposed – Rev A
- 11009 – DA –A551 – Sections – Existing – Rev A
- 11009 – DA –A561 – Sections – Proposed – Rev A
- 11009 – DA –A801 – Engine RM Internal Elevs – Existing/Demolition
- 11009 – DA –A802 – Gen. Room, Accum. Tower 1 & 2 Internal Elevs – Existing/Demolition – Rev A
- 11009 – DA –A811 – Engine Room Internal Elevs – Proposed – Rev A
- 11009 – DA –A814 – Gen. Room, Accum. Tower 1&2 Internal Elevs Proposed – Rev A
- 11009 – DA –A901 – Construction Details – Rev A
- 11009 – DA –A902 – Sandstone Plaques – Rev A

Structural documentation prepared by Northrop dated 9 May 2022:

- NL1622294 – S K00 – Structural Notes – Rev A
- NL1622294 – S K1 – Slab Support Structure Low Level (Temporary Formwork Support) – Rev A
- NL1622294 – S K2 – Floor Slab Plan – Rev A
- NL1622294 – S K3 – Floor Slab Details – Rev A
- NL1622294 – S KF.01 – Glass Floor Panel– Rev A
- NL1622294 – S K3 – Steel Access Ramp – Rev A

Electrical Services documentation prepared by Electrical Projects Australia Pty. Ltd dated 8 September 2021:

- 21341 – E00 – Cover Sheet – Issue B
- 21341 – E01 – Ground Floor Plan Electrical Layout – Issue E
- 21341 – E02 – Single Line Diagram – Issue B
- Electrical Services Specification dated 17 September 2021

Mechanical Services documentation prepared by Northrop dated 7 September 2021:

- 10000 – M000 – Cover Sheet and Drawing Schedule – Rev A
- 10000 – M001 – Legend, Notes, Schedules and Details – Rev B
- 10000 – M100 – Subfloor – Rev A

Survey Drawing Lot 30 DP 1190075 - prepared by Monteath & Powys dated 16 February 2017

Statement of Environment Effects prepared by ADW Johnson dated 14 April 2022

Statement of Heritage Impact – 003 Rev A prepared by EJE Heritage dated April 2022

Conservation Management Plan Revision A prepared by EJE Heritage dated 17 December 2021

APPENDIX C:
Standard Area Definitions

STANDARD AREA DEFINITIONS

The terminology “GFA” as utilised in this report relates to Gross Floor Area. The definition of GFA as measured in this report is as follows:

GROSS FLOOR AREA (G.F.A.)
The sum of the “Fully Enclosed Covered Area” and “Unenclosed Covered Area” as defined.

FULLY ENCLOSED COVERED AREA (F.E.C.A.)
The sum of all such areas at all building floor levels, including basements (except unexcavated portions), floored roof spaces and attics, garages, penthouses, enclosed porches and attached enclosed covered ways alongside buildings, equipment rooms, lift shafts, vertical ducts, staircases and any other fully enclosed spaces and usable areas of the building, computed by measuring from the normal inside face of exterior walls but ignoring any projections such as plinths, columns, piers and the like which project from the normal inside face of exterior walls. It shall not include open courts, lightwells, connecting or isolated covered ways and net open areas or upper portions of rooms, lobbies, halls, interstitial spaces and the like which extend through the storey being computed.

UNENCLOSED COVERED AREA (U.C.A.)
The sum of all such areas at all building floor levels, including roofed balconies, open verandahs, porches and porticos, attached open covered ways alongside buildings, undercrofts and usable space under buildings, unenclosed access galleries (including ground floor) and any other trafficable covered areas of the building which are not totally enclosed by full height walls, computed by measuring the area between the enclosing walls or balustrade (i.e. from the inside face of the U.C.A. excluding the wall or balustrade thickness). When the covering element (i.e. roof or upper floor) is supported by columns, is cantilevered or is suspended, or any combination of these, the measurements shall be taken to the edge of the paving or to the edge of the cover, whichever is the lesser. U.C.A. shall not include eaves overhangs, sun shading, awnings and the like where these do not relate to the clearly defined trafficable areas, nor shall it include connecting or isolated covered ways.