Information sheet for environmental audits and preliminary risk screen assessments (PRSAs)

Publication 2009 June 2021

Victoria's audit system

An environmental audit system has operated in Victoria since 1989. The *Environment Protection Act 2017* (the Act) provides for the appointment of environmental auditors. It also provides for Environment Protection Authority (EPA or the Authority) to have a system of preliminary risk screen assessments (PRSAs) and environmental audits. These are used in the planning, approval, regulation and management of activities, and in protection of human health and the environment.

Under the Act, the functions of an environmental auditor include to:

- conduct PRSAs and environmental audits
- prepare and issue PRSA statements and reports, and environmental audit statements and reports.

The purpose of a PRSA is to:

- assess the likelihood of the presence of contaminated land
- determine if an environmental audit is required
- recommend a scope for the environmental audit if an environmental audit is required.

The purpose of an environmental audit is to:

- assess the nature and extent of the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- recommend measures to manage the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- make recommendations to manage any contaminated land, waste, pollution or activity.

Upon completion, all PRSAs and environmental audits require preparation of either a PRSA statement, accompanied by a PRSA report, or an environmental audit statement, accompanied by an environmental audit report.

A person may engage an environmental auditor to conduct a PRSA or an environmental audit.

EPA administers the environmental audit system and ensures an acceptable quality of environmental auditing is maintained. This is achieved by assessing auditor applications and conducting a quality assurance program. These measures ensure that PRSAs and environmental audits that environmental auditors undertake are completed in accordance with the relevant sections of the Act or any other Act, and with the guidelines the Authority or other government agencies have published.

Environment Protection Authority Victoria
GPO BOX 4395 Melbourne VIC 3001
1300 372 842 (1300 EPA VIC) **epa.vic.gov.au**

File structures

EPA stores digital statements and reports from PRSAs and environmental audits in three parts:

- Part A, the PRSA or environmental audit report
- Part B, report appendices
- Part C, the PRSA statement and executive summary or environmental audit statement and executive summary.

Report executive summaries, findings and recommendations should be read and relied upon only in the context of the whole document, including any appendices and the PRSA statement or environmental audit statement.

Currency of PRSAs and environmental audits

PRSAs and environmental audits are based on the conditions encountered and information reviewed at the time of preparation. They don't represent any changes that may have occurred since the completion date. As it's not possible for the PRSA or audit report to present all data that could be of interest to all readers, consideration should be made to any appendices or referenced documentation for further information.

When information about the site changes from what was available at the time the PRSA or environmental audit was completed, or where an administrative error is identified, an environmental auditor may amend or withdraw PRSA or environmental audit statements and/or reports. Users are advised to check EPA's website to ensure documents' currency.

PDF searchability and printing

EPA can only provide PRSAs and environmental audit statements, reports and appendices that the environmental auditor provided to EPA via the EPA portal on the EPA website.

All statements and reports should be in a Portable Document Format (PDF) and searchable; however at times some appendices may be provided as image-only PDFs, which can affect searchability.

The PDF is compatible with Adobe Acrobat Reader, which is downloadable free from Adobe's Website (www.adobe.com).

Further information

For more information on Victoria's environmental audit system, visit EPA's website or contact EPA's Environmental Audit Unit.

Web: www.epa.vic.gov.au

Email: environmental.audit@epa.vic.gov.au

EPA VICTORIA

Preliminary risk screen assessment statement

Under Part 8.3 of the *Environment Protection Act 2017*

Publication F1031 published September 2021

This statement is a summary of the findings of a preliminary risk screen assessment conducted under Part 8.3 of the *Environment Protection Act 2017* for:

215 – 219 Albion Street, Brunswick, VIC

Further details are provided in the preliminary risk screen assessment report that accompanies this statement.

Section 1: Preliminary risk screen assessment overview

Environmental auditor details

Name:	Phillip Mulvey
Company:	Environmental Earth Sciences
Address:	98 Maribyrnong St, Footscray VIC 3011
Phone:	9687 1666
Email:	pmulvey@eesigroup.com

Site owner/occupant

Name:	Nightingale Albion Land Holding Pty Ltd
Company:	Nightingale Albion Land Holding Pty Ltd

Environmental auditor engaged by

Name:	Simon Pearce
Company:	Nightingale Albion Development Pty Ltd
Relationship to site owner:	Development manager

Reason for preliminary risk screen assessment

Planning scheme:	Moreland
Other:	MPS/2020/555 requirement due to audit overlay

Section 2: Assessment scope

Site details

Address:	215 – 219 Albion Street, Brunswick, VIC
Title details:	Lot 1 TP694780, Lot-1-TP567753 and Lot-1-TP712069
Area (hectares):	0.21926

☒ a plan of the site is attached

Use or proposed use assessed

☐ Sensitive use (including land used for residential use, a child care centre, pre-school, or primary school) or secondary school or children's playground
- ☒ high density
- ☐ other (lower density)

☐ Recreation/open space
☐ Parks and reserves
☐ Agricultural
☒ Commercial
☐ Industrial
☐ Other

Environmental elements assessed

☒ Ambient air
- ☒ all environmental values were considered **OR**
- ☐ all environmental values other than the following were considered:

☐ Ambient sound
- ☐ all environmental values were considered **OR**
- ☐ all environmental values other than the following were considered:

☒ Land
- ☒ all environmental values that apply to the land use category were considered **OR**
- ☐ all environmental values that apply to the land use category, other than the following, were considered:

☐ Water
- ☐ Surface water
  - ☐ all environmental values that apply to the applicable segment were considered **OR**
  - ☐ all environmental values that apply to the applicable segment, other than the following, were considered:
- ☐ Groundwater
  - ☐ all environmental values that apply to the applicable segment were considered **OR**
  - ☐ all environmental values that apply to the applicable segment, other than the following, were considered:

Standards considered

Environment Reference Standard 2021
National Environment Protection (Assessment of Site Contamination) Measure 1999

Preliminary risk screen assessment statement

National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

Assumptions made during the assessment or any limitations

Development to occur as per provided plans or equivalent level structure (ground floor commercial, overlying floors high density residential).

Exclusions from the assessment and the rationale for these

-

This statement is accompanied by the following preliminary risk screen assessment report

Title:	Preliminary Risk Screening Assessment - 215-219 Albion St, Brunswick, VIC
Report no:	220096_PRSA_V1
Date:	16/12/21

Section 3: Assessment outcome

Based on my assessment, I am of the opinion that an environmental audit is **not required** for the following land uses, **including** the use or proposed use for which the site has been assessed:

- ☐ Sensitive use (including land used for residential use, a child care centre, pre-school, or primary school) or secondary school or children's playground
  - ☒ high density
  - ☐ other (lower density)
- ☐ Recreation/open space
- ☐ Parks and reserves
- ☐ Agricultural
- ☒ Commercial
- ☐ Industrial
- ☐ Other

Other information

Note: An assessment that an audit is not required does not include any judgement as to whether responsibilities under section 39 of the *Environment Protection Act 2017* (duty to manage contaminated land) exist for the person in management or control of the land. Please refer to EPA publication 1977, *Assessing and controlling contaminated land risks: A guide to meeting the duty to manage for those in management or control of land* (https://www.epa.vic.gov.au/about-epa/publications/1977*).*

Section 4: Environmental auditor's declaration

I state that:

- I am appointed as an environmental auditor by the Environment Protection Authority Victoria under the *Environment Protection Act 2017*.
- The findings contained in this statement represents a true and accurate summary of the findings of the preliminary risk screen assessment that I have completed.

Date: 16/12/21

Signed:

Name: Phillip Mulvey

Environmental Auditor

Entered in the Register Book

Vol. 4802 Fol. 960318

VICTORIA.

Certificate of Title,

UNDER THE "TRANSFER OF LAND ACT 1915."

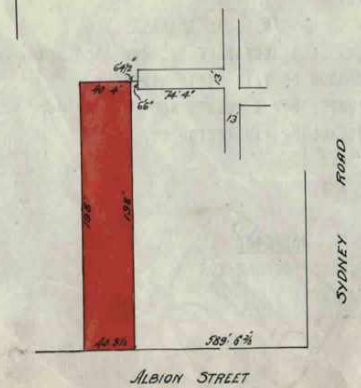
Donald Macdonald Gentleman and Frances Macdonald Married Woman both of 34 --- Albion Street West Brunswick are now joint proprietors - - - - - - - - - - - - - - - *~~now the proprietor~~* of an Estate in Fee-simple, subject to the Encumbrances notified hereunder in All that piece of Land, delineated and coloured red on the map in the margin being part of Crown Portion One hundred and - - - - - - twenty-five at Brunswick Parish of Jika Jika County of Bourke - - - - - - - - - - -

ORIGINAL CERTIFICATE.
Not to be dealt with outside the Titles Office.

Dated the Fifteenth *day of* January One thousand nine hundred and twenty-four.

Assistant Registrar of Titles.

ENCUMBRANCES REFERRED TO.



T04802-318-1-7

The Measurements are in feet and inches

Entered in the Register Book,
Vol. 3768 Fol. 753516

DIEU ET MON DROIT

VICTORIA.

Certificate of Title,

UNDER THE "TRANSFER OF LAND ACT 1890."

Arthur Henry Bates Noble of 32 Albion Street Brunswick Jeweller is now the proprietor of an Estate in Fee-simple, subject to the Encumbrances notified hereunder in All that piece of Land, delineated and coloured red on the map in the margin, being part of Crown Portion One hundred and twenty-five Parish of Jika Jika County of Bourke Together with a right of carriage way over the roads colored brown on the said map

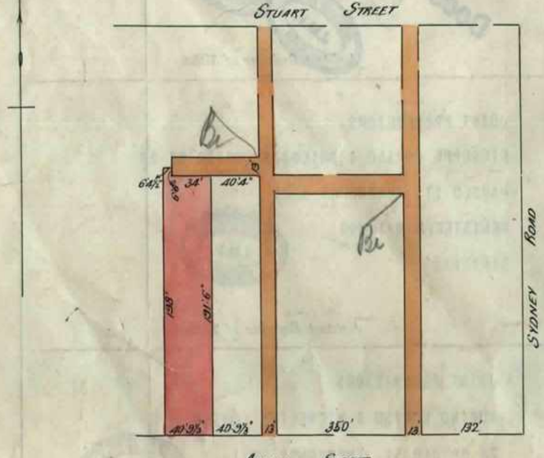
ORIGINAL CERTIFICATE ~~CROWN GRANT~~.
Not to be dealt with outside the Titles Office.

Dated the Twenty-first *day of* February *one thousand nine hundred and* fourteen.

Assistant Registrar of Titles.

OFFICE OF TITLES VICTORIA

ENCUMBRANCES REFERRED TO.



EAL

The Measurements are in Feet and inches

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Both text and diagram for this Folio have been fully converted to a computer Folio.

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Entered in the Register Book

Vol 4751 Fol. 950084

T04751-084-1-8

VICTORIA.

Certificate of Title,

UNDER THE "TRANSFER OF LAND ACT 1915."

Joseph Renshaw of 30 Albion Street West Brunswick Engineer is - - - - - - -

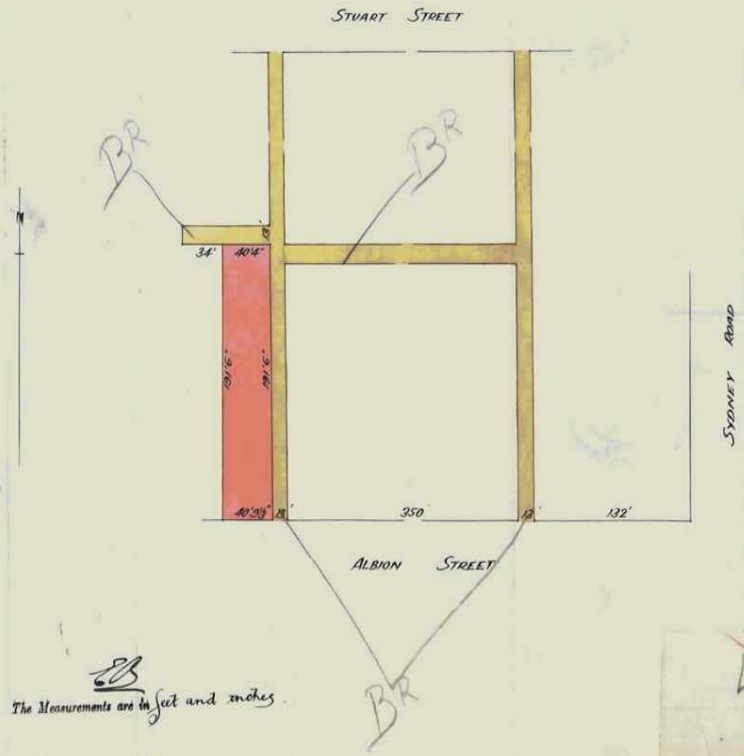
now the proprietor of an Estate in Fee-simple, subject to the Encumbrances notified hereunder in All that piece of Land, delineated and coloured red on the map in the margin being part of Crown Portion One hundred and twenty-five at Brunswick Parish of Jika Jika County of Bourke Together with a right of - - - carriage way over the roads colored brown on the said map - - - - - - - - - - - - - - -

Dated the Fifth day of September One thousand nine hundred and twenty-three.

Assistant Registrar of Titles.

ENCUMBRANCES REFERRED TO.

ORIGINAL CERTIFICATE.
Not to be dealt with outside the Titles Office.



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ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

PRELIMINARY RISK SCREEN ASSESSMENT - 215-219 ALBION ST, BRUNSWICK, VIC

NIGHTINGALE ALBION DEVELOPMENT PTY LTD

16 DECEMBER 2021
220096
VERSION 1

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

16 December 2021

Nightingale Albion Development Pty Ltd
1/6 Florence Street
Brunswick VIC 3056

Attention: **Simon Pearce**
Development Manager

Dear Simon

Preliminary Risk Screen Assessment - 215-219 Albion St, Brunswick, VIC

Please find enclosed a copy of our report entitled as above. Thank you for the opportunity to undertake this work.

As a result of the investigation we have concluded that an audit is unnecessary. Note all material disposed offsite will require waste classification.

Should you have any queries, please do not hesitate to contact us on (03) 96871666.

For and on behalf of
Environmental Earth Sciences VIC

Author
Phillip Mulvey
Environmental Auditor (Contaminated Land)
appointed pursuant to the *Environment Protection Act 2017*

220096_PRSA_V1

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

EXECUTIVE SUMMARY

Table 1: Summary of Audit Information

Item	Details
Auditor	Phillip Mulvey
Auditor account number	101441
Name of person requesting audit or PRSA	Simon Pearce
Relationship of person requesting audit or PRSA to site	Development Manager
Name of site owner	Nightingale Albion Land Holding Pty Ltd
Date of auditor engagement	16/11/2020 Project delayed and recommenced September 2021
Completion date of the audit or PRSA	16/12/2021
Reason for audit or PRSA	Audit overlay
Elements of the environment assessed	Air and land
Planning permit number or requirement detail if applicable	MPS/2020/555
EPA Region	Metro
Municipality	Moreland
Dominant — Lot on plan	Lot 1 TP694780
Additional — Lot on plan(s)	Lot-1-TP567753 Lot-1-TP712069
Site/premises name	-
Street/Lot — Lower No.	215
Street/Lot — Upper No	219
Street Name	Albion
Street type (For example, road, court)	Street
Street suffix (For example, North, South)	
Suburb	Brunswick
Postcode	3056
Site area (in square metres)	2192.6
Plan of site/ premises/ location showing the audit site boundary attached	Yes
Members and categories of support team utilised	Patrick Carroll – Auditor assistant
Further work or requirements	None
Nature and extent of continuing risk of harm	-

Item	Details
Outcome of the PRSA report	Outcome 2 - Likely that contaminated land is present, but no environmental audit is required

Table 2: Physical Site Information

Item	Details
Historical land use	Residential and clothing manufacture
Current land use	Builders site shed (219) and vacant warehouse
Proposed land use	Mixed land use (commercial/carpark on ground floor with high density residential from level1-8)
Current land use zoning	Commercial 1 Zone (C1Z)
Proposed land use zoning	Commercial 1 Zone (C1Z)
Surrounding land use – north	Commercial and industrial
Surrounding land use – south	Albion Street, Industrial/commercial
Surrounding land use – east	Ilhan Lane, residential and commercial.
Surrounding land use – west	Upfield train line, industrial to Cassels Road.
Has EPA been notified about the site under Section 40 of the Environment Protection Act 2017?	No
Nearest surface water receptor – name	Merri Creek
Nearest surface water receptor – direction	East
Site aquifer formation	Newer Volcanics
Groundwater segment	A2 – B (inferred)

ENVIRONMENTAL EARTH SCIENCES
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1 INTRODUCTION

On 16 November 2020, Nightingale Albion Development Pty Ltd (Nightingale) requested the Environmental Auditor (Phil Mulvey of Environmental Earth Sciences) to complete an Preliminary Risk Screen Assessment (PRSA) of the property located at 215, 217 and 219 Albion Street, Brunswick, Victoria (herein after referred to as "the site"). The audit was put on hold and did not start due to site constraints associated with COVID. In 2021 the permit conditions were upgraded to account for the regulations of the updated Environment Protection Act 2017.

The site is subject to an Environmental Audit Overlay (EAO) as per the Moreland City Council Planning Scheme. The Moreland City Council, Notice of Decision to Grant a Planning Permit (Application No. MPS/2020/555) states that

Prior to the commencement of construction or carrying out of buildings and works associated with a sensitive use, or where no buildings and works are proposed, prior to the commencement of the permitted sensitive use:

a) A preliminary risk screen assessment statement in accordance with the Environment Protection Act 2017 must be issued stating that an environmental audit is not required for the use and development allowed by this permit.

A upon initial engagement (prior to the introduction of PRSA), Phil Mulvey of Environmental Earth Sciences was engaged to undertake a 53X audit of the site, however, following an update to the planning permit requirements by Moreland City Council, a PRSA was opted for to determine if an audit would be required.

The regional location and investigation boundary are shown in **Figure 1**, with the Development plans provided in **Appendix A.**

2 OBJECTIVE

The objective of the PRSA is to

- Assess the potential for contamination to be present at the site;
- Conclude whether an Audit of the site will be required to determine that the land is suitable for the proposed high density residential use; and
- If an Audit is considered by the Auditor to be required, an outline scope for Audit will be provided.

3 SCOPE OF WORK

The scope of work undertaken comprised the following:

- Review previous assessor reports (e.g. Compass Environmental (2018) Preliminary Site Investigation)
- Undertake a detailed desktop historical review and development of conceptual site model;
- Advancement of 8 soil investigation bores to a maximum depth of 1.5m bgl.
- Collection of one soil vapour sample from a previously installed deep bore onsite;
- Analysis of soil and vapour samples for identified contaminants of concern;
- Undertake a site inspection by the auditor (to confirm the condition of the site); and
- Preparation of this report.

4 SITE IDENTIFICATION

4.1 Site definition and zoning

Key site information is summarised in Table 3. Refer to Figure 1 for site layout and location.

Table 3: Site Details

Item	Details
Site address	215 - 219 Albion Street Brunswick, Victoria
Site area	2192.6 m^2
Lot and plan	Lot-1-TP567753 Lot-1-TP694780 Lot-1-TP712069
Current site owner	Nightingale Albion Developments Pty Ltd
Local government	Moreland City Council
Current zoning	Commercial 1 Zone (C1Z)
Planning overlays	Environmental Audit Overlay (EAO)

4.2 Current site status

At the time of PRSA completion, the site was covered by three commercial buildings, including the following with the following uses:

- 215 Albion Street - Vacant warehouse
- 217 Albion Street - Vacant warehouse
- 219 Albion Street - Commercial building site office, lunch room and material lay down area for building operations occurring at 216 Albion Street.

4.3 Surrounding land uses

The surrounding land uses at the time of reporting included the following:

- North: Commercial land use including; Youthworx, Pea Green Boat and Natasha Jordan Bauer (hat shop) south of Tinning Street.
- East: Ilhan Lane, residential and vacant land with commercial (YourCoffee) less than 50m east of 215 Albion Street.
- South: bound by Albion Street, Anstey Train Station, Commercial land uses (Nerudas Brunswick) followed by high density residential north of Florence Street.
- West: Upfield train line to the immediate west of 219 Albion Street, followed by large commercial land use then residential from 227 Albion Street (west if Cassels Road).

4.4 Proposed development

The proposed development includes:

- Mixed use 9-storey high density residential (apartment);
- Commercial facilities on the ground and first floors (carparks, office space, studio and courtyard in the centre).
- Residential premises on elevated levels;
- Development will not involve extensive soil removal and will involve importation of material for levelling purposes, to be utilised predominantly in the southern portion of the site.
- The proposed development plans are provided in Appendix A.

5 CONCEPTUAL SITE MODEL DEVELOPMENT

A key component of a total assessment of the risk of harm to beneficial uses is the development of a conceptual site model (CSM). This identifies potential sources of contamination, potential migration pathways along which identified contaminants could migrate and potential receptors which may become exposed.

Topography and drainage

The surface elevation at site is approximately 54 mAHD in the north and 53 mAHD, sloping from north to south (DELWP, 2021). The regional topography is generally sloping downwards towards the Yarra River in the south.

Merri Creek (36mAHD) is also located approximately 1.8km east of 215 Albion St.

5.1 Soils

Van de Graaf and Wootton (1996) describes the soils typically found in the region to consist of Sodosols. The subsoil is described as having a strong texture contrast between A horizons and sodic B horizons. According to the Australian Soil Resource Information System (ASRIS), the soils are classified as Sodosols which are soil profiles which have a strong texture contrast between A and subsoil B horizons (CSIRO 2016).

Given that the underlying geology is basalt it is likely that the site is not underlain by Sodosols which are associated with the Dargile formation.

A review of the ASRIS Acid Sulfate Soils map indicates that the site is extremely low probability the potential for coastal or inland acid sulfate soils.

Geology

A review of the Geological Survey of Victoria 1:63,360 series Melbourne Map Sheet scale map sheet (GSV, 1974) indicate that:

- The surface geology at the site is Quaternary aged Newer Volcanics (Qvn) comprising of Olivine labradorite basalt.
- The basement layer of this area as indicated on this Map sheet is Silurian Aged Dargile Formation (Sud) (Melbourne Formation) consisting of sandstone and siltstone.

Hydrology and Hydrogeology

5.1.1 Groundwater aquifers and potentiometric surface

Groundwater is anticipated to be present within the Newer Volcanic unit and is likely To be present at depths ranging 5 – 10m below ground level (m bgl) (VVG 2021).

Based on surface topography, groundwater is likely to flow in a south – south easterly direction from the site towards Yarra River, approximately 5 km south of the site.

Information presented in the audit report (AECOM 2019) for 216 Albion Street Brunswick (20m south of the site) suggests that:

- Depth to groundwater is likely to exist at depths approximately 13-16 m bgl.
- Groundwater flow direction is likely to tend to the south;

5.1.2 Groundwater salinity

The groundwater salinity is expected to range 1,001 - 3,500mg/L (VVG, 2021), reported as total dissolved salts (TDS). Therefore, groundwater beneath the site is likely to be classified as Segment C according to *Environmental Reference Standard* (ERS).

Under this policy, the Environmental Values (EVs) that are to be protected under Segment C include:

- Water dependent ecosystems and species;
- Potable mineral water supply
- Agriculture and irrigation (stock watering)
- Industrial and commercial;
- Water-based recreation (primary contact recreation);
- Traditional Owner cultural values;
- Culture and spiritual values;
- Buildings and structures; and
- Geothermal properties.

5.1.3 Groundwater dependent ecosystems (GDE)

The Bureau of Meteorology (2021) Groundwater Dependent Ecosystems (GDE) map did not identify any terrestrial GDE within 2km of the site.

5.1.4 Groundwater resource utilisation

A search of the Department of Environment, Land, Water and Planning (DELWP) Water Measurement Information System was conducted to identify bores within a 1 km radius of the site

- Groundwater bores in the vicinity of the site are utilised for observation purposes;
- Groundwater bores installed for observation purposes are drilled to depths ranging 11 – 25 m bgl.

The nearest potential surface water receptors are Merri Creek (1.8 km east of site) and Moonee Ponds Creek (2.3km west of site).

The results of the registered bore search are presented in Appendix B.

5.2 Environmental report review

5.2.1 Compass Environmental (2018) – Preliminary site investigation

Compass Environmental conducted a site history review of 215-219 Albion Street, Brunswick which included a site inspection on 4 October 2018.

The following was noted:

215 Albion Street: Ground floor is vacant, no cracking or staining on concrete floor. The first floor was occupied by videographers and used as a studio.

217 Albion Street: Large ground floor was vacant. The south west corner of this property was a car space with some oil staining. The first floor has tenants who also occupy 219.

219 Albion Street: Ground floor was occupied by a clothing manufacturer with a small office in the southeast of the floor. This building was primarily a large warehouse filled with textile equipment and clothing. There is a boiler (believed to be powered by gas) servicing and ironing functions associated lines, air extraction and multiple ironing set ups. General laundry products and a flocculant were in use. There was no access to the first floor.

Compass Environmental stated that historical industrial/commercial land use as textile, (including sheepskins) could be a potential source of metals, monoaromatic hydrocarbons, PAH chlorinated solvents, petroleum hydrocarbons, oils, greases, organochlorine, pesticides and nitrates.

Imported fill material and building demolition rubble could also be a potential source of ground contamination.

Compass environmental also noted the potential presence of underground storage tanks could contribute to contamination onsite.

Compass environmental also noted that there is a moderate potential of contamination impact from off site source, mainly associated with historical nearby commercial and industrial properties.

5.2.2 GeoAust (2021) – Geotechnical report

A geotechnical investigation was undertaken by GeoAust at the site. The following information presented in the report is relevant to the existing environmental condition of the site:

- One groundwater bore was drilled onsite to a maximum depth of 10m bgl;
- Ground conditions consisted of clayey silt (completely weathered basalt) from surface to 0.6m bgl and distinctly weathered basalt from 0.6 – 10m bgl
- A description of the basalt is as follows *"The basalt was slightly fractured to fragmented with a distinct banding pattern… Most of the fractures were infilled extremely weathered seams. A number of fractures were also infilled with with a clay veneer or clay seams up to 30mm in thickness"*

- Several regions of core loss were encountered during drilling indicating extremely weathered basalt or clay seams (1.95 – 2.1, 4.95 – 5.4, 7.35 – 7.5, 8.6 – 9.0m bgl)
- No groundwater was encountered during the advancement of the groundwater bores, however, groundwater was measured at a depth of 6.94m bgl following installation (however, NMLC diamond core was used, introducing water in the drilling process).

5.3 Nearby Audit reports

A summary of key information from nearby completed Audits is provided in Table 4.

The following was noted:

- Regional diffuse chlorinated hydrocarbon (CHC) groundwater contamination is stated to be present throughout the area as a result of historical industrial activity.
- A vapour risk assessment (VRA) was undertaken by Beverage Williams as part of the audit completed at 208 Albion Street Brunswick, CARMs 57628-1.
- The VRA concluded that there was low risk associated with low level CHC concentrations.
- The audits completed at 216 and 210 Albion St cite the findings of the Beveridge Williams VRA as grounds for determining observed groundwater concentrations low risk.

5.4 EPA Victoria Records

The Priority Sites Register lists properties which EPA have issued a clean-up notice or pollution abatement notice under the *Environment Protection Act 1970*. A search conducted on the Priority Sites Register, identified that the site is not listed.

A review of the Victorian Landfill Register (VLR) revealed a closed landfill Located on Lee Street Brunswick East approximately 2km south east of 215 Albion Street (landfill register number: 10965). Another (closed) landfill is located 3.85km east of the site (landfill register number: 10590) on Brickworks Lane, Northcote.

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Table 4: Summary of nearby audits

Address	Distance and direction from site	CARMS & date	Groundwater depth and flow direction	Groundwater salinity	Site History	Contaminants	Outcome
216 Albion Street, Brunswick 3056	20m, South	74970-2 (18/12/2019)	13-16 mBGL South / southwest and south / southeast	601-1,200 mg/L	Light industrial (clothing and beverage manufacturing)	Nitrogen and nitrate. Also present in groundwater (but not considered pollution) are metals (cobalt, copper, manganese, nickel, sodium, vanadium, zinc)	Statement (GQRUZ recommended)
210 Albion Street, Brunswick 3056	50m, South	67364-1 (15/10/2010)	14.2Mbgl, flow to the south	720mg/L	Residential, Clothing Manufacturing Business (cutting and sewing only)	Dichloromethene (DCE) and Tetrachloroethene (PCE). TRH (C15-C36). BaP and total PAH	Statement
208 Albion Street Brunswick	60m, South East	57628-1, 17/11/2006	No groundwater investigation		Bakery and residence, pharmaceuticals, fuel merchants	Dichloromethene (DCE) and Tetrachloroethene (PCE). Metals; Boron, chromium, copper, zinc.	Statement
204-206 Albion Street Brunswick	100m South East	75410-1, 11/07/2018	No groundwater investigation		Nut company	Benzoapyrene (BaP) and lead.	Statement
200 Albion St Brunswick	150M South East	54059-1, 22/02/2005	10.5-13mBGL, S-SW	1,001-3,500mg/L	Residential, commercial chemical storage.	1,1-DCE, PCE, 1,1 – DCE, 1,1-DCA, Barium, manganese, B(a)P, total PAH.	Statement
1-7 Colebrook St, Brunswick	270m North West	62297-1, 22/05/2008	No groundwater investigation		Light industrial/commercial (warehousing)	No contamination	Certificate

5.5 Site history

5.5.1 Historical titles

A review of the historical titles indicate that

- Nightingale Albion land Holdings Pty Ltd is the current land owner for all three lots (215 - 219 Albion St) acquiring the last lot in July 2020.
- Uses at the site include residential (estimated until approximately 1965 at 217 – 219 Albion St and 1967 at 215 Albion St) and clothing manufacture (1967 onwards).
- The three buildings appear to have evidence of being utilised for clothing manufacture from the 1965 onwards, the proprietors Barden Clothing Pty Ltd, H.D. Lee (Australia) Pty Ltd and Ugg Australia Pty Ltd are all linked to clothing manufacture and or sheep skin footwear.

A summary of the title history is presented below in Table 5.

Table 5: Title history

Volume	Folio	Registered Proprietor	Date	Status
215 Albion Street				
11429	999	Nightingale Albion Land Holding Pty Ltd	6/11/2018	Current
		Flask Walk Holdings Pty Ltd	29/02/2016	History
		Ugg Australia Pty Ltd	22/10/1996	History
4751	84	Motek Brajtberg	14/07/1992	History
		Motek Brajtberg & Bluma Brajtberg (Company Directors)	31/10/1968	History
		Kynd Investments Pty Ltd	14/04/1967	History
		Joseph Charles Cyril Renshaw (Engineer)	30/09/1966	History
		Joseph Renshaw (Engineer)	5/09/1923	History
217 Albion Street				
3768	516	Nightingale Albion Land Holding Pty Ltd	9/11/2018	Current
		Flask Walk Holdings Pty Ltd	29/02/2016	History
		Ugg Australia Pty Ltd	28/08/2008	History
		G.O.R.M. Pty Ltd	14/07/2003	History
		Rubino Loriso & Michelina Loriso	2/12/1994	History
		Giuseppe Loriso & Ortenzia Loriso	9/10/1992	History
		Palmlea Pty Ltd	1/09/1989	History
		H.D. Lee (Australia) Pty Ltd	18/12/1987	History
		Barden Clothing Pty Ltd	7/12/1965	History
		Norman Joseph Heymanson (Manufacturer)	9/09/1958	History

Volume	Folio	Registered Proprietor	Date	Status
		Catherine Maud Noble	17/07/1956	History
		Arthur Henry Bates Noble (Jeweller)	21/02/1914	History
219 Albion Street				
4802	318	Nightingale Albion Land Holding Pty Ltd	2/07/2020	Current
		KI Portfolio Pty Ltd	17/03/2000	History
		Zamozip Australia Pty Ltd	21/11/1996	History
		Ekrem Unalan, Mahmut Gundogdu, Nusret Goc & Cavit Goc	7/03/1995	History
		Super Action Pty Ltd	8/08/1989	History
		H.D. Lee (Australia) Pty Ltd	18/12/1987	History
		Barden Clothing Pty Ltd	7/12/1965	History
		Norman Joseph Heymanson (Manufacturer)	30/06/1959	History
		Thelma Mary Hosking	14/10/1958	History
		Richard John Davies (Driver)	7/09/1931	History
		Donald Macdonald & Frances Macdonald	15/01/1924	History

Copies of historical titles are included in Appendix C.

5.5.2 Royal Historical Society Victoria (RHSV)

The Royal Historical Society of Victoria (RHSV) conducted a search of available historical records, namely the Sand and McDougall directories, to determine historical business activities at the site. A summary is provided below:

- The area of Brunswick was grazing land between 1850s to 1880s before the railway (Upfield Train line to the west of site) and tramway were established on Sydney Road in 1884.
- The area was subdivided and private residences were built along Albion Street. This particular site was “under investigation” and buildings were first constructed in 1912.
- Sands & McDougall directory listed the site as “3 vacant houses” with number 30, 32 and 34 respectively in 1912.
- The house numbers changed in the 1950s to 215, 217 and 219.
- The current warehouse buildings were first listed in the 1971 directory.
    - 215 Albion St was listed as a clothes manufacturer, 215A was a motor accessory retailer;
    - 217 Albion St as an apartment; and

  - 219 Albion St was listed as a clothing manufacturer.

- In 1974 number 217 Albion St was listed as: Yakka clothing manufacturer, while 215 and 219 remained as previously stated.

A copy of the RHSV transcript is presented in Appendix D.

5.5.3 Aerial imagery

A review of the available aerial images is presented in Table 6 below. Copies of aerial imagery are presented in Appendix E.

Table 6: Review of available aerial images

Year	Site	Site surrounds
1951	Three buildings are present at the site situated in the southern portion of the site. What appears to be trees present in the northern portions of 219 and 217 Albion St. The roofing layout of the buildings present is similar to houses which are present (and remain present to this day) west of the site along Albion St.	Albion St, Sydney Road, Anstey Rail station are present. Large residential are west of the railway line, commercial area to the north of site along Sydney Road. Small warehouses appear south of Albion Street. Regionally, A G Gillion Oval (approximately 950 south west of the site) is present. The area where Gilpin Park is south of Albert St, approximately 1.25 km south east. Appears to be a quarry
1968	**219 Albion** Buildings are present in the southern portion of the lot as per 1951. The northern portion of has a roof extending on it 1/3 of the block from the northern adjacent property. **217 Albion** Buildings are present in the southern portion of the lot as per 1951. A tree appears to be present in the centre of the lot as per 1951. **215 Albion** 215 Albion St Appears vacant with the only clear building outline present existing in the north western corner.	Large residential are west of the railway line, commercial area to the north of site along Sydney Road. Small warehouses appear south of Albion Street. Regionally, A G Gillion Oval (approximately 950 south west of the site) is present. The area where Gilpin Park is south of Albert St, approximately 1.25km south east. Appears to be a quarry
1989	The site appears in its current configuration, 3 warehouse buildings covering the majority of the lots.	Commercial/industrial development has increased north of site along Sydney. Regionally, Gilpin Park appears to be more like an open park.
2001	A new roof appears to be present at 215 Albion St. Others as per 1989.	Similar to above, more industrial/warehouse growth west of the trainline, north east of the site.
2009	As above	As above, further commercial/industrial growth in the south of Albion St, west of Sydney Road.

Year	Site	Site surrounds
		Evidence of high density/mixed use land use along Sydney Road, South of Albion St.
2020 (Nearmap)	Warehouses on 217 and 219 Albion St appear to have elongated to the north of the site.	As above, construction evident on the immediate west of the trainline, south of Albion St.

5.6 Site inspection

The Auditor undertook a site inspection of the site on 26 November 2021, the following observations were made:

- The ground floor of all buildings was suspended in the south and apparently on ground level at the North.
- There was no evidence of hydrocarbon staining or USTs.
- There no evidence of any use of heavy machinery on the floors which were continuous concrete.
- The large opening buildings with some minor areas partitioned for offices are consistent with the use of clothing manufacture.
- There was no sunken areas consistent with vats used for tanning.
- The was no evidence of any use apart from clean uses of open warehouses such as clothing manufacture.

Photos collected during the site inspection are presented in Appendix F.

5.7 Site history summary

A review of available historical records indicates the following about the site's history:

- The three lots were used for residential purposes up until the 1965 – Based upon aerial imagery, title history and Sand and McDougall records;
- Residential premises were demolished to build the current warehouse buildings between 1968 and 1971 – based upon aerial imagery and Sands and McDougall records;
- Each of the lots were used for clothing manufacture from the 1960's onwards – Based upon title history and Sand and McDougall records;
- The sites have no evidence of being utilised for textile processing such as dying or leather tanning based on their layout which was implied by Compass Environmental (2018). The site inspection indicates the use was a non-staining use of a smooth floored warehouse, consistent with clothing manufacture.

5.8 Potential sources and contaminants of potential concern

Based on the historical review, the potential for contamination exists from the following historical site uses and surrounding land uses/ features. The site history and site layout suggests that the historical use of the site for:

- Clothing manufacture purposes is likely limited to cutting, ironing and sewing of fabric.
- Sheep skinning (as stated in Compass 2020) refers to assembling and of “Ugg” boots and the removal and tanning of sheep skins. The tannery associated with Ugg Australia Pty Ltd exists in Laverton. Only sewing of sheep skins was likely to have occurred at site.
- The inference of the potential presence of underground ground storage tanks (USTs) in Compass (2018) is not supported by site observations.

As a result the potential contamination sources applicable to the site include the following.

Onsite sources of contamination

- Imported fill.

Offsite sources of contamination

- Regional diffuse groundwater as reported in Audit reports south on Albion street less than 200m of the site.

Based on these potential sources of contamination, the following chemicals of potential concern (CoPC) were identified:

Imported fill

- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury);
- Polycyclic aromatic hydrocarbons (PAH);
- Total recoverable hydrocarbons (TRH);

Offsite sources of contamination

- Chlorinated solvents (vinyl chloride, TCE, DCE and PCE) in groundwater and soil vadose zone.

6 FIELD PROGRAM

6.1 Soil investigation

6.1.1 Rationale for sampling locations

Sampling density is informed by Table E1 *Minimum Sampling Required for Site Characterisation Based on Detection of Circular Hot Spots Using a square grid*, AS 4482.1-2005. Based on the size of the site, a minimum of 8 soil sampling locations were recommended to be advanced.

6.1.2 Soil sampling methodology

Soil sampling was conducted using a hand auger at all locations. Soil sampling locations are presented in **Figure 1.**

Soil sampling was conducted in accordance with Standards Australia (1999) and Standards Australia (2005).

Field logging at all soil profiles was undertaken, describing the soil characteristics including lithology, extent of lithology, colour, odour, field pH measurements, moisture content (dry, moist, wet), and other inclusions. Field headspace readings were from sub samples of soil collected down the soil profile using a calibrated Photo Ionisation Detector (PID) to provide an indication of presence of VOCs.

Samples were generally collected using the following rationale at each test pit/borehole location:

- Regular intervals (i.e. immediately beneath the concrete slab (0.1 – 0.2), 0.5 , 1.0 and 1.5m); and/or
- Change of lithology; and/or
- Areas where potential soil contamination was identified (based on visual/ olfactory indicators or elevated PID levels).

Samples were collected by hand using dedicated disposable nitrile gloves, with soil placed directly into a clean glass jar supplied by the nominated NATA accredited laboratory. Samples are to be placed immediately into a chilled (i.e. <4°C) container for transport to the laboratory under full chain-of-custody documentation.

6.1.3 Soil sampling observations

The following observations were made during soil sampling:

- Fill material was present up to a maximum depth of 1.5m bgl;
- Fill material was described generally consisting of grey/ brown clay and sand with gravel throughout. Clearly not a Sodosol;

- Natural soil material was encountered and consisted of dark grey/brown, firm clay;
- No odours or staining were noted during sampling;
- PID readings were between 0.1 and 0.4 ppm;

Geological borelogs are presented in Appendix G.

6.2 Vapour Investigation

One primary soil vapour sample and one duplicate sample were collected from an existing groundwater bore at the site. The groundwater bore was previously installed by GeoAust (geotechnical consultants) to determine the presence of groundwater at the site. The groundwater bore was dry at the time of vapour sampling. The installation details of the groundwater bore are presented below in Table 6.

Table 7: Groundwater bore installation details

Bore	Top of casing (mAHD)	Total depth (m)	Auger drilling (m)	Diamond core drilling (m)	Screen interval (m)	Filter pack interval (m)
GTB01[1]	52.56	10.0	0 – 1.5	1.5 – 10.0	4.0 – 10.0	1.5 – 10.0

Notes:
1. Name assigned to borehole by Environmental Earth Sciences

Soil vapour samples were collected on 9 November 2021. Calibration records are provided in Appendix J and soil vapour sampling field sheets are provided in Appendix H. The soil-vapour samples were collected in general accordance with the methods listed below:

- TO-15 (USEPA, 1999) using summa canister;
- USEPA (2002); and
- ASTM 2001.

Prior to the collection of soil-vapour, air was purged from the groundwater bore using a multi gas meter (GA5000). Given the large holding volume of air within the standpipe, air was purged for a nominal amount of time (25min) and stabilised gas reading were obtained, considered to be representative of sub soil concentrations.

Vapour was collected from the groundwater bore via a J Plug fitting using summa canisters with laboratory calibrated flow rate controllers (set at 60ml/minute).

To assess the likelihood of ambient air entering the sampling line during the sampling, leak testing was conducted using isopropyl alcohol. Isopropyl alcohol was placed on a rag within the headworks of the bore. The vapour sample was then analysed for isopropyl alcohol to assess the potential for ambient air leakage into the canister.

7 LABORATORY ANALYSIS

Samples were analysed by ALS Environmental (ALS) and Eurofins MGT. All laboratories are accredited with the National Association of Testing Authorities (NATA) for the methods used. Inter- and intra-laboratory duplicates, rinsate and trip blanks were analysed as part of our Quality Assurance and Quality Control (QA/QC) procedure.

The following chemical of potential concern were variously analysed for within the soil:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, tin, zinc and mercury);
- Polycyclic aromatic hydrocarbons (PAHs, 16 priority compounds).
- Chlorinated hydrocarbons (TCE, PCE and others);
- Total recoverable/petroleum hydrocarbons (TRH/TPH);
- Benzene, toluene, ethyl benzene, total xylene and naphthalene (BTEXN);
- EPA Victoria 1828.2 Table 2 – Broad screen of contaminants for waste classification;
- Soil characterisation analytes (Fe, TOC, pH and CEC).

The following chemical of potential concern were variously analysed for within the vapour sample collected:

- Chlorinated hydrocarbons (TCE, PCE and others); and
- Isopropyl alcohol (for quality assurance purposes)

Laboratory transcripts and documentation are provided in Appendix I.

7.1 Procedures for quality control and quality assurance

Quality control is achieved by using NATA registered laboratories using ASTM standard methods supported by internal duplicates, the checking of high, abnormal or otherwise anomalous results against background and other chemical results for the sample concerned.

Quality assurance is achieved by confirming that field results, or anticipated results based upon comparison with field observations, are consistent with laboratory results, and that sampling and decontamination methods are appropriate. In addition, the laboratory undertakes additional duplicate analysis as part of their internal quality assurance program on the basis of one duplicate analysis for every 20 samples analysed.

Field observations are compared with laboratory results when they are not as expected. Confirmation, re-sampling and re-analysis of a sample are undertaken if the results are not consistent with field observations and/or measurements. In addition, field duplicate sample results have to be within the acceptable range of reproducibility.

Laboratory QC calculations are presented in Tables 13 and 14 (Tables Appendix).

The overall assessment of the data quality is as follows:

- No analysis holding time breaches were identified;
- Calculated RPDs were generally within acceptable ranges;
- Field observations and measurements were generally comparable to laboratory data;
- Internal laboratory quality data is considered acceptable;
- The use of field instruments was acceptable;
- The dataset as a whole is considered suitable for basing the conclusions made in this report.

A complete explanation of quality assurance and quality control (QAQC) practices and objectives is presented in Appendix J.

8 ENVIRONMENTAL QUALITY OBJECTIVES AND CRITERIA

The Victorian Government has prepared an *Environmental Reference Standard* (ERS) in accordance with Clause 93 of the *Environment Protection Act* 2017. The ERS provides the framework for the assessment and reporting on environmental conditions in Victoria. It sets out the environmental values (EVs) of the ambient air, ambient sound, land, and water environments that are sought to be achieved or maintained in Victoria and standards to support those values.

Standards for the environmental values are comprised of objectives for supporting different uses of the environment and indicators that can be measured to determine whether those objectives are being met. The ERS is not a compliance standard, but the indicators and objectives provide a basis for assessment and reporting on environmental conditions in Victoria and the ERS is required to be considered by Auditors when carrying out their functions under the Act, including PRSA's.

The PRSA process requires that the levels of contamination reported be assessed in the context of the future land use. The applicable sections of the environment which need to be considered, such as soil, groundwater, surface water and air, are discussed in more detail below.

8.1 Land environmental values

Part 4 of the ERS sets out EVs applicable to various land use categories. These are summarised in **Table 8**.

Table 8: Land Environmental Values

Environmental Values		Land use						
		Parks and reserves	Agricultural	Sensitive use		Recreation/ open space	Commercial	Industrial
				High Density	Other (lower density)			
Land dependant ecosystems and species	Natural ecosystems	✓						
	Modified ecosystems	✓	✓		✓	✓		
	Highly modified ecosystems	✓	✓	✓	✓	✓	✓	✓
Human Health		✓	✓	✓	✓	✓	✓	✓
Building and structures		✓	✓	✓	✓	✓	✓	✓
Aesthetics		✓		✓	✓	✓	✓	
Production of food, flora, and fibre		✓	✓		✓			

The site is proposed for high density residential and commercial use, for which EVs are:

- Highly modified ecosystems
- Human Health
- Buildings and Structures
- Aesthetics.

The land EVs considered to be applicable to the site are defined by the proposed use, mixed commercial and residential. In considering the approved development (Appendix A) it is noted that:

- The proposed development is to have no access to soil and as such the EV Aesthetics is not considered to be relevant.
- The Human health EV is considered relevant to the site with regards to underlying natural soil material
- The Buildings and structures EV is considered to be relevant to the site given that development will occur at the site in the future.

Table 9: Indicators and objectives for land

Beneficial use	Indicators	Objectives
Maintenance of ecosystems	Concentration of contaminants.	Contamination must not adversely affect the maintenance of relevant ecosystems and the level of any indicator must not be greater than any ecological investigation level (EIL) developed in accordance with the NEPM (NEPC, 2013) or levels approved by EPA Victoria.
Human health	Concentration of contaminants.	Contamination must not cause an adverse effect on human health and the level of any indicator must not be greater than the investigation level specified for human health in NEPC (2013) or levels derived using a risk assessment methodology described in the NEPM, or levels approved by EPA Victoria.
Buildings and structures	pH; sulfate; ORP; salinity; other substance or waste that may have a detrimental impact on the structural integrity of buildings and other structures.	Contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials.

8.1.1 Screening criteria

Soil analytical results were compared to ASC NEPM (2013) Schedule B(1): Guideline on the Investigation Levels for Soil and Groundwater:

- Health investigation level (HIL) human exposure setting B (High density Residential).
- Ecological investigation levels (EILs), aged soil. Residential land use
- Ecological Screening Levels (ESLs) for TRH fractions and BTEXN in soil. Residential land use.
- Management Limits for TPH/TRH in soil. Residential land use.
- Health Screening Levels (HSLs) for Petroleum Hydrocarbons in Soil and Groundwater, Summary, Technical Report 10, September 2011 (CRC Care, 2011). Residential land use.

Site specific derived EIL calculations are provided below.

The EILs assigned by ASC NEPM (2013) Schedule B5a - *Guideline on Ecological Risk Assessment* are adopted for this assessment. This guideline presents the methodology for deriving terrestrial EILs using both fresh and aged (i.e. > 2 years old) contamination for soil.

The methodology has been developed to protect soil processes, soil biota (flora and fauna) and terrestrial invertebrates and vertebrates. The proposed use for the site is high density residential and thus EILs for “urban residential and public open space” have been adopted for this assessment.

The values presented for zinc, chromium (III), copper and lead are added contaminant limits (ACLs) based on added concentrations. The EIL is calculated from summing the ACL and the ambient background concentration (ABC) to derive the site-specific soil quality guideline (SQG) taking into account the effect caused by pH, exchangeable cations, iron and total organic carbon in soil that can affect concentration toxicity data.

Values presented for arsenic, naphthalene and DDT are generic EILs based on total concentrations of aged (arsenic) and fresh contaminants. The EIL for lead has been calculated using the most conservative SQG value.

A summary of the EILs for aged contamination in soil (>2 years) for the adopted proposed land use is presented in Table 10 below. EIL calculation spreadsheets are presented in Appendix K.

Table 10: Site specific EILs

Analyte	Ambient background concentration (mg/kg)1	EIL – Urban Residential and public open space (mg/kg)
Arsenic	25	100
Naphthalene		170
DDT		180
Chromium III	222	870
Copper	39	85
Lead	14	1100
Nickel	61	330
Zinc	74	510

Notes:

2. Ambient background concentrations (ABC) were calculated as per Hamon et al (2004);
3. Added contaminant limits were determined using Tables 1B(1-5), Schedule B1, NEPC (2013) (via the NEPC EIL calculation spreadsheet) using a pH of 6.1 and CEC of 20.5 cmol/kg; clay content of 43% and organic carbon content of 0.7%
4. EILs have been rounded in accordance with Schedule B1, NEPC (2013)

8.2 Surface water

No surface water bodies are located on the site or in the immediate vicinity. In addition, there are unlikely to be any in the future. As such, the Environmental Auditor has not considered this environmental aspect in further detail.

8.3 Air

Ambient air is a segment of the environment that requires protection as per the ERS. The relevant EVs applicable to potential volatile contamination at the site includes:

- Life, health and well-being of humans

- Life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity

Specific indicators for volatile contamination relevant to the site are not defined within the ERS, however, screening values presented by NEPM (2013) are utilised for the purposes of comparison to determine if the above listed EVs are considered to be protected or compromised.

The NEPM (2013) includes interim soil vapour Health Investigation Levels (HILs) for selected volatile chlorinated organic compounds, including:

- tetrachloroethylene (PCE);
- trichloroethylene (TCE);
- cis-1,2-dichloroethylene (DCE);
- 1,1,1-trichloroethane (1,1,1-TCA); and
- vinyl chloride (VC).

9 RESULTS

Tabulated results, compared to adopted screening criteria are presented in Table 11 and Table 12 (soil and vapour, respectively) in the tables appendix.

9.1 Soil

The following exceedances of adopted screening criteria were identified:

- Benzo (a) pyrene (BAP) Toxicity Equivalent Quotient (TEQ) exceeded the adopted HIL (3 mg/kg) in sample BH04_0.2 (11.1 mg/kg).

All other analytes were below adopted screening criteria.

Elevated concentrations (greater than the anticipated background concentration) of the following analytes were noted, however, were below the adopted screening level:

- TRH >C16-C34 Fraction in sample BH04_0.2;
- Heavy metals, zinc and lead at sample locations BH02_0.2, BH03_0.2, BH04_0.2, BH05_0.2, BH08_0.2;
- Polycyclic aromatic hydrocarbons (PAHs) at sample locations BH03_0.2 and BH05_0.2.

9.2 Vapour

No exceedances of adopted screening criteria were noted in the vapour sample collected at the site.

- TCE was detected in the samples collected (one primary one duplicate) at a concentration of 0.0188 mg/m^3, less than the adopted NEPM (2013) screening criteria (0.02 mg/m^3).
- No other volatile organic contaminants (VOCs) were detected above the LOR.

10 DISCUSSION

10.1 Soil

The results of the soil investigation conducted indicate that:

- The presence of elevated BAP TEQ within fill material is considered likely to be resultant from disposal of combustion by-products such as ash during the use of the site as residences.
- Low level PAH concentrations, inclusive of BAP, are ubiquitous throughout historical fill material.
- By comparison of reported individual PAH species concentrations to reported concentrations of reference PAH sources (such as black/brown coal tar, ash from black/brown coal combustion, coke, bitumen, creosote and waste diesel/petrol), the concentrations of PAHs observed in all samples is likely to be representative of black coal ash or coke (Environmental Earth Sciences 2021).
- Concentrations of BAP TEQ in the duplicate and triplicate samples collected (DUP_01 and SPLIT_01) were reported below adopted guideline values suggesting that elevated concentrations of BAP and other PAHs are likely representative of small inclusions within the soil samples collected and of heterogeneous contamination. This is consistent with the source being soot or char associated with ash.
- The proposed development at the site is a mixed commercial/ high density residential development with no access to underlying soil material. The primary exposure pathway for human PAH exposure is ingestion of soil material and no pathway for residential land user exposure will exist as a result of the proposed development.
- No pathway between residential receptors and identified BAP TEQ contamination will exist as a result of the proposed development, risk to human receptors at the site is considered to be low.
- The presence of elevated BAP and other PAHs within fill material indicates that the site is likely to be considered ‘contaminated land’, however, the presence of contamination is not considered to impose any risk or restriction to the proposed use of the site (as

described by the proposed plans) and as such, an environmental audit is not considered to be required to further assess risks presented by the contamination. This soil would need to be classified if any soil was to be disposed offsite. Any change of use from slab on ground will also require investigation and potential disposal of soil. This is normal remediation practices and would not require a higher level of validation than any development.

10.2 Vapour

The results of the vapour investigation conducted indicate that:

- The presence of detectable concentrations of TCE within the collected soil vapour sample indicates the presence of TCE within the vadose zone or the groundwater table.
- The adopted screening criteria is applicable to direct sub slab soil vapour concentrations (assuming a concentration attenuation factor of 0.1 between sub slab and ambient indoor concentrations) and is considered a highly conservative screening criteria.
- The collected vapour sample is considered to be representative of concentrations arising from immediately overlying the groundwater table before diffusing through the upper 7 metres or so of clayey soil. It is considered likely that considerable concentration attenuation will occur throughout the overlying soil profile, reducing potential vapour risk.
- The reported results are consistent with the assumption of low level diffuse, regional chlorinated hydrocarbon concentrations in groundwater, supported by completed environmental assessments on nearby properties (EPA Audit CARMS 67364-1, 57628-1 and 54059-1).
- The proposed development at the site is to include commercial usage on the ground floor, mitigating residential exposure to potential volatile contamination at the site.
- The risk to human receptors at the site posed by low level detectable TCE concentration in soil vapour (less than NEPM 2013 conservative tier 1 screening criteria) is considered to be very low.
- The presence of detectable TCE within soil vapour at the site indicates that groundwater at the site has the potential to be ‘contaminated’, however, the presence of contamination is not considered to impose any risk or restriction to the proposed use of the site (as described by the proposed plans) and as such, an environmental audit is not considered to be required to further assess risks presented by the potential offsite contamination.

11 PRSA OUTCOME

As a result of the investigations completed to date, the outcome of the PRSA is:

- Outcome 2 - Likely that contaminated land is present, but no environmental audit is required.

12 CONCLUSION AND RECOMMENDATIONS

The investigations undertaken identified the following:

- The site history indicates the site is likely to have been utilised for residential purposes (>1965) and clothing manufacturing from the 1965 onwards;
- The current site layout of three warehouses is likely to have been developed between 1968 and 1971 (based on aerial imagery and Sands and McDougall archives).
- Soil sampling at the site identified fill material to a maximum depth of 1.5m bgl;
- Natural soil at the site consists of dark grey basaltic clay;
- Laboratory analysis of collected soil samples identified that Benzo (a) pyrene (BAP) Toxicity Equivalent Quotient (TEQ) exceeded the adopted HIL (3 mg/kg) in sample BH04_0.2 (11.1 mg/kg).
- The presence of elevated BAP TEQ within fill material is considered likely to be resultant from disposal of combustion by products from residences such as ash.
- No pathway between residential receptors and identified BAP TEQ contamination will exist as a result of the proposed development, risk to human receptors at the site is considered to be low.
- The presence of elevated BAP and other PAHs within fill material indicates that the site is likely to be considered ‘ contaminated land’, however, the presence of contamination is not considered to impose any risk or restriction to the proposed use of the site (as described by the proposed plans) and as such, an environmental audit is not considered to be required to further assess risks presented by the contamination.
- TCE was detected in the samples collected (one primary and one duplicate) at a concentration of 0.0188 mg/m^3 , less than the adopted NEPM (2013) screening criteria (0.02 mg/m^3).
- The reported results are consistent with the assumption of low level diffuse, regional chlorinated hydrocarbon concentrations in groundwater, supported by completed environmental assessments on nearby properties (EPA Audit CARMS 67364-1, 57628-1 and 54059-1).
- The presence of detectable TCE within soil vapour at the site indicates that groundwater at the site has the potential to be ‘contaminated’ from an offsite source, however, the presence of contamination is not considered to impose any risk or restriction to the proposed use of the site (as described by the proposed plans) and as such, an environmental audit is not considered to be required to further assess risks presented by the potential contamination.

12.1 PRSA outcome

As a result of the investigations completed to date, the outcome of the PRSA is:

- Outcome 2 - Likely that contaminated land is present, but no environmental audit is required.

13 LIMITATIONS

This report has been prepared by Environmental Earth Sciences VIC ACN 109 404 024 in response to and subject to the following limitations:

1. The specific instructions received from Nightingale Albion Development Pty Ltd
2. The specific scope of works set out in PO220214 issued by Environmental Earth Sciences VIC for and on behalf of Nightingale Albion Development Pty Ltd, is included in Section 3 (Scope of Work) of this report;
3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences VIC (which consent may or may not be given at the discretion of Environmental Earth Sciences VIC);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the scope of works being located 215 – 219 Albion Street, Brunswick, VIC ("the site");
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill if deposited off site;
9. This report is not a geotechnical report suitable for planning or zoning purposes; and
10. Our General Limitations set out at the back of the body of this report.

14 REFERENCES

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ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services
The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report
A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change
Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others
Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences VIC. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

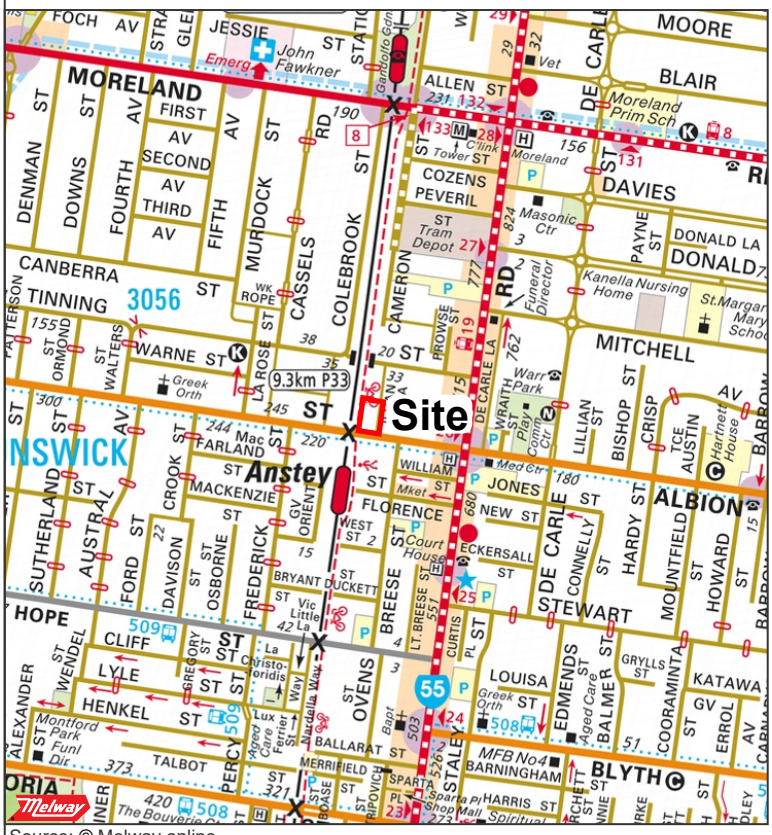
Obtain regulatory approval
The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

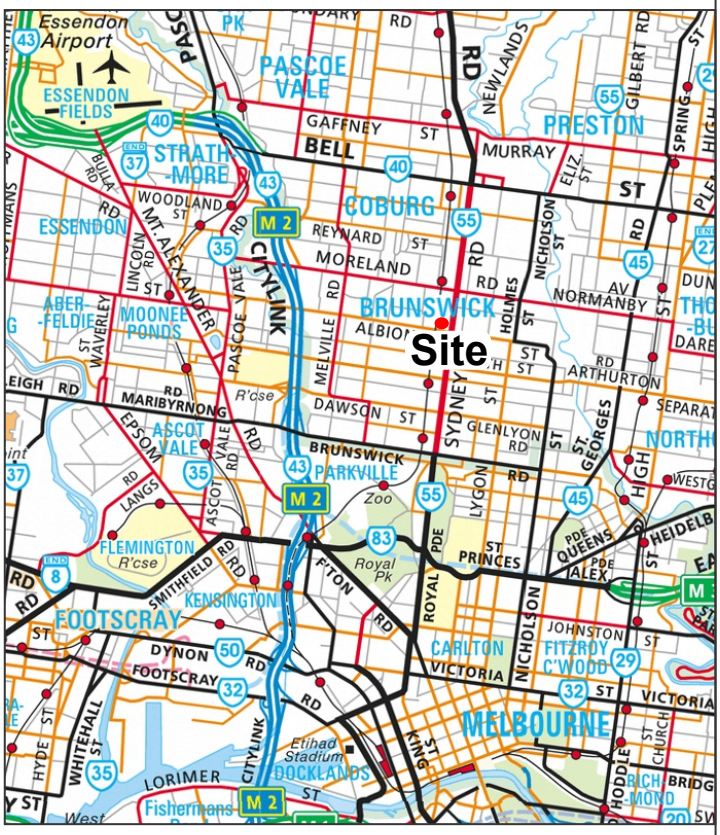
Limit of liability
This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences VIC disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences VIC disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences VIC's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES

Source: © Nearmap





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ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title:	**Site Layout and Sampling Plan**		
Location:	**215-219 Albion Street, Brunswick, Vic.**		
Client:	**Nightingale**	Job No:	**220096**
PM:	**PC**	Scale:	**As Shown**
Drawn:	**LB**	Date:	**November 2021**
			Figure 1

TABLES

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Table 11: Soil results

									Fill	Fill	Fill	Fill	Nat	Nat	Fill	Nat	Fill	Nat	Fill	Fill	Nat
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH01_0.2	BH01_0.4	BH02_0.2	BH03_0.2	BH03_0.7	BH03_1.0	BH04_0.2	BH04_1.0	BH05_0.2	BH05_1.0	BH06_0.2	BH06_1.5	BH07_0.2
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021
Inorganics	CEC	meq/100g	0.1						-	-	-	-	20.5	-	-	-	-	-	-	-	-
	pH (CaCl2)	pH Unit	0.1						-	-	-	-	6.1	-	-	-	-	-	-	-	-
	Moisture Content	%	1						7.6	7.1	19.1	10.8	20.5	25	10.5	22.1	25.6	27.3	23.4	19.5	26.1
Organic Matter	Organic Matter	%	0.5						-	-	-	-	1.2	-	-	-	-	-	-	-	-
Halogenated Ali Compounds	1,1,2-trichloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Tetrachloroethene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,3-dichloropropane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	cis-1,4-Dichloro-2-butene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Dichlorodifluoromethane	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	Pentachloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2-dichloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Dibromomethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Carbon tetrachloride	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Hexachlorobutadiene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloroethene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Bromomethane	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	1,1,1-trichloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Iodomethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloropropene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2-dibromo-3-chloropropane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	trans-1,4-Dichloro-2-butene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,1,1,2-tetrachloroethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Vinyl chloride	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	Chloromethane	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	Trichloroethene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Trichlorofluoromethane	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	Chloroethane	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
Halogenated Aromatic Compounds	1,2,3-trichlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2,3-trichloropropane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,4-dichlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,3-dichlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2-dichlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Chlorobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	4-chlorotoluene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	2-chlorotoluene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Bromobenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
Oxygenated compounds	Vinyl acetate	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	2-hexanone (MBK)	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	Methyl Ethyl Ketone	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
	4-Methyl-2-pentanone	mg/kg	5						<5	-	-	<5	-	-	-	-	<5	-	-	-	-
Phenolic Compounds	4-chloro-3-methylphenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	2	130					-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.5	45000					-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitrophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methylphenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dimethylphenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,5-trichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfonated Compounds	Carbon disulfide	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
TPH (NEPM, 1999)	TPH C6-C9 Fraciton	mg/kg	10						<10	<10	<10	<10	-	-	<10	-	<10	-	<10	-	<10
	TPH C10 - C14 Fraction	mg/kg	20						<50	<50	<50	<50	-	-	<50	-	<50	-	<50	-	<50
	TPH C15-C28 Fraction	mg/kg	50						<100	<100	<100	<100	-	-	200	-	<100	-	<100	-	<100
	TPH C29-C36 Fraction	mg/kg	50						<100	<100	<100	<100	-	-	120	-	<100	-	<100	-	<100
	TPH C10 - C36 (Sum of total)	mg/kg	50						<50	<50	<50	<50	-	-	320	-	<50	-	<50	-	<50
TRH (NEPM, 2013)	TRH C6-C10 Fraction	mg/kg	10					800	<10	<10	<10	<10	-	-	<10	-	<10	-	<10	-	<10
	TRH C6-C10 less BTEX (F1)	mg/kg	10		50	180			<10	<10	<10	<10	-	-	<10	-	<10	-	<10	-	<10
	TRH >C10-C16 Fraction	mg/kg	50					1000	<50	<50	<50	<50	-	-	<50	-	<50	-	<50	-	<50

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Table 11: Soil results

										Fill	Fill	Fill	Fill	Nat	Nat	Fill	Nat	Fill	Nat	Fill	Fill	Nat
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH01_0.2	BH01_0.4	BH02_0.2	BH03_0.2	BH03_0.7	BH03_1.0	BH04_0.2	BH04_1.0	BH05_0.2	BH05_1.0	BH06_0.2	BH06_1.5	BH07_0.2
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021
	TRH >C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50		280	120			<50	<50	<50	<50	-	-	<50	-	<50	-	<50	-	<50
	TRH >C16-C34 Fraction	mg/kg	100			1300		3500	<100	<100	<100	<100	-	-	280	-	<100	-	<100	-	<100
	TRH >C34-C40 Fraction	mg/kg	100			5600		10000	<100	<100	<100	<100	-	-	<100	-	<100	-	<100	-	<100
	TRH C10 - C40 (Sum of total)	mg/kg	50						<50	<50	<50	<50	-	-	280	-	<50	-	<50	-	<50
Trihalomethanes	Chloroform	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
BTEX	Benzene	mg/kg	0.1		0.7	65			<0.2	<0.2	<0.2	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-	<0.2
	Ethylbenzene	mg/kg	0.1		NL	125			<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Toluene	mg/kg	0.1		480	105			<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Xylene (o)	mg/kg	0.1						<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Total BTEX	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-	<0.2
	Xylene Total	mg/kg	0.3		110	45			<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
Chlorinated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,2-dichloropropane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	2,2-dichloropropane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Bromodichloromethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Bromoform	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Chlorodibromomethane	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
Cyanides	Cyanide (WAD)	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides	Atrazine	mg/kg	0.05	470					-	-	-	-	-	-	-	-	-	-	-	-	-
MAH	1,2,4-trimethylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Isopropylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	n-butylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	n-propylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	p-isopropyltoluene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	sec-butylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	Styrene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
	tert-butylbenzene	mg/kg	0.5						<0.5	-	-	<0.5	-	-	-	-	<0.5	-	-	-	-
Metals	Arsenic	mg/kg	2	500			100		<5	<5	<5	16	-	<5	7	<5	<5	<5	<5	<5	<5
	Beryllium	mg/kg	1	90					-	-	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	50	40000					-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.4	150					<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium (III+VI)	mg/kg	2				870		17	25	59	39	-	80	34	54	57	82	80	57	74
	Cobalt	mg/kg	2	600					-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (hexavalent)	mg/kg	0.5	500					-	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	5	30000			85		27	34	23	58	-	11	41	10	36	13	12	42	11
	Lead	mg/kg	5	1200			1100		7	15	119	120	-	14	114	9	54	9	10	<5	8
	Mercury	mg/kg	0.1	120					<0.1	<0.1	<0.1	<0.1	-	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2	1200			330		81	89	28	42	-	35	43	35	49	37	37	86	41
	Selenium	mg/kg	5	1400					-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	60000			510		48	60	114	172	-	17	194	14	87	19	23	65	16
	Manganese	mg/kg	5	14000					-	-	-	-	-	-	-	-	-	-	-	-	-
	Barium	mg/kg	10						-	-	-	-	-	-	-	-	-	-	-	-	-
	Vanadium	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-
Organochlorine Pesticides	4,4-DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05	10					-	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane (cis)	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane (trans)	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.2				180		-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05	600					-	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan	mg/kg	0.05	400					-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05	20					-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-

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Table 11: Soil results

									Fill	Fill	Fill	Fill	Nat	Nat	Fill	Nat	Fill	Nat	Fill	Fill	Nat
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH01_0.2	BH01_0.4	BH02_0.2	BH03_0.2	BH03_0.7	BH03_1.0	BH04_0.2	BH04_1.0	BH05_0.2	BH05_1.0	BH06_0.2	BH06_1.5	BH07_0.2
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021	10/11/2021
	g-BHC (Lindane)	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05	10					-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2	500					-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05	15					-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides	Bifenthrin	mg/kg	0.05	840					-	-	-	-	-	-	-	-	-	-	-	-	-
	Mirex	mg/kg	0.05	20					-	-	-	-	-	-	-	-	-	-	-	-	-
Organophosphorous Pesticides	Azinophos methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05	340					-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Diazinon	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
PAH	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	1.7	-	<0.5	-	<0.5	-	<0.5
	Naphthalene	mg/kg	0.5		5		170		<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	2.5	-	<0.5	-	<0.5	-	<0.5
	Fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	2.6	-	-	17.9	-	1.1	-	<0.5	-	<0.5
	Phenanthrene	mg/kg	0.5						<0.5	<0.5	<0.5	1.8	-	-	11.3	-	<0.5	-	<0.5	-	<0.5
	Benz(a)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	1.2	-	-	7.8	-	0.6	-	<0.5	-	<0.5
	Chrysene	mg/kg	0.5						<0.5	<0.5	<0.5	0.8	-	-	5.9	-	<0.5	-	<0.5	-	<0.5
	Benzo(b+j)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	1.2	-	-	9	-	0.7	-	<0.5	-	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	0.6	-	-	3.4	-	<0.5	-	<0.5	-	<0.5
	Benzo(a) pyrene	mg/kg	0.5			33			<0.5	<0.5	<0.5	1.1	-	-	8	-	0.7	-	<0.5	-	<0.5
	Pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	2.4	-	-	16.1	-	1.1	-	<0.5	-	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	3.7	-	<0.5	-	<0.5	-	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	-	-	0.6	-	<0.5	-	<0.5	-	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	<0.5	0.6	-	-	4.7	-	<0.5	-	<0.5	-	<0.5
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	3					<0.5	<0.5	<0.5	1.4	-	-	11.1	-	0.8	-	<0.5	-	<0.5
	Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	3					0.6	0.6	0.6	1.7	-	-	11.1	-	1.1	-	0.6	-	0.6
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	3					1.2	1.2	1.2	2	-	-	11.1	-	1.4	-	1.2	-	1.2
	PAHs (Sum of total)	mg/kg	0.5	400					<0.5	<0.5	<0.5	12.3	-	-	92.6	-	4.2	-	<0.5	-	<0.5
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.1	1					-	-	-	-	-	-	-	-	-	-	-	-	-

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Table 11: Soil results

									Fill	Fill	Fill	Fill
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH08_0.2	BH08_0.5	DUP_01	SPLIT_01
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021
Inorganics	CEC	meq/100g	0.1						-	-	-	-
	pH (CaCl2)	pH Unit	0.1						-	-	-	-
	Moisture Content	%	1						29.1	19.2	17.9	27
Organic Matter	Organic Matter	%	0.5						-	-	-	-
Halogenated Ali Compounds	1,1,2-trichloroethane	mg/kg	0.5						-	-	-	-
	Tetrachloroethene	mg/kg	0.5						-	-	-	-
	1,3-dichloropropane	mg/kg	0.5						-	-	-	-
	cis-1,4-Dichloro-2-butene	mg/kg	0.5						-	-	-	-
	Dichlorodifluoromethane	mg/kg	5						-	-	-	-
	Pentachloroethane	mg/kg	0.5						-	-	-	-
	1,2-dichloroethane	mg/kg	0.5						-	-	-	-
	Dibromomethane	mg/kg	0.5						-	-	-	-
	Carbon tetrachloride	mg/kg	0.5						-	-	-	-
	Hexachlorobutadiene	mg/kg	0.5						-	-	-	-
	1,1-dichloroethene	mg/kg	0.5						-	-	-	-
	1,1-dichloroethane	mg/kg	0.5						-	-	-	-
	Bromomethane	mg/kg	5						-	-	-	-
	1,1,1-trichloroethane	mg/kg	0.5						-	-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5						-	-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5						-	-	-	-
	Iodomethane	mg/kg	0.5						-	-	-	-
	1,1-dichloropropene	mg/kg	0.5						-	-	-	-
	1,2-dibromo-3-chloropropane	mg/kg	0.5						-	-	-	-
	trans-1,4-Dichloro-2-butene	mg/kg	0.5						-	-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5						-	-	-	-
	1,1,1,2-tetrachloroethane	mg/kg	0.5						-	-	-	-
	Vinyl chloride	mg/kg	5						-	-	-	-
	Chloromethane	mg/kg	5						-	-	-	-
	Trichloroethene	mg/kg	0.5						-	-	-	-
	Trichlorofluoromethane	mg/kg	5						-	-	-	-
	Chloroethane	mg/kg	5						-	-	-	-
Halogenated Aromatic Compounds	1,2,3-trichlorobenzene	mg/kg	0.5						-	-	-	-
	1,2,3-trichloropropane	mg/kg	0.5						-	-	-	-
	1,4-dichlorobenzene	mg/kg	0.5						-	-	-	-
	1,3-dichlorobenzene	mg/kg	0.5						-	-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5						-	-	-	-
	1,2-dichlorobenzene	mg/kg	0.5						-	-	-	-
	Chlorobenzene	mg/kg	0.5						-	-	-	-
	4-chlorotoluene	mg/kg	0.5						-	-	-	-
	2-chlorotoluene	mg/kg	0.5						-	-	-	-
	Bromobenzene	mg/kg	0.5						-	-	-	-
Oxygenated compounds	Vinyl acetate	mg/kg	5						-	-	-	-
	2-hexanone (MBK)	mg/kg	5						-	-	-	-
	Methyl Ethyl Ketone	mg/kg	5						-	-	-	-
	4-Methyl-2-pentanone	mg/kg	5						-	-	-	-
Phenolic Compounds	4-chloro-3-methylphenol	mg/kg	0.5						<0.5	-	-	-
	2,4-dichlorophenol	mg/kg	0.5						<0.5	-	-	-
	2,6-dichlorophenol	mg/kg	0.5						<0.5	-	-	-
	Pentachlorophenol	mg/kg	2	130					<2	-	-	-
	Phenol	mg/kg	0.5	45000					<0.5	-	-	-
	2-nitrophenol	mg/kg	0.5						<0.5	-	-	-
	2-methylphenol	mg/kg	0.5						<0.5	-	-	-
	2,4-dimethylphenol	mg/kg	0.5						<0.5	-	-	-
	2,4,5-trichlorophenol	mg/kg	0.5						<0.5	-	-	-
	2-chlorophenol	mg/kg	0.5						<0.5	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.5						<0.5	-	-	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1						<1	-	-	-
Sulfonated Compounds	Carbon disulfide	mg/kg	0.5						-	-	-	-
TPH (NEPM, 1999)	TPH C6-C9 Fraciton	mg/kg	10						<10	<10	<10	<20
	TPH C10 - C14 Fraction	mg/kg	20						<50	<50	<50	<20
	TPH C15-C28 Fraction	mg/kg	50						<100	<100	<100	<50
	TPH C29-C36 Fraction	mg/kg	50						<100	<100	<100	<50
	TPH C10 - C36 (Sum of total)	mg/kg	50						<50	<50	<50	<50
TRH (NEPM, 2013)	TRH C6-C10 Fraction	mg/kg	10					800	<10	<10	<10	<20
	TRH C6-C10 less BTEX (F1)	mg/kg	10		50	180			<10	<10	<10	<20
	TRH >C10-C16 Fraction	mg/kg	50					1000	<50	<50	<50	<50

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Table 11: Soil results

									Fill	Fill	Fill	Fill
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH08_0.2	BH08_0.5	DUP_01	SPLIT_01
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021
	TRH >C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50		280	120			<50	<50	<50	<50
	TRH >C16-C34 Fraction	mg/kg	100			1300		3500	<100	<100	<100	<100
	TRH >C34-C40 Fraction	mg/kg	100			5600		10000	<100	<100	<100	<100
	TRH C10 - C40 (Sum of total)	mg/kg	50						<50	<50	<50	<100
Trihalomethanes	Chloroform	mg/kg	0.5						-	-	-	-
BTEX	Benzene	mg/kg	0.1		0.7	65			<0.2	<0.2	<0.2	<0.1
	Ethylbenzene	mg/kg	0.1		NL	125			<0.5	<0.5	<0.5	<0.1
	Toluene	mg/kg	0.1		480	105			<0.5	<0.5	<0.5	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.5	<0.2
	Xylene (o)	mg/kg	0.1						<0.5	<0.5	<0.5	<0.1
	Total BTEX	mg/kg	0.2						<0.2	<0.2	<0.2	-
	Xylene Total	mg/kg	0.3		110	45			<0.5	<0.5	<0.5	<0.3
Chlorinated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5						-	-	-	-
	1,2-dichloropropane	mg/kg	0.5						-	-	-	-
	2,2-dichloropropane	mg/kg	0.5						-	-	-	-
	Bromodichloromethane	mg/kg	0.5						-	-	-	-
	Bromoform	mg/kg	0.5						-	-	-	-
	Chlorodibromomethane	mg/kg	0.5						-	-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5						-	-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5						-	-	-	-
Cyanides	Cyanide (WAD)	mg/kg	1						<1	-	-	-
Herbicides	Atrazine	mg/kg	0.05	470					<0.05	-	-	-
MAH	1,2,4-trimethylbenzene	mg/kg	0.5						-	-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5						-	-	-	-
	Isopropylbenzene	mg/kg	0.5						-	-	-	-
	n-butylbenzene	mg/kg	0.5						-	-	-	-
	n-propylbenzene	mg/kg	0.5						-	-	-	-
	p-isopropyltoluene	mg/kg	0.5						-	-	-	-
	sec-butylbenzene	mg/kg	0.5						-	-	-	-
	Styrene	mg/kg	0.5						-	-	-	-
	tert-butylbenzene	mg/kg	0.5						-	-	-	-
Metals	Arsenic	mg/kg	2	500			100		<5	<5	17	11
	Beryllium	mg/kg	1	90					<1	-	-	-
	Boron	mg/kg	50	40000					<50	-	-	-
	Cadmium	mg/kg	0.4	150					<1	<1	<1	<0.4
	Chromium (III+VI)	mg/kg	2				870		66	40	41	89
	Cobalt	mg/kg	2	600					26	-	-	-
	Chromium (hexavalent)	mg/kg	0.5	500					<0.5	-	-	-
	Copper	mg/kg	5	30000			85		45	22	67	47
	Lead	mg/kg	5	1200			1100		81	20	116	87
	Mercury	mg/kg	0.1	120					<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2	1200			330		54	44	45	66
	Selenium	mg/kg	5	1400					<5	-	-	-
	Zinc	mg/kg	5	60000			510		97	42	177	170
	Manganese	mg/kg	5	14000					959	-	-	-
	Barium	mg/kg	10						210	-	-	-
	Vanadium	mg/kg	5						54	-	-	-
Organochlorine Pesticides	4,4-DDE	mg/kg	0.05						<0.05	-	-	-
	a-BHC	mg/kg	0.05						<0.05	-	-	-
	Aldrin	mg/kg	0.05						<0.05	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05	10					<0.05	-	-	-
	b-BHC	mg/kg	0.05						<0.05	-	-	-
	Chlordane (cis)	mg/kg	0.05						<0.05	-	-	-
	Chlordane (trans)	mg/kg	0.05						<0.05	-	-	-
	d-BHC	mg/kg	0.05						<0.05	-	-	-
	DDD	mg/kg	0.05						<0.05	-	-	-
	DDT	mg/kg	0.2				180		<0.2	-	-	-
	DDT+DDE+DDD	mg/kg	0.05	600					<0.05	-	-	-
	Dieldrin	mg/kg	0.05						<0.05	-	-	-
	Endosulfan	mg/kg	0.05	400					<0.05	-	-	-
	Endosulfan I	mg/kg	0.05						<0.05	-	-	-
	Endosulfan II	mg/kg	0.05						<0.05	-	-	-
	Endosulfan sulphate	mg/kg	0.05						<0.05	-	-	-
	Endrin	mg/kg	0.05	20					<0.05	-	-	-
	Endrin aldehyde	mg/kg	0.05						<0.05	-	-	-
	Endrin ketone	mg/kg	0.05						<0.05	-	-	-

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Table 11: Soil results

									Fill	Fill	Fill	Fill
				NEPM 2013 Table 1A(1) HILs Res B Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1-5) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine	BH08_0.2	BH08_0.5	DUP_01	SPLIT_01
Chemical Group	**Chemical Name**	**Units**	**LOR**		0-1m				10/11/2021	10/11/2021	10/11/2021	10/11/2021
	g-BHC (Lindane)	mg/kg	0.05						<0.05	-	-	-
	Heptachlor	mg/kg	0.05	10					<0.05	-	-	-
	Heptachlor epoxide	mg/kg	0.05						<0.05	-	-	-
	Methoxychlor	mg/kg	0.2	500					<0.2	-	-	-
	Hexachlorobenzene	mg/kg	0.05	15					<0.05	-	-	-
Pesticides	Bifenthrin	mg/kg	0.05	840					<0.05	-	-	-
	Mirex	mg/kg	0.05	20					<0.05	-	-	-
Organophosphorous Pesticides	Azinophos methyl	mg/kg	0.05						<0.05	-	-	-
	Bromophos-ethyl	mg/kg	0.05						<0.05	-	-	-
	Carbophenothion	mg/kg	0.05						<0.05	-	-	-
	Chlorfenvinphos	mg/kg	0.05						<0.05	-	-	-
	Chlorpyrifos	mg/kg	0.05	340					<0.05	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05						<0.05	-	-	-
	Demeton-S-methyl	mg/kg	0.05						<0.05	-	-	-
	Diazinon	mg/kg	0.05						<0.05	-	-	-
	Dichlorvos	mg/kg	0.05						<0.05	-	-	-
	Dimethoate	mg/kg	0.05						<0.05	-	-	-
	Ethion	mg/kg	0.05						<0.05	-	-	-
	Fenamiphos	mg/kg	0.05						<0.05	-	-	-
	Fenthion	mg/kg	0.05						<0.05	-	-	-
	Malathion	mg/kg	0.05						<0.05	-	-	-
	Methyl parathion	mg/kg	0.2						<0.2	-	-	-
	Monocrotophos	mg/kg	0.2						<0.2	-	-	-
	Parathion	mg/kg	0.2						<0.2	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						<0.05	-	-	-
	Prothiofos	mg/kg	0.05						<0.05	-	-	-
PAH	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5		5		170		<0.5	<0.5	<0.5	<0.5
	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						<0.5	<0.5	1.7	1.3
	Phenanthrene	mg/kg	0.5						<0.5	<0.5	1	<0.5
	Benz(a)anthracene	mg/kg	0.5						<0.5	<0.5	0.9	1.2
	Chrysene	mg/kg	0.5						<0.5	<0.5	0.6	1.1
	Benzo(b+j)fluoranthene	mg/kg	0.5						<0.5	<0.5	0.9	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Benzo(a) pyrene	mg/kg	0.5			33			<0.5	<0.5	0.8	<0.5
	Pyrene	mg/kg	0.5						0.5	<0.5	1.7	1.3
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	3					<0.5	<0.5	1	<0.5
	Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	3					0.6	0.6	1.3	0.7
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	3					1.2	1.2	1.6	1.3
	PAHs (Sum of total)	mg/kg	0.5	400					0.5	<0.5	7.6	4.9
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.1	1					<0.1	-	-	-

Table 12: Vapour results

Analyte	Units	LOR	NEPM 2013 Table 1A(2) HILs Res A Soil vapour	GTB01	DUP01
				9/11/2021	9/11/2021
Vinyl chloride	mg/m³	0.0051	0.03	<0.0051	<0.0051
Chloroethane	mg/m³	0.13		<0.130	<0.130
1.1-Dichloroethene	mg/m³	0.2		<0.200	<0.200
1.1-Dichloroethane	mg/m³	0.2		<0.200	<0.200
cis-1.2-Dichloroethene	mg/m³	0.02	0.08	<0.0200	<0.0200
1.2-Dichloroethane	mg/m³	0.2		<0.200	<0.200
1.1.1-Trichloroethane	mg/m³	0.27	60	<0.270	<0.270
Trichloroethene	mg/m³	0.0054	0.02	0.0188	0.0188
1.1.2-Trichloroethane	mg/m³	0.27		<0.270	<0.270
Tetrachloroethene	mg/m³	0.34	2	<0.340	<0.340
trans-1.2-Dichloroethene	mg/m³	0.2		<0.200	<0.200
Isopropyl Alcohol	mg/m³	0.12		<0.120	<0.120

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Table 13: Soil RPDs

			Laboratory	ALS	ALS		ALS	Eurofins	
			Field ID	BH03_0.2	DUP_01	RPD	BH03_0.2	SPLIT_01	RPD
			Sampled Date/Time	10/11/2021	10/11/2021		10/11/2021	10/11/2021	
Chemical Group	**Chemical Name**	**Units**	**LOR**						
Moisture Content	Moisture Content	%	1	10.8	17.9	49	10.8		
TPH (NEPM, 1999)	TPH C6-C9 Fraciton	mg/kg	10 (Primary): 20 (Interlab)	<10.0	<10.0	0	<10.0	<20.0	0
	TPH C10 - C14 Fraction	mg/kg	50 (Primary): 20 (Interlab)	<50.0	<50.0	0	<50.0	<20.0	0
	TPH C15-C28 Fraction	mg/kg	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	TPH C29-C36 Fraction	mg/kg	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	TPH C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
TRH (NEPM, 2013)	TRH C6-C10 Fraction	mg/kg	10 (Primary): 20 (Interlab)	<10.0	<10.0	0	<10.0	<20.0	0
	TRH C6-C10 less BTEX (F1)	mg/kg	10 (Primary): 20 (Interlab)	<10.0	<10.0	0	<10.0	<20.0	0
	TRH >C10-C16 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH C10 - C40 (Sum of total)	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0
BTEX	Benzene	mg/kg	0.2 (Primary): 0.1 (Interlab)	<0.2	<0.2	0	<0.2	<0.1	0
	Ethylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.1	0
	Toluene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.1	0
	Xylene (m & p)	mg/kg	0.5 (Primary): 0.2 (Interlab)	<0.5	<0.5	0	<0.5	<0.2	0
	Xylene (o)	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.1	0
	Total BTEX	mg/kg	0.2	<0.2	<0.2	0	<0.2		
	Xylene Total	mg/kg	0.5 (Primary): 0.3 (Interlab)	<0.5	<0.5	0	<0.5	<0.3	0
Metals	Arsenic	mg/kg	5 (Primary): 2 (Interlab)	16.0	17.0	6	16.0	11.0	37
	Cadmium	mg/kg	1 (Primary): 0.4 (Interlab)	<1.0	<1.0	0	<1.0	<0.4	0
	Chromium (III+VI)	mg/kg	2 (Primary): 5 (Interlab)	39.0	41.0	5	**39.0**	**89.0**	**78**
	Copper	mg/kg	5	58.0	67.0	14	58.0	47.0	21
	Lead	mg/kg	5	120.0	116.0	3	120.0	87.0	32
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	2 (Primary): 5 (Interlab)	42.0	45.0	7	42.0	66.0	44
	Zinc	mg/kg	5	172.0	177.0	3	172.0	170.0	1
PAH	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Naphthalene	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<0.5	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	2.6	1.7	42	2.6	1.3	67
	Phenanthrene	mg/kg	0.5	1.8	1.0	57	**1.8**	**<0.5**	113
	Benz(a)anthracene	mg/kg	0.5	1.2	0.9	29	1.2	1.2	0
	Chrysene	mg/kg	0.5	0.8	0.6	29	0.8	1.1	32
	Benzo(b+j)fluoranthene	mg/kg	0.5	1.2	0.9	29	**1.2**	**<0.5**	82
	Benzo(k)fluoranthene	mg/kg	0.5	0.6	<0.5	18	0.6	<0.5	18
	Benzo(a) pyrene	mg/kg	0.5	1.1	0.8	32	1.1	<0.5	75
	Pyrene	mg/kg	0.5	2.4	1.7	34	2.4	1.3	59
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	0.6	<0.5	18	0.6	<0.5	18
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	1.4	1.0	33	**1.4**	**<0.5**	95
	Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	1.7	1.3	27	**1.7**	**0.7**	83
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	2.0	1.6	22	2.0	1.3	42
	PAHs (Sum of total)	mg/kg	0.5	12.3	7.6	47	**12.3**	**4.9**	**86**

Table 14: Vapour RPDs

			GTB01	DUP01	RPD
Analyte	Units	LOR	9/11/2021	9/11/2021	
Vinyl chloride	mg/m³	0.0051	<0.0051	<0.0051	0
Chloroethane	mg/m³	0.13	<0.130	<0.130	0
1.1-Dichloroethene	mg/m³	0.2	<0.200	<0.200	0
1.1-Dichloroethane	mg/m³	0.2	<0.200	<0.200	0
cis-1.2-Dichloroethene	mg/m³	0.02	<0.0200	<0.0200	0
1.2-Dichloroethane	mg/m³	0.2	<0.200	<0.200	0
1.1.1-Trichloroethane	mg/m³	0.27	<0.270	<0.270	0
Trichloroethene	mg/m³	0.0054	0.0188	0.0188	0
1.1.2-Trichloroethane	mg/m³	0.27	<0.270	<0.270	0
Tetrachloroethene	mg/m³	0.34	<0.340	<0.340	0
trans-1.2-Dichloroethene	mg/m³	0.2	<0.200	<0.200	0
Isopropyl Alcohol	mg/m³	0.12	<0.120	<0.120	0

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Table 15: Field blank results

Laboratory	ALS
Field ID	RIN1
Sampled_Date/Time	10/11/2021
Sample Type	Rinsate

Chemical Group	Chemical Name	Units	LOR	
BTEX	Benzene	µg/L	1	<1
	Ethylbenzene	µg/L	2	<2
	Toluene	µg/L	2	<2
	Xylene (m & p)	µg/L	2	<2
	Xylene (o)	µg/L	2	<2
	Total BTEX	µg/L	1	<1
	Xylene Total	µg/L	2	<2
PAH	Naphthalene	µg/L	5	<5
TPH (NEPM, 1999)	TPH C6-C9 Fraciton	mg/l	0.02	<0.02
	TPH C10 - C14 Fraction	mg/l	0.05	<0.05
	TPH C15-C28 Fraction	mg/l	0.1	<0.1
	TPH C29-C36 Fraction	mg/l	0.05	<0.05
	TPH C10 - C36 (Sum of total)	mg/l	0.05	<0.05
TRH (NEPM, 2013)	TRH C6-C10 Fraction	mg/l	0.02	<0.02
	TRH C6-C10 less BTEX (F1)	mg/l	0.02	<0.02
	TRH >C10-C16 Fraction	mg/l	0.1	<0.1
	TRH >C10 - C16 Fraction minus Naphthalene (F2)	mg/l	0.1	<0.1
	TRH >C16-C34 Fraction	mg/l	0.1	<0.1
	TRH >C34-C40 Fraction	mg/l	0.1	<0.1
	TRH C10 - C40 (Sum of total)	mg/l	0.1	<0.1