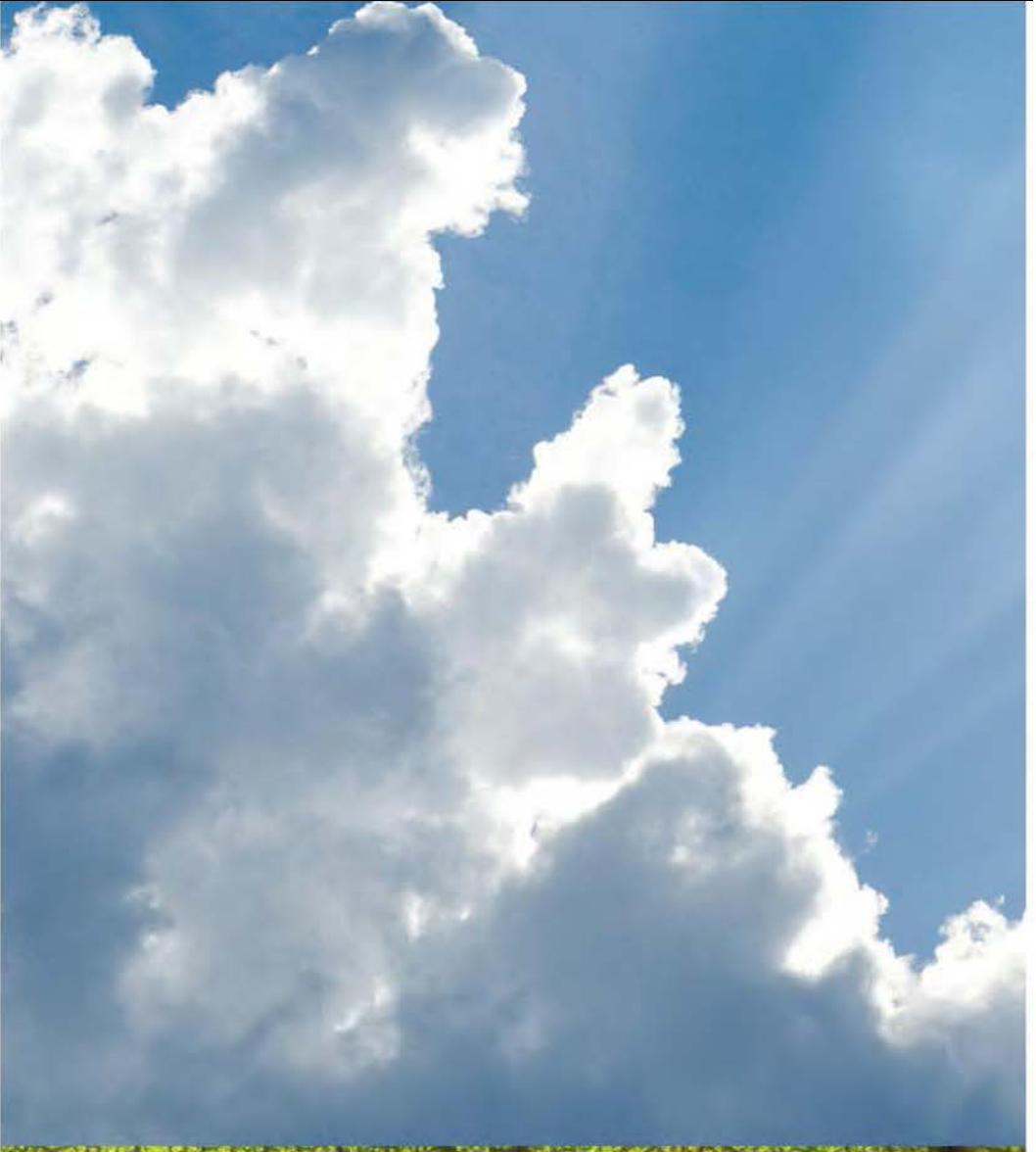

CITY OF PORT PHILLIP

DETAILED SITE INVESTIGATION

46-58 Marlborough Street, Balaclava, Victoria

June 2020

Report

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USE OF REPORT

The preparation of this report has been undertaken for the purpose of providing the results of a Detailed Site Investigation of land at 46-58 Marlborough Street, Balaclava, Victoria, and this report cannot be used for any other purpose.

This report is prepared solely for the benefit of City of Port Phillip and is provided on the condition that it or any part of it will not be made available to, or relied upon by, any other party for any purpose except with the prior written consent of Peter J Ramsay & Associates Pty Ltd (whose consent may or may not be given at its discretion). Peter J Ramsay & Associates Pty Ltd consents to City of Port Phillip, making this report available to other parties for the purpose of showing the scope of, and the recommendations provided in, this report, however those third parties cannot rely on the contents of this report.

DISCLAIMER

This report is provided on the condition that Peter J Ramsay & Associates Pty Ltd disclaims all liability to any person other than City of Port Phillip in respect of the actions, errors or omissions of any such person in reliance, whether in whole or in part, upon the contents of this report.

LIMITATIONS

Peter J Ramsay & Associates Pty Ltd has undertaken this Detailed Site Investigation in accordance with Environment Protection Authority Victoria and National guidelines. The nature of a Detailed Site Investigation is influenced by factors such as professional judgement, selective testing of representative samples from the site and the reliability of the information relating to the site which was obtained by the methodology described in this report. Reasonable care has been taken to verify the accuracy of the data and information available to Peter J Ramsay & Associates Pty Ltd.

Our findings presented in this report are based on the information available to us during this Detailed Site Investigation, and some of those findings could vary if the information upon which they are based is determined to be false, inaccurate, or incomplete. Peter J Ramsay & Associates Pty Ltd disclaims all liability to any person for events taking place after the time during which the Detailed Site Investigation was undertaken.

IMPORTANT INFORMATION RELATING TO THIS REPORT

A section titled ‘Important Information Relating to this Report’ is provided at the end of this report. The information presented within this section is intended to inform the reader of the proper use of this report. It is important that the reader understands the qualifications set out in this section.

EXECUTIVE SUMMARY

A Detailed Site Investigation (DSI) was performed at 46-58 Marlborough Street, Balaclava, Victoria (the 'site') for the City of Port Phillip Council (CoPP). The purpose of the DSI was to evaluate the environmental condition of the site by identifying potential sources of contamination which may represent a significant environmental liability should the site be redeveloped for a high-density residential land use by Council. The DSI is expected to be required as a condition of the Planning Permit issued by CoPP.

As outlined in the development plans, the site is proposed to be redeveloped for a high-density residential land use, comprising a single level basement carpark, ground floor apartments and commercial space and five levels of residential units. The development plans indicate that soil in the eastern and southern portions of the site (where mature trees are present) is to be retained on-site for the development. Soil within the footprint of the proposed basement is to be excavated and disposed of off-site.

The DSI included site inspections, a review of the site history together with available information on the site and a soil and groundwater sampling and analytical program. The investigation was performed in accordance with Environment Protection Authority Victoria (EPA) and National Guidelines for the assessment and management of site contamination.

The site is approximately 1,800 m^2 and is occupied by a public car park, which is positioned in the central and eastern portions of the site, with a vacant lot comprising the western portion of the site. Apart from minor staining on the paved surface of the car park and minor quantities of anthropogenic materials in soils, no evidence of contamination was observed on-site during the inspections for the DSI.

Historically, the site is indicated to have been occupied by seven residential properties from at least 1895 until circa 1979. By 1979, the two residential buildings in the easternmost portion of the site were demolished and replaced by a public car park. With the exception of the lot at 48 Marlborough Street (western portion of the site), by 1987, all residential buildings at the site had been demolished and replaced by a public car park (eastern portion of site) or were vacant (westernmost portion of site). By mid-2013, the residential buildings located the lot at 48 Marlborough Street (western portion of the site) had been demolished. Between mid-2013 and 2015, the site was used by Metro Trains as a staging area for the redevelopment of Balaclava Railway Station. Previous environmental investigations were completed at the site by CoPP in 2011, the data from which were considered in the DSI.

The analytical results for the soil samples retrieved from the site for the DSI (in areas which will not be subject to excavation for the basement and will therefore remain on-site following redevelopment) showed heavy metals and polycyclic aromatic hydrocarbon (PAH) concentrations variably above the relevant ecological and health-based criteria. In particular, significantly contaminated fill was identified in the eastern portion of the site (Soil Domain 3, associated with soil borehole BH8) at levels above the ecological health-based guidelines applicable for a high-density residential land use. The soil in this area should be further assessed (by way of risk assessment) and/or remediated, with the resultant excavation validated. These works should be performed and reported by a suitably qualified environmental consultant to the satisfaction of CoPP.

In view of the exceedances of ecological based criteria in soil at the site, existing soil in any areas of accessible soil (i.e. garden beds or where the ground is not otherwise fully sealed), should be replaced with a layer of 500 mm of soil which is demonstrated to be suitable for the site and consistent with EPA Publication IWRG621 as 'Fill Material'. This layer should be maintained as necessary.

Due to the historical presence of buildings and structures at the site, there is the potential for asbestos containing material and hazardous building materials to be present in the soil at the site. If encountered during future development or use of the site, any encountered asbestos containing material or hazardous building materials should be assessed, handled and disposed of in accordance with regulatory requirements.

The results of the direct groundwater investigation performed for the DSI showed elevated nitrate, nitrogen and heavy metal concentrations variably above the criteria for water dependent ecosystems and species and agriculture and irrigation (irrigation). However, in view of the distance to the receiving water body (Port Phillip Bay, approximately 1.7 km south-west of the site) and as the beneficial uses of agriculture and irrigation (irrigation) are unlikely to be realised at the site, the risk posed by these concentrations is considered to be low. Further, based on the results of the groundwater analysis, there is not considered to be an unacceptable risk to human health due to vapour intrusion (i.e. from groundwater contamination).

Reduced standing water levels obtained from groundwater monitoring wells during the direct groundwater investigation performed for the DSI indicate that the groundwater at the site is positioned just below the base of the proposed excavation for the basement. In view of this, it is recommended that advice be sought from a suitably qualified engineer on specific design and engineering controls necessary in view of the potential interaction of the basement with groundwater. The potential for temporal and spatial fluctuations in groundwater levels should be considered. Further, should groundwater at the site be proposed to be extracted for any reason in the future, advice should be sought from a suitably qualified person to ensure that it is of suitable quality for its intended use.

A soil classification programme was performed for the DSI in accordance with the requirements of EPA Publication IWRG621 for the purposes of off-site disposal. Six soil domains were identified during the soil classification programme. Soil within the fill layer (upper soil profile), is variably classified as Category A or C Contaminated Soil in accordance with EPA Publication IWRG621 for the purposes of off-site disposal. With the exception of soil in the vicinity of soil borehole BH13, natural soil (associated with the lower soil profile as represented by Soil Domain 4a) is classified as Fill Material for the purposes of off-site disposal. During off-site disposal, the earthworks contractor must take all reasonable measures to identify and separate soil domains during the soil remediation works such that the soil is appropriately disposed of off-site/reused on-site, according to its classification. All works associated with the excavation and off-site disposal of the soil must be performed in accordance with relevant environmental and occupational health & safety regulatory requirements.

For the off-site disposal of the contaminated soils, a copy of this report should be provided to the waste receiver to facilitate disposal. In addition, EPA Waste Transport Certificates should be obtained to verify that the soil was transported and disposed of in accordance with EPA guidelines and regulations.

Providing that the strategies and recommendations relating to the management of contamination as provided in this report are implemented, it is considered that a Section 53X Environmental Audit under the *Environment Protection Act 1970* is not necessary for the proposed high-density residential development.

LIST OF ABBREVIATIONS

AGST	Above Ground Storage Tank
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)
ASLP	Australian Standard Leaching Procedure
B(a)P	Benzo(a)pyrene
B(a)P TEQ	Benzo(a)pyrene Toxicity Equivalence Quotient
BGL	Below Ground Level
COC	Chain of Custody
CPS	Cathodic Protection System
CSM	Conceptual Site Model
DBYD	Dial Before You Dig
DELWP	Department of Environment, Land, Water & Planning
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EPA	Environment Protection Authority Victoria
ESV	Energy Safe Victoria
GME	Groundwater Monitoring Event
GPN	General Practice Note
GQRUZ	Groundwater Quality Restricted Use Zones
IWRG	Industrial Waste Resource Guidelines
MAH	Monocyclic Aromatic Hydrocarbons
MMBW	Melbourne Metropolitan Board of Works
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PEA	Preliminary Environmental Assessment
PID	Photoionisation Detector

PJRA	Peter J Ramsay & Associates Pty Ltd
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RFI	Request For Information
RHSV	Royal Historical Society of Victoria
RPD	Relative Percentage Difference
SEPP	State Environment Protection Policy
SQAP	Sampling Quality Assurance Plan
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UPSS	Underground Petroleum Storage System
VCAT	Victorian Civil & Administrative Tribunal
VOC	Volatile Organic Compound

1. INTRODUCTION

On 12 May 2020, City of Port Phillip (CoPP) engaged Peter J Ramsay & Associates Pty Ltd (PJRA) to undertake a Detailed Site Investigation (DSI) at 46-58 Marlborough Street, Balaclava, Victoria (the 'site'). The location of the site is shown in **Figure F1**.

The purpose of the DSI was to evaluate the environmental condition of the site by identifying any potential sources of contamination which may represent a significant environmental liability should the site be redeveloped for a high-density residential land use by CoPP. As described in **Section 1.1** below, the DSI is expected to be required as a condition of the Planning Permit issued by CoPP.

The DSI involved a review of the site history of the land, the development of a conceptual site model (CSM) and completion of a soil and groundwater sampling and analytical program. The DSI was performed in accordance with the *National Environment Protection* (*Assessment of Site Contamination*) *Measure 1999* (ASC NEPM) and National guidelines. Our conclusions and recommendations are presented in **Section 5** of this report.

1.1 Requirement for DSI

The DSI has been prepared in response to an expected condition of a Planning Permit anticipated to be issued by CoPP for the development. In particular, it is expected that it will be a requirement of the Planning Permit that:

> *"Before the development commences, excluding demolition and excluding remediation works necessary to facilitate the testing, the applicant must carry out a Preliminary Environmental Assessment (PEA) of the site to determine if it is suitable for the intended uses. The PEA must be undertaken by a suitably qualified professional. This PEA must be submitted to the Responsible Authority prior to the commencement of the development. The PEA should include:*
>
> *a) Details of the nature of the land uses previously occupying the site and the activities associated with these land uses, including the filling of the site. This should include details of how long the uses occupied the site.*
> *b) A review of any previous assessments of the site and surrounding sites including details of the anticipated sources of any contaminated materials. ·*
> *c) A recommendation as to whether any further investigative or remedial work is required to accommodate the intended uses.*
>
> *Any recommendations of the PEA must be implemented to the satisfaction of the Responsible Authority, before the commencement of the development (unless otherwise specified in the PEA).*

If the PEA recommends that a Certificate or Statement of Environmental Audit is required:

i. *An appointed auditor must be engaged pursuant to Section 53U of the Environment Protection Act 1970 to perform an environmental audit of the land.*
ii. *An environmental audit report must be produced in accordance with Section 53X of the Environment Protection Act 1970 must be provided to the Responsible Authority and*
iii. *A Certificate or Statement of Environmental Audit must be provided to the Responsible Authority.*

A copy of CoPP's Notice of Decision to issue a Planning Permit for the development at the Site is provided in **Appendix A** of this report, together with the proposed development plans. It is assumed that the 'PEA' (expected to be required as a condition of the Planning Permit, as described above) has the same meaning as a Preliminary Site Investigation (PSI) in accordance with the ASC NEPM[1].

1.2 Proposed Development

As shown in the development plans (provided in **Appendix A** of this report), the site is proposed to be redeveloped for a high-density residential land use, comprising a single level basement carpark, ground floor apartments and commercial tenancy and five levels of residential units. The development plans indicate that soil in the eastern and southern portions of the site (where mature trees are present) is to be retained on-site for the development. Soil within the footprint of the proposed basement is to be excavated and disposed of off-site.

1.3 Scope

The scope of the DSI included:

- Review of relevant documentation relating to the site, including Land Title Certificates and site plans (where available);
- Site history enquiries;
- Inspections of the site and immediate surrounds (undertaken on 19 May 2020 and 20 May 2020);
- Development of a CSM, including an assessment of the potential for historical site use and surrounding land uses to impact the site;
- Soil sampling at 12 locations across the site (to supplement CoPP's previous investigation locations);
- Soil vapour survey for volatile organic compounds (VOCs) using a photoionisation detector (PID);
- Installation and development of three groundwater monitoring wells at the site;
- One groundwater monitoring event (GME), including groundwater gauging and sampling;

[1] It is noted that at proposal stage, CoPP requested that a soil and groundwater sampling and analytical program be performed as part of the investigation in order to provide greater certainty regarding the contamination status of the site. On this basis, it was recommended in our proposal that a DSI be completed (as opposed to a PSI, which would satisfy the expected requirement for a 'PEA').

- Laboratory analysis of soil and groundwater samples for a comprehensive suite of organic and inorganic contaminants to supplement the sampling and analytical program previously completed by CoPP at the site;
- Implementation of a quality assurance (QA) and quality control (QC) program in accordance with Environment Protection Authority Victoria (EPA) guidelines;
- Interpretation and tabulation of analytical data and QA/QC data;
- Classification of soil for off-site disposal in accordance with EPA Publications IWRG702 and IWRG621;
- Recommendations for the site in accordance with guidelines for the assessment and management of site contamination and EPA requirements, including any further investigation or remediation that may be required and a recommendation on whether an Environmental Audit is required at the site for the proposed development; and
- Preparation of a report summarising the findings from the DSI (this report).

2. SITE DESCRIPTION

The site subject to this DSI is located in the inner south eastern Melbourne suburb of Balaclava. The site location is shown in **Figure F1**. Key features of the site are presented in **Figure F2** and are described in the sections below.

2.1 Site Details

The site was inspected by qualified PJRA staff on 19 May 2020 and 20 May 2020. The purpose of the site inspections was to observe the condition of the site and identify any potential sources of contamination to the land or groundwater. Photographs of the site taken during the site inspections are presented in **Appendix B**. The findings of the inspections and information obtained in relation to the land are summarised in the following sections. The details and features of the site are summarised in **Table 1** below. Key features of the site which were observed during the site inspections are shown in **Figure F2**.

Table 1 Summary of Site Details and Features

Address:	46-58 Marlborough Street, Balaclava, Victoria
Occupiers:	City of Port Phillip
Current Use:	Car Park
Owner:	City of Port Phillip
Area:	Approximately 1,817 m^2

Certificate of Title:	Lots 1 of the following Plans: TP700921N; TP895352J; TP329426S; TP697841W; TP903892L; TP219094F; and TP592703U Title documentation is provided as part of the City of Port Phillip Due Diligence Investigation Report (CoPP 2011a) (**Appendix E**).
Local Government Administration:	City of Port Phillip
Zoning:	Mixed Use Zone (MUZ)
Environmental Audit Overlay:	There is not an Environmental Audit Overlay on the site
Adjacent Land Uses:	North: Dianella Lane, then retail and commercial properties along Carlisle Street South: Marlborough Street, then residential properties East: Balaclava Rail Station, then commercial and residential properties West: Residential properties
Topography:	The site is generally flat and level. Regional topography grades very gently to the south-west towards Port Phillip Bay. The Balaclava Rail Station (located to the direct east of the site) is positioned on raised ground (approximately 4 metres above surrounding ground level).
Buildings and structures:	The site comprises a public car park which occupies the central and eastern portions of the site, and a vacant lot of land which is covered by grass and woodchips in the western portion of the site. The vacant lot is fenced off from the remainder of the site and is accessed via a locked gate on Marlborough Street. There are no aboveground buildings or structures on-site other than fencing and lamp posts.
Surface Conditions:	The central and eastern portions of the site is almost entirely covered in paving ('monoblocking') associated with the car park, with the exception of several garden beds which have exposed soil. The western portion of the site (vacant lot) is largely covered in grass, with an area covered in woodchips.
Surface Drainage:	Surface drainage was observed to be satisfactory during the site inspections with no obvious ponding of water across the site.
Vegetation:	Garden beds were present in the central, southern and eastern portion of the site which comprised soft landscaping of vegetation and mature trees, which appeared to be in healthy condition. The grass in the western portion of the site (vacant lot) also appeared to be healthy.

2.2 Potential Sources of Contamination

2.2.1 Above Ground Storage Tanks

Above ground storage tanks (AGSTs) were not observed on the site during the site inspections, nor was there evidence of AGSTs being formerly present.

2.2.2 Underground Petroleum Storage Systems

No indicators of underground petroleum storage tanks (UPSSs) were observed on the site during the site inspections, nor was there evidence of UPSSs being formerly present.

2.2.3 Other Facilities and Installations

No facilities or installations of note were identified during the site inspections.

2.2.4 Storage Areas

No waste or chemical storage areas were observed during the site inspections.

2.2.5 Staining and Spillages

Minor areas of oil/grease staining were observed within several parking bays of the car park on-site. This staining was associated with minor leakage of lubricants/oil from parked vehicles. No other areas of significant staining of spillages were observed during the site inspections.

2.3 Geology

2.3.1 Natural Soil

The geology map from State Government Victoria - Department of Environment, Land, Water & Planning (DELWP) 1:50,000 indicates that the site is entirely underlain by Miocene to Pliocene age Red Bluff Sandstone. The unit comprises sandstone and conglomerate. The site geology is shown in **Figure 1** below.

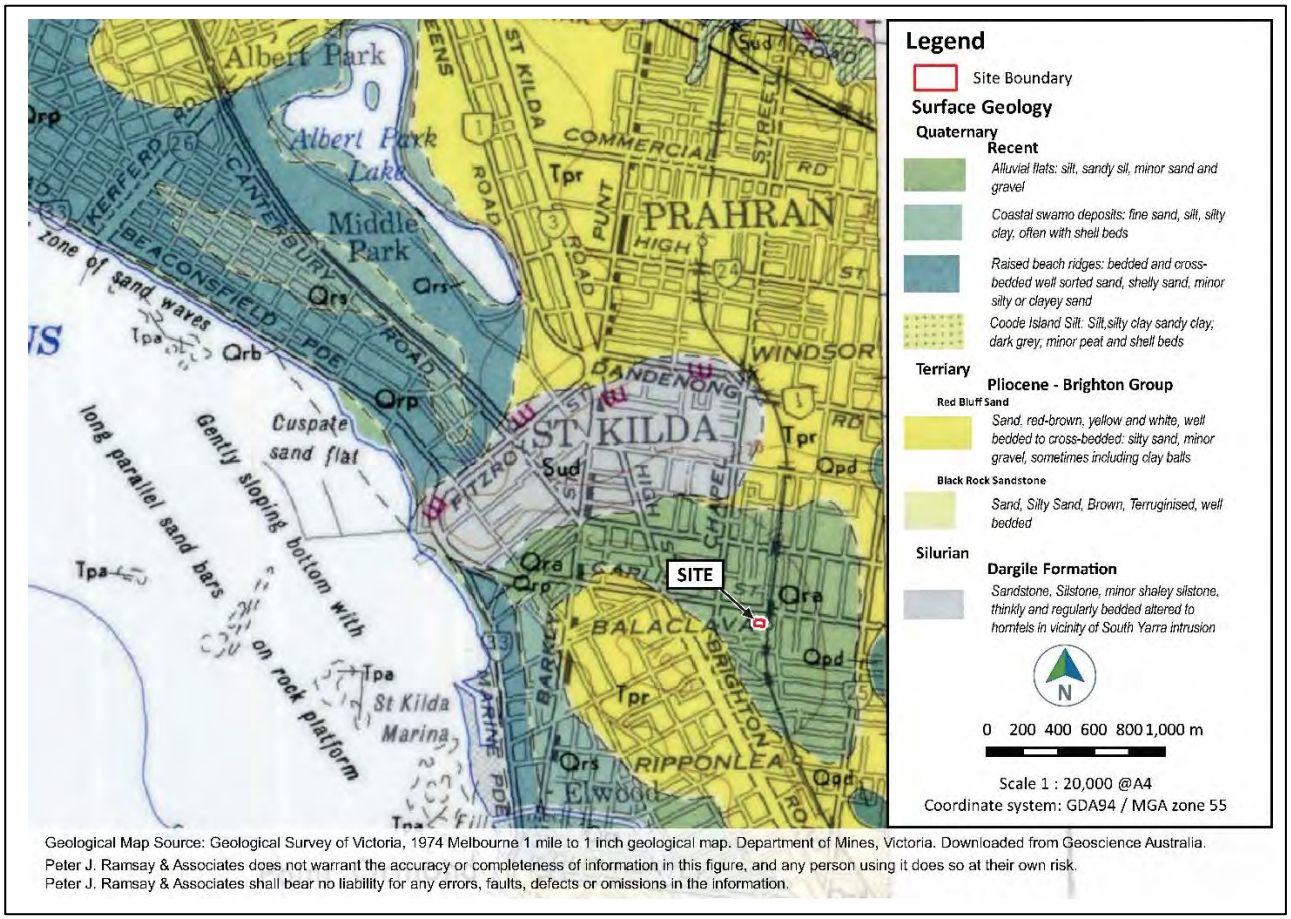

Figure 1 Site Geology

CoPP (2011a, 2011b) report that natural soil was encountered at 0.3 – 0.8 m below ground level (BGL) across the site. CoPP (2011a, 2011b) report that the natural soil comprised light brown to grey sand and grey and orange mottled silty clay. Natural soil encountered by PJRA during the DSI was generally consistent with conditions encountered by CoPP.

2.3.2 Fill

The site and surrounding areas are generally flat and level, with the regional topography grading south-west towards Port Phillip Bay.

CoPP (2011a, 2011b) report that fill ranged in thickness from 0.3 m BGL to 0.8 m BGL across the site. CoPP (2011a, 2011b) report that the fill generally comprised crushed rock, sand and brown sandy silt with roots and minor rock, charcoal, ash, coke, brick and rock fragments. Fill encountered by PJRA during the DSI was generally consistent with conditions encountered by CoPP.

2.3.3 Acid Sulfate Soil Potential

A search of CSIRO's Atlas of Australian Acid Sulfate Soils was performed as part of the searches completed by Lotsearch Pty Ltd (Lotsearch). The results of the search are provided on page 121 of the Lotsearch report (refer to **Appendix C**). The site is denoted as probability Category C with extremely low probability (1% to 5%) of occurrence of acid sulfate soils in 'small localised areas'. Therefore, in accordance with EPA Publication 655.1, *Acid Sulfate Soil and Rock*, July 2009, there is considered to be an extremely low potential for acid sulfate soils to be present on the site.

2.4 Hydrogeology

A direct groundwater investigation was undertaken involving sampling three groundwater monitoring wells installed on the site for the DSI. The locations of the groundwater monitoring wells installed at the site are shown in **Figure F3**.

A summary of the hydrogeological conditions encountered at the site is presented in **Table 2**.

Table 2 Site Hydrogeology

Depth to Groundwater:	Depth to groundwater at the site was measured at the time of sampling between 3.64 m to 3.67 m from the top of the PVC casing.
Water Table Aquifer:	The aquifer lithology comprises sandstone associated with the Red Bluff Sandstone.
Expected Aquifer Characteristics[(a)]:	Fractured or fissured, extensive aquifers of low to moderate productivity.
Groundwater Flow Direction:	Reduced standing water levels for the groundwater monitoring wells installed at the site indicate a shallow groundwater gradient flow to the south-west towards Port Phillip Bay (located approximately 1.7 km from the site). The regional groundwater flow is understood to flow south-west. Please refer to **Figure F5** for a site plan showing the inferred groundwater flow direction.
Groundwater Salinity[(a)(b)]:	During the GME for the DSI, total dissolved solids values for groundwater beneath the site ranged between 1,000 mg/L and 1,300 mg/L. Therefore, in accordance with the State Environment Protection Policy (SEPP) (Waters), the groundwater would be classified as Segment A2-B.
Beneficial Uses of Groundwater to be Protected[(b)]:	Water dependent ecosystems and species; Potable water supply (acceptable); Potable mineral water supply; Agriculture and irrigation (irrigation); Agriculture and irrigation (stock watering); Industrial and commercial; Water-based recreation (primary contact recreation); Traditional Owner cultural values;

	Cultural and spiritual values; Buildings and structures; and Geothermal properties.
Surrounding Groundwater Users[(a)(c)]:	260 groundwater bores located within 2,000 m: • 30 Domestic & Stock; • 35 Groundwater Investigation; • 23 Domestic; • 26 Sec Bores (unidentified); • 11 Non-Groundwater; • 11 Investigation; • 1 Not Known; • 50 Observation; • 5 Irrigation; • 1 Commercial; and • 67 use not described.

Notes:
a) As provided on Pages 73 to 91 of Lotsearch's report (**Appendix C**).
b) Under the State Environment Protection Policy (Waters).
c) The results of the search of surrounding groundwater bores are within a radius of 2,000 m.

2.5 Flora and Fauna

According to the SEPP (Prevention and Management of Contamination of Land), Maintenance of Ecosystems is a beneficial use that is to be protected for the site. In particular, as the land is almost entirely used as a public use zone (with the exception of the western portion of the site being a grass covered plot of land which is gated off from the public), the relevant ecosystems that must be protected are Modified and Highly Modified Ecosystems.

Vegetation was observed on the site during the site inspections. It is considered that the conservation value of the vegetation present at the site is low as it is predominantly comprised of introduced grasses, trees and shrubs. Therefore, a quantitative flora and fauna study was not performed for the DSI. The Planning Authority would need to determine if a qualitative flora and fauna study is necessary at the site.

3. SITE HISTORY

3.1 Information Sources

The site history of the land subject to the DSI was reviewed by PJRA in order to identify the potential for soil contamination to be present on the site resulting from historical activities. The site history information reviewed for the DSI is presented below. A request for information (RFI) was provided to CoPP at the commencement of the DSI for any available information which may be relevant to the environmental condition of the site (i.e. previous environmental assessments, historical maps etc.). In response, CoPP provided copies of the current

land title, proposed development plans, previous environmental assessments and a notice of decision to grant a Planning Permit (CoPP Reference 773/2018).

The site history was compiled from information obtained from the following sources:

- Publicly available EPA records;
- Aerial photographs of the site and surrounds held by the DELWP (as provided by Lotsearch from Page 47 to Page 57 of their report; refer to **Appendix C**) and Nearmap;
- Royal Historical Society of Victoria (RHSV) as provided as part of a previous environmental assessment;
- Internet search;
- Energy Safe Victoria (ESV);
- WorkSafe Victoria;
- Dial Before You Dig (DBYD);
- CoPP;
- Historical title searches (as provided by CoPP);
- Interview with previous site occupants (Metro Trains); and
- Previous environmental reports prepared for the site.

Three environmental assessments have been completed previously at the site between 2011 and 2017. The reports prepared for the previous environmental assessments are entitled:

- CoPP 2011a, *46-58 Marlborough Street, Balaclava – Due Diligence Investigation*, prepared by City of Port Phillip, May 2011;
- CoPP 2011b, *46-58 Marlborough Street, Balaclava – Soil Remediation Plan,* prepared by City of Port Phillip, 31 August 2011; and
- Golder 2017, *Due Diligence Contamination and Geotechnical Desktop Assessment*, prepared by Golder Associates Pty Ltd for Port Phillip Housing Association, 15 November 2017.

Copies of the aforementioned previous environmental assessments are provided in **Appendix E** to **Appendix G** of this report.

3.2 Search of Publicly Available EPA Records

The EPA compiles information including databases and documents related to contaminated sites or other sites known to the EPA. In particular, the key sources of information relating to potentially contaminated land are the EPA Priority Sites Register database, the list of properties for which a *Certificate* or *Statement of Environmental Audit* has been issued, and the map of groundwater quality restricted use zones (GQRUZs). The results of a search of these databases are provided below.

3.2.1 EPA Priority Sites Register

A search of the EPA Priority Sites Register, conducted on 15 May 2020 by Lotsearch, indicated that the site is not listed on and is not in the vicinity of a property currently listed on, the Priority Sites Register at the date last notified by the EPA. The results of the search are shown in the plan provided on page 7 of the Lotsearch report (**Appendix C**). In addition, no properties were listed on the Priority Sites Register in the suburb of Balaclava at the time of the DSI.

3.2.2 EPA List of Certificates and Statements

A search of EPA's listing of properties for which a *Certificate* or *Statement of Environmental Audit* has been issued, conducted on 3 April 2020 by Lotsearch, identified 30 properties within 1,000 m of the site where a *Certificate* or *Statement of Environmental Audit* has been issued. The results of the search are shown on the plan provided on Page 10 of the Lotsearch report (**Appendix C**), with full search results provided on Pages 11 and 12.

A detailed review of the Environmental Audit Reports for the majority of properties within 0.5 km issued with Statements was not considered necessary as the properties were located cross or down hydraulic gradient of the site and are, therefore, not considered to be potential sources of off-site contamination.

However, in August 2016, a *Statement of Environmental Audit* was issued for the property at 308 Carlisle Street, Balaclava, located approximately 110 metres north-east to the site (up inferred hydraulic gradient of the site). The review of the review of the Environmental Audit Report prepared for this property is presented in **Table 3** below. On the basis of the results of the Environmental Audit Report and in view of the relatively close proximity of the property to site (up inferred hydraulic gradient), this property is considered to present a potential off-site source of groundwater contamination at the site.

3.2.3 EPA Groundwater Quality Restricted Use Zones

The review of EPA's map of GQRUZs in Victoria, conducted on 3 April 2020 by Lotsearch, indicated that there are five properties located within 1,000 m of the site that had been declared a GQRUZ at the time of the DSI. The results of the search are shown in the plan provided on Page 13 of the Lotsearch report (**Appendix C**). The properties for which a GQRUZ has been declared are located either cross or down inferred hydraulic gradient of the site with the exception of the property located at 308 Carlisle Street, Balaclava (the Environmental Audit Report for which is reviewed in **Table 3** below and described in **Section 3.2.2** above**)**. This property is considered to present a potential off-site source of groundwater contamination at the site.

Table 3 Summary of Relevant Surrounding Environmental Audits

Address, CARMs and Date of Completion	Distance and Direction from Site (Approximate)	Groundwater Monitoring Wells Installed	Groundwater Flow Direction and Aquifer	Groundwater Polluted	Beneficial Uses of Groundwater Precluded	Audit Outcome
308 Carlisle Street, Balaclava, Victoria, 3183 (73636-1) 05/08/2016	110 m north-east (up inferred hydraulic gradient of the site)	11 on-site groundwater monitoring wells and one off-site groundwater monitoring well targeting the regional aquifer and 8 monitoring wells targeting the perched water in the vicinity of UPSSs	Variable, noting groundwater mounding in the vicinity of each of the on-site UPSS pits Regionally, groundwater was assessed to flow west to south-west towards Port Phillip Bay	Yes. Concentrations of TRH, benzene, PAHs, heavy metals, sulphate, chloride, sodium, fluoride, nitrate, nitrite and total nitrogen were shown to exceed the adopted assessment criteria for the protection of beneficial uses. Concentrations of copper, zinc were considered to be naturally occurring. Concentrations of sulphate, chloride, sodium, fluoride, nitrate, nitrite and total nitrogen were considered to be representative of regional concentrations.	Maintenance of Ecosystems; Agriculture, Parks and Gardens; Stock Watering; Primary Contact Recreation; and Industrial Water Use [1].	*Statement of Environmental Audit* issued. Beneficial uses of land at the Audit property were precluded due to PAH, TRH and heavy metal contamination identified during the Audit. The property was considered to be suitable for a high-density residential land use provided that the areas of soil with elevated contaminant concentrations were sealed with topsoil or concrete and any that exposed areas of soil with elevated contaminant concentrations were subject to remediation.

Note:
This table is based on the conclusions of the Auditor undertaking the Environmental Audit at each property. Criteria and raw data for each Audit have not been analysed.
1. It is noted that at the time of the completion of the Environmental Audit Report, the SEPP (Waters of Victoria) applied. This has since been replaced by SEPP (Waters), in which different beneficial uses and groundwater segments are referred to.

PAH = Polycyclic Aromatic Hydrocarbon
TRH = Total Recoverable Hydrocarbon

3.2.4 Waste Management Facilities and Legacy Landfills

The results of a search of various databases for waste management facilities and legacy landfill sites within a 1 km radius of the site are presented on pages 15 to 17 of the Lotsearch report (**Appendix C**). Several waste transport facilities were identified by Lotsearch at properties within this zone, however, the nearest facilities located up inferred hydraulic gradient of the site are approximately 550 m away from the site and are not considered to present a potential off-site source of contamination at the site.

As shown on pages 15 to 17 of the Lotsearch report (**Appendix C**) the site is indicated to be located within a 'former waste disposal area' which was used from 1859 to 1888 (indicating filling with 'municipal wastes'). In particular, as described on Page 17 of the Lotsearch report, the original levels of the land on the property were "approximately 3 feet lower" (indicating subsequent filling). Further review of the Lotsearch report shows that property subject to filling is located at the 'St Kilda Town Hall' property, which is located approximately 400 metres west of the site, and therefore is not considered to present a potential off-site source of contamination at the site[2].

3.3 Review of Historical Sources

Previous land uses at the site have been determined from historical aerial photographs and site history information as reviewed for the DSI. A summary of the site history is provided in the following sections.

3.3.1 Aerial Photographs

As part of its report (**Appendix C**), Lotsearch obtained historical aerial photographs of the site for the years 1931, 1942, 1951, 1963, 1966, 1966, 1977, 1987, 1989, 2001, 2009 and 2019. The historical aerial photographs are presented on Pages 47 to 57 of the Lotsearch report. In addition, Google Earth and Nearmap (2020) images were examined to identify previous land uses on the site. A review of the historical aerial photographs is provided in **Table 4** Review of Historical Aerial Photographs **.**

Table 4 Review of Historical Aerial Photographs

Date and Origin	Description of Land Use/Occupant	Surrounding Land Use
1931 (Lotsearch)	The site, which comprises at least six plots of land, is occupied by several buildings (inferred residential) fronting Marlborough Street. Further detail cannot be made out due to the low resolution of the image.	Two roads and a railway appear to be present surrounding the site, consistent with the present-day configuration of Dianella Lane (north of site), Marlborough Street (south of site), and Sandringham Railway Line (east of site). Structures consistent with the present day surrounding residential dwellings and commercial

[2] Broad 'Melway' map references have been used to identify former waste disposal sites in the Lotsearch database. The reasoning for the identification of the site in the database as a 'former waste disposal site' is that the large area of the Melway grid which encompassed the actual 'waste disposal site' (the St Kilda Town Hall) also encompasses the site.

Date and Origin	Description of Land Use/Occupant	Surrounding Land Use
		buildings in the Carlisle Street shopping area appear to be positioned to the properties in the vicinity of the site and broader surrounding area.
1942 (Lotsearch)	The site appears essentially unchanged from the 1931 aerial photograph. However, given the clearer imagery, the individual buildings present on the site are more clearly defined and are indicated to be consistent with residential buildings. The largest of the buildings is present in the eastern portion of the site.	The surrounding land uses appear essentially unchanged from the 1931 aerial photograph.
1951 (Lotsearch)	The site appears essentially unchanged from the 1942 aerial photograph.	The surrounding land uses appear essentially unchanged from the 1942 aerial photograph.
1963 (Lotsearch)	The site appears essentially unchanged from the 1951 aerial photograph.	Apart from additional commercial/industrial development, the surrounding land uses appear essentially unchanged from the 1951 aerial photograph.
1966 (Lotsearch)	The site appears essentially unchanged from the 1963 aerial photograph.	Apart from additional commercial/industrial development, the surrounding land uses appear essentially unchanged from the 1963 aerial photograph.
1977 (Lotsearch)	The site features are difficult to make out due to the poor resolution of the image. However, the building in the eastern portion of the site appears to have been demolished.	Substantial commercial/residential redevelopment has commenced on the surrounding land since the 1966 aerial photograph. In particular, large commercial buildings and car parks have been constructed to the north and east of the site.
1987 (Lotsearch)	With the exception of one residential property in the western portion of the site, the majority of the on-site structures have been demolished and replaced by a public car park (eastern portion of the site) and a vacant lot (westernmost portion of the site). .	The surrounding land appear essentially unchanged from the 1977 aerial photograph.
1989 (Lotsearch)	The site appears essentially unchanged from the 1987 aerial photograph.	The surrounding land appear essentially unchanged from the 1987 aerial photograph.
2001 (Lotsearch)	The site appears essentially unchanged from the 1989 aerial photograph.	The surrounding land appears essentially unchanged from the 1989 aerial photograph with the exception of further commercial/industrial development of the properties on the surrounding land.
2009 (Lotsearch)	The site appears essentially unchanged from the 2001 aerial photograph.	The surrounding land appears essentially unchanged from the 2001 aerial photograph with the exception of further commercial/industrial development of the properties in the surrounding land.

Date and Origin	Description of Land Use/Occupant	Surrounding Land Use
2013 (Nearmap)	The building previously present in the western portion of the site has been demolished by April 2013. By May 2013, the site is indicated to be being used as a staging area for construction activities (the redevelopment of the Balaclava Railway Station, as described in **Section 3.3.10** below).	The surrounding land uses appear essentially unchanged from the 2009 aerial photograph with the exception of further minor residential/commercial development.
2015 (Nearmap)	The staging area has been removed. The land in the western portion of the site is vacant and the remainder of the site appears to be being used as a public car park (consistent with the present-day land use/configuration).	The surrounding land uses appear essentially unchanged from the 2013 aerial photograph with the exception of further minor residential/commercial development.
2019 (Lotsearch)	The site appears essentially unchanged from the 2015 aerial photograph.	The surrounding land appears essentially unchanged from the 2015 aerial photograph with the exception of further commercial/industrial development of the properties in the surrounding land.
2020 (Nearmap)	The site appears essentially unchanged from the 2019 aerial photograph.	The surrounding land uses appear essentially unchanged from the 2019 aerial photograph.

3.3.2 Royal Historical Society of Victoria

An enquiry was lodged by CoPP (2011a) with the RHSV to provide information regarding the history of the site. No information relating specifically to the site was provided by RHSV. The RHSV reports that from Sands & McDougall Directories of Victoria published between the 1860's and 1974, four private residential house were listed on the northern side of Marlborough Street with street numbers assigned in the 1890s as 46 to 60. A copy of RHSV's report is included in on Page 27 to 28 of CoPP's report (2011a) which is included as **Appendix E** of this report.

3.3.3 Internet search

A search of the Victorian Places website[3] revealed the following information about the suburb of Balaclava:

- The train line from Melbourne to Brighton (which is located to the direct east of the site) was established in 1859;
- The suburb is served by trams which were first established in Chapel Street in 1886 (located ~200 metres to the west of the site); and
- By 1913, the Carlisle Street tram line was established (located ~40 metres to the north of the site).

[3] https://www.victorianplaces.com.au/

A Google search for the site address did not identify any additional relevant information apart from details of the proposed redevelopment of the site as provided on CoPP's website[4].

3.3.4 Historical Maps

Several georeferenced historical maps are included in the Lotsearch report (**Appendix C**). A compiled historical map produced by the Melbourne Metropolitan Board of Works (MMBW) between 1895 and 1897 is provided on Page 65 of the Lotsearch report. The MMBW plan shows that between 1895 and 1897 the site was occupied by seven buildings consistent with a residential land use. The surrounding properties appear to be largely residential in nature, with commercial properties fronting Carlisle Street to the north, a fire station to the north-east and Balaclava Railway Station located immediately to the east of the site.

Lotsearch also includes several historical business directories from the surrounding area. No businesses were listed previously on-site. A photograph developer/printer, electrical repair, chemist, electrical engineer, bootmakers, butcher, hairdressers, undertaker, jewellers, drapers, paint and varnish manufacturer, plumber, sheet metal works, dry cleaners, coal & wood yard, several motor garages and service stations are listed for properties in the vicinity of the site in business directories published between 1896 and 1991. These business activities are considered to pose a direct risk of soil or groundwater contamination at the site.

With respect to nearby 'features of interest' a gas pipeline is shown in the Lotsearch report to be present approximately 390 m south-east of the site. The gas pipeline is down inferred hydraulic gradient of the site and is not considered to pose a direct risk of soil or groundwater contamination at the site.

3.3.5 Energy Safe Victoria

ESV maintains a register of cathodic protection systems (CPSs), which are installed to protect UPSSs. ESV found no record of a CPS installed or having been installed at the site. ESV's response is provided in **Appendix D**.

3.3.6 WorkSafe Victoria

WorkSafe Victoria maintains a Dangerous Goods Licence database for properties which are, or have been, licensed to store dangerous goods. WorkSafe Victoria found no record of dangerous goods being licensed to be stored at the site. WorkSafe Victoria's response is provided in **Appendix D**.

3.3.7 Dial Before You Dig

A review of underground service plans provided by asset owners through DBYD revealed no evidence of underground services within the site, other than services that would normally be expected in a

[4] http://www.portphillip.vic.gov.au/46-58-marlborough-street.htm

commercial/residential area. A copy of the search results is provided in **Appendix D**. It is noted that several street lights are present on-site, which are expected to be serviced by underground powerlines (which are not shown on the DBYD service plans).

3.3.8 City of Port Phillip

A search of the CoPP's Online Planning Register on 1 June 2020 did not identify any current planning applications relating to the site, other than the Notice of Decision (773/2018) which was provided by CoPP with the RFI and is included in **Appendix A** of this report.

3.3.9 Historical Titles

Historical titles relating to the site were reviewed by CoPP (2011a) as part of their Due Diligence Investigation (CoPP 2011a, provided in **Appendix E**). The historical title information relates to the seven separate titles which relate to the site. Legible text provided on the historical titles indicates lots were owned by individuals whose occupations (where listed), included: a brass finisher, labourer, accountant, company director, engineer and solicitor. It is noted that whilst the historic titles often provide an indication of a property owner's occupation, they do not necessarily indicate that the practices of the owner's occupation were undertaken at a property. Titles for the lots were transferred to The Mayor Councillors and Citizens of the City of St Kilda (CoPP's predecessor) between 1970 and 1988, which corresponds with the time in which the lots in the eastern portion of the site were developed as a car park.

3.3.10 Interview with Previous Site Occupants

We were advised by CoPP that from 2013 to 2015, 48 Marlborough Street was used by Metro Trains as a staging area for the renovation of Balaclava Railway Station. Mr Kenton Hall, Project Manager, Metro Trains was interviewed for the DSI on 3 June 2020 to ascertain Metro Trains' activities at the site during their occupancy and whether any potentially contaminating activities were undertaken on-site during this time.

Mr Hall advised that the car park and 48 Marlborough Street (westernmost portion of the site) were used as a staging and storage area for the renovation of Balaclava Railway Station. In particular, the car park was used to store plant and machinery and all associated fluids, fuels, oils and/or lubricants. Mr Hall said that he was not aware of any incidents or spillages of potentially contaminating substances that could have caused contamination at the site.

Regarding ground disturbance on-site during Metro Trains' occupancy, Mr Hall advised that 'clean fill' was imported onto site and stored in the car park to be utilised for the construction of the present day elevated walkway which provides access to Balaclava Railway Station (located to the direct east of the site). Mr Hall also stated that he was unaware of any fill material being imported and used on-site. Mr Hall noted that some material was removed from the Balaclava Railway Station property to the direct east of the site, with the excavation encroaching into the easternmost boundary of the site. Mr Hall said that this material was identified

to contain elevated concentrations of PAH's (in particular benzo(a)pyrene (B(a)P)) and was classified for off-site disposal as Category A contaminated soil. It is noted that this classification is consistent with the findings of CoPP's 2011 assessments (2011a; 2011b).

3.4 Previous Environmental Assessments

As described in **Section 3.1** above, three environmental assessments have been previously completed at the site. These are described in **Sections 3.4.1** to **3.4.3** below. Copies of the previous environmental assessments are provided in **Appendix E** to **Appendix G** of this report. Sample locations from the previous environmental assessments are shown on **Figure F3** of this report.

3.4.1 City of Port Philip's Due Diligence Investigation, May 2011

The results of a due diligence investigation completed on-site are provided in CoPP's report of 10 May 2011 (CoPP 2011a, **Appendix E**). Pertinent aspects of CoPP's report (2011a) are summarised as follows:

- The report and associated field works were completed by CoPP's 'in-house' Site Contamination Advisor, Mr Darren Pendergast;
- The due diligence investigation included site history enquiries, a site inspection and a soil sampling and analytical program;
- CoPP reported that site was used for residential purposes from the late 1800s up until 1978 and 1979, when the easternmost portion of the site was acquired by CoPP and developed for a carpark;
- At the time of the investigation 46 Marlborough Street (westernmost portion of the site) was vacant, a residential dwelling (including a weatherboard house with a sheet metal roof, a sheet metal shed and concrete paths) occupied 48 Marlborough Street (western portion of the site) and a car park occupied 50-58 Marlborough Street;
- No potentially contaminating above or below ground infrastructure was identified on-site by CoPP during the investigation;
- The soil sampling program comprised drilling of seven boreholes using a hand auger on a systematic grid (labelled BH1 to BH7) across the site. These works were completed internally by the site contamination advisor within CoPP;
- Near surface fill was observed at all sample locations to comprise sandy topsoil with regular brick, basalt rocks, charcoal and ash. Wood chips mulch and toppings were also described as present in the near surface of garden bed areas;
- Natural soil was observed underlying the fill material at the majority of sample locations and was observed to comprise silty clay with sand;
- Soil samples were analysed for a broad range of organic and inorganic contaminants (including the EPA Publication IWRG621 'screen');

- The results of chemical analysis showed elevated concentrations of heavy metals, B(a)P and total PAHs exceeding various health-based criteria and threshold concentrations for soil hazard categories (for off-site disposal) as provided in EPA Publication IWRG621; and
- CoPP concluded that the majority of the fill layer at the site (upper soil profile) was classified as Category C Contaminated Soil if it were to be disposed of off-site.

It is noted that the boreholes drilled by CoPP for the investigation (2011a) were 65 mm in diameter, however the ASC NEPM indicates that bores must be 150 mm in diameter (i.e. to readily allow identification of asbestos containing material in the soil). Furthermore, a PID was not used by CoPP for the soil sampling program to screen soil samples for ionisable vapours. Notwithstanding this, the data collected by CoPP (2011a) as part of the investigation are considered to be suitable and the results of CoPP's investigation (2011a) have been considered in this DSI (as described in **Section 7** below).

3.4.2 City of Port Philip's Soil Remediation Plan, August 2011

The results of a limited soil remediation plan completed on-site are provided in CoPP's report of 31 August 2011 (CoPP 2011b, **Appendix F**). Pertinent aspects of CoPP's report (2011b) are summarised as follows:

- The report and associated field works were completed by CoPP's 'in-house' Site Contamination Advisor, Mr Pendergast (as per CoPP 2011a);
- The limited soil remediation plan included review of the due diligence investigation (CoPP 2011a), a site inspection and a soil sampling and analytical program;
- The soil sampling program comprised drilling of twelve additional boreholes using a hand auger on a systematic pattern (labelled BH8 to BH19) in order to augment the boreholes from the previous investigation (CoPP 2011a) and provide sufficient data for the classification of the soil for off-site disposal;
- Near surface fill was observed at all sample locations to comprise sandy silt, sand and crushed rock;
- Natural soil was observed underlying the fill material at the majority of sample locations and comprised silty clay with sand;
- Results of chemical analysis showed elevated concentrations of heavy metals, B(a)P and total PAHs exceeding various health-based criteria and threshold concentrations for soil hazard categories (for off-site disposal) as provided in EPA Publication IWRG621; and
- In accordance with EPA Publication IWRG621, CoPP concluded that the majority of the fill material (upper soil profile) was classified as Category C Contaminated Soil for off-site disposal purposes, with isolated areas of Category A and B Contaminated Soil. With the exception of the natural soil at BH13 in the northern portion of 48 Marlborough Street, CoPP concluded that natural soil material at the site was classified as Fill Material in accordance with EPA Publication IWRG621.

The same minor non-conformances with respect to guidance provided in the ASC NEPM (i.e. use of a PID and borehole diameter) as described in **Section 3.4.1** above in relation to the due diligence investigation

(CoPP 2011a) are noted to have occurred for the limited soil remediation plan (CoPP 2011b). Notwithstanding, this, the data collected by CoPP (2011b) for the soil remediation plan are considered to be suitable and the results of CoPP's sampling (2011b) have been considered in this DSI (as described in **Section 7** below).

3.4.3 Golder's Due Diligence Contamination and Geotechnical Desktop Assessment, November 2017

The results of a desktop assessment are provided in Golder's report of 15 November 2017 (Golder 2017, **Appendix G**). Pertinent aspects of Golder's report (2017), are summarised as follows:

- The report was prepared for due diligence and included consideration of contamination and geotechnical aspects relating to the site;
- CoPP's investigation reports (2011a; 2011b) were reviewed by Golder as part of their assessment;
- Golder did not report any shortcomings associated with the previous investigations performed by CoPP (2011a; 2011b);
- Golder utilised the data obtained from the previous investigations performed by CoPP (2011a; 2011b) to provide cost estimates for the off-site disposal of soil at the site for the proposed redevelopment (principally the basement excavation);
- Prior to acquisition of the site, Golder recommended that the 'environmental sign off requirements' is confirmed with the Responsible Planning Authority; and
- Based on the available information and the identified risks, the contamination management strategy for the site was recommended by Golder as follows:
    - Confirm the environmental sign off requirements for the site (if any).
    - If an Audit is required, appoint an Auditor and confirm any soil or groundwater assessment requirements.
    - Based on the further assessment, a Soil Management Plan should be developed to support the site excavation for development.
    - Following completion of the soil removal and assessment of groundwater (if required by audit), a contamination validation report would be prepared verifying the condition of the site and to support an Environmental Audit (should this be triggered).

3.5 Summary of Site History

The site history is summarised in **Table 5** below.

Table 5 Site History Summary

Approximate Date Range	Description
1895 - 1977	The site appears to have been occupied by seven individual residential properties (buildings fronting Marlborough Street) with associated gardens at the rear (fronting Dianella Lane). By 1979, two residential buildings in the easternmost portion of the site had been demolished and replaced by a car park. The properties surrounding the site during this time are indicated to have been used for residential and commercial/retail purposes (including commercial activities (i.e. dry cleaning and a service station) which have the potential to cause groundwater contamination which may impact the site). From 1859, the Sandringham Railway Line has been present immediately east of the site.
1977 - 2013	With the exception of the lot at 48 Marlborough Street (western portion of the site) by 1987, all residential buildings at the on-site had been demolished and replaced by a public car park (eastern portion of site) or were vacant (westernmost portion of site). During this time properties surrounding the site are indicated to have been used predominantly for residential and retail/commercial purposes (including commercial activities (i.e. dry cleaning) which have the potential to cause groundwater contamination which may impact the site).
2013 - 2015	By mid-2013, the residential buildings located the lot at 48 Marlborough Street (western portion of the site) had been demolished. Between 2013 and 2015, the site was used by Metro Trains as a staging area for the redevelopment of Balaclava Railway Station. During this time properties surrounding the site are indicated to have been used predominantly for residential and retail/commercial purposes (including commercial activities (i.e. a service station) which have the potential to cause groundwater contamination which may impact the site).
2015 – 2020 (Present)	The western portion of the site remains vacant and the central and eastern portions of the site continue to be used as a public car park. The properties surrounding the site are indicated to be used predominantly for residential and retail/commercial purposes. A service station previously located at a nearby property on Carlisle Street (to the north of the site) was decommissioned in circa 2016, with residual groundwater pollution present which may impact the site.

4. CONCEPTUAL SITE MODEL

Based on a review of the site history, site description and site inspections, a CSM has been developed in order to evaluate the potential on-site and off-site contamination sources, exposure pathways and receptors. The CSM is also used to identify any data gaps which may require further investigation.

4.1 Summary of Site Characteristics

The site characteristics are described in detail in **Section 3** and summarised in this section as part of the CSM.

The site is located in a predominantly commercial and residential area. The topography at the site and in the surrounding area is generally flat and level. The site is indicated to have been occupied by seven residential properties from at least 1895 until circa 1979. By 1979, the two residential buildings in the easternmost portion of the site were demolished and replaced by a public car park. With the exception of the lot at 48 Marlborough Street (western portion of the site) by 1987, all residential buildings at the on-site had been demolished and replaced by a public car park (eastern portion of site) or were vacant (westernmost portion of site). By mid-2013, the residential buildings located the lot at 48 Marlborough Street (western portion of the site) had been demolished. Between mid-2013 and 2015, the site was used by Metro Trains as a staging area for the redevelopment of Balaclava Railway Station. At the time of this DSI, the western portion of the site was vacant and unoccupied. The remainder of the site continued to be used as a public car park. The ground surface of the present-day car park was observed to be in fair to good condition with several cracks, but no obvious staining observed on the ground surface during the inspections for the DSI.

Review of plans available from asset owners did not identify any underground facilities located at the site other than services that would normally be expected in an urban residential or light commercial area.

The site is underlain by gravel, sand, and silt associated with the Pleistocene to Holocene alluvium deposits. These beds typically comprise gravel, sand and silt, variably sorted and rounded, generally unconsolidated, including deposits of low terraces and floodplain deposits.

Groundwater has been encountered less than 5 m BGL and is indicated to be migrating in south-westerly direction towards Port Phillip Bay which is located approximately 1.5 km from the site. The nearest extractive groundwater use is located approximately 590 metres west of the site (Bore ID WRK046975, registered for domestic & stock).

4.2 Potential Sources, Mechanisms of Contamination and Contaminants of Concern

The potential sources of soil and groundwater contamination, mechanism(s) of contamination and contaminants of concern identified during the DSI are summarised in **Table 6.**

Table 6 Potential Sources and Mechanisms of Contamination and Contaminants of Concern

Potential Sources of Contamination	Mechanisms of Contamination	Contaminants of Concern	Risk Rating[1]
On-site Sources:			
Hazardous building materials (e.g. potential lead paint, galvanised iron and asbestos cement sheet) associated with the historical buildings.	Mobilisation during historical construction, demolition, and/or renovation activities, or through deterioration of the buildings over time, causing contamination of the near surface soil. Redundant services which may have been constructed from hazardous materials (i.e. asbestos pipes etc.). Asbestos material used in the construction of the on-site buildings.	Heavy metals (e.g. lead, zinc) and asbestos.	Low
Contaminated fill which may have been historically imported onto the site.	Distributed in an area where fill may have been spread on-site. Downward migration of leachable contaminants.	A broad range of organic and inorganic contaminants depending on source, but often comprising heavy metals, PAHs, cyanide and asbestos.	Moderate to High
Oil and lubricant spills associated with leakages from vehicles at the site during its use as a car park.	Downward migration from the surface through the soil profile where there are joints and cracks in the surface asphalt. Contaminants can be localised in the vicinity of drains of areas where there are cracks or joints in sealed surfaces.	TRHs, MAHs, PAHs and VOCs.	Low
Oil, fuel and lubricant spills associated with the storage of plant machinery during the sites use as a staging area for the renovation of Balaclava railway station.	Downward migration from the surface through the soil profile where there are joints and cracks in the surface asphalt. Contaminants can be localised in the vicinity of drains of areas where there are cracks or joints in sealed surfaces.	TRHs, MAHs, PAHs and VOCs	Low
Wastes which may be dumped at the site by member of the public (particularly on the boundaries of the site (ornamental garden beds) and in the vicinity of the clothing recycle bins located in the south-west portion of the site and a municipal waste bins ('wheelie bins') in the southern and eastern portions of the site)	Downward migration from the surface through the soil profile in unsealed areas of the site.	A broad range of organic and inorganic contaminants depending on waste, but often comprising heavy metals, TRHs, PAHs and asbestos.	Low
Use of chemicals for the control of pests and weeds during former residential use of site.	Downward migration from the surface through the soil profile in unsealed areas of the site.	Herbicides and pesticides including heavy metals, OCPs and OPPs.	Low

Potential Sources of Contamination	Mechanisms of Contamination	Contaminants of Concern	Risk Rating[1]
Off-site Sources:			
Commercial and industrial land uses within the surrounding area including a motor garage and dry cleaners.	Downward and lateral migration of contaminants from the surface through cracks and joints in the flooring into the soil profile and groundwater. Any defect in the concrete slab on-site may provide a preferential pathway for the migration of vapour contamination onto the site from off-site sources	A wide range of organic and inorganic contaminants including heavy metals, TRHs, MAHs, PAHs, VOCs and phenols.	Low to Moderate
Contaminated soils associated with the construction of the railway line immediately to the east of the site.	Downward migration from the surface through the soil profile in unsealed areas of the site.	Heavy metals, PAHs	Low to Moderate

Notes:
MAH = Monocyclic Aromatic Hydrocarbon
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
OCP = Organochlorine Pesticide
OPP = Organophosphate Pesticide
TRH = Total Recoverable Hydrocarbon
VOC = Volatile Organic Compound

1. Risk ratings are qualitative only and are based on the likelihood of contamination being present that would present a significant financial liability for the site. In most instances further investigation would be necessary to quantify the liability.

Soil Contamination

The potential for soil contamination to have occurred at the site due to on-site sources is considered to be low on the basis of the nature of historical site activities. The historical residential properties were constructed prior to 1895 and therefore, it is considered unlikely that the fabric of the buildings or associated services on-site contained significant quantities of hazardous building materials which may have caused significant soil contamination at the site. In view of the relatively flat nature of the site, it is considered that only minor (if any) fill material would have been used in the construction of the historical buildings at the site.

Based on historical plans and field observations, there is the potential that limited fill may have been imported onto the site for site levelling purposes. As imported fill may contain elevated leachable contaminant concentrations and asbestos containing materials, the potential for contamination to have occurred across the site due to the impacts of fill is considered to be moderate.

There is considered to be low to moderate potential for soil contamination to have occurred from off-site sources as there was no surface evidence of potential contamination resulting from leachates or wastes entering the site from adjacent properties observed during the site inspections. Historical sources of potential contamination have been identified up-gradient of the site including a former garage and dry cleaners. However, there was no obvious evidence of contamination associated with these sources identified during the site investigation. In addition, due to the topography of the site and surrounds, sediment and surface water drainage from adjacent properties is unlikely to have impacted the site historically. Elevated contaminant concentrations have previously been identified in soil in the eastern portion of the site (CoPP 2011a; 2011b), these concentrations are likely associated with the construction and/or operation of the adjacent Sandringham Railway Line.

On the basis of the CSM, a soil sampling and analytical program was completed for this DSI to augment the investigations previously completed by CoPP (2011a; 2011b).

Groundwater Contamination

Geology beneath the site and its immediate surrounds is understood to comprise layers of silt, sand and gravel which is likely to allow the downward migration of contaminants into the groundwater beneath the site. It is considered that there is a potential for groundwater at the site to be contaminated from the leakage of lubricants/oils from vehicles parked at the site and from any leachable contaminants which may be present in the soil at the site. Off-site sources in the surrounding area, including dry cleaners and a motor garage represent a potential source of contamination.

Based on the depth of groundwater being approximately less than 5 metres BGL and on the basis of the commercial use of neighbouring properties (including those located up/cross inferred hydraulic gradient of the site), there is considered to be a moderate potential for groundwater contamination to have occurred from off-

site sources. In view of this, and on the basis that the proposed development includes a basement, a direct groundwater investigation was performed as part of this DSI.

Soil Vapour/Ground Gas Contamination

There is considered to be a low potential for soil vapour impacts to occur based on potential sources identified within the immediate area surrounding the site. Overall, the risk of ground gas (e.g. methane and carbon dioxide) impacts on the site is considered to be low on the basis of the low potential for any fill at the site to have contained significant quantities of organic materials (which may give rise to ground gas generation) and the likely low volume of any such fill.

4.3 Human and Ecological Receptors

Based on the proposed use of the site for mixed land use (commercial and high-density residential) with potentially accessible soil, the following potential receptors are relevant:

- Child and adult residents of the proposed development living within the potential dwellings;
- Child and adult visitors to the proposed development;
- Adult occupants of the proposed development, working within commercial areas;
- Maintenance and construction workers,
- Current and future users of groundwater on site and in the immediate vicinity of the site;
- Human and ecological receptors within off-site and down-gradient receiving environments;
- Ecological receptors (excluding poultry) associated with areas of garden/accessible soil;
- Child and adult residents/visitors of the proposed development consuming produce grown at the site; and
- Child and adult residents/visitors of the proposed development playing, working etc. in areas of garden/accessible soil, including in private gardens and public open space.

4.4 Potential Exposure Pathways

In view of the results of the site history review and site inspections, the following potential exposure pathways would be expected to occur for mixed land use with potentially accessible soil:

- Exposure to contaminants by adult and child residents and adult commercial workers, who may come into contact with contaminated soil;
- Exposure to contaminants in soil by adult and child residents who may consume produce grown at the site;
- Exposure to contaminants in soil, soil vapour and groundwater by maintenance and construction workers involved in sub-surface excavations at the site or on surrounding properties;
- Exposure to ecological receptors in areas of garden/accessible soil and down-gradient receiving environments; and
- Exposure to potential contaminants by groundwater users.

Based on the current CSM, there is considered to be an overall low risk of a complete exposure pathway associated with exposure to elevated concentrations of volatile soil vapours or ground gasses. As such, the need for a direct soil vapour/ground gas investigation at the site should be determined on the basis of the results of the recommended soil sampling program.

5. DATA QUALITY OBJECTIVES FOR ASSESSMENT

The ASC NEPM and Australian Standard (AS) 4482.1-2005 recommend that data quality objectives (DQOs) be implemented during the investigation of potentially contaminated sites. The DQO process is a systematic planning process used to define the objectives of a site assessment and to allow an appropriate sampling and analysis plan to be developed to achieve those objectives. This is necessary to ensure that an investigation is performed in a systematic, structured and efficient manner. The process involves seven distinct steps:

Step 1. State the problem;
Step 2. Identify the decision/goal of the study;
Step 3. Identify the information inputs;
Step 4. Define the boundaries of the study;
Step 5. Develop the analytical approach;
Step 6. Specify performance or acceptance criteria; and
Step 7. Develop the plan for obtaining data.

DQOs regarding the amount, nature and quality of data have been established for this investigation. The DQOs have been chosen to ensure that the data obtained during the program are sufficient to adequately characterise the contamination on the site so that an appropriate assessment of health and environmental risks resulting from any contamination present on the site can be made for its current or proposed land use. The DQOs established for this investigation are provided in **Table 7.**

Table 7 Data Quality Objectives

DQO Step	DQO Adopted
Step 1: State the Problem	
• Objective	Provide a screen of the site for potential contamination and allow the magnitude and extent of contamination to be identified so that appropriate risk-based management strategies can be developed.
• Contamination issue(s) to be addressed	Various on-site and off-site sources as outlined in the CSM.
• Reason for investigation	To classify on-site soil for disposal and investigate the potential on-site and off-site contaminative issues outlined in the CSM.
• Project team	Mr Peter Ramsay and expert support team including suitably qualified environmental scientists and engineers employed by Peter J Ramsay & Associates.
• Community concern issues	None identified.
• Regulatory authorities	EPA.
• Local government	City of Port Phillip.

DQO Step	DQO Adopted
Step 2: Identify the Decision/Goal of the Study	
• Identify Decision	Are the contaminant concentrations above the acceptance criteria for the DSI, including ecological and human health criteria, and aesthetic based considerations? Are there unacceptable human health or ecological risks posed by the current condition of the site?
• Goal of the Study	Characterisation of the natural background and anthropogenic concentrations of contaminants at the site. Classification of natural and anthropogenic soils at the site for off-site disposal.
• Alternative actions	The contaminant concentrations pose an unacceptable risk to either human health or ecological receptors that may occupy the site in the future and therefore will require further remediation or management. The contaminant concentrations do not pose an unacceptable risk to either human health or ecological receptors that may occupy the site in the future and therefore there is no requirement for further remediation or management.
Step 3: Identify the Information Inputs	
• Media to be collected	Measurement of the concentrations of the contaminants of potential concern in soil and groundwater samples.
• Environmental parameters to be measured	Potential contaminants in the soil and groundwater indicated by the site history review, CSM and site inspections, and EPA and ASC NEPM guidelines.
• Site criteria	Natural background levels and acceptable guideline values.
• Analytical methods	National Association of Testing Authorities (NATA) approved methods and methods endorsed in the ASC NEPM.
• Field screening	Presence/absence of fill or debris, use of a PID, and visual and olfactory observations.
• Additional information to be considered	The results of previous investigations and monitoring undertaken at the site (where available) including: Previous and existing site features; Expected subsurface soil profile; Data gaps identified from previous investigations; and Findings from Environmental Audits of nearby properties.
Step 4: Define the Boundaries of the Study	
• Geographic Area of the Investigation	Undertake the investigation within the geographic boundary of the site.
• Definition of Sampling Unit	The laboratory supplied bottle/jar.
• Smallest Unit on which Decisions or Estimates will be Made	An appropriately assessed, collected, logged and field screened sample.
• Population of Interest	The top 3 m of the soil profile in relation to potential human health and aesthetic risks. The top 2 m of the soil profile in relation to potential ecological risks. The unsaturated zone in relation to potential risks to groundwater.
• Separation of Populations	The site may be divided into different populations based on strata encountered during the investigation works (Domains).
• Temporal Boundaries	The timeframe of the sampling program.
• Practical Constraints	The use of non-destructive drilling techniques for soil in the top 1 m of the soil profile, which may compromise data from those samples. Access and health and safety restrictions.

DQO Step	DQO Adopted
Step 5: Develop the Analytical Approach (or Decision Rule)	
• Statistical parameter(s) of interest	Soil samples: The true mean of the contaminant concentrations, to be estimated by determining the 95% upper confidence limit (UCL) of the mean. In addition, the standard deviation and maximum will be determined. Where there are insufficient data to calculate the 95% UCL, the maximum will be used. The maximum concentration will be used to evaluate potential acute risks to human health and the environment.
• Screening level	Tier 1 screening criteria for a residential land use with areas of open accessible soil including the relevant Ecological Investigation Levels (EILs)/Ecological Screening Levels (ESLs), Health Investigation Levels (HILs)/Health Screening Levels (HSLs) and Total Petroleum Hydrocarbon (TPH) management limits as specified in the ASC NEPM. Where there are no criteria for certain analytes specified in the ASC NEPM, the Canadian SQGs for the Protection of Environmental and Human Health and United States Environment Protection Agency (USEPA) ecological soil screening levels (Eco-SSLs) will be considered. For groundwater, criteria relevant to the proposed land use (per the ASC NEPM) and the groundwater TDS (per protected beneficial uses as provided in the SEPP (Waters)) will be considered.
• Decision rules	• Contaminant concentrations above natural background are not considered to be significant for all land uses, unless those naturally elevated contaminants may present an unacceptable risk to the environment (e.g. naturally occurring asbestos deposits). • The 95% UCL of the mean should not be above the relevant ecological and health-based guideline values. In addition, the standard deviation must not be greater than 50% of the guideline and no single value should be greater than 250% of the guideline values. • Individual contaminant concentrations should not be above the guideline values protective of risks to groundwater, explosive hazards, buildings and structures, and maintenance workers in subsurface trenches. • Where the above conditions are not met, the soil must be demonstrated by risk assessment to not present an unacceptable risk for the proposed land use. • The soil should not contain anthropogenic materials, staining or odour that would be offensive to the senses of human beings in the context of the applicable land use. • The soil should not be corrosive to buildings and structures. • Underground facilities that are potential sources of contamination should be identified and, where appropriate, removed.
• Alternative actions	Where contaminant concentrations are above the acceptable guideline values and are not attributed to natural background, the following will be employed: • Utilisation of statistics and comparison to acceptable guideline values to evaluate potential risks. • Site specific risk assessments. • Evaluation of risk to other media including groundwater, surface water and air. • Evaluation of need for further investigation and/or remediation or management.
• Appropriate measurement levels	The laboratory limits of reporting must be below the adopted criteria wherever practicable.

DQO Step	DQO Adopted
• Acceptable error limits	
- Blanks	Contaminants of concern should not be detected or should not be present above background concentrations.
- Recovery of spikes	Recovery should range between 70% and 130%.
- Relative Percent Differences (RPDs) for field QC samples	RPDs >30% should be investigation to determine the cause of the discrepancy (as per ASC NEPM). RPDs >50% may compromise the data for inorganic analytes as per AS 4482.1. AS 4482.1-2005 also states that the variation can be expected to be higher for organic analytes than for inorganics, and for low concentrations of analytes. Based on Peter J Ramsay & Associates experience, RPDs up to 70% are considered to be acceptable for organic species. Where the duplicate results are lower than five times the detection limit, the USEPA methodology indicates that the results are valid if the difference between the results for the duplicate soil sample is equal to or less than twice the detection limit. The level of error must be considered when interpreting the data set relevant to the RPDs.
- RPDs for laboratory QC sample	Method blanks should not return any positives on analysis. RPDs >35% may compromise the data for duplicate soil samples. Control samples should generally give a recovery of 70-130%, depending on the chemical and medium.
• Summary "If..then..else.." decision rule	If the contaminant concentrations are above the applicable criteria then remediation or management will be necessary, or else if the contaminant concentrations are below the applicable criteria, then remediation or management will not be necessary.
Step 6: Specify Performance or Acceptance Criteria	
• Null hypothesis	Sampled soils and groundwater are contaminated above the relevant criteria values.
• Consequences of making incorrect decisions from the test	Contaminated soil and groundwater that may present an unacceptable risk to human health and the environment remains at the site. Contravening the relevant legislation. Removal of uncontaminated soil unnecessarily, resulting in increased costs and time delays for the project, or compromising other beneficial uses.
• Decision errors	The use of conservative acceptance criteria will ensure that the site is not considered to be uncontaminated when in fact it is.
• Acceptable limits on the likelihood of making decision errors - alpha (α) and beta (β) values	α = 0.05 (represents the probability of determining that soil is classified as uncontaminated when it is in fact contaminated (Type I error). β = 0.2 (represents probability of determining that the soil is contaminated when it is in fact uncontaminated (Type II error).
Step 7: Develop the Plan for Obtaining Data	
• Sampling and analysis design	Refer to **Section 6**.
• Quality assurance procedures	Refer to **Section 6**.
• Operational details and theoretical assumptions	The samples are representative of soil and groundwater in the vicinity of the sample location.

6. SAMPLING AND ANALYSIS QUALITY PLAN FOR ASSESSMENT

The field activities undertaken as part of the assessment for the DSI comprised soil sampling at twelve (12) grid-based sampling locations and the installation and development of three (3) groundwater monitoring wells on 19 and 20 May 2020, and the sampling of three (3) groundwater monitoring wells on 26 May 2020. The results of the assessment for the DSI are discussed in **Section 7**.

The assessment was performed according to:

- EPA guidelines;
- ASC NEPM;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC/NHMRC 1992);
- Australian Standard AS 4482.2 – 1999, *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances*, 5 September 1999, Standards Australia; and
- Australian Standard AS4482.1-2005*: Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil - Part 1: Non-volatile and Semi-volatile Compounds*, 2 November 2005, Standards Australia.

6.1 Soil Sampling Program

Details regarding the soil sampling and analytical program are described in **Table 8** below.

Table 8 Description of the Soil Sampling and Analytical Program

Item	Description
Sample Design and Frequency	Soil samples were retrieved from a total of soil sample locations (labelled SB01 to SB12) drilled on-site to augment the locations previously sampled by CoPP (2011a; 2011b). The PJRA soil bores, together with CoPP's previous locations provide a suitable grid based sampling program for the site in accordance with AS448.1-2005 and to adequately classify on-site soils for off-site disposal (per EPA Publication IWRG702). The sample locations are shown on the site plan in **Figure F3**. Sample locations were referenced to existing ground features and positioned subject to on-site services, subsurface conditions and other constraints which were encountered during fieldwork activities.
Staffing	Qualified and experienced environmental consultants performed the sampling activities under my direction. Relevant staff initials are noted on documentation.
Underground Service Clearance	Prior to drilling, DBYD Plans and site plans were reviewed to identify the locations of over-head and underground utilities. An underground services locator also engaged to clear to soil sampling locations and identify any detectable underground infrastructure.
Drilling Method	The paving block surface at SB05 and SB07 were penetrated using a crowbar.

Item	Description
	Boreholes were drilled using a post hole digger to the maximum depth of fill material into the top of natural soil (where conditions permitted). The boreholes were a minimum of 150 mm in diameter. Once natural soil had been reached, the bore was completed using a 100 mm diameter stainless steel hand auger. Boreholes were backfilled following soil sampling activities with soil placed back into the boreholes in the order in which it was extracted and the paving blocks (at locations SB05 and SB07) reinstated using traffic grade concrete.
Sample Procedures - Initial Assessment	Representative soil samples were retrieved directly from the near surface or post hole digger/hand auger using a clean (decontaminated) trowel and/or a gloved hand. Soil samples were generally collected from 0.1 m, 0.5 m and 1.0 m BGL, or where there was a change in lithology or where evidence of contamination was identified. For each soil sample, one 250 mL laboratory supplied glass jar sealed with a Teflon-lined lid was used. Samples were immediately transferred to the sample containers. The jars were filled with soil to minimise the headspace present above the soil sample in each jar. This method of sampling ensures that the loss of volatiles during sample storage is minimised. Further detail regarding the sampling procedures is provided in Peter J Ramsay & Associates' Sampling Quality Assurance Plan (SQAP), which is presented in **Appendix H**.
Field Testing	A sub-sample was placed in a zip lock bag for field testing using a PID in order to provide an initial qualitative screening of the degree of contamination of the soil with volatile organic compounds. Further detail regarding the methodology for the headspace soil vapour survey is presented in the SQAP. The PID used was a 10.6 eV MiniRae 2000 PID calibrated to read "isobutylene equivalent v/v" (ppm). The PID is regularly calibrated following procedures in the SQAP. The PID readings are presented on the Soil Profile Logs (**Appendix I**).
Decontamination procedures	All equipment in contact with contaminated soil was decontaminated between samples and sample locations utilising the following procedures: • Removal of encrusted material; • Scrubbing using laboratory grade phosphate free detergent; • Rinsing with water of potable quality; and • Final rinsing with deionised water.
Sampling Nomenclature	Each sample container was labelled with a sample number which consists of the site identifier, sample location number, and date of sample collection. The labelling system identifies the origin of each soil sample collected, e.g. 991/SB01_0.0_0.1 as follows: • 991 = The site identifier • SB01 = Borehole Name • 0.0_0.1= Refers to the depth at which the sample was taken The sample numbering convention is not followed where it is necessary to conceal the identity of duplicate samples. In such cases, a fictitious sample location number is used. For example, DUP01 etc (see below).
Sampling Storage, Transport and Tracking	Only clean, laboratory supplied containers with appropriate preservatives (if necessary) were used. Samples were stored in chilled and insulated containers whilst on-site, prior to delivery to the laboratories.

Item	Description
	Chain of Custody (COC) documentation detailing the required analyses accompanied the samples to the laboratory (**Appendix J**). Samples were delivered to the laboratory within applicable holding times.
Field Records	Specific field proforma were filled in for each borehole describing the characteristics of the soil profile including observations of odour and staining, and results of field tests.
Analytical Suite – Initial Assessment	Heavy Metals; TRHs; MAHs; PAHs; Phenols; PCBs; Organochlorine Pesticides (OCPs); Chlorinated hydrocarbons; Halogenated benzenes; Halogenated hydrocarbons; Organophosphate Pesticides (OPPs); Asbestos; pH; and Cation Exchange Capacity (CEC).
Laboratories	Primary Laboratory: Eurofins Laboratories Secondary Laboratory: ALS Environmental
NATA Accreditation	Each laboratory is NATA accredited for the analyses and the laboratory reports contain a NATA accreditation stamp with its accreditation number and site number.
Quality Assurance Procedures	The QA procedures, actions, checks and decisions implemented during this investigation included: • The utilisation of appropriate sampling methods in accordance with the EPA and ASC NEPM guidelines, and Peter J Ramsay & Associates' SQAP (**Appendix H**); • Calibration of field instruments; • Use of standardised field forms including a site inspection proforma, soil profile logs and COC documentation; • Appropriate sample handling and transportation; • Comparison of laboratory analytical results against field observations and instrument measurements; • The collection of QC samples; • Implementation of internal laboratory QC analyses; and • The use of NATA registered laboratories (primary and secondary) and methods.
QC Testing – rinsate and trip blank samples	Rinsate and trip blanks were collected on each day that soil sampling was performed. Rinsate blanks are samples of deionised water collected from the field equipment after decontamination. They are used to determine the effectiveness of the decontamination procedures. The trip blank is carried through the sampling program, transported with the samples to the laboratory and stored with the samples. They are used to identify laboratory errors or to identify sources of contamination due to sample storage and handling.
Blank Sample Nomenclature	**Sample Date** / **Rinsate ID** / **Trip ID** 19/05/2020 / 991/RB01 / 991/TB01 20/05/2020 / 991/RB02 / 991/TB02
QC Testing – field duplicate frequency	Field split duplicate soil samples were collected at a frequency of approximately 5% of the primary samples analysed at the primary

Item	Description		
	laboratory. These were sent to a secondary laboratory for analysis as a check on the accuracy of the sampling and analytical procedures. Field blind replicate samples were collected at a frequency of approximately 5% of the total number of primary samples. These were sent for analysis to the primary laboratory as a check on the precision of the analyses. The blind replicate samples were labelled with a sample identification number different to its primary sample number in order to conceal its identity. Samples were split in the field to form the primary sample, split duplicate sample and blind replicate sample. Sample splitting was undertaken without mixing to avoid loss of volatiles (if present).		
Field Duplicate Nomenclature	**Split Duplicate ID**	**Blind Replicate ID**	**Corresponding Primary Sample**
	991/GW02_0.1_0.2	DUP01	991/GW02_0.1_0.2
	991/SB06_0.1_0.2	DUP02	991/SB06_0.1_0.2
	991/SB04_0.0_0.1	DUP03	991/SB04_0.0_0.1
QC Testing – field duplicate results	The analytical results of the split/inter-laboratory and blind replicate/intra-laboratory analyses are compared using the RPD (refer to **Section 9**).		
Laboratory QA/QC procedures	Laboratory QC has been assessed by reviewing QC data for the following: • Condition of samples at time of receipt; • Holding times; • Laboratory QC samples; • Matrix spikes; and • Surrogate spikes. (Refer to **Section 9)**		
Laboratory detection limits	Laboratory detection limits will be selected so as to be lower than the Tier 1 criteria for each contaminant where practicable.		

6.2 Groundwater Sampling Program

Details regarding the groundwater sampling program are described in **Table 9** below.

Table 9 Description of the Groundwater Sampling and Analytical Program

Item	Description
Purpose	Screen for potential groundwater contamination at the site.
Sample Design and Frequency	Three (3) groundwater monitoring wells were installed to depths of between 6.3 m and 6.5 m BGL and screened in the natural alluvial deposits. The wells were installed and developed in accordance with Southern Rural Water Licensing requirements for groundwater wells, and procedures contained in the SQAP (**Appendix H**). The Bore Construction Licence (No. WLE078429) for the wells is presented in **Appendix K.** Groundwater samples were collected from the groundwater monitoring wells during a GME on 26 May 2020. The location of the groundwater monitoring well is shown in **Figure F3**.

Item	Description
Staffing	Qualified and experienced personnel of PJRA, performed the groundwater sampling activities under my direction. Relevant staff initials are noted on documentation.
Drilling Method	The boreholes for the groundwater monitoring wells were drilled using a Geoprobe drill rig and solid flight augers. The groundwater monitoring wells were constructed from 50 mm PVC casing. A pack of washed gravel was installed over the entire screened length and was capped by a bentonite seal. The well heads were covered by a metal Gatic cover installed flush with the surrounding ground surface. Installation details for the groundwater monitoring well are presented in on the Soil Profile Logs (**Appendix I**). The Bore Construction Licence (No. WLE078429) for the groundwater monitoring wells is presented in **Appendix K.** The groundwater monitoring wells were developed on the day of installation in accordance with the requirements of Southern Rural Water and procedures contained in the SQAP. The groundwater monitoring wells were left to recover for a minimum of seven (7) days prior to sampling in accordance with EPA requirements.
Sample Procedures	The groundwater was gauged prior to sampling using an interface meter and it was confirmed that non-aqueous phase liquid was not present in the groundwater monitoring wells. The depth to groundwater was identified between 3.64 m and 3.67 m below the top of the well casing (BTOC) in the groundwater monitoring well network. The groundwater monitoring wells were purged prior to sampling. The volume of groundwater purged from the well prior to sampling and the well purging parameters measured in the field (drawdown, pump rate, pH, electrical conductivity (EC), redox potential (Eh), temperature and dissolved oxygen (DO)) are presented in the groundwater monitoring well sampling logs provided in **Appendix L**. Groundwater samples were removed by the use of a micro-purge pump using low-flow/minimum drawdown methods in accordance with the procedures as described in the SQAP and EPA Publication 669 Groundwater Sampling Guidelines April 2000. Groundwater samples (primary sample and QA/QC samples) were stored in insulated containers whilst on site, prior to delivery to the laboratories.
Decontamination procedures	Sampling equipment in contact with groundwater samples was decontaminated prior to sampling each groundwater monitoring well in accordance with the SQAP and EPA guidelines.
Sampling Nomenclature	Each sample bottle was labelled with a sample number which consists of the site identifier, sample location number, monitoring round and date of sample collection. The labelling system identifies the origin of each groundwater sample collected, e.g. 991/GW01 as follows: • 991= The site identifier • GW01 = Groundwater monitoring well identifier The sample numbering convention is not followed where it is necessary to conceal the identity of duplicate samples. In such cases, a fictitious sample location number is used. For example, GWDUP01, GWDUP02 etc. (see below).
Sampling Storage, Transport and Tracking	Only clean, laboratory supplied bottles with appropriate preservatives (if necessary) were used. Samples were stored in chilled and insulated containers whilst on-site, prior to delivery to the laboratories. COC documentation detailing the required analyses accompanied the samples to the laboratory (**Appendix J**). Samples were delivered to the laboratory within applicable holding times.

Item	Description		
Field Records	A specific field proforma was filled in during groundwater sampling describing the characteristics of the groundwater encountered. Groundwater monitoring field records are presented in **Appendix L.**		
Analytical Suite	Heavy metals; TRHs; MAHs; PAHs; Phenols; Ammonia Nitrate	PCBs; OCPs; OPPs; Halogenated Benzenes Halogenated hydrocarbons; VOCs; and Solvents	
Laboratories	Primary Laboratory: Eurofins Laboratories Secondary Laboratory: ALS Environmental		
NATA Accreditation	Each laboratory is NATA accredited for the analyses and the laboratory reports contain a NATA accreditation stamp with its accreditation number and site number.		
Quality Assurance Procedures	The QA procedures, actions, checks and decisions implemented during this investigation included: • The utilisation of appropriate sampling methods in accordance with the EPA and ASC NEPM guidelines, and Peter J Ramsay & Associates' SQAP (**Appendix H**); • Calibration of field instruments (**Appendix M**); • Use of standardised field forms including a site inspection proforma, soil profile logs, groundwater construction logs and COC documentation; • Appropriate sample handling and transportation; • Comparison of laboratory analytical results against field observations and instrument measurements; • The collection of QC samples; • Implementation of internal laboratory QC analyses; and • The use of NATA registered laboratories (primary and secondary) and methods.		
QC Testing – trip blank sample	Rinsate and trip blanks were collected on each day that groundwater sampling was performed. Rinsate blanks are samples of deionised water collected from the field equipment after decontamination. They are used to determine the effectiveness of the decontamination procedures. The trip blank is carried through the sampling program, transported with the samples to the laboratory and stored with the samples. They are used to identify laboratory errors or to identify sources of contamination due to sample storage and handling.		
Blank Sample Nomenclature	**Sample Date**	**Rinsate ID**	**Trip ID**
	26/05/2020	991/RB01	991/TB01

Item	Description		
QC Testing – field duplicate frequency	Field blind replicate samples were collected at a frequency of approximately 5% of the total number of primary samples. These were sent for analysis to the primary laboratory as a check on the precision of the analyses. The blind replicate samples were labelled with a sample identification number different to its primary sample number in order to conceal its identity. As only one groundwater well was sampled, one blind replicate was collected. Field split duplicate groundwater samples were collected at a frequency of approximately 5% of the primary samples analysed at the secondary laboratory. These were sent to a secondary laboratory for analysis as a check on the accuracy of the sampling and analytical procedures. As only one groundwater well was sampled, one split duplicate was collected. Samples were split in the field to form the primary sample, split duplicate sample and blind replicate sample. Sample splitting was undertaken without mixing to avoid loss of volatiles (if present).		
Field Duplicate Nomenclature	**Split Duplicate ID**	**Blind Replicate ID**	**Corresponding Primary Sample**
	991/GW02	991/DUP01	991/GW02
QC Testing – field duplicate results	The analytical results of the split/inter-laboratory and blind replicate/intra-laboratory analyses are compared using the RPD (refer to **Section 9**).		
Laboratory QA/QC procedures	Laboratory QC has been assessed by reviewing QC data for the following: • Condition of samples at time of receipt; • Holding times; • Laboratory QC samples; • Matrix spikes; and • Surrogate spikes. (Refer to **Section 8.3**)		
Laboratory detection limits	Laboratory detection limits were selected so as to be lower than the Tier 1 criteria for each contaminant where possible.		

7. RESULTS AND INTERPRETATION

The results of the soil and groundwater sampling programs conducted as part of the DSI have been interpreted, compared and combined with results obtained during previous investigations performed by CoPP (2011a; 2011b). Interpretation of the soil and groundwater sampling program results is provided in **Sections 7.1** and **7.2** respectively. Results of soil classification (for off-site disposal) are provided in **Section 8** below.

7.1 Soil Sampling Program

7.1.1 Analytical Results of Soil Sampling Program

The analytical results for the soil samples from the soil sampling program performed by PJRA for this DSI are presented in the NATA endorsed laboratory results included in **Appendix N** and summarised in **Table R1** (Summary of Analytical Results for Soil Samples) of this report together with results obtained during previous investigations performed by CoPP (2011a; 2011b). The soil analytical results have been compared with the ASC NEPM health investigation levels (HILs), the ASC NEPM ecological investigation levels (EILs) and the

USEPA ecological soil screening levels (Eco-SSLs) for a high-density residential land use. The adopted screening criteria for a high-density residential land use are considered to be protective of receptors relevant to the proposed development, including future staff (of the ground floor commercial tenancy) and residents.

As summarised in **Table R1**, elevated contaminant concentrations were measured above the adopted ecological and heath-based criteria across the site. However, as shown in the development plans (provided in **Appendix A**) and discussed in **Section 8**, the majority of the fill layer (upper soil profile) at the site is proposed to be removed for the construction of the basement associated with the proposed development. In view of this, the soil analytical results associated with the sample locations which are proposed to be excavated as part of the development (refer to **Figure F3**) have not been discussed with respect to ecological and heath based criteria. That is, as the soil associated with these sample locations will be removed as part of the development, the contamination status of these soils does not have a bearing on the environmental condition of the site following the completion of the development.

The analytical results for the soil samples (which will remain on-site following the basement excavation) identified elevated concentrations of the following analytes above certain screening criteria:

- Elevated **lead** (1,120 mg/kg), **zinc** (up to 1,060 mg/kg), **anthracene** (13.1 mg/kg), **benz(a)anthracene** (up to 39.5 mg/kg), **benzo(a)pyrene** (up to 41.3 mg/kg), **benzo(g,h,i)perylene** (24.2 mg/kg), **benzo(k)fluoranthene** (16.8 mg/kg), **chrysene** (30.5 mg/kg), **fluoranthene** (74.8 mg/kg), **indeno(1,2,3-c,d)pyrene** (up to 19.5 mg/kg) and **phenanthrene** (41.3 mg/kg) concentrations above their respective ecological-based criteria for a high-density residential land use; and
- Elevated **PAHs (Total)** (437 mg/kg) and **benzo(a)pyrene toxicity equivalence quotient (B(a)P TEQ) (LOR)** (up to 53.5 mg/kg) concentrations above their respective health-based criteria for a high-density residential land use.

It is noted that, with the exception of lead, the maximum concentration of all contaminants described above were measured in soil sample BH8–0.05 as retrieved at soil borehole BH8 during CoPP's 2011 investigation (CoPP 2011b). Soil borehole BH8 is positioned within the garden bed in the eastern portion of the site. As described in **Section 8** below, soil in this area is distinct in nature and has therefore been ascribed an individual soil 'domain' (Soil Domain 3) in accordance with EPA Publication IWRG702.

As shown in the development plans (**Appendix A**), a garden bed is proposed to be established in this area as part of the proposed development (likely in order to retain the large native trees in this area). Furthermore, B(a)P TEQ (LOR) concentration of 53.5 mg/kg as measured in this sample is more than two and half times (2.5 times) the health-based criteria for a high-density residential land use (4 mg/kg). In view of this, the B(a)P TEQ contamination at this location may present an unacceptable risk to human health for the proposed high-density residential land use where the soil is accessible. On this basis, it is recommended that the soil within the vicinity of soil borehole BH8 (represented by Soil Domain 3 and including soil sample locations SB08, SB10, BH6, BH7 and BH8) be further assessed (by way of risk assessment) and/or remediated, with the

resultant excavation validated. These works should be performed and reported by a suitably qualified environmental consultant to the satisfaction of CoPP.

Aside from the elevated contaminant concentrations identified at Soil Domain 3 (as described above), elevated zinc, benz(a)anthracene, B(a)P, indeno(1,2,3-c,d)pyrene and B(a)P TEQ concentrations were measured variably above the relevant ecological and health-based criteria in soil samples retrieved from soil bores SB06, SB07, SB09 and BH18. As shown in the development plans (**Appendix A**) and by the footprint of the proposed basement (**Figure F3**), the soil associated with these sample locations will remain on-site following the completion of the development in areas of hardstand or garden beds. In areas of the site where the ground surface is fully sealed, these ecological and health-based exceedances are not considered to pose an unacceptable risk to ecological receptors or future site users. However, in view of the exceedances of ecological based criteria, it will be necessary to ensure that any areas of accessible soil (i.e. garden beds) are developed to ensure that impacts to plants do not occur. On this basis, for any garden bed or area of accessible soil on-site (i.e. where the ground is not otherwise fully sealed), it is recommended that a layer of 500 mm of soil demonstrated to be suitable for the site and consistent with EPA Publication IWRG621 as 'Fill Material' is placed and maintained at the surface.

It is noted that asbestos was not detected in any of the soil samples for which it was analysed for during the sampling performed for the DSI. In addition, fragments of potential asbestos containing material were not at any of the soil sample locations during the DSI. However, as buildings and structures have been present at the site, there is the potential that asbestos (and other hazardous building materials) may be encountered during the excavation of soil on-site for the redevelopment. If encountered during future development or use of the site, any encountered asbestos containing material or hazardous building materials should be assessed, handled and disposed of in accordance with relevant regulatory requirements.

7.2 Groundwater Sampling Program

7.2.1 Monitoring for Light Non-Aqueous Phase Liquid

LNAPL was not identified at any of the on-site groundwater monitoring wells which were sampled for the GME (GW01 to GW03).

7.2.2 Groundwater Levels

As shown on the well purges sheets (provided in **Appendix L**) and on the potentiometric contours (**Figure F5**), groundwater was measured at 3.64 m BGL to 3.67 m BGL in the groundwater monitoring wells (GW01 to GW03) during the GME. As show in the development plans provided in **Appendix A**, the basement level is proposed to be approximately 3.4 m BGL. Noting that engineering considerations that are not within the scope of this DSI, in view of depth to groundwater, which is just below the proposed basement level, it is recommended that advice should be sought from a suitably qualified engineer on specific design and engineering controls necessary in view of the potential interaction of the basement with groundwater. Further, the potential for temporal and spatial fluctuations in groundwater levels should be considered in this regard.

7.2.3 Groundwater Analytical Results

The NATA endorsed analytical results for the groundwater samples retrieved during the GME are provided in **Appendix N** and summarised in **Table R2**. The groundwater analytical results have been compared against the ASC NEPM Groundwater Health Screening Levels (HSL) criteria for vapour intrusion for a commercial/industrial land use and the United States Environmental Protection Agency (US EPA) Vapour Intrusion Screening Level (VISL) criteria for a high-density residential land use (assuming a target risk for carcinogens of $1x10^{-5}$ and target hazard quotient of 1 for non-carcinogens). The adopted Tier 1 screening criteria for a high-density residential land use are considered to be protective of receptors relevant to the proposed development, including future commercial workers and residents. In addition, the analyte concentrations have been compared with groundwater quality criteria relevant to the groundwater segment at the site (on the basis of TDS, as described in SEPP (Waters)) and results above criteria are highlighted in **Table R2** accordingly.

The analytical results for the groundwater samples identified elevated concentrations of the following analytes above certain screening criteria:

- Elevated **nitrate (as N)** (up to 6.9 mg/L), **nitrogen (total)** (up to 8.2 mg/L), **cobalt** (0.002 mg/L), **copper** (up to 0.006 mg/L) and **zinc** (up to 0.091 mg/L) above their respective criteria of 3.8 mg/L, 500 mg/L, 0.0014 mg/L, 0.0018 mg/L and 0.015 mg/L for water dependent ecosystems and species;
- Elevated **nitrogen (total)** (up to 8.2 mg/L) and **manganese** (0.068 mg/L) above their respective criteria of 0.5 mg/L and 0.02 mg/L for industrial and commercial beneficial use; and
- Elevated **nitrogen (total)** (up to 8.2 mg/L) above the criterion value of 5 mg/L for agriculture and irrigation (irrigation) beneficial uses.

Elevated concentrations of nitrate, nitrogen, cobalt, copper and zinc were measured above the criteria for water dependent ecosystems and species. However, given the proposed high-density residential land use and the distance to the nearest receiving water body (Port Phillip Bay, approximately 1.7 km south-west of the site), the risk posed by these elevated concentrations is considered to be low.

Elevated concentrations of nitrogen (total) and manganese were measured above the criteria for commercial and industrial uses and for agriculture and irrigation (irrigation). However, as these beneficial uses are unlikely to be realised at the site, the risk posed by these concentrations is considered to be low.

The concentrations for all other analytes measured in the groundwater were below the groundwater quality criteria or below laboratory detection limits.

Based on the results of the groundwater analysis, there is not considered to be an unacceptable risk to human health due to vapour intrusion (i.e. from groundwater contamination).

Should groundwater at the site be proposed to be extracted for any reason in the future, advice should be sought from a suitably qualified person to ensure that it is of suitable quality for its intended use.

8. SOIL CLASSIFICATION FOR OFF-SITE DISPOSAL

8.1 Summary of Soil Domains

In accordance with the requirements of EPA Publication IWRG702, for the purpose of categorising soil for off-site disposal, the site should be split into soil domains (for in-situ classification sampling) representing similar material types (e.g. fill, natural soil or rock), similar contamination, and other site-specific features as indicated by the site history (e.g. underground storage tank areas). For this soil classification sampling programme, the in-situ soil has been divided into soil domains on the basis of the results of the previous assessments (CoPP 2011a; 2011b) and the soil sampling and analytical program undertaken as a part of this DSI. The soil domains are summarised in **Table 10** below and presented in **Figures F4a** and **F4b**.

Table 10 Summary of Soil Domains

Soil Domain	Description
Soil Domain 1A	**FILL:** Located in the western portion of the site in the vicinity of soil boreholes SB01, SB02 and BH12. Dark brown silty clay with occasional fragments of brick, metal and concrete. Encountered between 0.0 m and 0.4 m BGL. Characterised by elevated concentrations of heavy metals and PAHs, including benzo(a)pyrene.
Soil Domain 1B	**FILL:** Located in the western third of the site (refer to **Figure F4a**), excluding the fill material in the vicinity of Soil Domain 1A. Dark brown to brown silty clay with occasional bricks, concrete fragments, rootlets and mixed lithologies. Encountered between 0.0 m and 0.5 m BGL.
Soil Domain 2	**FILL:** Located in the central and eastern portion of the site. Dark brown to brown sandy, gravelly silt and silty clay with occasional bands of sand, likely associated with the paving block surface. Occasional fragments of brick, concrete and other mixed lithologies and rootlets and roots. Encountered between 0.0 m and 0.6 m BGL.
Soil Domain 3	**FILL:** Located in the garden bed on the eastern boundary of the site. Dark brown sandy silt with fragments of brick, coke, basalt, fertilizer beads, and rootlets and roots. Encountered between 0.0 m and 0.8 m BGL. Characterised by elevated concentrations of heavy metals and PAHs, including benzo(a)pyrene.
Soil Domain 4A	**NATURAL SOIL:** Identified across the entire site beneath the fill. The natural soil beneath site comprises a layer of brown to grey silty sand, underlain by grey and orange mottled clay. In GW01-

Soil Domain	Description
	GW03, which extended to a depth of 6.5 m BGL, whitish grey and orange sands and gravels were encountered from approximately 4 m BGL.
Soil Domain 4B	**NATURAL SOIL:** Located in the vicinity of BH13 in the north-western portion of the site. Grey mottled orange silty clay. Identified at a depth of 0.5 m to 0.6 m BGL. Characterised by an elevated concentration of zinc.

8.2 Soil Classification Sampling Frequency

As described in **Section 8.1** soil classification samples were collected from each soil domain at the site to adequately classify each soil domain in accordance with the requirements of EPA Publication IWRG702. Confirmation of the soil classification sampling frequency for each soil domain is provided in **Table 11** below. It is noted that analytical results for 38 primary soil samples collected by CoPP during previous assessments at the site (CoPP 2011a and 2011b) have been included in the soil classification sampling program. The soil analytical results are provided in **Table R1** (Human Health and Ecological Criteria), **Table R3** (Classification Criteria) and **Table R4** (Leachate Samples – Classification Criteria).

Table 11 Summary of Soil Classification Sample Frequencies

Soil Domain Reference and Description	Estimated In-Situ Volume [1.]	Estimated Ex-Situ Volume (1.33 Bulking Factor) [2.]	Number of Soil Classification Samples Required (Based on Maximum Concentration) [3.]	Number of Soil Classification Samples Required (Based on 95% UCL Concentration) [3.]	Number of Soil Classification Samples Analysed
Soil Domain 1A: Clayey Fill in the vicinity of bores SB01, SB02 and BH12	47 m^3	62 m^3	3	10	3
Soil Domain 1B: Silty clayey Fill in the western portion of the site	212 m^3	282 m^3	12	10	12
Soil Domain 2: Sandy gravelly silt and silty clayey Fill located in the central and eastern portions of the site	866 m^3	1152 m^3	28	10	17
Soil Domain 3: Sandy silty Fill located in the garden bed in the easternmost portion of the site. In the vicinity of BH6, BH7, BH8, SB08 and SB10.	52 m^3	69 m^3	3	10	8
Soil Domain 4A: Natural sand, clay and sandy gravels beneath the entire site	4,350 m^3	5,786 m^3	232	24	23 [4.]

Soil Domain Reference and Description	Estimated In-Situ Volume [1.]	Estimated Ex-Situ Volume (1.33 Bulking Factor) [2.]	Number of Soil Classification Samples Required (Based on Maximum Concentration) [3.]	Number of Soil Classification Samples Required (Based on 95% UCL Concentration) [3.]	Number of Soil Classification Samples Analysed
Soil Domain 4B: Natural silty clay in the vicinity of soil bore BH13	20 m^3	26 m^3	3	10	1 [5.]

Notes:
All units are in mg/kg unless otherwise specified.

1. With the exception of Soil Domain 4A, all volumes are on the basis of the maximum depths of fill/identified contamination within the soil domain and the area of the domains as shown on Figures F4a and F4b. The volume for Soil Domain 4A is on the basis of the inferred extent of the basement excavation as shown in the development plans (**Appendix A**). All volumes relate to the basement excavation and/or maximum depths of fill/identified contamination only and do not include any other excavations (i.e. piles or services etc.). No contingency has been applied to the volumes, nor has the excavation and disposal of hard stands or any below ground infrastructure been taken into consideration.
2. Bulking factor as provided in EPA Publication IWRG702.
3. Per sampling frequencies provided in EPA Publication IWRG702.
4. On the basis of excavation of In view of the slight grade in ground levels on the site (which reduce towards the west), the estimated soil domain volume is considered to be conservative as a consistent depth from ground surface to the base of the basement has been conservatively assumed for the volume calculation. In any case, on the basis of the results of this DSI, there is a 'low' potential for contamination of the natural soil associated with this soil domain, so the soil classification sampling frequency can be reduced in accordance with the provisions of EPA Publication IWRG621.
5. Based on the analytical results, the location and the lithology encountered at soil borehole BH13, Soil Domain 4B should be combined with the overlying soils associated with Soil Domains 1B and 2 for the purpose of off-site disposal. On this basis, the reduced classification sampling frequency for this soil domain is not of significance.

8.3 Analytical Results of Soil Classification Sampling Program

The analytical results for the soil samples analysed for the soil classification program are presented in the NATA endorsed laboratory results included in **Appendix N** and are summarised in **Table R3** (Classification Criteria) and **Table R4** (Leachate Samples – Classification Criteria). The analyte concentrations in the soil samples have been compared with the EPA total concentration thresholds for Fill Material, Category C contaminated soil and Category B contaminated soil, and the EPA leachable concentration (ASLP) thresholds for Category C contaminated soil and Category B contaminated soil, as specified in EPA Publication IWRG621, *Soil Hazard Categorisation and Management*, June 2009.

The analytical results for the soil samples from Soil Domains 1A, 1B, 2, 3 and 4B identified several elevated concentrations of contaminants above their respective screening criteria. The elevated concentrations are presented in **Table 12** below.

Table 12 Summary of Exceedances of Screening Criteria

Analyte	Maximum Concentration Above Criteria	Fill Material Threshold	Category C Threshold	Category B Threshold
Soil Domain 1A				
Lead	1,900	**300**	**1,500**	6,000
Copper	313	**100**	5,000	20,000
Zinc	1,350	**200**	35,000	140,000

Analyte	Maximum Concentration Above Criteria	Fill Material Threshold	Category C Threshold	Category B Threshold
Benzo(a)pyrene	32	**1**	**5**	**20**
Total PAH	336.1	**20**	**100**	400
Soil Domain 1B				
Copper	180	**100**	5,000	20,000
Lead	1,180	**300**	1,500	6,000
Zinc	970	**200**	35,000	140,000
Benzo(a)pyrene	7.4	**1**	**5**	20
Total PAH	76.85	**20**	100	400
Organochlorine Pesticides	1.73	**1**		
Soil Domain 2				
Lead	770	**300**	1,500	6,000
Nickel	110	**60**	3,000	12,000
Zinc	1,500	**200**	35,000	140,000
Benzo(a)pyrene	4.5	**1**	5	20
Total PAH	43.85	**20**	100	400
Soil Domain 3				
Arsenic	37	**20**	500	2,000
Lead	1,120	**300**	1,500	6,000
Zinc	1,060	**200**	35,000	140,000
Benzo(a)pyrene	41.3	**1**	**5**	**20**
Total PAH	438.2	**20**	**100**	**400**
Soil Domain 4B				
Zinc	1,060	**200**	35,000	140,000

Notes:
a) All units are in mg/kg unless otherwise specified.
Criteria in **bold** have been exceeded by analyte concentrations.

In addition, various concentrations of other contaminants were reported above the laboratory limit of reporting, however, all concentrations were below the adopted screening criteria.

Based on the exceedances identified from the soil analysis (total concentrations), 16 representative soil samples were analysed by the laboratory for leachable contaminant concentrations using the Australian Standard Leaching Procedure (ASLP). In particular, in accordance with guidance provided in EPA Publication IWRG621, soil samples in which maximum total concentrations of arsenic, lead, nickel and B(a)P were measured at greater than 20 times the ASLP threshold concentrations were analysed using the ASLP. The

results of the ASLP analysis are provided in **Table R4**. Comparison of the ASLP results to Category B and Category C ASLP upper limits shows that no exceedances of the relevant screening criteria were identified.

8.3.1 Statistical Analysis

Where at least 10 results are available for each soil domain in accordance with guidance in IWRG702, statistical analysis was undertaken using the USEPA software ProUCL in order to evaluate the significance of the heavy metal and PAH concentrations identified above the adopted screening criteria. The results of the statistical analysis are presented in **Table 13** below and the data inputs and outputs for the statistical analyses are provided in **Appendix O**.

Where insufficient data were available to perform statistical analysis in accordance with the guidance provided in EPA publication IWRG702 (i.e. 10 samples), maximum concentrations measured from each soil domain have been used for the purpose of soil classification (as described in **Section 8.3.2** below).

Table 13 Statistical Analysis

Analyte	Maximum	95% UCL	Fill Material Threshold	Category C Threshold	Category B Threshold	Soil Hazard Category
Soil Domain 1B						
Copper	180	160.4	**100**	5,000	20,000	**Category C**
Lead	1,180	668.6	**300**	1,500	6,000	**Category C**
Zinc	970	506	**200**	35,000	140,000	**Category C**
Benzo(a)pyrene	7.4	2.98	**1**	5	20	**Category C**
Total PAH	76.85	87.52	**20**	100	400	**Category C**
Soil Domain 2						
Lead	770	333.6	**300**	1,500	6,000	**Category C**
Nickel	110	71.18	**60**	3,000	12,000	**Category C**
Zinc	1,500	714.4	**200**	35,000	140,000	**Category C**
Benzo(a)pyrene	4.5	2.07	**1**	5	20	**Category C**
Total PAH	43.85	19.34	20	100	400	**Fill Material**

All units are in mg/kg unless otherwise specified.
Criteria in **bold** have been exceeded by analyte concentrations.

Green	Fill Material
Yellow	Category C Contaminated Soil
Orange	Category B Contaminated Soil
Red	Category A Contaminated Soil

A summary of the soil classification results based on the results of statistical analysis, together with the maximum results of total and leachable contaminant concentrations are provided in **Section 8.3.2** below.

8.3.2 Soil Classification

In view of the analytical results and statistical analysis, the soil associated with each soil domain has been classified in accordance with EPA publication IWRG621, *Soil Hazard Categorisation and Management,* June 2009. The soil hazard categories for each soil domain are presented in **Table 14** below and are shown in **Table R3.**

Table 14 Summary of Soil Classification

Analyte Forming Basis of Soil Classification	Categorisation Method	Number of Samples Taken	Sampling Method	Estimated Ex-Situ Volume [1.]	Soil Hazard Category
Soil Domain 1A					
Benzo(a)pyrene	Maximum Total Concentration	3	In-situ	62 m^3	**Category A**
Soil Domain 1B					
Lead	95% UCL	12	In-situ	282 m^3	**Category C**
Soil Domain 2					
Lead, nickel, zinc and benzo(a)pyrene	95% UCL	15	In-situ	1,152 m^3	**Category C**
Soil Domain 3					
Benzo(a)pyrene	Maximum Total Concentration	8	In-situ	69 m^3	**Category A**
Soil Domain 4A					
No contaminant concentration exceeded the Fill Material threshold criteria	N/A	23	In-situ	5,785 m^3	**Fill Material**
Soil Domain 4B					
Zinc	Maximum Total Concentration	1 [2.]	In-situ	26 m^3	**Category C**

Notes:
All units are in mg/kg unless otherwise specified.
1. Ex-situ volume calculated on the basis of a bulking factor of 1.33 as per the notes provided to **Table 11**.
2. Based on the analytical results, the location of soil borehole BH13 and the lithology at this location, the Category C Contaminated Soil associated with Soil Domain 4B should be combined with the overlying Category C Contaminated Soil associated with Soil Domains 1B and 2 for the purpose of off-site disposal.

Green	Fill Material
Yellow	Category C Contaminated Soil
Orange	Category B Contaminated Soil
Red	Category A Contaminated Soil

8.3.3 Recommendations for Off-Site Disposal of Soil

Whilst the existing data are considered sufficient for the classification of the majority of the soil domains identified at the site, in view of the number of samples collected and the soil hazard categories determined for Soil Domains 1A (Category A), 3 (Category A) and 4B (Category C) and the conservative method of categorisation (maximum concentration), it is potentially viable that material from these soil domains could be stockpiled on-site following excavation to allow additional soil classification sampling and analysis to confirm the soil hazard categories for these soil domains (i.e. by way of completion of statistical analysis for the calculation of the 95% UCL average for each soil domain). This may result in the reclassification of the soil domains to alternate soil hazard categories (which may be lower or higher, depending on the analytical results).

The earthworks contractor must take all reasonable measures to identify and separate soil domains during the excavation works such that the soil is appropriately disposed of off-site/reused on-site, according to its classification. All works associated with the excavation and off-site disposal of the soil must be performed in accordance with relevant environmental and occupational health & safety publications, guidelines and regulations.

9. EVALUATION OF DATA QUALITY ASSURANCE

The quality of the data gathered during the soil and groundwater sampling program has been assessed to confirm that the data satisfy the DQOs established for the investigation and therefore are of a suitable standard to be utilised to characterise the condition of the Site. The assessment was completed in general accordance with: Assessment of data quality of Schedule B2: Site Characterisation of the ASC NEPM.

The data validation review is presented in **Appendix P**. This includes a review of the RPDs calculated from replicate and corresponding primary sample results, and a review of the analytical results for field blank samples and matrix spike samples. In addition, the QC procedures of all laboratories used for this investigation have been reviewed to ensure that the sample data are reliable and complete.

Overall it is concluded that the data are of sufficient quality to enable characterisation of the condition of the soil and groundwater at the Site.

10. REQUIREMENT FOR SECTION 53X ENVIRONMENTAL AUDIT OF LAND

As described in **Section 1.1** above, the DSI has been prepared in response to an expected condition of a Planning Permit anticipated to be issued by CoPP for the development. In particular, as described in the expected Planning Permit condition, where it is a recommendation of a PEA (which is analogous to a PSI) that: *"…that a Certificate or Statement of Environmental Audit is required….:"* (including the completion of a 53X Environmental Audit under the *Environment Protection Act 1970*), then this must be completed and provided to the Responsible Authority[5]. To that end, our opinion regarding the requirement for a Section 53X Environmental Audit at the site on the basis of the results of the DSI and legislative requirements is provided below.

In view of the site history and site conditions (as described in the preceding Sections above), the site would be classified as potentially contaminated land with a 'Medium Potential' for contamination based on the classifications set out in the Department of Sustainability and Environment, *Potentially Contaminated Land-General Practice Note,* June 2005 (referred to hereafter as the 'GPN').

As described in the GPN, for a 'Medium Potential' (Category B) site, there is a requirement to undertake: *"a site assessment from a suitably qualified environmental professional if insufficient information is available to determine if an audit is appropriate. If advised that an audit is not required, default to (Category) C"*. In performing this DSI, PJRA has fulfilled the requirement for the completion of a 'site assessment' by a 'suitably qualified environmental professional'.

With respect to the requirement for an Environmental Audit, the *Planning and Environment Act 1987*, Ministerial Direction No.1, *Potentially Contaminated Land*, September 2001 (Ministerial Direction), directs that an Environmental Audit is required for 'potentially contaminated land' proposed to be developed for a sensitive use (which includes a high-density residential land use) either as part of the rezoning process or as a condition for the development of the land for the sensitive use. However, on Page 5 of the GPN, an exemption from the need for an Environmental Audit is provided as follows:

> *"An environmental audit should be required unless the proponent can demonstrate to the satisfaction of the responsible authority that the site has never been used for a potentially contaminating activity, or that other strategies or programs are in place to effectively manage any contamination."*

On the basis of that strategies and recommendations relating to the management of contamination at the site are implemented, it is considered that a Section 53X Environmental Audit under the *Environment Protection Act 1970* is not necessary for the proposed high-density residential development. The key management

[5] As described in **Table 1**, the site is not subject to an Environmental Audit Overlay, which would require the completion of a Section 53X Environmental Audit Report.

strategies and recommendations (as described in **Section 7.1** above and outlined in **Section 11.2** below) are summarised as follows:

- The redevelopment of the site in accordance with the development plans which show:
  - the site to be developed for a high-density residential land use;
  - the excavation of the majority of soils (including contaminated soils) at the site for the construction of a basement; and
  - the site to be predominantly fully sealed (with the exception of minor areas of garden beds);
- For any garden bed or area of accessible soil on-site (i.e. where the ground is not otherwise fully sealed), a layer of 500 mm of soil demonstrated to be suitable for the site and consistent with EPA Publication IWRG621 as 'Fill Material' is placed and maintained at the surface;
- Soil associated with Soil Domain 3 is further assessed (by way of risk assessment) and/or remediated, with the resultant excavation validated to the satisfaction of CoPP; and
- Although not indicated or encountered in the samples associated with the DSI, should any asbestos containing material or hazardous building materials be encountered at the site (i.e. during or post-development) these materials should be assessed, handled and disposed of in accordance with relevant regulations.

In addition, with respect to the requirement for an Environmental Audit, we note that the Potentially Contaminated Land Advisory Committee's enquiry into the EPA which was completed in 2011 found that:

> *'There are a number of Victorian Civil and Administrative Tribunal (VCAT) decisions which have determined that an environmental audit is not required where a proponent has a strategy or program in place to effectively manage the contamination. In other cases, a construction management plan has been required to address contamination and disposal of contaminated matter'.*

That is, there is a precedent at the VCAT where a Section 53X Environmental Audit has not been required on the basis that the proponent has a strategy or program in place to effectively manage the contamination (which is considered to be the case in this instance).

11. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the DSI of the site at 46-58 Marlborough Street, Balaclava, Victoria, the following conclusions and recommendations are made.

11.1 Conclusions

- Historically, the site is indicated to have been occupied by seven residential properties from at least 1895 until circa 1979. By 1979, the two residential buildings in the easternmost portion of the site were demolished and replaced by a public car park. With the exception of the lot at 48 Marlborough Street (western portion of the site), by 1987, all residential buildings at the on-site had been demolished and replaced by a public car park (eastern portion of site) or were vacant (westernmost portion of site). By mid-2013, the residential buildings located the lot at 48 Marlborough Street (western portion of the site) had been demolished. Between mid-2013 and 2015, the site was used by Metro Trains as a staging area for the redevelopment of Balaclava Railway Station.

- At the time of this DSI, the western portion of the site was vacant and unoccupied. The remainder of the site continued to be used as a public car park.

- The paved ground surface of the present-day public car park is in fair to good condition with occasional cracks and areas of raised paving blocks. There was no significant staining noted to be present on the site surface during the inspections for the DSI.

- The site is proposed to be redeveloped as high-density residential apartments with a basement car parking area and a ground floor commercial tenancy. The development plans indicate that soil in the eastern and southern portions of the site (where mature trees are present) is to be retained on-site for the development. Soil within the footprint of the proposed basement is to be excavated and disposed of off-site.

- The analytical results for the soil samples retrieved from the site (in areas which will not be subject to excavation for the basement and will therefore remain on-site following redevelopment) showed heavy metals and PAH concentrations variably above the relevant ecological and health-based criteria. In particular, significantly contaminated fill was identified in the eastern portion of the site (**Soil Domain 3**, associated with soil borehole BH8) at levels above the ecological health-based guidelines applicable for a high-density residential land use.

- The results of the direct groundwater investigation performed for the DSI showed elevated nitrate, nitrogen and heavy metal concentrations above the criteria for water dependent ecosystems and species. In addition, nitrogen (total) and manganese were measured above the criteria for commercial and industrial uses and for agriculture and irrigation (irrigation). However, in view of the distance to the receiving water body (Port Phillip Bay, approximately 1.7 km south-west of the site) and that the beneficial uses agriculture and irrigation (irrigation) are unlikely to be realised at the site, the risk posed by these concentrations is considered to be low.

- Based on the results of the groundwater analysis, there is not considered to be an unacceptable risk to human health due to vapour intrusion (i.e. from groundwater contamination).

- Reduced standing water levels obtained from groundwater monitoring wells during the direct groundwater investigation performed for the DSI indicate that the groundwater at the site is positioned just below the base of the proposed excavation for the basement.

- In view of the relevant legislative requirements and on the basis of that strategies and recommendations relating to the management of contamination at the site as outlined in this report are implemented, it is considered that a Section 53X Environmental Audit under the *Environment Protection Act 1970* is not necessary for the proposed high-density residential development.

- The soil associated with **Soil Domain 1A** and **Soil Domain 3** is classified as **Category A** contaminated soil in accordance with the EPA publication IWRG621, *Soil Hazard Categorisation and Management*, June 2009.

- The soil associated with **Soil Domain 1B, Soil Domain 2** and **Soil Domain 4B** is classified as **Category C** contaminated soil in accordance with the EPA publication IWRG621, *Soil Hazard Categorisation and Management*, June 2009.

- The soil associated with **Soil Domain 4A** is classified as **Fill Material** in accordance with the EPA publication IWRG621, *Soil Hazard Categorisation and Management*, June 2009.

11.2 Recommendations

- Soil within the vicinity of soil borehole BH8 (represented by **Soil Domain 3** and including soil sample locations SB08, SB10, BH6, BH7 and BH8) is significantly contaminated above the ecological and/or heath-based criteria for the proposed high-density residential land use. This soil is located in the easternmost portion of the site and will remain on-site following completion of the development (in an area of a proposed garden bed). The soil in this area should be further assessed (by way of risk assessment) and/or remediated, with the resultant excavation validated. These works should be performed and reported by a suitably qualified environmental consultant to the satisfaction of CoPP.

- In view of the exceedances of ecological based criteria in soil at the site, existing soil in any areas of accessible soil (i.e. garden beds or where the ground is not otherwise fully sealed), should be replaced with a layer of 500 mm of soil which is demonstrated to be suitable for the site and consistent with EPA Publication IWRG621 as 'Fill Material'. This layer should be maintained as necessary.

- Due to the historical presence of buildings and structures at the site, there is the potential for asbestos containing material and hazardous building materials to be present in the soil at the site. If encountered during future development or use of the site, any encountered asbestos containing material or hazardous building materials should be assessed, handled and disposed of in accordance with regulatory requirements.

- In view of depth to groundwater which is just below the level of the proposed basement, it is recommended that advice be sought from a suitably qualified engineer on specific design and engineering controls necessary in view of the potential interaction of the basement with groundwater. The potential for temporal and spatial fluctuations in groundwater levels should be considered.

- Should groundwater at the site be proposed to be extracted for any reason in the future, advice should be sought from a suitably qualified person to ensure that it is of suitable quality for its intended use.

- Prior to construction of the proposed high-density residential development, the three groundwater monitoring wells present at the site (GW01 to GW03) should be decommissioned in accordance with the requirements of '*Minimum Construction Requirements for Water Bores in Australia'*, published by the National Uniform Drillers Licensing Committee (3rd Edition - February 2012).

- The **Category C Contaminated Soil** associated with **Soil Domain 4B** should be combined with the overlying **Category C Contaminated Soil** associated with **Soil Domains 1B** and **2** for the purpose of off-site disposal.

- In view of the soil hazard categories determined for **Soil Domain 1A** (**Category A Contaminated Soil**) and **Soil Domain 4B** (**Category C Contaminated Soil**) and the conservative method of categorisation (based on maximum concentrations), the material from these soil domains could be stockpiled on-site following excavation to allow additional soil classification sampling and analysis to confirm the soil hazard categories for these soil domains (i.e. by way of completion of statistical analysis for the calculation of the 95% UCL average for each soil domain).

- The earthworks contractor must take all reasonable measures to identify and separate soil domains during the excavation works such that the soil is appropriately disposed of off-site/reused on-site, according to its classification.

- For the off-site disposal of the contaminated soils, a copy of this report should be provided to the waste receiver to facilitate disposal. In addition, EPA Waste Transport Certificates should be obtained to verify that the soil was transported and disposed of in accordance with EPA guidelines and regulations.

- All works associated with the excavation and off-site disposal of the soil must be performed in accordance with relevant environmental and occupational health & safety regulatory requirements.

12. REFERENCES

Environment Protection Authority 2009a, *Acid Sulfate Soil and Rock*, Publication 655.1, EPA, Melbourne.

Environment Protection Authority 2009b, *Soil Hazard Categorisation and Management,* Publication IWRG621, EPA, Melbourne.

Environment Protection Authority 2009c, *Sampling and Analysis of Waters, Wastewaters, Soils and Wastes,* Publication IWRG701, EPA, Melbourne.

DSE 2005, *Potentially Contaminated land - General Practice Note,* Department of Sustainability and Environment, June 2005.

National Environment Protection Council 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999*, 10 December 1999, and as amended 11 April 2013 (ASC NEPM).

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Victorian Government 2018, State Environment Protection Policy (Waters), Victorian Government Gazette, No. S 493, Melbourne, 19 October 2018.

Important Information Relating to this Report

The report to which this document is attached and which this document forms a part of, has been issued by Peter J Ramsay and Associates Pty Ltd and is subject to the qualifications outlined below. These qualifications are in addition to the Use of Report, Disclaimer and Limitations sections as provided in the report.

Scope of Work

The scope of work performed for this environmental investigation was detailed in the contract between Peter J Ramsay & Associates Pty Ltd and the Client. If work is not expressly referred to in the report, it should not be assumed that it has been completed as part of the scope of work. If a matter is not addressed in this report, it should not be assumed that Peter J Ramsay & Associates Pty Ltd has investigated it.

Laboratory Errors

Chemical analysis has inherent limitations and uncertainties that cannot be controlled. Peter J Ramsay & Associates Pty Ltd routinely consults with laboratories regarding anomalous or unexpected analytical results where they are encountered. Peter J Ramsay & Associates Pty Ltd request that the laboratories report any problems experienced during sample receipt or analysis, so that such issues can be considered while evaluating analytical data.

Uncertainty

Some uncertainty is inherent in all environmental investigations. Furthermore, conditions can only be verified at the exact location of any sample collected. Therefore, a sample collected for chemical analysis may or may not be representative of the larger area. Professional judgement and interpretation of results, whilst conducted objectively and following scientific principles, have a degree of inherent uncertainty. Though a reasonably thorough assessment program has already been completed, uncertainty can be further reduced with additional assessment.

Failure to Detect

Even when environmental investigations are completed thoroughly and in accordance with State and National guidelines, it must be recognised that certain conditions present challenging analyte detection problems. Such conditions may include, but are not limited to: complex, random, discontinuous and heterogenous analyte distributions; complex geological or hydrogeological settings; unusual behaviour or fate characteristics of analytes; physical impediments to investigation, such as the location of man-made structures or services; and, limitations of laboratory assessment technologies. Variations in conditions may occur between samples and sample locations, potentially resulting in conditions that are not considered in the report. While all reasonable efforts are made to be thorough, the environmental investigation detailed herein should not be considered to be exhaustive of the environmental conditions present on the site.

Limitations of Information

The effectiveness of an environmental investigation can be influenced by limitations in the information used to define the objective or the scope of work for the environmental investigation. The inability to obtain information regarding the historic site uses or prior environmental investigations can limit the effectiveness of the environmental investigation.

Peter J Ramsay & Associates Pty Ltd accepts no responsibility for the accuracy or completeness of information provided to it by or on behalf of the Client or sourced from a third party. Peter J Ramsay & Associates Pty Ltd has assumed such information is accurate unless otherwise stated. Peter J Ramsay & Associates Pty Ltd accepts no responsibility for incomplete or inaccurate data supplied by the Client.

Data Useability

Data obtained during environmental investigations are only representative of site conditions at the time of their collection. The data collected as part of this environmental investigation may have a finite lifetime depending on how the data are being used. Data should be evaluated for future use to determine if the data are still appropriate and representative of the site. This is especially true if the data are to be used for a purpose other than what they were originally collected for. It should be ensured that laws, regulations or regulator polices are checked regarding the use of older data to determine if limits exists for the useability lifetime of the data. Peter J Ramsay & Associates Pty Ltd accepts no responsibility for data being used for purposes other than those outlined in the original contract.

Regulatory Limitations

Data were evaluated against the applicable regulatory standards at the time of this environmental investigation. However, due to the often-changing regulatory evaluation criteria, concentrations of contaminants that were considered to be acceptable may, in the future, become subject to different regulatory standards.

Comparison with Subsequent Assessment

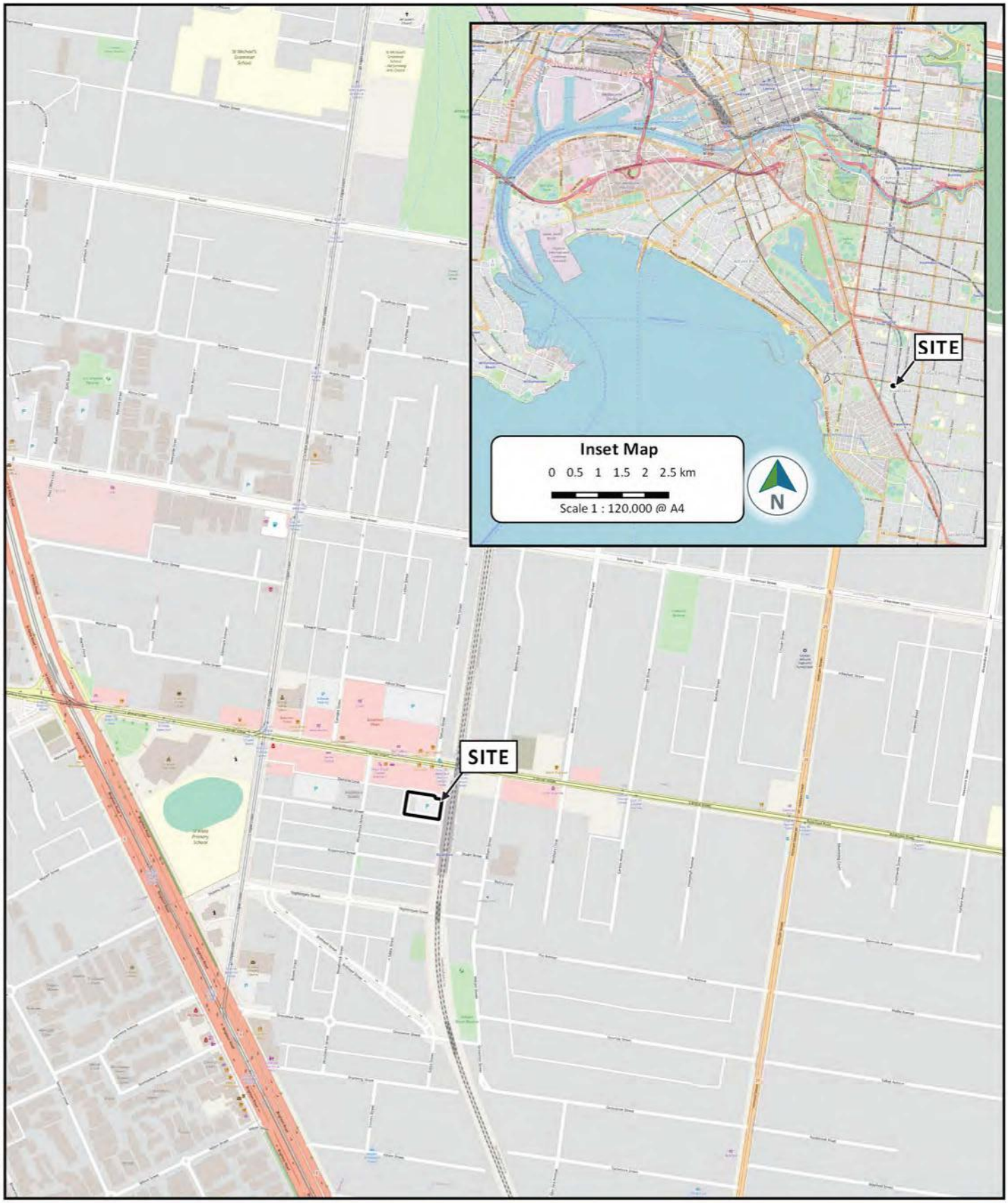
As analytical methods are constantly improving, and environmental investigations cannot, by their nature, be exhaustive, future investigations of the site should evaluate the justification and adequacy of the findings of the environmental investigation based on the reasonableness of the judgements made at the time and the circumstances under which they were made. The accuracy, applicability and usefulness of the opinions and assessments made in this report may be affected by the passage of time.

This report is based on information and circumstances that existed at the time of the environmental investigation and were known to Peter J Ramsay & Associates Pty Ltd when the report was prepared. Should additional information become available in the future, the conclusions and recommendations presented in this report should be revisited and re-evaluated. Peter J Ramsay & Associates Pty Ltd did not consider possible future developments, outside of those outlined in the contract, or potential changes to laws and regulations relevant to the site.

Costs Estimates

Any reference to costs provided in this report (if provided) are indicative estimates only and do not represent a quotation or proposal. Any cost estimates provided are based upon assumptions and known information and are not intended to warrant or guarantee the actual conditions or costs at the site. Any indicative cost estimates are applicable at the time of the preparation of this report and are subject to the assumptions made at the time of the report, market fluctuations and regulatory conditions. Peter J Ramsay & Associates Pty Ltd do not seek or proport to provide business advice.

Figures



PETER J RAMSAY & ASSOCIATES

N

Project: 991.4
Date: 14/05/2020
Revision: DRAFT A
Designed: RM
Drawn: CT
Reviewed: XXX Reviewer

0 50 100 150 200 m

Main Map Scale 1: 10,000 @ A4

Coordinates: GDA94 / MGA 55

LEGEND

Site Boundary

Data Sources

Basemap: © 2019 OpenStreetMap contributors.
Available under the Open Database License, cartography licensed as CC BY-SA.

SITE LOCALITY MAP

Detailed Site Investigation

46-58 Marlborough Street.
Balaclava, Victoria

City of Port Phillip Council

Figure
F1

File: P:/Projects/991_City_of_Port_Phillip/04/Maps/DRAFT_A/F1_Locality Map.qgs

PETER J RAMSAY & ASSOCIATES

Legend

Site Boundary

Data Sources

Aerial imagery: Nearmap Australia Pty Ltd, photograph dated 28/04/2020

Property Lot Boundaries: Spatial Datamart Victoria, Department of Environment, Land, Water and Planning. Downloaded on 13/05/2020. https://services.land.vic.gov.au/SpatialDatamart

Site Boundary: Title Re-Establishment, Feature & Level Survey (Surveyors Ref: J117560), Charter Kerck Cramer, 12 July 2018

N

0 2 4 6 8 10 m

Scale 1 : 500 @ A4
Coordinate System: GDA94 / MGA Zone 55

SITE LAYOUT PLAN

Detailed Site Investigation

46-58 Marlborough Street. Balaclava, Victoria

City of Port Phillip Council

Project:	991.4
Date:	05/06/2020
Revision:	Rev00
Designed:	RM
Drawn:	CT
Reviewed:	RM

Figure **F2**

File: P:\Projects\991_City_of_Port_Phillip\04\Maps\DRAFT_A\F2_Site_Plan.qgs.qgz

PETER J RAMSAY & ASSOCIATES

Legend

- Soil Boreholes (PJRA 2020)
- Soil Boreholes (City of Port Phillip 2011)
- Groundwater Wells (PJRA 2020)
- Site Boundary
- Extent of Proposed Basement

Data Sources

Aerial imagery: Nearmap Australia Pty Ltd, photograph dated 28/04/2020
Property Lot Boundaries: Spatial Datamart Victoria, Department of Environment, Land, Water and Planning. Downloaded on 13/05/2020. https://services.land.vic.gov.au/SpatialDatamart

Site Boundary: Title Re-Establishment, Feature & Level Survey (Surveyors Ref: J117560), Charter Kerck Cramer, 12 July 2018

Extent of Proposed Basement: City of Port Phillip Advertised Plan Attachemnt 1, Doig Architechture, September 2018

Historic Soil Locations / Soil Classification: 48-56 Marlborough Street, Balaclava, Soil Remediation Plan (Version 1), City of Port Phillip 2011

N

0 2 4 6 8 10 m

Scale 1 : 500 @ A4
Coordinate System: GDA94 / MGA Zone 55

SITE PLAN SHOWING SAMPLE LOCATIONS AND PROPOSED BASEMENT OUTLINE

Detailed Site Investigation

46-58 Marlborough Street. Balaclava, Victoria

City of Port Phillip Council

Project:	991.4
Date:	05/06/2020
Revision:	01
Designed:	RM
Drawn:	CT
Reviewed:	RM

Figure **F3**

File: P:\Projects\991_City_of_Port_Phillip\04\Maps\DRAFT_A\F3_Historic_Sample_Locs_QGIS2.18.qgs

PETER J RAMSAY & ASSOCIATES

Legend

- Site Boundary
- Extent of Proposed Basement
- Soil Boreholes (PJRA)
- Soil Boreholes (CoPP 2011b)
- Groundwater Monitoring Wells (PJRA)
- Domain 1A
- Domain 1B
- Domain 2
- Domain 3

Data Sources

Aerial imagery: Nearmap Australia Pty Ltd, photograph dated 28/04/2020
Property Lot Boundaries: Spatial Datamart Victoria, Department of Environment, Land, Water and Planning. Downloaded on 13/05/2020. https://services.land.vic.gov.au/SpatialDatamart
Site Boundary: Title Re-Establishment, Feature & Level Survey (Surveyors Ref: J117560), Charter Kerck Cramer, 12 July 2018
Extent of Proposed Basement: City of Port Phillip Advertised Plan Attachemnt 1, Doig Architechture, September 2018
Historic Soil Locations: CoPP 2011b, 46-58 Marlborough Street, Balaclava – Soil Remediation Plan, prepared by City of Port Phillip, 31 August 2011

N

0 2 4 6 8 10 m

Scale 1 : 500 @ A4
Coordinate System: GDA94 / MGA Zone 55

SITE PLAN SHOWING SOIL DOMAINS - FILL LAYER (UPPER SOIL PROFILE)

Detailed Site Investigation

46-58 Marlborough Street. Balaclava, Victoria

City of Port Phillip

Project:	991.4
Date:	09/06/2020
Revision:	00
Designed:	RM
Drawn:	CT
Reviewed:	ALG

Figure **F4a**

File: P:\Projects\991_City_of_Port_Phillip\04\Maps\DRAFT_A\F4a_Soil Domains (Upper).qgs.qgz

PETER J RAMSAY & ASSOCIATES

Legend

- Site Boundary
- Extent of Proposed Basement
- Groundwater Monitoring Wells (PJRA)
- Soil Boreholes (PJRA)
- Soil Boreholes (CoPP 2011b)
- Domain 4A
- Domain 4B

Data Sources

Aerial imagery: Nearmap Australia Pty Ltd, photograph dated 28/04/2020
Property Lot Boundaries: Spatial Datamart Victoria, Department of Environment, Land, Water and Planning. Downloaded on 13/05/2020. https://services.land.vic.gov.au/SpatialDatamart
Site Boundary: Title Re-Establishment, Feature & Level Survey (Surveyors Ref: J117560), Charter Kerck Cramer, 12 July 2018
Extent of Proposed Basement: City of Port Phillip Advertised Plan Attachemnt 1, Doig Architechture, September 2018
Historic Soil Locations / Soil Classification: 48-56 Marlborough Street, Balaclava, Soil Remediation Plan (Version 1), City of Port Phillip 2011
Historic Soil Locations: CoPP 2011b, 46-58 Marlborough Street, Balaclava – Soil Remediation Plan, prepared by City of Port Phillip, 31 August 2011

N

0 2 4 6 8 10 m

Scale 1 : 500 @ A4
Coordinate System: GDA94 / MGA Zone 55

SITE PLAN SHOWING SOIL DOMAINS - NATURAL SOIL (LOWER SOIL PROFILE)

Detailed Site Investigation

46-58 Marlborough Street. Balaclava, Victoria

City of Port Phillip

Project:	991.4
Date:	10/06/2020
Revision:	00
Designed:	RM
Drawn:	CT
Reviewed:	ALG

Figure **F4b**

File: P:\Projects\991_City_of_Port_Phillip\04\Maps\DRAFT_A\F4b_Soil Domains (Lower).qgs.qgz

PETER J RAMSAY & ASSOCIATES

Legend

- Site Boundary
- Groundwater Wells (PJRA 2020)
- 2.985 Standing Water Level (mAHD)
- Major Potentiometric Contour
- Minor Oitentiometric Contour
- Inferred Groundwater Flow Direction

Data Sources

Aerial imagery: Nearmap Australia Pty Ltd, photograph dated 28/04/2020

Property Lot Boundaries: Spa□al Datamart Victoria, Department of Environment, Land, Water and Planning. Downloaded on 13/05/2020. https://services.land.vic.gov.au/SpatialDatamart

Site Boundary: Title Re-Establishment, Feature & Level Survey (Surveyors Ref: J117560), Charter Kerck Cramer, 12 July 2018

N

0 2 4 6 8 10 m

Scale 1 : 500 @ A4
Coordinate System: GDA94 / MGA Zone 55

SITE PLAN SHOWING GROUNDWATER MONITORING WELL LOCATIONS AND POTENTIOMETRIC CONTOURS

Detailed Site Investigation

46-58 Marlborough Street. Balaclava, Victoria

City of Port Phillip Council

Project:	991.4
Date:	05/06/2020
Revision:	Rev00
Designed:	RM
Drawn:	CT
Reviewed:	RM

Figure **F5**

File: P:\Projects\991_City_of_Port_Phillip\04\Maps\DRAFT_A\F5_Groundwater Contours.qgs.qgz

Tables

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (1 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	LocCode	Sample_Depth_Range	Monitoring_Round	SampleComments	Sample Date
												991/GW01_0.0_0.1	GW01	0-0.1		FILL	19/05/2020
												991/GW01_3.2_3.4	GW01	3.2-3.4		NAT	19/05/2020
												991/GW02_0.1_0.2	GW02	0.1-0.2		FILL	19/05/2020
												991/GW03_0.0_0.1	GW03	0-0.1		FILL	19/05/2020
												991/GW03_3.0_3.1	GW03	3-3.1		NAT	19/05/2020
												991/SB01_0.0_0.1	SB01	0-0.1		FILL	20/05/2020
												991/SB02_0.0_0.1	SB02	0-0.1		FILL	20/05/2020
												991/SB02_0.4_0.5	SB02	0.4-0.5		NAT	20/05/2020
												991/SB03_0.0_0.1	SB03	0-0.1		FILL	20/05/2020
CEC	meq/100g	0.05										27	-	-	19	-	-	-	-	-
Mass of test sample	g											39	-	44	-	-	29	-	-	-
OCP																				
Organochlorine pesticides EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
Other organochlorine pesticides EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03										-	-	-	-	-	-	0.14	-	<0.1
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03										-	-	-	-	-	-	<0.1	-	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Polycylic aromatic hydrocarbons EPAVic	mg/kg											-	-	-	-	-	102.3	-	7.25	-
Phenols																				
Phenols (non-halogenated) EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
Phenols(halogenated) EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
SVOC																				
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5										-	-	-	-	-	-	<20	-	<20
VOC																				
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Volatile Organic Compounds - U																				
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2										-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01										-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01										-	-	-	-	-	-	-	-	-
Asbestos																				
FA- Comment	Comment											1	-	1	-	-	1	-	-	-
ACM - Comment	Comment											1	-	1	-	-	1	-	-	-
Asbestos fibres	Comment											1	-	1	-	-	1	-	-	-
Asbestos from ACM in Soil	%w/w											0	-	0	-	-	0	-	-	-
Asbestos from FA & AF in Soil	%w/w											0	-	0	-	-	0	-	-	-
AF - Comment	Comment											1	-	1	-	-	1	-	-	-
Organic Fibres - Comment	Comment											1	-	1	-	-	1	-	-	-
Mass ACM	g											0	-	0	-	-	0	-	-	-
Mass AF	g											0	-	0	-	-	0	-	-	-
Mass Asbestos in ACM	g											0	-	0	-	-	0	-	-	-
Mass Asbestos in AF	g											0	-	0	-	-	0	-	-	-
Mass Asbestos in FA	g											0	-	0	-	-	0	-	-	-
Mass Asbestos in FA & AF	g											0	-	0	-	-	0	-	-	-
Mass FA	g											0	-	0	-	-	0	-	-	-
Respirable Fibres - Comment	Comment											0	-	1	-	-	1	-	-	-
Synthetic Fibres - Comment	Comment											1	-	1	-	-	1	-	-	-
BTEX																				
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]				-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]				-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]				-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2										-	<0.2	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1										-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]				-	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	<0.3
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]				-	<20	-	-	<20	<20	<20	<20	<20
Chlorinated Hydrocarbons																				
Chlorinated hydrocarbons EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg											-	-	-	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01										-	-	-	-	-	-	<0.5	-	<0.5
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,1,2,2-tetrachloroethane	mg/kg	0.02										-	-	-	-	-	-	<0.5	-	<0.5
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,2,3-trichloropropane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Bromochloromethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Bromodichloromethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Bromoform	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Chlorodibromomethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Chloroethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Chloroform	mg/kg	0.02	34[#6]	68[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Chloromethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
cis-1,2-dichloroethene	mg/kg	0.01										-	-	-	-	-	-	<0.5	-	<0.5
cis-1,3-dichloropropene	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Dibromomethane	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Hexachlorobutadiene	mg/kg	0.02										-	-	-	-	-	-	<0.5	-	<0.5
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Tetrachloroethene	mg/kg	0.02	3.8[#8]	34[#9]								-	-	-	-	-	-	<0.5	-	<0.5
trans-1,2-dichloroethene	mg/kg	0.02										-	-	-	-	-	-	<0.5	-	<0.5
trans-1,3-dichloropropene	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]								-	-	-	-	-	-	<0.5	-	<0.5
Halogenated Benzenes																				
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]								-	-	-	-	-	-	<0.5	-	<0.5
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]								-	-	-	-	-	-	<0.5	-	<0.5
4-chlorotoluene	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Bromobenzene	mg/kg	0.5										-	-	-	-	-	-	<0.5	-	<0.5
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]								-	-	-	-	-	-	<0.5	-	<0.5

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (2 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	991/GW01_0.0_0.1	991/GW01_3.2_3.4	991/GW02_0.1_0.2	991/GW03_0.0_0.1	991/GW03_3.0_3.1	991/SB01_0.0_0.1	991/SB02_0.0_0.1	991/SB02_0.4_0.5	991/SB03_0.0_0.1
												LocCode	GW01	GW01	GW02	GW03	GW03	SB01	SB02	SB02	SB03
												Sample_Depth_Range	0-0.1	3.2-3.4	0.1-0.2	0-0.1	3-3.1	0-0.1	0-0.1	0.4-0.5	0-0.1
												Monitoring_Round									
												SampleComments	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	FILL
												Sample Date	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80					-	-	-	-	-	-	<0.05	-	<0.05
Halogenated Hydrocarbons																					
1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Bromomethane	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]									-	-	-	-	-	-	<0.5	-	<0.5
Iodomethane	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]									-	-	-	-	-	-	<0.5	-	<0.5
Halogenated Phenols																					
2,3,5,6-Tetrachlorophenol	mg/kg	0.03											-	-	-	-	-	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	-	-	-	-	-	<1	-	<1
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	-	-	-	-	-	<1	-	<1
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]									-	-	-	-	-	-	<0.5	-	<0.5
2,6-dichlorophenol	mg/kg	0.03											-	-	-	-	-	-	<0.5	-	<0.5
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05											-	-	-	-	-	-	-	-	-
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]									-	-	-	-	-	-	<0.5	-	<0.5
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660					-	-	-	-	-	-	<1	-	<1
tetrachlorophenols	mg/kg	10											-	-	-	-	-	-	<10	-	<10
Herbicides																					
Dinoseb	mg/kg	5											-	-	-	-	-	-	<20	-	<20
Inorganics																					
% Moisture	%	1											19	15	-	11	14	17	16	8.5	14
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]					-	-	-	-	-	-	<5	-	<5
Fluoride	mg/kg	40											-	-	-	-	-	-	<100	-	<100
Moisture Content (dried @ 103°C)	%	1											-	-	-	-	-	-	-	-	-
pH (aqueous extract)	pH_Units	0.1											-	-	-	-	-	-	7.4	-	9.3
Lead																					
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500					-	6.6	-	-	6.4	1500	1900	120	120
MAH																					
Monocylic aromatic hydrocarbons EPAVic	mg/kg												-	-	-	-	-	<0.6	-	<0.6	-
1,2,4-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Total MAH	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
1,3,5-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Isopropylbenzene	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]									-	-	-	-	-	-	<0.5	-	<0.5
Metals																					
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000					-	7	-	-	2.9	16	9.2	13	7
Barium	mg/kg	10	750[#6]	1500[#7]									-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500					-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900					-	<0.4	-	-	<0.4	0.5	0.7	<0.4	<0.4
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600					-	-	-	-	-	-	<1	-	<1
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]					-	89	-	-	21	16	17	6.8	21
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000					-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000					-	<5	-	-	<5	95	180	12	23
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000					-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]					-	<0.1	-	-	<0.1	1.6	0.7	<0.1	<0.1
Molybdenum	mg/kg	2	40[#6]	40[#7]									-	-	-	-	-	-	<5	-	<5
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000					-	19	-	-	7.5	16	21	<5	52
Selenium	mg/kg	2	1[#8]	2.9[#9]	200	1400	700	10000					-	-	-	-	-	-	<2	-	<2
Silver	mg/kg	0.2	20[#6]	40[#7]									-	-	-	-	-	-	0.4	-	<0.2
Tin	mg/kg	5											-	-	-	-	-	-	29	-	<10
Vanadium	mg/kg	5	130[#8]	130[#9]									-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000					-	18	-	-	9.3	940	850	120	94
Organochlorine Pesticides																					
4,4-DDE	mg/kg	0.05											-	-	-	-	-	-	<0.05	-	<0.05
a-BHC	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	-	-	-	-	-	<0.05	-	<0.05
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45					-	-	-	-	-	-	<0.05	-	<0.05
b-BHC	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530					-	-	-	-	-	-	<0.1	-	<0.1
Chlordane (cis)	mg/kg	0.03											-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03											-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]									-	-	-	-	-	-	<0.05	-	<0.05
DDT	mg/kg	0.05	180	640									-	-	-	-	-	-	0.14	-	<0.05
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600					-	-	-	-	-	-	0.14	-	<0.05
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	-	-	-	-	-	<0.05	-	<0.05
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000					-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05											-	-	-	-	-	-	<0.05	-	<0.05
Endosulfan II	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
Endosulfan sulphate	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100					-	-	-	-	-	-	<0.05	-	<0.05
Endrin aldehyde	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
Endrin ketone	mg/kg	0.05											-	-	-	-	-	-	<0.05	-	<0.05
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]									-	-	-	-	-	-	<0.05	-	<0.05
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50					-	-	-	-	-	-	<0.05	-	<0.05
Heptachlor epoxide	mg/kg	0.03											-	-	-	-	-	-	<0.05	-	<0.05
Methoxychlor	mg/kg	0.03			300	500	400	2500					-	-	-	-	-	-	<0.05	-	<0.05
Toxaphene	mg/kg	1			20	30	30	160					-	-	-	-	-	-	<1	-	<1

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												LocCode	GW01	GW01	GW02	GW03	GW03	SB01	SB02	SB02	SB03
												Sample_Depth_Range	0-0.1	3.2-3.4	0.1-0.2	0-0.1	3-3.1	0-0.1	0-0.1	0.4-0.5	0-0.1
												Monitoring_Round									
												SampleComments	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	FILL
												Sample Date	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
PAH/Phenols																					
2,4-dimethylphenol	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
2,4-dinitrophenol	mg/kg	5											-	-	-	-	-	-	<5	-	<5
2-methylphenol	mg/kg	0.2											-	-	-	-	-	-	<0.2	-	<0.2
2-nitrophenol	mg/kg	0.5											-	-	-	-	-	-	<1	-	<1
3-&4-methylphenol	mg/kg	0.4											-	-	-	-	-	-	<0.4	-	<0.4
4,6-Dinitro-2-methylphenol	mg/kg	5											-	-	-	-	-	-	<5	-	<5
4-chloro-3-methylphenol	mg/kg	0.03											-	-	-	-	-	-	<1	-	<1
4-nitrophenol	mg/kg	5											-	-	-	-	-	-	<5	-	<5
Acenaphthene	mg/kg	0.5											-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5											-	<0.5	-	-	<0.5	1.4	4	<0.5	<0.5
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]									-	<0.5	-	-	<0.5	3.8	9.9	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]									-	<0.5	-	-	<0.5	8.5	27	0.6	0.6
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4									-	<0.5	-	-	<0.5	9	32	0.8	0.6
Benzo(b+j)fluoranthene	mg/kg	0.5											-	<0.5	-	-	<0.5	6	24	0.6	0.8
Benzo(b+k)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]									-	<0.5	-	-	<0.5	4.7	21	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]									-	<0.5	-	-	<0.5	6.9	23	0.8	1.2
Chrysene	mg/kg	0.5	7[#6]	14[#7]									-	<0.5	-	-	<0.5	8.7	24	0.7	0.7
Dibenz(a,h)anthracene	mg/kg	0.5											-	<0.5	-	-	<0.5	1.2	4.1	<0.5	<0.5
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]									-	<0.5	-	-	<0.5	20	56	1	1.4
Fluorene	mg/kg	0.5											-	<0.5	-	-	<0.5	0.8	1.1	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]									-	<0.5	-	-	<0.5	3.8	21	<0.5	<0.5
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]					-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000					-	<0.5	-	-	<0.5	107.8	336.1	5.6	8.1
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]									-	<0.5	-	-	<0.5	14	34	<0.5	1.1
Phenol	mg/kg	0.5	20[#5]	128[#9]	3000	45000	40000	240000					-	-	-	-	-	-	<0.5	-	<0.5
Pyrene	mg/kg	0.5											-	<0.5	-	-	<0.5	19	55	1.1	1.7
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40					-	1.2	-	-	1.2	13	46	1.6	1.4
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40					-	<0.5	-	-	<0.5	13	46	1	0.9
Phenolics																					
Phenols (Total Halogenated)	mg/kg	0.03											-	-	-	-	-	-	<1	-	<1
Phenols (Total Non Halogenated)	mg/kg	1											-	-	-	-	-	-	<20	-	<20
Polychlorinated Biphenyls																					
Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	0.2
Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	<0.1	-	<0.1
PCBs (Sum of total)	mg/kg	0.1	1.3[#6]	33[#9]	1	1	1	7					-	-	-	-	-	-	<0.1	-	0.2
Solvents																					
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]									-	-	-	-	-	-	<0.5	-	<0.5
4-Methyl-2-pentanone	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Acetone	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Allyl chloride	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Carbon disulfide	mg/kg	0.5											-	-	-	-	-	-	<0.5	-	<0.5
Total Petroleum Hydrocarbons (TPHs)																					
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	1000	1000			-	<50	-	-	<50	<50	<50	<50	<50
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	2500[#21]	3500[#21]			-	<100	-	-	<100	480	1200	<100	<100
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	10000	10000			-	<100	-	-	<100	<100	150	<100	<100
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]							-	<50	-	-	<50	<50	<50	<50	<50
C6 - C9	mg/kg	10											-	-	-	-	-	-	-	-	-
C10 - C14	mg/kg	50											-	-	-	-	-	-	-	-	-
C15 - C28	mg/kg	100											-	-	-	-	-	-	-	-	-
C29-C36	mg/kg	100											-	-	-	-	-	-	-	-	-
+C10 - C36 (Sum of total)	mg/kg	50											-	-	-	-	-	-	-	-	-
C10 - C40 (Sum of total)	mg/kg	50											-	<100	-	-	<100	480	1350	<100	<100
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	700[#21]	700[#21]			-	<20	-	-	<20	<20	<20	<20	<20

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (4 of 18)

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												991/SB08_0.7_0.8	SB08	0.7-0.8		FILL	20/05/2020
												991/SB08_1.3_1.4	SB08	1.3-1.4		NAT	20/05/2020
												991/SB09_0.0_0.1	SB09	0-0.1		FILL	20/05/2020
												991/SB10_0.4_0.5	SB10	0.4-0.5		FILL	20/05/2020
												991/SB10_0.8_0.9	SB10	0.8-0.9		NAT	20/05/2020
												991/SB11_0.0_0.1	SB11	0-0.1		FILL	20/05/2020
												991/SB12_0.0_0.1	SB12	0-0.1		FILL	20/05/2020
												991/SB12_0.5_0.6	SB12	0.5-0.6		NAT	20/05/2020
												991/SB12_0.6_0.7	SB12	0.6-0.7		NAT	20/05/2020
												BH1-0.0	BH1	0	Due Dilligence		29/03/2011
CEC	meq/100g	0.05										-	-	29	-	-	-	-	12	-	-
Mass of test sample	g											-	-	-	-	-	33	46	-	-	-
OCP																					
Organochlorine pesticides EPAVic	mg/kg											-	-	-	<1	-	-	-	-	-	<1.2
Other organochlorine pesticides EPAVic	mg/kg											-	-	-	<0.75	-	-	-	-	-	<0.8
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03										-	-	-	<0.1	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03										-	-	-	<0.1	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Polycylic aromatic hydrocarbons EPAVic	mg/kg											-	<7.5	28.85	20.65	<7.5	<7.5	30.9	-	<7.5	15.1
Phenols																					
Phenols (non-halogenated) EPAVic	mg/kg											-	-	-	<37.2	-	-	-	-	-	<2
Phenols(halogenated) EPAVic	mg/kg											-	-	-	<5.5	-	-	-	-	-	<5
SVOC																					
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5										-	-	-	<20	-	-	-	-	-	-
VOC																					
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Volatile Organic Compounds - U																					
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2										-	-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01										-	-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01										-	-	-	-	-	-	-	-	-	-
Asbestos																					
FA- Comment	Comment											-	-	-	-	-	1	1	-	-	-
ACM - Comment	Comment											-	-	-	-	-	1	1	-	-	-
Asbestos fibres	Comment											-	-	-	-	-	1	1	-	-	-
Asbestos from ACM in Soil	%w/w											-	-	-	-	-	0	0	-	-	-
Asbestos from FA & AF in Soil	%w/w											-	-	-	-	-	0	0	-	-	-
AF - Comment	Comment											-	-	-	-	-	1	1	-	-	-
Organic Fibres - Comment	Comment											-	-	-	-	-	1	1	-	-	-
Mass ACM	g											-	-	-	-	-	0	0	-	-	-
Mass AF	g											-	-	-	-	-	0	0	-	-	-
Mass Asbestos in ACM	g											-	-	-	-	-	0	0	-	-	-
Mass Asbestos in AF	g											-	-	-	-	-	0	0	-	-	-
Mass Asbestos in FA	g											-	-	-	-	-	0	0	-	-	-
Mass Asbestos in FA & AF	g											-	-	-	-	-	0	0	-	-	-
Mass FA	g											-	-	-	-	-	0	0	-	-	-
Respirable Fibres - Comment	Comment											-	-	-	-	-	1	1	-	-	-
Synthetic Fibres - Comment	Comment											-	-	-	-	-	1	1	-	-	-
BTEX																					
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.2
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5
Xylene (m & p)	mg/kg	0.2										<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.5
Xylene (o)	mg/kg	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]				<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]				<20	<20	<20	<20	<20	<20	<20	-	<20	-
Chlorinated Hydrocarbons																					
Chlorinated hydrocarbons EPAVic	mg/kg											-	-	-	<8.5	-	-	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg											-	-	-	<7.5	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01										-	-	-	<0.5	-	-	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02										-	-	-	<0.5	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]								-	-	-	<0.5	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Bromoform	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]								-	-	-	<0.5	-	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Chloroethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Chloroform	mg/kg	0.02	34[#6]	68[#7]								-	-	-	<0.5	-	-	-	-	-	-
Chloromethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01										-	-	-	<0.5	-	-	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]								-	-	-	<0.5	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02										-	-	-	<0.5	-	-	-	-	-	-
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]								-	-	-	<0.5	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.02	3.8[#6]	34[#9]								-	-	-	<0.5	-	-	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02										-	-	-	<0.5	-	-	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]								-	-	-	<0.5	-	-	-	-	-	-
Halogenated Benzenes																					
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]								-	-	-	<0.5	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]								-	-	-	<0.5	-	-	-	-	-	-
4-chlorotoluene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]								-	-	-	<0.5	-	-	-	-	-	-

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (5 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	LocCode	Sample_Depth_Range	Monitoring_Round	SampleComments	Sample Date
												991/SB08_0.7_0.8	SB08	0.7-0.8		FILL	20/05/2020
												991/SB08_1.3_1.4	SB08	1.3-1.4		NAT	20/05/2020
												991/SB09_0.0_0.1	SB09	0-0.1		FILL	20/05/2020
												991/SB10_0.4_0.5	SB10	0.4-0.5		FILL	20/05/2020
												991/SB10_0.8_0.9	SB10	0.8-0.9		NAT	20/05/2020
												991/SB11_0.0_0.1	SB11	0-0.1		FILL	20/05/2020
												991/SB12_0.0_0.1	SB12	0-0.1		FILL	20/05/2020
												991/SB12_0.5_0.6	SB12	0.5-0.6		NAT	20/05/2020
												991/SB12_0.6_0.7	SB12	0.6-0.7		NAT	20/05/2020
												BH1-0.0	BH1	0	Due Dilligence		29/03/2011
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80				-	-	-	<0.05	-	-	-	-	-	<0.05
Halogenated Hydrocarbons																					
1,2-dibromoethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Bromomethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]								-	-	-	<0.5	-	-	-	-	-	-
Iodomethane	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]								-	-	-	<0.5	-	-	-	-	-	-
Halogenated Phenols																					
2,3,5,6-Tetrachlorophenol	mg/kg	0.03										-	-	-	-	-	-	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	-	<1	-	-	-	-	-	<0.5
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	-	<1	-	-	-	-	-	<0.5
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]								-	-	-	<0.5	-	-	-	-	-	<0.5
2,6-dichlorophenol	mg/kg	0.03										-	-	-	<0.5	-	-	-	-	-	<0.5
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]								-	-	-	<0.5	-	-	-	-	-	<0.5
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660				-	-	-	<1	-	-	-	-	-	<2
tetrachlorophenols	mg/kg	10										-	-	-	<10	-	-	-	-	-	-
Herbicides																					
Dinoseb	mg/kg	5										-	-	-	<20	-	-	-	-	-	-
Inorganics																					
% Moisture	%	1										15	18	12	9.4	11	18	13	11	20	-
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]				-	-	-	<5	-	-	-	-	-	-
Fluoride	mg/kg	40										-	-	-	<100	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1										-	-	-	-	-	-	-	-	-	9.7
pH (aqueous extract)	pH_Units	0.1										-	-	-	8.6	-	-	-	-	-	-
Lead																					
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500				270	9.4	210	160	120	470	840	-	50	461
MAH																					
Monocylic aromatic hydrocarbons EPAVic	mg/kg											-	<0.6	<0.6	<1.1	<0.6	<0.6	<0.6	-	<0.6	<2.2
1,2,4-trimethylbenzene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Total MAH	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]								-	-	-	<0.5	-	-	-	-	-	-
Metals																					
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000				10	4.1	7.2	4.9	2.4	3	10	-	10	6
Barium	mg/kg	10	750[#6]	1500[#7]								-	-	-	-	-	-	-	-	-	90
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500				-	-	-	-	-	-	-	-	-	<1
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900				0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.1	-	<0.4	<1
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600				-	-	-	<1	-	-	-	-	-	<0.5
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]				13	28	19	21	5.3	6.3	19	-	37	13
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000				-	-	-	-	-	-	-	-	-	3
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000				28	<5	40	26	7.2	23	180	-	15	68
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000				-	-	-	-	-	-	-	-	-	56
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]				0.3	<0.1	0.3	0.5	<0.1	0.2	0.7	-	0.1	0.4
Molybdenum	mg/kg	2	40[#6]	40[#7]								-	-	-	<5	-	-	-	-	-	-
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000				12	8.2	22	13	<5	<5	28	-	18	7
Selenium	mg/kg	2	1[#8]	2.9[#9]	200	1400	700	10000				-	-	-	<2	-	-	-	-	-	-
Silver	mg/kg	0.2	20[#6]	40[#7]								-	-	-	<0.2	-	-	-	-	-	-
Tin	mg/kg	5										-	-	-	<10	-	-	-	-	-	-
Vanadium	mg/kg	5	130[#8]	130[#9]								-	-	-	-	-	-	-	-	-	28
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000				390	14	210	200	170	190	970	-	62	473
Organochlorine Pesticides																					
4,4-DDE	mg/kg	0.05										-	-	-	<0.05	-	-	-	-	-	<0.05
a-BHC	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	-	<0.05	-	-	-	-	-	<0.05
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45				-	-	-	<0.05	-	-	-	-	-	-
b-BHC	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530				-	-	-	<0.1	-	-	-	-	-	-
Chlordane (cis)	mg/kg	0.03										-	-	-	-	-	-	-	-	-	<0.05
Chlordane (trans)	mg/kg	0.03										-	-	-	-	-	-	-	-	-	<0.05
d-BHC	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]								-	-	-	<0.05	-	-	-	-	-	<0.05
DDT	mg/kg	0.05	180	640								-	-	-	<0.05	-	-	-	-	-	<0.2
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600				-	-	-	<0.05	-	-	-	-	-	-
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	-	<0.05	-	-	-	-	-	<0.05
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000				-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05										-	-	-	<0.05	-	-	-	-	-	<0.05
Endosulfan II	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
Endosulfan sulphate	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100				-	-	-	<0.05	-	-	-	-	-	<0.05
Endrin aldehyde	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
Endrin ketone	mg/kg	0.05										-	-	-	<0.05	-	-	-	-	-	<0.05
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]								-	-	-	<0.05	-	-	-	-	-	<0.05
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50				-	-	-	<0.05	-	-	-	-	-	<0.05
Heptachlor epoxide	mg/kg	0.03										-	-	-	<0.05	-	-	-	-	-	<0.05
Methoxychlor	mg/kg	0.03			300	500	400	2500				-	-	-	<0.05	-	-	-	-	-	<0.2
Toxaphene	mg/kg	1			20	30	30	160				-	-	-	<1	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (6 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	991/SB08_0.7_0.8	991/SB08_1.3_1.4	991/SB09_0.0_0.1	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.5_0.6	991/SB12_0.6_0.7	BH1-0.0
Sample Name												991/SB08_0.7_0.8	991/SB08_1.3_1.4	991/SB09_0.0_0.1	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.5_0.6	991/SB12_0.6_0.7	BH1-0.0
LocCode												SB08	SB08	SB09	SB10	SB10	SB11	SB12	SB12	SB12	BH1
Sample_Depth_Range												0.7-0.8	1.3-1.4	0-0.1	0.4-0.5	0.8-0.9	0-0.1	0-0.1	0.5-0.6	0.6-0.7	0
Monitoring_Round																					Due Dilligence
SampleComments												FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	NAT	
Sample Date												20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	29/03/2011
PAH/Phenols																					
2,4-dimethylphenol	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	<0.5
2,4-dinitrophenol	mg/kg	5										-	-	-	<5	-	-	-	-	-	-
2-methylphenol	mg/kg	0.2										-	-	-	<0.2	-	-	-	-	-	<0.5
2-nitrophenol	mg/kg	0.5										-	-	-	<1	-	-	-	-	-	<0.5
3-&4-methylphenol	mg/kg	0.4										-	-	-	<0.4	-	-	-	-	-	<1
4,6-Dinitro-2-methylphenol	mg/kg	5										-	-	-	<5	-	-	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03										-	-	-	<1	-	-	-	-	-	<0.5
4-nitrophenol	mg/kg	5										-	-	-	<5	-	-	-	-	-	-
Acenaphthene	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Acenaphthylene	mg/kg	0.5										<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]								<0.5	<0.5	0.8	0.8	<0.5	<0.5	0.7	-	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]								1.1	<0.5	2.4	1.7	<0.5	<0.5	2.6	-	<0.5	1.1
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4								1.3	<0.5	3.1	1.9	<0.5	<0.5	3.5	-	<0.5	1.3
Benzo(b+j)fluoranthene	mg/kg	0.5										1	<0.5	2.3	1.6	<0.5	<0.5	2.7	-	<0.5	-
Benzo(b+k)fluoranthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	1.6
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]								0.9	<0.5	1.6	<0.5	<0.5	<0.5	1.9	-	<0.5	1
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]								1.1	<0.5	2.8	1.9	<0.5	<0.5	3.1	-	<0.5	0.6
Chrysene	mg/kg	0.5	7[#6]	14[#7]								1.2	<0.5	2.6	1.5	<0.5	<0.5	3.1	-	<0.5	1.1
Dibenz(a,h)anthracene	mg/kg	0.5										<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	-	<0.5	<0.5
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]								2.4	<0.5	5.1	4.2	<0.5	<0.5	5.3	-	<0.5	2.4
Fluorene	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]								0.8	<0.5	1.3	<0.5	<0.5	<0.5	1.6	-	<0.5	0.8
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000				13.1	<0.5	30.4	20.5	<0.5	<0.5	32.6	-	<0.5	-
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]								0.9	<0.5	1.7	3.1	<0.5	<0.5	1.6	-	<0.5	1.2
Phenol	mg/kg	0.5	20[#8]	128[#9]	3000	45000	40000	240000				-	-	-	<0.5	-	-	-	-	-	<0.5
Pyrene	mg/kg	0.5										2.4	<0.5	5.6	3.8	<0.5	<0.5	5.9	-	<0.5	2.5
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40				2.2	1.2	4.6	3	1.2	1.2	5.2	-	1.2	2.071
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40				1.7	<0.5	4.6	2.4	<0.5	<0.5	5.2	-	<0.5	1.571
Phenolics																					
Phenols (Total Halogenated)	mg/kg	0.03										-	-	-	<1	-	-	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1										-	-	-	<20	-	-	-	-	-	-
Polychlorinated Biphenyls																					
Arochlor 1016	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1										-	-	-	<0.1	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	1.3[#8]	33[#9]	1	1	1	7				-	-	-	<0.1	-	-	-	-	-	<0.15
Solvents																					
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]								-	-	-	<0.5	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Acetone	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5										-	-	-	<0.5	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																					
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	**1000**	**1000**		<50	<50	<50	<50	<50	<50	<50	-	<50	-
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	**2500[#21]**	**3500[#21]**		140	<100	190	290	<100	<100	210	-	<100	-
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	**10000**	**10000**		<100	<100	<100	<100	<100	<100	<100	-	<100	-
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]						<50	<50	<50	<50	<50	<50	<50	-	<50	-
C6 - C9	mg/kg	10										-	-	-	-	-	-	-	-	-	<10
C10 - C14	mg/kg	50										-	-	-	-	-	-	-	-	-	<50
C15 - C28	mg/kg	100										-	-	-	-	-	-	-	-	-	<100
C29-C36	mg/kg	100										-	-	-	-	-	-	-	-	-	140
+C10 - C36 (Sum of total)	mg/kg	50										-	-	-	-	-	-	-	-	-	140
C10 - C40 (Sum of total)	mg/kg	50										140	<100	190	290	<100	<100	210	-	<100	-
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	**700[#21]**	**700[#21]**		<20	<20	<20	<20	<20	<20	<20	-	<20	-

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (7 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH1-0.4	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0
												LocCode	BH1	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14
												Sample_Depth_Range	0.4	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011
CEC	meq/100g	0.05											-	-	-	-	-	-	-	-	-	-
Mass of test sample	g												-	-	-	-	-	-	-	-	-	-
OCP																						
Organochlorine pesticides EPAVic	mg/kg												-	<1.08	-	-	-	-	<0.6	1.73	-	-
Other organochlorine pesticides EPAVic	mg/kg												-	<0.78	-	-	-	-	<0.39	0.5	-	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	1.31	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	0.14	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																						
Polycylic aromatic hydrocarbons EPAVic	mg/kg												<8	4.1	<8	10.95	<8	54.35	<7	19.7	<8	76.85
Phenols																						
Phenols (non-halogenated) EPAVic	mg/kg												-	<24	-	-	-	-	<24	<24	-	-
Phenols(halogenated) EPAVic	mg/kg												-	<0.62	-	-	-	-	<0.45	<0.62	-	-
SVOC																						
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5											-	<5	-	-	-	-	<5	<5	-	-
VOC																						
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																						
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2											-	<0.2	-	-	-	-	<0.2	<0.2	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01											-	<0.01	-	-	-	-	<0.01	<0.01	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01											-	<0.01	-	-	-	-	<0.01	<0.01	-	-
Asbestos																						
FA- Comment	Comment												-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment												-	-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w												-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w												-	-	-	-	-	-	-	-	-	-
AF - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Mass ACM	g												-	-	-	-	-	-	-	-	-	-
Mass AF	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g												-	-	-	-	-	-	-	-	-	-
Mass FA	g												-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
BTEX																						
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]					<0.2	<0.2	-	-	-	-	<0.2	<0.2	-	-
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]					<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	-
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]					<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	-
Xylene (m & p)	mg/kg	0.2											<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	-
Xylene (o)	mg/kg	0.1											<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	-
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]					-	<0.5	-	-	-	-	<0.5	<0.5	-	-
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]					-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																						
Chlorinated hydrocarbons EPAVic	mg/kg												-	<0.68	-	-	-	-	<0.68	<0.68	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg												-	<0.64	-	-	-	-	<0.64	<0.64	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01											-	<0.01	-	-	-	-	<0.01	<0.01	-	-
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]									-	<0.01	-	-	-	-	<0.01	<0.01	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02											-	<0.02	-	-	-	-	<0.02	<0.02	-	-
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]									-	<0.04	-	-	-	-	<0.04	<0.04	-	-
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]									-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]									-	<0.01	-	-	-	-	<0.01	<0.01	-	-
1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]									-	<0.01	-	-	-	-	<0.01	<0.01	-	-
Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02	34[#6]	68[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
Chloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01											-	<0.01	-	-	-	-	<0.01	<0.01	-	-
cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]									-	<0.4	-	-	-	-	<0.4	<0.4	-	-
Hexachlorobutadiene	mg/kg	0.02											-	<0.02	-	-	-	-	<0.02	<0.02	-	-
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
Tetrachloroethene	mg/kg	0.02	3.8[#6]	34[#9]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
trans-1,2-dichloroethene	mg/kg	0.02											-	<0.02	-	-	-	-	<0.02	<0.02	-	-
trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
Halogenated Benzenes																						
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]									-	<0.01	-	-	-	-	<0.01	<0.01	-	-
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]									-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-
4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]									-	<0.02	-	-	-	-	<0.02	<0.02	-	-

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (8 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH1-0.4	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0
												LocCode	BH1	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14
												Sample_Depth_Range	0.4	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80					-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Halogenated Hydrocarbons																						
1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]									-	-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]									-	-	-	-	-	-	-	-	-	-
Halogenated Phenols																						
2,3,5,6-Tetrachlorophenol	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	<0.06	-	-	-	-	<0.05	<0.06	-	-
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	<0.06	-	-	-	-	<0.05	<0.06	-	-
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]									-	<0.06	-	-	-	-	<0.03	<0.06	-	-
2,6-dichlorophenol	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05											-	<0.12	-	-	-	-	<0.05	<0.12	-	-
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]									-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660					-	<0.2	-	-	-	-	<0.2	<0.2	-	-
tetrachlorophenols	mg/kg	10											-	-	-	-	-	-	-	-	-	-
Herbicides																						
Dinoseb	mg/kg	5											-	<5	-	-	-	-	<5	<5	-	-
Inorganics																						
% Moisture	%	1											-	-	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]					-	<1	-	-	-	-	<1	2	-	-
Fluoride	mg/kg	40											-	<40	-	-	-	-	220	360	-	-
Moisture Content (dried @ 103°C)	%	1											17.8	5.5	21.2	6.8	4.4	14	23.4	11.5	19.9	17.6
pH (aqueous extract)	pH_Units	0.1											-	-	-	-	-	-	-	-	-	-
Lead																						
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500					28	381	10	186	17	1360	51	1180	38	646
MAH																						
Monocylic aromatic hydrocarbons EPAVic	mg/kg												<2.2	<2.7	-	-	-	-	<2.7	<2.7	-	-
1,2,4-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]									-	<0.5	-	-	-	-	<0.5	<0.5	-	-
Metals																						
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000					5	6	7	<5	<5	10	8	8	10	9
Barium	mg/kg	10	750[#6]	1500[#7]									140	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500					<1	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900					<1	<1	<1	<1	<1	2	<1	2	<1	<1
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]					16	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000					5	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000					15	15	5	12	<5	313	13	148	10	57
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000					29	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]					0.1	0.5	<0.1	0.3	<0.1	1.1	0.1	0.7	0.1	0.5
Molybdenum	mg/kg	2	40[#6]	40[#7]									-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000					8	5	6	3	<2	15	8	11	15	10
Selenium	mg/kg	2	1[#8]	2.9[#9]	200	1400	700	10000					-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	mg/kg	0.2	20[#6]	40[#7]									-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	mg/kg	5											-	7	<5	<5	<5	40	<5	42	<5	26
Vanadium	mg/kg	5	130[#8]	130[#9]									38	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000					66	321	11	114	19	1350	56	840	1060	231
Organochlorine Pesticides																						
4,4-DDE	mg/kg	0.05											-	<0.06	-	-	-	-	<0.05	0.46	-	-
a-BHC	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45					-	<0.06	-	-	-	-	<0.03	0.49	-	-
b-BHC	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530					-	<0.06	-	-	-	-	<0.03	0.14	-	-
Chlordane (cis)	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	0.06	-	-
Chlordane (trans)	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	0.08	-	-
d-BHC	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]									-	<0.06	-	-	-	-	<0.05	<0.06	-	-
DDT	mg/kg	0.05	180	640									-	<0.06	-	-	-	-	<0.05	0.22	-	-
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600					-	<0.06	-	-	-	-	<0.05	0.68	-	-
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	<0.06	-	-	-	-	<0.03	0.49	-	-
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000					-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Endosulfan I	mg/kg	0.05											-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Endosulfan sulphate	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100					-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Endrin aldehyde	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Endrin ketone	mg/kg	0.05											-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]									-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50					-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Heptachlor epoxide	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Methoxychlor	mg/kg	0.03			300	500	400	2500					-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Toxaphene	mg/kg	1			20	30	30	160					-	-	-	-	-	-	-	-	-	-

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (9 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH1-0.4	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0
												LocCode	BH1	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14
												Sample_Depth_Range	0.4	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011
PAH/Phenols																						
2,4-dimethylphenol	mg/kg	0.5											-	<1	-	-	-	-	<1	<1	-	-
2,4-dinitrophenol	mg/kg	5											-	<5	-	-	-	-	<5	<5	-	-
2-methylphenol	mg/kg	0.2											-	<1	-	-	-	-	<1	<1	-	-
2-nitrophenol	mg/kg	0.5											-	<1	-	-	-	-	<1	<1	-	-
3-&4-methylphenol	mg/kg	0.4											-	<1	-	-	-	-	<1	<1	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5											-	<5	-	-	-	-	<5	<5	-	-
4-chloro-3-methylphenol	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
4-nitrophenol	mg/kg	5											-	<5	-	-	-	-	<5	<5	-	-
Acenaphthene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	1.3
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]									<0.5	<0.5	<0.5	<0.5	<0.5	2.2	<0.5	<0.5	<0.5	2
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]									<0.5	<0.5	<0.5	0.9	<0.5	4.2	<0.5	1.9	<0.5	6.2
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4									<0.5	<0.5	<0.5	1	<0.5	4.5	<0.5	2.5	<0.5	7.4
Benzo(b+j)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Benzo(b+k)fluoranthene	mg/kg	0.5											-	0.6	-	-	-	-	<0.5	4	-	-
Benzo(b)fluoranthene	mg/kg	0.5											<0.5	-	<0.5	0.8	<0.5	3.7	-	-	<0.5	6.3
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]									<0.5	<0.5	<0.5	0.6	<0.5	2.9	<0.5	1.6	<0.5	5.2
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]									<0.5	-	<0.5	0.8	<0.5	3.8	-	-	<0.5	5.8
Chrysene	mg/kg	0.5	7[#6]	14[#7]									<0.5	<0.5	<0.5	0.9	<0.5	4	<0.5	1.8	<0.5	6.3
Dibenz(a,h)anthracene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	1.2
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]									<0.5	0.5	<0.5	1.8	<0.5	8.3	<0.5	3.7	<0.5	11.8
Fluorene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	1.4	<0.5	4.3
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]					<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000					-	1.7	<0.5	9.2	<0.5	54.1	<0.5	22.2	<0.5	76.1
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]									<0.5	<0.5	<0.5	0.6	<0.5	6.6	<0.5	1.7	<0.5	6.3
Phenol	mg/kg	0.5	20[#5]	128[#9]	3000	45000	40000	240000					-	<1	-	-	-	-	<1	<1	-	-
Pyrene	mg/kg	0.5											<0.5	0.6	<0.5	1.8	<0.5	7.9	<0.5	3.6	<0.5	12
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40					1.16	1.11	1.16	1.735	1.16	6.319	1.11	3.364	1.16	10.345
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40					0	0	0	1.185	0	6.319	0	2.864	0	10.345
Phenolics																						
Phenols (Total Halogenated)	mg/kg	0.03											-	<0.06	-	-	-	-	<0.03	<0.06	-	-
Phenols (Total Non Halogenated)	mg/kg	1											-	<1	-	-	-	-	<1	<1	-	-
Polychlorinated Biphenyls																						
Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	1.3[#8]	33[#9]	1	1	1	7					-	<0.5	-	-	-	-	<0.1	<0.5	-	-
Solvents																						
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]									-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																						
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	1000	1000			-	<50	-	-	-	-	<50	<50	-	-
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	2500[#21]	3500[#21]			-	<100	-	-	-	-	<100	190	-	-
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	10000	10000			-	<100	-	-	-	-	<100	110	-	-
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]							-	-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10											<10	<10	-	-	-	-	<10	<10	-	-
C10 - C14	mg/kg	50											<50	<50	-	-	-	-	<50	<50	-	-
C15 - C28	mg/kg	100											<100	<100	-	-	-	-	<100	100	-	-
C29-C36	mg/kg	100											<100	<100	-	-	-	-	<100	120	-	-
+C10 - C36 (Sum of total)	mg/kg	50											<50	<50	-	-	-	-	<50	220	-	-
C10 - C40 (Sum of total)	mg/kg	50											-	<50	-	-	-	-	<50	300	-	-
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	700[#21]	700[#21]			-	-	-	-	-	-	-	-	-	-

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (10 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1
												LocCode	BH14	BH15	BH15	BH16	BH16	BH17	BH17	BH18	BH18	BH19
												Sample_Depth_Range	0.5	0.1	0.4	0.1	0.6	0.1	0.5	0.1	0.5	0.1
												Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
CEC	meq/100g	0.05											-	-	-	-	-	-	-	-	-	-
Mass of test sample	g												-	-	-	-	-	-	-	-	-	-
OCP																						
Organochlorine pesticides EPAVic	mg/kg												-	-	-	<0.6	-	-	<0.6	-	-	-
Other organochlorine pesticides EPAVic	mg/kg												-	-	-	<0.39	-	-	<0.39	-	-	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																						
Polycylic aromatic hydrocarbons EPAVic	mg/kg												<8	<8	<8	3.75	<8	<8	<7	<8	20.1	<8
Phenols																						
Phenols (non-halogenated) EPAVic	mg/kg												-	-	-	<24	-	-	<24	-	-	-
Phenols(halogenated) EPAVic	mg/kg												-	-	-	<0.45	-	-	<0.45	-	-	-
SVOC																						
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5											-	-	-	<5	-	-	<5	-	-	-
VOC																						
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																						
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2											-	-	-	<0.2	-	-	<0.2	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01											-	-	-	<0.01	-	-	<0.01	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01											-	-	-	<0.01	-	-	<0.01	-	-	-
Asbestos																						
FA- Comment	Comment												-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment												-	-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w												-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w												-	-	-	-	-	-	-	-	-	-
AF - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Mass ACM	g												-	-	-	-	-	-	-	-	-	-
Mass AF	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g												-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g												-	-	-	-	-	-	-	-	-	-
Mass FA	g												-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-
BTEX																						
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]					-	-	-	<0.2	-	-	<0.2	-	-	-
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]					-	-	-	<0.5	-	-	<0.5	-	-	-
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]					-	-	-	<0.5	-	-	<0.5	-	-	-
Xylene (m & p)	mg/kg	0.2											-	-	-	<0.5	-	-	<0.5	-	-	-
Xylene (o)	mg/kg	0.1											-	-	-	<0.5	-	-	<0.5	-	-	-
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]					-	-	-	<0.5	-	-	<0.5	-	-	-
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]					-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																						
Chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	<0.68	-	-	<0.68	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	<0.64	-	-	<0.64	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01											-	-	-	<0.01	-	-	<0.01	-	-	-
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]									-	-	-	<0.01	-	-	<0.01	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02											-	-	-	<0.02	-	-	<0.02	-	-	-
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]									-	-	-	<0.04	-	-	<0.04	-	-	-
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]									-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]									-	-	-	<0.01	-	-	<0.01	-	-	-
1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]									-	-	-	<0.01	-	-	<0.01	-	-	-
Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02	34[#6]	68[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
Chloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01											-	-	-	<0.01	-	-	<0.01	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]									-	-	-	<0.4	-	-	<0.4	-	-	-
Hexachlorobutadiene	mg/kg	0.02											-	-	-	<0.02	-	-	<0.02	-	-	-
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
Tetrachloroethene	mg/kg	0.02	3.8[#8]	34[#9]									-	-	-	<0.02	-	-	<0.02	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02											-	-	-	<0.02	-	-	<0.02	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
Halogenated Benzenes																						
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]									-	-	-	<0.01	-	-	<0.01	-	-	-
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]									-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-
4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]									-	-	-	<0.02	-	-	<0.02	-	-	-

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (11 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1
												LocCode	BH14	BH15	BH15	BH16	BH16	BH17	BH17	BH18	BH18	BH19
												Sample_Depth_Range	0.5	0.1	0.4	0.1	0.6	0.1	0.5	0.1	0.5	0.1
												Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80					-	-	-	<0.03	-	-	<0.03	-	-	-
Halogenated Hydrocarbons																						
1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]									-	-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]									-	-	-	-	-	-	-	-	-	-
Halogenated Phenols																						
2,3,5,6-Tetrachlorophenol	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	-	-	<0.05	-	-	<0.05	-	-	-
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]									-	-	-	<0.05	-	-	<0.05	-	-	-
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]									-	-	-	<0.03	-	-	<0.03	-	-	-
2,6-dichlorophenol	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05											-	-	-	<0.05	-	-	<0.05	-	-	-
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]									-	-	-	<0.03	-	-	<0.03	-	-	-
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660					-	-	-	<0.2	-	-	<0.2	-	-	-
tetrachlorophenols	mg/kg	10											-	-	-	-	-	-	-	-	-	-
Herbicides																						
Dinoseb	mg/kg	5											-	-	-	<5	-	-	<5	-	-	-
Inorganics																						
% Moisture	%	1											-	-	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]					-	-	-	<1	-	-	1	-	-	-
Fluoride	mg/kg	40											-	-	-	180	-	-	160	-	-	-
Moisture Content (dried @ 103°C)	%	1											13.8	6.3	16.5	6.1	16.8	6.5	17	5.2	10.9	7
pH (aqueous extract)	pH_Units	0.1											-	-	-	-	-	-	-	-	-	-
Lead																						
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500					15	<5	15	7	11	<5	41	<5	552	12
MAH																						
Monocylic aromatic hydrocarbons EPAVic	mg/kg												-	-	-	<2.7	-	-	<2.7	-	-	-
1,2,4-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]									-	-	-	<0.5	-	-	<0.5	-	-	-
Metals																						
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000					10	<5	<5	<5	13	<5	6	<5	14	<5
Barium	mg/kg	10	750[#6]	1500[#7]									-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500					-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]					-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000					-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000					<5	26	<5	29	<5	25	7	28	59	24
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000					-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]					<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.6	<0.1
Molybdenum	mg/kg	2	40[#6]	40[#7]									<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000					9	94	7	91	8	68	9	81	26	68
Selenium	mg/kg	2	1[#9]	2.9[#9]	200	1400	700	10000					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	mg/kg	0.2	20[#6]	40[#7]									<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	mg/kg	5											<5	<5	<5	<5	<5	<5	<5	<5	11	<5
Vanadium	mg/kg	5	130[#8]	130[#9]									-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000					23	50	12	54	8	41	21	40	631	44
Organochlorine Pesticides																						
4,4-DDE	mg/kg	0.05											-	-	-	<0.05	-	-	<0.05	-	-	-
a-BHC	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	-	-	<0.03	-	-	<0.03	-	-	-
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45					-	-	-	<0.03	-	-	<0.03	-	-	-
b-BHC	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530					-	-	-	<0.03	-	-	<0.03	-	-	-
Chlordane (cis)	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Chlordane (trans)	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
d-BHC	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]									-	-	-	<0.05	-	-	<0.05	-	-	-
DDT	mg/kg	0.05	180	640									-	-	-	<0.05	-	-	<0.05	-	-	-
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600					-	-	-	<0.05	-	-	<0.05	-	-	-
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]									-	-	-	<0.03	-	-	<0.03	-	-	-
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000					-	-	-	<0.03	-	-	<0.03	-	-	-
Endosulfan I	mg/kg	0.05											-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Endosulfan sulphate	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100					-	-	-	<0.03	-	-	<0.03	-	-	-
Endrin aldehyde	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Endrin ketone	mg/kg	0.05											-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]									-	-	-	<0.03	-	-	<0.03	-	-	-
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50					-	-	-	<0.03	-	-	<0.03	-	-	-
Heptachlor epoxide	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Methoxychlor	mg/kg	0.03			300	500	400	2500					-	-	-	<0.03	-	-	<0.03	-	-	-
Toxaphene	mg/kg	1			20	30	30	160					-	-	-	-	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (12 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1
												LocCode	BH14	BH15	BH15	BH16	BH16	BH17	BH17	BH18	BH18	BH19
												Sample_Depth_Range	0.5	0.1	0.4	0.1	0.6	0.1	0.5	0.1	0.5	0.1
												Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
												SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
												Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
PAH/Phenols																						
2,4-dimethylphenol	mg/kg	0.5											-	-	-	<1	-	-	<1	-	-	-
2,4-dinitrophenol	mg/kg	5											-	-	-	<5	-	-	<5	-	-	-
2-methylphenol	mg/kg	0.2											-	-	-	<1	-	-	<1	-	-	-
2-nitrophenol	mg/kg	0.5											-	-	-	<1	-	-	<1	-	-	-
3-&4-methylphenol	mg/kg	0.4											-	-	-	<1	-	-	<1	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5											-	-	-	<5	-	-	<5	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
4-nitrophenol	mg/kg	5											-	-	-	<5	-	-	<5	-	-	-
Acenaphthene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.9	<0.5
Benzo(b+j)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Benzo(b+k)fluoranthene	mg/kg	0.5											-	-	-	<0.5	-	-	<0.5	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5											<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	1.4	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]									<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	1.8	<0.5
Chrysene	mg/kg	0.5	7[#6]	14[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]									<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	3	<0.5
Fluorene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000					<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	18.6	<0.5
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5
Phenol	mg/kg	0.5	20[#5]	128[#9]	3000	45000	40000	240000					-	-	-	<1	-	-	<1	-	-	-
Pyrene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.1	<0.5
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40					1.16	1.16	1.16	1.11	1.16	1.16	1.11	1.16	2.903	1.16
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40					0	0	0	0	0	0	0	0	2.403	0
Phenolics																						
Phenols (Total Halogenated)	mg/kg	0.03											-	-	-	<0.03	-	-	<0.03	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1											-	-	-	<1	-	-	<1	-	-	-
Polychlorinated Biphenyls																						
Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	1.3[#6]	33[#9]	1	1	1	7					-	-	-	<0.1	-	-	<0.1	-	-	-
Solvents																						
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]									-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																						
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	1000	1000			-	-	-	<50	-	-	<50	-	-	-
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	2500[#21]	3500[#21]			-	-	-	<100	-	-	<100	-	-	-
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	10000	10000			-	-	-	<100	-	-	<100	-	-	-
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]							-	-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10											-	-	-	<10	-	-	<10	-	-	-
C10 - C14	mg/kg	50											-	-	-	<50	-	-	<50	-	-	-
C15 - C28	mg/kg	100											-	-	-	<100	-	-	<100	-	-	-
C29-C36	mg/kg	100											-	-	-	<100	-	-	<100	-	-	-
+C10 - C36 (Sum of total)	mg/kg	50											-	-	-	<50	-	-	<50	-	-	-
C10 - C40 (Sum of total)	mg/kg	50											-	-	-	<50	-	-	<50	-	-	-
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	700[#21]	700[#21]			-	-	-	-	-	-	-	-	-	-

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (13 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5	BH7-0.05
												LocCode	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6	BH7
												Sample_Depth_Range	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5	0.05
												Monitoring_Round	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
												SampleComments	23-Jun-11											
												Sample Date	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
CEC	meq/100g	0.05											-	-	-	-	-	-	-	-	-	-	-	-
Mass of test sample	g												-	-	-	-	-	-	-	-	-	-	-	-
OCP																								
Organochlorine pesticides EPAVic	mg/kg												-	-	<1.2	-	-	-	<1.2	<1.2	-	-	<30	-
Other organochlorine pesticides EPAVic	mg/kg												-	-	<0.8	-	-	-	<0.8	<0.8	-	-	<20	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03											-	-	-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03											-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																								
Polycylic aromatic hydrocarbons EPAVic	mg/kg												<8	15.1	<8	8.35	<8	30.85	<8	<8	<8	26.7	19.65	32.45
Phenols																								
Phenols (non-halogenated) EPAVic	mg/kg												-	-	<2	-	-	-	<2	<2	-	-	<2	-
Phenols(halogenated) EPAVic	mg/kg												-	-	<5	-	-	-	<5	<5	-	-	<5	-
SVOC																								
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5											-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																								
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2											-	-	-	-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01											-	-	-	-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01											-	-	-	-	-	-	-	-	-	-	-	-
Asbestos																								
FA- Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment												-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w												-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w												-	-	-	-	-	-	-	-	-	-	-	-
AF - Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
Mass ACM	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass AF	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g												-	-	-	-	-	-	-	-	-	-	-	-
Mass FA	g												-	-	-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment												-	-	-	-	-	-	-	-	-	-	-	-
BTEX																								
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]					-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]					-	<0.5	<0.5	<0.5	<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	<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	<0.5	<0.5	<0.5
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]					-	-	-	-	-	-	-	-	-	-	-	-
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]					-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																								
Chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	-	-	-	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01											-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02											-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02	34[#6]	68[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01											-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02											-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.02	3.8[#8]	34[#9]									-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02											-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																								
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]									-	-	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]									-	-	-	-	-	-	-	-	-	-	-	-
4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]									-	-	-	-	-	-	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (14 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5	BH7-0.05
												LocCode	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6	BH7
												Sample_Depth_Range	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5	0.05
												Monitoring_Round	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
												SampleComments	23-Jun-11											
												Sample Date	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80				-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-
Halogenated Hydrocarbons																								
1,2-dibromoethane	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Bromomethane	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]								-	-	-	-	-	-	-	-	-	-	-	-	
Iodomethane	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]								-	-	-	-	-	-	-	-	-	-	-	-	
Halogenated Phenols																								
2,3,5,6-Tetrachlorophenol	mg/kg	0.03										-	-	-	-	-	-	-	-	-	-	-	-	
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]								-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
2,6-dichlorophenol	mg/kg	0.03										-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]								-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660				-	-	<2	-	-	-	<2	<2	-	-	<2	-	
tetrachlorophenols	mg/kg	10										-	-	-	-	-	-	-	-	-	-	-	-	
Herbicides																								
Dinoseb	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	
Inorganics																								
% Moisture	%	1										-	-	-	-	-	-	-	-	-	-	-	-	
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]				-	-	-	-	-	-	-	-	-	-	-	-	
Fluoride	mg/kg	40										-	-	-	-	-	-	-	-	-	-	-	-	
Moisture Content (dried @ 103°C)	%	1										17.6	5.9	18.6	9.7	5.4	9.3	14.7	4	24.6	7.6	7.1	4.8	
pH (aqueous extract)	pH_Units	0.1										-	-	-	-	-	-	-	-	-	-	-	-	
Lead																								
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500				10	405	20	770	<5	516	16	133	11	810	1120	230	
MAH																								
Monocylic aromatic hydrocarbons EPAVic	mg/kg											-	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	
1,2,4-trimethylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Total MAH	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
1,3,5-trimethylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Isopropylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]								-	-	-	-	-	-	-	-	-	-	-	-	
Metals																								
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000				9	<5	13	6	<5	6	10	<5	<5	18	10	7	
Barium	mg/kg	10	750[#6]	1500[#7]								-	70	10	110	<10	90	<10	40	20	220	270	50	
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500				-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600				<0.5	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-	
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]				-	5	28	6	<2	10	22	4	24	13	14	6	
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000				-	2	4	2	<2	2	3	<2	2	7	6	5	
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000				6	68	8	28	<5	50	<5	10	<5	59	41	15	
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000				-	70	16	97	<5	91	16	112	18	190	129	90	
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]				0.1	0.8	<0.1	0.4	<0.1	0.7	<0.1	0.2	<0.1	0.7	0.4	<0.1	
Molybdenum	mg/kg	2	40[#6]	40[#7]								<2	-	-	-	-	-	-	-	-	-	-	-	
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000				8	7	8	5	<2	8	6	3	7	24	21	14	
Selenium	mg/kg	2	1[#8]	2.9[#9]	200	1400	700	10000				<5	-	-	-	-	-	-	-	-	-	-	-	
Silver	mg/kg	0.2	20[#6]	40[#7]								<2	-	-	-	-	-	-	-	-	-	-	-	
Tin	mg/kg	5										<5	-	-	-	-	-	-	-	-	-	-	-	
Vanadium	mg/kg	5	130[#8]	130[#9]								-	12	84	14	12	18	63	16	38	18	26	12	
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000				11	344	12	323	<5	353	40	1500	17	661	607	188	
Organochlorine Pesticides																								
4,4-DDE	mg/kg	0.05										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
a-BHC	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45				-	-	-	-	-	-	-	-	-	-	-	-	
b-BHC	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530				-	-	-	-	-	-	-	-	-	-	-	-	
Chlordane (cis)	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Chlordane (trans)	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
d-BHC	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]								-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
DDT	mg/kg	0.05	180	640								-	-	<0.2	-	-	-	<0.2	<0.2	-	-	<5	-	
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600				-	-	-	-	-	-	-	-	-	-	-	-	
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000				-	-	-	-	-	-	-	-	-	-	-	-	
Endosulfan I	mg/kg	0.05										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endosulfan II	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endosulfan sulphate	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100				-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endrin aldehyde	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Endrin ketone	mg/kg	0.05										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]								-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50				-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Heptachlor epoxide	mg/kg	0.03										-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	-	
Methoxychlor	mg/kg	0.03			300	500	400	2500				-	-	<0.2	-	-	-	<0.2	<0.2	-	-	<5	-	
Toxaphene	mg/kg	1			20	30	30	160				-	-	-	-	-	-	-	-	-	-	-	-	

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (15 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5	BH7-0.05
												LocCode	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6	BH7
												Sample_Depth_Range	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5	0.05
												Monitoring_Round	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
												SampleComments	23-Jun-11											
												Sample Date	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
PAH/Phenols																								
2,4-dimethylphenol	mg/kg	0.5											-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-
2,4-dinitrophenol	mg/kg	5											-	-	-	-	-	-	-	-	-	-	-	-
2-methylphenol	mg/kg	0.2											-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-
2-nitrophenol	mg/kg	0.5											-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-
3-&4-methylphenol	mg/kg	0.4											-	-	<1	-	-	-	<1	<1	-	-	<1	-
4,6-Dinitro-2-methylphenol	mg/kg	5											-	-	-	-	-	-	-	-	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03											-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-
4-nitrophenol	mg/kg	5											-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.6
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.7
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]									<0.5	1.1	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.2	1.5	2.7
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4									<0.5	1.5	<0.5	0.7	<0.5	3.1	<0.5	<0.5	<0.5	2.9	2.1	3.4
Benzo(b+j)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+k)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5											<0.5	1.9	<0.5	0.6	<0.5	2.5	<0.5	<0.5	<0.5	2.2	1.5	2.6
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]									<0.5	1.2	<0.5	0.5	<0.5	2.3	<0.5	<0.5	<0.5	2.2	1.5	2.3
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]									<0.5	0.6	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.2	1.6	2.4
Chrysene	mg/kg	0.5	7[#6]	14[#7]									<0.5	1.1	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.1	1.5	2.6
Dibenz(a,h)anthracene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	<0.5	0.6
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]									<0.5	2.2	<0.5	1.2	<0.5	5	<0.5	<0.5	<0.5	3.7	2.7	4.8
Fluorene	mg/kg	0.5											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]									<0.5	1	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	1.8	1.2	1.8
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000					<0.5	-	-	-	-	-	-	-	-	25.7	17.9	31.7
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]									<0.5	0.7	<0.5	0.6	<0.5	1.1	<0.5	<0.5	<0.5	1.3	1.2	1.9
Phenol	mg/kg	0.5	20[#5]	128[#9]	3000	45000	40000	240000					-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	-
Pyrene	mg/kg	0.5											<0.5	2.3	<0.5	1.2	<0.5	4.9	<0.5	<0.5	<0.5	4	3.1	5.3
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40					1.16	2.293	1.16	1.381	1.16	4.49	1.16	1.16	1.16	4.163	3.06	4.739
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40					0	1.793	0	0.831	0	4.49	0	0	0	4.163	2.56	4.739
Phenolics																								
Phenols (Total Halogenated)	mg/kg	0.03											-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1											-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																								
Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	1.3[#6]	33[#9]	1	1	1	7					-	-	<0.1	-	-	-	<0.1	<0.1	-	-	<2.5	-
Solvents																								
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]									-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																								
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	1000	1000			-	-	-	-	-	-	-	-	-	-	-	-
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	2500[#21]	3500[#21]			-	-	-	-	-	-	-	-	-	-	-	-
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	10000	10000			-	-	-	-	-	-	-	-	-	-	-	-
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]							-	-	-	-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10											-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
C10 - C14	mg/kg	50											-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28	mg/kg	100											-	<100	<100	<100	<100	<100	<100	<100	<100	200	110	180
C29-C36	mg/kg	100											-	<100	<100	<100	<100	<100	<100	<100	<100	230	160	290
+C10 - C36 (Sum of total)	mg/kg	50											-	<50	<50	<50	<50	<50	<50	<50	<50	430	270	470
C10 - C40 (Sum of total)	mg/kg	50											-	-	-	-	-	-	-	-	-	-	-	-
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	700[#21]	700[#21]			-	-	-	-	-	-	-	-	-	-	-	-

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (16 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
												LocCode	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
												Sample_Depth_Range	0.3	0.05	0.5	0.1	0.5	1	2	3
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
CEC	meq/100g	0.05											-	-	-	-	-	-	-	-
Mass of test sample	g												-	-	-	-	-	-	-	-
OCP																				
Organochlorine pesticides EPAVic	mg/kg												-	-	-	<0.6	-	-	-	-
Other organochlorine pesticides EPAVic	mg/kg												-	-	-	<0.39	-	-	-	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03											-	-	-	<0.03	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03											-	-	-	<0.03	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Polycylic aromatic hydrocarbons EPAVic	mg/kg												15	438.2	<8	<7	<8	35.85	33.7	<8
Phenols																				
Phenols (non-halogenated) EPAVic	mg/kg												-	-	-	<24	-	-	-	-
Phenols(halogenated) EPAVic	mg/kg												-	-	-	<0.45	-	-	-	-
SVOC																				
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5											-	-	-	<5	-	-	-	-
VOC																				
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5											-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																				
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2											-	-	-	<0.2	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01											-	-	-	<0.01	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01											-	-	-	<0.01	-	-	-	-
Asbestos																				
FA- Comment	Comment												-	-	-	-	-	-	-	-
ACM - Comment	Comment												-	-	-	-	-	-	-	-
Asbestos fibres	Comment												-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w												-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w												-	-	-	-	-	-	-	-
AF - Comment	Comment												-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment												-	-	-	-	-	-	-	-
Mass ACM	g												-	-	-	-	-	-	-	-
Mass AF	g												-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g												-	-	-	-	-	-	-	-
Mass Asbestos in AF	g												-	-	-	-	-	-	-	-
Mass Asbestos in FA	g												-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g												-	-	-	-	-	-	-	-
Mass FA	g												-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment												-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment												-	-	-	-	-	-	-	-
BTEX																				
Benzene	mg/kg	0.1	50[#1]	75[#1]	0.5[#2]	0.5[#2]	120[#3]	3[#2]					<0.2	-	-	<0.2	-	<0.2	-	-
Ethylbenzene	mg/kg	0.1	70[#1]	165[#1]	55[#2]	55[#2]	5300[#3]	27000[#3]					<0.5	-	-	<0.5	-	<0.5	-	-
Toluene	mg/kg	0.1	85[#1]	135[#1]	160[#2]	160[#2]	18000[#3]	99000[#3]					<0.5	-	-	<0.5	-	<0.5	-	-
Xylene (m & p)	mg/kg	0.2											<0.5	-	-	<0.5	-	<0.5	-	-
Xylene (o)	mg/kg	0.1											<0.5	-	-	<0.5	-	<0.5	-	-
Xylene Total	mg/kg	0.3	45[#4]	95[#4]	40[#2]	40[#2]	15000[#3]	230[#2]					-	-	-	<0.5	-	-	-	-
C6-C10 less BTEX (F1)	mg/kg	20	180	215	40[#5]	40[#3]		250[#5]					-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																				
Chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	<0.68	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	<0.64	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01											-	-	-	<0.01	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01	17.6[#6]	35.2[#7]									-	-	-	<0.01	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02											-	-	-	<0.02	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04	80[#6]	160[#7]									-	-	-	<0.04	-	-	-	-
1,1-dichloroethane	mg/kg	0.5	8.4[#6]	16.8[#7]									-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01	50[#6]	100[#7]									-	-	-	<0.01	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02	48[#6]	96[#7]									-	-	-	<0.02	-	-	-	-
1,2-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5	25[#6]	50[#7]									-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5											-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01	5.8[#6]	11.6[#7]									-	-	-	<0.01	-	-	-	-
Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02	34[#6]	68[#7]									-	-	-	<0.02	-	-	-	-
Chloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01											-	-	-	<0.01	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	0.78[#6]	1.56[#7]									-	-	-	<0.4	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02											-	-	-	<0.02	-	-	-	-
Trichloroethene	mg/kg	0.02	100[#6]	200[#7]									-	-	-	<0.02	-	-	-	-
Tetrachloroethene	mg/kg	0.02	3.8[#6]	34[#9]									-	-	-	<0.02	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02											-	-	-	<0.02	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	<0.02	-	-	-	-
Halogenated Benzenes																				
1,2,4-trichlorobenzene	mg/kg	0.01	13[#6]	30[#7]									-	-	-	<0.01	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02	3.4[#6]	6.8[#7]									-	-	-	<0.02	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5	4.8[#6]	9.6[#7]									-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02	3.6[#6]	7.2[#7]									-	-	-	<0.02	-	-	-	-
4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	6[#6]	12[#7]									-	-	-	<0.02	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (17 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
												LocCode	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
												Sample_Depth_Range	0.3	0.05	0.5	0.1	0.5	1	2	3
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
Hexachlorobenzene	mg/kg	0.03	100[#6]	200[#7]	10	15	10	80				-	-	-	<0.03	-	-	-	-
Halogenated Hydrocarbons																				
1,2-dibromoethane	mg/kg	0.5										-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5										-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	40[#6]	80[#7]								-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5										-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	16[#6]	32[#7]								-	-	-	-	-	-	-	-
Halogenated Phenols																				
2,3,5,6-Tetrachlorophenol	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	-	<0.05	-	-	-	-
2,4,6-trichlorophenol	mg/kg	0.05	4.4[#6]	10[#7]								-	-	-	<0.05	-	-	-	-
2,4-dichlorophenol	mg/kg	0.03	1.68[#6]	3.36[#7]								-	-	-	<0.03	-	-	-	-
2,6-dichlorophenol	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05										-	-	-	<0.05	-	-	-	-
2-chlorophenol	mg/kg	0.03	1.56[#6]	3.12[#7]								-	-	-	<0.03	-	-	-	-
Pentachlorophenol	mg/kg	0.2	11[#8]	28[#9]	100	130	120	660				-	-	-	<0.2	-	-	-	-
tetrachlorophenols	mg/kg	10										-	-	-	-	-	-	-	-
Herbicides																				
Dinoseb	mg/kg	5										-	-	-	<5	-	-	-	-
Inorganics																				
% Moisture	%	1										-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1			250[#10]	300[#10]	240[#10]	1500[#10]				-	-	-	<1	-	-	-	-
Fluoride	mg/kg	40										-	-	-	140	-	-	-	-
Moisture Content (dried @ 103°C)	%	1										5.8	5.6	9.4	5.7	7.8	11	18.9	6.6
pH (aqueous extract)	pH_Units	0.1										-	-	-	-	-	-	-	-
Lead																				
Lead	mg/kg	5	1100[#11]	1800[#11]	300	1200	600	1500				315	493	7	<5	16	380	1070	22
MAH																				
Monocylic aromatic hydrocarbons EPAVic	mg/kg											<2.2	-	-	<2.7	-	<2.2	-	-
1,2,4-trimethylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5										-	-	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5										-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5	17.2[#6]	34.4[#7]								-	-	-	<0.5	-	-	-	-
Metals																				
Arsenic	mg/kg	2	100[#11]	160[#11]	100	500	300	3000				9	37	<5	<5	<5	6	9	<5
Barium	mg/kg	10	750[#6]	1500[#7]								60	-	-	-	-	60	-	-
Beryllium	mg/kg	1	4[#6]	8[#7]	60	90	90	500				<1	-	-	-	-	<1	-	-
Cadmium	mg/kg	0.4	10[#6]	22[#9]	20	150	90	900				<1	<1	<1	<1	<1	<1	<1	<1
Chromium (hexavalent)	mg/kg	0.5	0.4[#8]	1.4[#9]	100	500	300	3600				-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Chromium (III+VI)	mg/kg	2	510[#12]	840[#12]	100[#13]	500[#13]	300[#13]	3600[#13]				9	-	-	-	-	11	-	-
Cobalt	mg/kg	2	40[#6]	80[#7]	100	600	300	4000				9	-	-	-	-	3	-	-
Copper	mg/kg	5	210[#14]	300[#14]	6000	30000	17000	240000				24	28	<5	25	<5	44	232	25
Manganese	mg/kg	5	220[#15]	220[#15]	3800	14000	19000	60000				146	-	-	-	-	54	-	-
Mercury	mg/kg	0.1	12[#16]	50[#17]	40[#18]	120[#18]	80[#18]	730[#18]				0.1	0.4	<0.1	<0.1	<0.1	0.2	1.1	<0.1
Molybdenum	mg/kg	2	40[#6]	40[#7]								-	<2	<2	<2	2	-	<2	<2
Nickel	mg/kg	2	200[#19]	330[#19]	400	1200	1200	6000				34	25	<2	76	<2	6	13	68
Selenium	mg/kg	2	1[#8]	2.9[#9]	200	1400	700	10000				-	<5	<5	<5	<5	-	<5	<5
Silver	mg/kg	0.2	20[#6]	40[#7]								-	<2	<2	<2	<2	-	<2	<2
Tin	mg/kg	5										-	16	<5	<5	<5	-	52	<5
Vanadium	mg/kg	5	130[#8]	130[#9]								13	-	-	-	-	30	-	-
Zinc	mg/kg	5	520[#20]	770[#20]	7400	60000	30000	400000				262	1060	13	41	18	320	786	58
Organochlorine Pesticides																				
4,4-DDE	mg/kg	0.05										-	-	-	<0.05	-	-	-	-
a-BHC	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Aldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	-	<0.03	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.03			6	10	10	45				-	-	-	<0.03	-	-	-	-
b-BHC	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
chlordane	mg/kg	0.03	1.08[#6]	2.16[#7]	50	90	70	530				-	-	-	<0.03	-	-	-	-
Chlordane (cis)	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Chlordane (trans)	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
d-BHC	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
DDD	mg/kg	0.05	6.8[#6]	13.6[#7]								-	-	-	<0.05	-	-	-	-
DDT	mg/kg	0.05	180	640								-	-	-	<0.05	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05			240	600	400	3600				-	-	-	<0.05	-	-	-	-
Dieldrin	mg/kg	0.03	0.044[#6]	0.088[#7]								-	-	-	<0.03	-	-	-	-
Endosulfan	mg/kg	0.03	0.15[#6]	0.3[#7]	270	400	340	2000				-	-	-	<0.03	-	-	-	-
Endosulfan I	mg/kg	0.05										-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Endosulfan sulphate	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Endrin	mg/kg	0.03	0.019[#6]	0.038[#7]	10	20	20	100				-	-	-	<0.03	-	-	-	-
Endrin aldehyde	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Endrin ketone	mg/kg	0.05										-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03	5.9[#6]	12[#7]								-	-	-	<0.03	-	-	-	-
Heptachlor	mg/kg	0.03	0.2[#6]	0.4[#7]	6	10	10	50				-	-	-	<0.03	-	-	-	-
Heptachlor epoxide	mg/kg	0.03										-	-	-	<0.03	-	-	-	-
Methoxychlor	mg/kg	0.03			300	500	400	2500				-	-	-	<0.03	-	-	-	-
Toxaphene	mg/kg	1			20	30	30	160				-	-	-	-	-	-	-	-

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Table R1 Summary of Analytical Results for Soil Samples – Human Health and Ecological Criteria (18 of 18)

Analyte	Units	EQL	{02} ECO-SQC (Residential/ Open Space)	{03} ECO-SQC (Commercial/ Industrial)	{04} HH-SQC A (Low Density Residential)	{04} HH-SQC B (High Density Residential)	{04} HH-SQC C (Recreational/ Open Space)	{04} HH-SQC D (Commercial/ Industrial)	{07} TPH Mgt Limit (Residential/ Parkland)	{08} TPH Mgt Limit (Commercial/ Industrial)	{26} SQC for Protection of Buildings and Structures	Sample Name	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
												LocCode	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
												Sample_Depth_Range	0.3	0.05	0.5	0.1	0.5	1	2	3
												Monitoring_Round	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
												SampleComments		23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
												Sample Date	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
PAH/Phenols																				
2,4-dimethylphenol	mg/kg	0.5											-	-	-	<1	-	-	-	-
2,4-dinitrophenol	mg/kg	5											-	-	-	<5	-	-	-	-
2-methylphenol	mg/kg	0.2											-	-	-	<1	-	-	-	-
2-nitrophenol	mg/kg	0.5											-	-	-	<1	-	-	-	-
3-&4-methylphenol	mg/kg	0.4											-	-	-	<1	-	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5											-	-	-	<5	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03											-	-	-	<0.03	-	-	-	-
4-nitrophenol	mg/kg	5											-	-	-	<5	-	-	-	-
Acenaphthene	mg/kg	0.5											<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5											<0.5	9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	2.5[#8]	32[#9]									<0.5	13.1	<0.5	<0.5	<0.5	<0.5	0.8	<0.5
Benz(a)anthracene	mg/kg	0.5	0.5[#6]	1[#7]									1.2	39.5	<0.5	<0.5	<0.5	2.7	2.8	<0.5
Benzo(a) pyrene	mg/kg	0.5	0.7	1.4									1.4	41.3	<0.5	<0.5	<0.5	5	3.3	<0.5
Benzo(b+j)fluoranthene	mg/kg	0.5											-	-	-	-	-	-	-	-
Benzo(b+k)fluoranthene	mg/kg	0.5											-	-	-	<0.5	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5											1.1	49.2	<0.5	-	<0.5	6.4	2.7	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5	6.6[#6]	13.2[#7]									0.8	24.2	<0.5	<0.5	<0.5	3.6	2.6	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	7.6[#6]	15.2[#7]									1.1	16.8	<0.5	-	<0.5	2	2.7	<0.5
Chrysene	mg/kg	0.5	7[#6]	14[#7]									1.2	30.5	<0.5	<0.5	<0.5	2.4	2.9	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5											<0.5	4.1	<0.5	<0.5	<0.5	0.7	0.6	<0.5
Fluoranthene	mg/kg	0.5	50[#8]	180[#9]									2.4	74.8	<0.5	<0.5	<0.5	3.6	5	<0.5
Fluorene	mg/kg	0.5											<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.38[#6]	0.76[#7]									0.7	19.5	<0.5	<0.5	<0.5	3.1	2.1	<0.5
Naphthalene	mg/kg	0.5	170	370	3[#2]	3[#2]	1900[#3]	11000[#3]					<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5			300	400	300	4000					12.8	437	<0.5	<0.5	<0.5	-	32.7	<0.5
Phenanthrene	mg/kg	0.5	6.2[#6]	12.4[#7]									1.1	41.3	<0.5	<0.5	<0.5	0.6	2.2	<0.5
Phenol	mg/kg	0.5	20[#5]	128[#9]	3000	45000	40000	240000					-	-	-	<1	-	-	-	-
Pyrene	mg/kg	0.5											2.5	72.7	<0.5	<0.5	<0.5	4.5	5	<0.5
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5			3	4	3	40					2.22	53.527	1.16	1.11	1.16	6.54	4.715	1.16
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5			3	4	3	40					1.72	53.527	0	0	0	6.54	4.715	0
Phenolics																				
Phenols (Total Halogenated)	mg/kg	0.03											-	-	-	<0.03	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1											-	-	-	<1	-	-	-	-
Polychlorinated Biphenyls																				
Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	1.3[#6]	33[#9]	1	1	1	7					-	-	-	<0.1	-	-	-	-
Solvents																				
Methyl Ethyl Ketone	mg/kg	0.5	35[#6]	70[#7]									-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5											-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5											-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5											-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5											-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																				
C10-C16	mg/kg	50	120	170	3300[#3]	4200[#3]	3800[#3]	20000[#3]	1000	1000			-	-	-	<50	-	-	-	-
C16-C34	mg/kg	100	300[#1]	1700[#1]	4500[#3]	5800[#3]	5300[#3]	27000[#3]	2500[#21]	3500[#21]			-	-	-	<100	-	-	-	-
C34-C40	mg/kg	100	2800[#1]	3300[#1]	6300[#3]	8100[#3]	7400[#3]	38000[#3]	10000	10000			-	-	-	<100	-	-	-	-
F2-NAPHTHALENE	mg/kg	50			110[#2]	110[#5]							-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10											<10	-	-	<10	-	<10	-	-
C10 - C14	mg/kg	50											<50	-	-	<50	-	<50	-	-
C15 - C28	mg/kg	100											<100	-	-	<100	-	440	-	-
C29-C36	mg/kg	100											180	-	-	<100	-	740	-	-
+C10 - C36 (Sum of total)	mg/kg	50											180	-	-	<50	-	1180	-	-
C10 - C40 (Sum of total)	mg/kg	50											-	-	-	<50	-	-	-	-
C6-C10	mg/kg	20			4400[#3]	5600[#3]	5100[#3]	26000[#3]	700[#21]	700[#21]			-	-	-	-	-	-	-	-

Env Stds Comments

#1:ESL for coarse soil.
#2:Vapour intrusion HSL for sand.
#3:Direct contact HSL (CRC CARE Technical Report no. 10).
#4:ESL for fine soil.
#5:Vapour intrusion HSL for silt.
#6:Ontario MoE Soil Standard (plants and invertebrates) for coarse residential soil.
#7:Ontario MoE Soil Standard (plants and invertebrates) for coarse commercial/industrial soil.
#8:CCME SQC for residential/parkland land use.
#9:CCME SQC for commercial/industrial land use.
#10:Criterion for cyanide (free).
#11:EIL for soil with aged contamination.
#12:EIL for Cr(III) calculated based on a clay content of 20%.
#13:Criterion for chromium (VI).
#14:EIL calculated based on a soil pH of 8.3, a CEC of 29 cmol/kg, and an organic matter content of 1 %OC.
#15:Most conservative US EPA Eco-SSL.
#16:Criterion for inorganic mercury (CCME SQC for residential/parkland land use).
#17:Criterion for inorganic mercury (CCME SQC for commercial/industrial land use).
#18:Criterion for inorganic mercury.
#19:EIL calculated based on a CEC of 29 cmol/kg.
#20:EIL calculated based on a soil pH of 8.3 and a CEC of 29 cmol/kg.
#21:Criterion for coarse soil.

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Table R2 Summary of Analytical Results for Groundwater Samples (1 of 3)

Analyte	Units	EQL	{10} [GW] Water Dependent Ecosystems and Species	{11} [GW] Potable Water Supply: Desirable/ Acceptable	{120} [GW] Aesthetics	{13} [GW] Agriculture and irrigation (irrigation)	{14} [GW] Agriculture and irrigation (stock watering)	{17} [GW] Industrial and commercial	{18} [GW] Buildings and Structures	{19} [GW] Water-Based Recreation (Primary Contact Recreation)	{21} [GW] Vapour Intrusion HSL A and HSL B	Sample Name 991/GW01	991/GW02	991/GW03
												Location ID GW01	GW02	GW03
												Sample Date 26/05/2020	26/05/2020	26/05/2020
Tokuthion	mg/L	0.002										<0.002	<0.002	<0.002
Nitrogen (Organic)	mg/L	0.2										1.2	0.7	1
BTEX														
Benzene	µg/L	1	1300	1			10			10[#1]	800[#2]	<1	<1	<1
Ethylbenzene	µg/L	1	110[#3]	300	3							<1	<1	<1
Toluene	µg/L	1	230[#3]	800	25							<1	<1	<1
Xylene (m & p)	µg/L	2										<2	<2	<2
Xylene (o)	µg/L	1	470									<1	<1	<1
Xylene Total	µg/L	3	100[#4]	600	20							<3	<3	<3
C6-C10 less BTEX (F1)	mg/L	0.02									1[#2]	<0.02	<0.02	<0.02
Chlorinated Hydrocarbons														
1,1,1,2-tetrachloroethane	µg/L	1										<1	<1	<1
1,1,1-trichloroethane	µg/L	1	400[#3]									<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	1	500[#3]									<1	<1	<1
1,1,2-trichloroethane	µg/L	1	7300									<1	<1	<1
1,1-dichloroethane	µg/L	1	90[#3]									<1	<1	<1
1,1-dichloroethene	µg/L	1	900[#3]	30			0.3			0.3[#1]		<1	<1	<1
1,2,3-trichloropropane	µg/L	1										<1	<1	<1
1,2-dichloroethane	µg/L	1	2600[#3]	3			10			10[#1]		<1	<1	<1
1,2-dichloropropane	µg/L	1	1200[#3]									<1	<1	<1
1,3-dichloropropane	µg/L	1	1400[#3]									<1	<1	<1
Bromochloromethane	µg/L	1										<1	<1	<1
Bromodichloromethane	µg/L	1										<1	<1	<1
Bromoform	µg/L	1										<1	<1	<1
Carbon tetrachloride	µg/L	1	320[#3]	3			3			3[#1]		<1	<1	<1
Chlorodibromomethane	µg/L	1										<1	<1	<1
Chloroethane	µg/L	1										<1	<1	<1
Chloroform	µg/L	5	370[#3]									<5	<5	<5
Chloromethane	µg/L	1										<1	<1	<1
cis-1,2-dichloroethene	µg/L	1										<1	<1	<1
cis-1,3-dichloropropene	µg/L	1										<1	<1	<1
Dibromomethane	µg/L	1										<1	<1	<1
Dichloromethane	µg/L	1	5000[#3]	4								<1	<1	<1
Trichloroethene	µg/L	1	400[#3]				30			30[#1]		<1	<1	<1
Tetrachloroethene	µg/L	1	100[#3]	50			10			10[#1]		<1	<1	<1
trans-1,2-dichloroethene	µg/L	1										<1	<1	<1
trans-1,3-dichloropropene	µg/L	1										<1	<1	<1
Vinyl chloride	µg/L	1	140[#3]	0.3								<1	<1	<1
Halogenated Benzenes														
1,2-dichlorobenzene	µg/L	1	200	1500	1							<1	<1	<1
1,3-dichlorobenzene	µg/L	1	350		20							<1	<1	<1
1,4-dichlorobenzene	µg/L	1	75	40	0.3							<1	<1	<1
4-chlorotoluene	µg/L	1										<1	<1	<1
Bromobenzene	µg/L	1										<1	<1	<1
Chlorobenzene	µg/L	1	100[#3]	300	10							<1	<1	<1
Hexachlorobenzene	µg/L	0.1	0.05[#5]									<0.1	<0.1	<0.1
Halogenated Hydrocarbons														
1,2-dibromoethane	µg/L	1		1								<1	<1	<1
Bromomethane	µg/L	1		1								<1	<1	<1
Dichlorodifluoromethane	µg/L	1										<1	<1	<1
Iodomethane	µg/L	1										<1	<1	<1
Trichlorofluoromethane	µg/L	1										<1	<1	<1
Halogenated Phenols														
2,4,5-trichlorophenol	µg/L	10	0.5[#5]				1			1[#1]		<10	<10	<10
2,4,6-trichlorophenol	µg/L	10	3[#6]	20	2		10			10[#1]		<10	<10	<10
2,4-dichlorophenol	µg/L	3	120[#7]	200	0.3							<3	<3	<3
2,6-dichlorophenol	µg/L	3	34[#3]									<3	<3	<3
2-chlorophenol	µg/L	3	340[#7]	300	0.1					1000[#1]		<3	<3	<3
Pentachlorophenol	µg/L	10	3.6[#7]	10			10			10[#1]		<10	<10	<10
tetrachlorophenols	µg/L	30										<30	<30	<30
Herbicides														
Dinoseb	µg/L	100										<100	<100	<100
Inorganics														
Nitrite + Nitrate as N	mg/L	0.05										7	6.1	6.4
Ammonia as N	µg/L	10	1430		500					100[#1]		<10	<10	<10
Kjeldahl Nitrogen Total	mg/L	0.2										1.2	0.7	1
Nitrate (as N)	mg/L	0.02	3.8[#8]	13.5			90			100[#9]		6.9	6	6.3
Nitrite (as N)	mg/L	0.02		1.1			10			10[#9]		0.11	0.08	0.04
Nitrogen (Total)	µg/L	200	500[#10]			5000[#11]		500				8200	6800	7400
Total Solids	µg/L	10000										1,300,000	1,100,000	1,000,000
Lead														
Lead (Filtered)	mg/L	0.001	0.0056	0.01		2[#11]	0.1			0.5[#9]		<0.001	<0.001	<0.001
MAH														
1,2,4-trimethylbenzene	µg/L	1										<1	<1	<1
Total MAH	mg/L	0.003										<0.003	<0.003	<0.003
1,3,5-trimethylbenzene	µg/L	1										<1	<1	<1
Isopropylbenzene	µg/L	1	40[#3]									<1	<1	<1

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Table R2 Summary of Analytical Results for Groundwater Samples (2 of 3)

Analyte	Units	EQL	{10} [GW] Water Dependent Ecosystems and Species	{11} [GW] Potable Water Supply: Desirable/ Acceptable	{120} [GW] Aesthetics	{13} [GW] Agriculture and irrigation (irrigation)	{14} [GW] Agriculture and irrigation (stock watering)	{17} [GW] Industrial and commercial	{18} [GW] Buildings and Structures	{19} [GW] Water-Based Recreation (Primary Contact Recreation)	**{21} [GW] Vapour Intrusion HSL A and HSL B**	**Sample Name** 991/GW01 **Location ID** GW01 **Sample Date** 26/05/2020	991/GW02 GW02 26/05/2020	991/GW03 GW03 26/05/2020
Styrene	µg/L	1		30	4							<1	<1	<1
Metals														
Arsenic (Filtered)	mg/L	0.001	0.042[#12]	0.01		0.1[#11]	0.5			0.05[#1]		0.002	0.002	0.002
Beryllium (Filtered)	mg/L	0.001	0.00013[#13]	0.06		0.1[#11]						<0.001	<0.001	<0.001
Boron (Filtered)	mg/L	0.05	0.68	4		0.5[#11]	5			1[#1]		0.2	0.23	0.17
Cadmium (Filtered)	mg/L	0.0002	0.0004[#14]	0.002		0.01[#11]	0.01			0.005[#1]		<0.0002	<0.0002	<0.0002
Chromium (hexavalent)	mg/L	0.005	0.006	0.05								<0.005	<0.005	<0.005
Cobalt (Filtered)	mg/L	0.001	0.0014[#3]			0.05[#11]	1					0.002	<0.001	<0.001
Copper (Filtered)	mg/L	0.001	0.0018	2	1	0.2[#11]	0.4			10[#9]		0.003	0.006	0.005
Manganese (Filtered)	mg/L	0.005	2.5	0.5	0.1	2[#11]		0.02		1[#9]		0.068	0.014	0.019
Mercury (Filtered)	mg/L	0.0001	0.00005[#15]	0.001		0.002[#11]	0.002			0.001[#1]		<0.0001	<0.0001	<0.0001
Nickel (Filtered)	mg/L	0.001	0.013	0.02		0.2[#11]	1			0.1[#1]		0.006	0.012	0.008
Selenium (Filtered)	mg/L	0.001	0.005[#16]	0.01		0.02[#11]	0.02			0.01[#1]		<0.001	0.001	<0.001
Zinc (Filtered)	mg/L	0.005	0.015		3	2[#11]	20			5[#1]		0.041	0.085	0.091
Organochlorine Pesticides														
4,4-DDE	µg/L	0.1										<0.1	<0.1	<0.1
a-BHC	µg/L	0.1										<0.1	<0.1	<0.1
Aldrin	µg/L	0.1	0.001[#5]				1			1[#1]		<0.1	<0.1	<0.1
Aldrin + Dieldrin	µg/L	0.1		0.3								<0.1	<0.1	<0.1
b-BHC	µg/L	0.1										<0.1	<0.1	<0.1
chlordane	µg/L	1	0.03[#6]	2			6			6[#1]		<1	<1	<1
d-BHC	µg/L	0.1										<0.1	<0.1	<0.1
DDD	µg/L	0.1										<0.1	<0.1	<0.1
DDT	µg/L	0.1	0.006[#6]	9			3			3[#1]		<0.1	<0.1	<0.1
DDT+DDE+DDD	µg/L	0.1										<0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	0.01[#5]				1			1[#1]		<0.1	<0.1	<0.1
Endosulfan I	µg/L	0.1	0.0002[#5]									<0.1	<0.1	<0.1
Endosulfan II	µg/L	0.1	0.007[#5]									<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1										<0.1	<0.1	<0.1
Endrin	µg/L	0.1	0.01[#6]				1			1[#1]		<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1										<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1										<0.1	<0.1	<0.1
g-BHC (Lindane)	µg/L	0.1	0.4	10			10			10[#1]		<0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	0.01[#6]	0.3			3			3[#1]		<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1										<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	0.005[#5]	300								<0.1	<0.1	<0.1
Toxaphene	mg/L	0.01	0.0001[#6]									<0.01	<0.01	<0.01
Organophosphorous Pesticides														
Azinophos methyl	µg/L	2	0.01[#7]	30			10			100[#9]		<2	<2	<2
Bolstar (Sulprofos)	µg/L	2		10			20			20[#1]		<2	<2	<2
Chlorfenvinphos	µg/L	2		2			10			100[#9]		<2	<2	<2
Chlorpyrifos	µg/L	20	0.00004[#6]	10			2			2[#1]		<20	<20	<20
Chlorpyrifos-methyl	mg/L	0.002										<0.002	<0.002	<0.002
Coumaphos	µg/L	20										<20	<20	<20
Demeton-O	µg/L	2										<2	<2	<2
Demeton-S	µg/L	20	0.04[#3]									<20	<20	<20
Diazinon	µg/L	2	0.2	4			10			10[#1]		<2	<2	<2
Dichlorvos	µg/L	2		5			20			200[#9]		<2	<2	<2
Dimethoate	µg/L	2	0.2	7			100			1000[#9]		<2	<2	<2
Disulfoton	µg/L	2		4			6			6[#1]		<2	<2	<2
Ethion	µg/L	2		4			6			6[#1]		<2	<2	<2
Ethoprop	µg/L	2		1			1			1[#1]		<2	<2	<2
Fenitrothion	µg/L	2	0.3	7			20			200[#9]		<2	<2	<2
Fensulfothion	µg/L	2		10			20			200[#9]		<2	<2	<2
Fenthion	µg/L	2		7								<2	<2	<2
Malathion	µg/L	2	0.2	70			100			1000[#9]		<2	<2	<2
Merphos	mg/L	0.002										<0.002	<0.002	<0.002
Methyl parathion	µg/L	2		0.7			6			60[#9]		<2	<2	<2
Mevinphos (Phosdrin)	µg/L	2		5			6			60[#9]		<2	<2	<2
Monocrotophos	µg/L	2		2			2			20[#9]		<2	<2	<2
Naled (Dibrom)	µg/L	2										<2	<2	<2
Omethoate	µg/L	2		1			0.4			4[#9]		<2	<2	<2
Phorate	µg/L	2										<2	<2	<2
Pyrazophos	µg/L	2		20			1000			10000[#9]		<2	<2	<2
Ronnel	µg/L	2					60			60[#1]		<2	<2	<2
Terbufos	µg/L	2		0.9								<2	<2	<2
Trichloronate	µg/L	2										<2	<2	<2
Tetrachlorvinphos	mg/L	0.002		0.1								<0.002	<0.002	<0.002
PAH														
Benzo(b+j)fluoranthene	mg/L	0.001										<0.001	<0.001	<0.001
PAH/Phenols														
2,4-dimethylphenol	µg/L	3	2[#3]									<3	<3	<3
2,4-dinitrophenol	mg/L	0.03	0.08									<0.03	<0.03	<0.03
2-methylphenol	µg/L	3										<3	<3	<3
2-nitrophenol	µg/L	10	2[#3]									<10	<10	<10
3-&4-methylphenol	µg/L	6										<6	<6	<6
4,6-Dinitro-2-methylphenol	µg/L	30										<30	<30	<30

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Table R2 Summary of Analytical Results for Groundwater Samples (3 of 3)

Analyte	Units	EQL	{10} [GW] Water Dependent Ecosystems and Species	{11} [GW] Potable Water Supply: Desirable/ Acceptable	{120} [GW] Aesthetics	{13} [GW] Agriculture and irrigation (irrigation)	{14} [GW] Agriculture and irrigation (stock watering)	{17} [GW] Industrial and commercial	{18} [GW] Buildings and Structures	{19} [GW] Water-Based Recreation (Primary Contact Recreation)	{21} [GW] Vapour Intrusion HSL A and HSL B	Sample Name 991/GW01	991/GW02	991/GW03
												Location ID GW01	GW02	GW03
												Sample Date 26/05/2020	26/05/2020	26/05/2020
4-chloro-3-methylphenol	µg/L	10										<10	<10	<10
4-nitrophenol	µg/L	30	58[#3]									<30	<30	<30
Acenaphthene	µg/L	1										<1	<1	<1
Acenaphthylene	µg/L	1										<1	<1	<1
Anthracene	µg/L	1	0.01[#5]									<1	<1	<1
Benz(a)anthracene	µg/L	1										<1	<1	<1
Benzo(a) pyrene	µg/L	1	0.1[#5]	0.01			0.01			0.01[#1]		<1	<1	<1
Benzo(g,h,i)perylene	µg/L	1										<1	<1	<1
Benzo(k)fluoranthene	µg/L	1										<1	<1	<1
Chrysene	µg/L	1										<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1										<1	<1	<1
Fluoranthene	µg/L	1	1[#5]									<1	<1	<1
Fluorene	µg/L	1										<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1										<1	<1	<1
Naphthalene	µg/L	1	37									<1	<1	<1
PAHs (Sum of total)	µg/L	1		0.01								<1	<1	<1
Phenanthrene	µg/L	1	0.6[#5]									<1	<1	<1
Phenol	µg/L	3	600									<3	<3	<3
Pyrene	µg/L	1										<1	<1	<1
Pesticides														
Parathion	µg/L	2	0.01	20			30			30[#1]		<2	<2	<2
Pirimiphos-methyl	mg/L	0.02		0.09			0.06			0.06[#1]		<0.02	<0.02	<0.02
Phenolics														
Phenols (Total Halogenated)	mg/L	0.01										<0.01	<0.01	<0.01
Phenols (Total Non Halogenated)	mg/L	0.1										<0.1	<0.1	<0.1
Polychlorinated Biphenyls														
Arochlor 1016	µg/L	1	0.001[#5]									<1	<1	<1
Arochlor 1221	µg/L	1	1[#5]									<1	<1	<1
Arochlor 1232	µg/L	1	0.3[#5]									<1	<1	<1
Arochlor 1242	µg/L	1	0.3[#6]									<1	<1	<1
Arochlor 1248	µg/L	1	0.3[#5]									<1	<1	<1
Arochlor 1254	µg/L	1	0.01[#6]									<1	<1	<1
Arochlor 1260	µg/L	1	25[#5]									<1	<1	<1
PCBs (Sum of total)	µg/L	1					0.1			1[#9]		<1	<1	<1
Solvents														
Methyl Ethyl Ketone	µg/L	1										<1	<1	<1
4-Methyl-2-pentanone	µg/L	1										<1	<1	<1
Acetone	mg/L	0.001										<0.001	<0.001	<0.001
Allyl chloride	mg/L	0.001	0.003[#3]									<0.001	<0.001	<0.001
Carbon disulfide	µg/L	1	20[#3]									<1	<1	<1
SVOCs														
EPN	µg/L	2										<2	<2	<2
Total Petroleum Hydrocarbons (TPHs)														
C10-C16	mg/L	0.05		0.09[#17]						0.09[#1]		<0.05	<0.05	<0.05
C16-C34	mg/L	0.1		0.09[#18]						0.09[#1]		<0.1	<0.1	<0.1
C34-C40	mg/L	0.1										<0.1	<0.1	<0.1
F2-NAPHTHALENE	mg/L	0.05									1[#2]	<0.05	<0.05	<0.05
C10 - C40 (Sum of total)	µg/L	100										<100	<100	<100
C6-C10	mg/L	0.02										<0.02	<0.02	<0.02

Env Stds Comments

#1:Drinking water guideline, unadjusted on the basis of high permeability, volatility or toxicity to skin.
#2:HSL for vapour intrusion for a sand soil and a groundwater depth of 8+ m.
#3:Low reliability trigger value adopted in the absence of a high reliability one.
#4:Trigger value for m-xylene.
#5:Low reliability trigger value adopted in the absence of a high reliability one. Bioaccumulating chemical (99% species protection was adopted).
#6:Bioaccumulating chemical (99% species protection was adopted).
#7:99% species protection trigger value adopted as recommended by ANZECC 2000.
#8:Grading concentration from National Institute of Water and Atmospheric Research 2013 (criterion only available for freshwater).
#9:Drinking water guideline, adjusted to an ingestion rate of 200 mL/day as described in NHMRC (2008).
#10:Trigger value for lowland rivers in south-east Australia.
#11:Long-term trigger value.
#12:Trigger value for arsenic (V).
#13:Environmental Concern Level adopted as a low reliability trigger value.
#14:99% species protection trigger value adopted as recommended by ANZECC 2000.
#15:Table 2 of Schedule F7 SEPP - Waters of the Yarra Catchment.
#16:Bioaccumulating chemical (99% species protection was adopted).
#17:WHO (2008) Drinking Water Guideline for aromatic TRH >C10-C16.
#18:WHO (2008) Drinking Water Guideline for aromatic TRH >C16-C35.

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (1 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	991/GW01_0.0_0.1	991/GW01_3.2_3.4	991/GW02_0.1_0.2	991/GW03_0.0_0.1	991/GW03_3.0_3.1	991/SB01_0.0_0.1	991/SB02_0.0_0.1	991/SB02_0.4_0.5	991/SB03_0.0_0.1	991/SB03_0.4_0.5	991/SB04_0.0_0.1	991/SB05_0.2_0.3	991/SB05_0.3_0.4	991/SB06_0.1_0.2
							Sample Location	GW01	GW01	GW02	GW03	GW03	SB01	SB02	SB02	SB03	SB03	SB04	SB05	SB05	SB06
							Sample Depth	0-0.1	3.2-3.4	0.1-0.2	0-0.1	3-3.1	0-0.1	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1	0.2-0.3	0.3-0.4	0.1-0.2
							Monitoring_Round														
							SampleComments	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	FILL	NAT	FILL	FILL	NAT	FILL
							Sample Date	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5						-	1.2	-	-	1.2	13	46	1.6	1.4	1.2	1.2	1.2	1.2	6.6
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5						-	<0.5	-	-	<0.5	13	46	1	0.9	<0.5	<0.5	<0.5	<0.5	6.6
CEC	meq/100g	0.05						27	-	-	19	-	-	-	-	-	-	-	31	-	-
Mass of test sample	g							39	-	44	-	-	29	-	-	-	-	-	51	-	-
OCP																					
Organochlorine pesticides EPAVic	mg/kg				1			-	-	-	-	-	-	-	-	-	-	-	-	<1	-
Other organochlorine pesticides EPAVic	mg/kg		50	10				-	-	-	-	-	-	-	-	-	-	-	-	<0.75	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03						-	-	-	-	-	-	0.14	-	<0.1	-	-	-	<0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03						-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Polycyclic aromatic hydrocarbons EPAVic	mg/kg				20			-	-	-	-	-	102.3	-	7.25	-	<7.5	<7.5	<7.5	<7.5	43.85
Phenols																					
Phenols (non-halogenated) EPAVic	mg/kg		2200	560	60	280		-	-	-	-	-	-	-	-	-	-	-	-	<37.2	-
Phenols(halogenated) EPAVic	mg/kg		320	10	1	40		-	-	-	-	-	-	-	-	-	-	-	-	<5.5	-
SVOC																					
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5						-	-	-	-	-	-	<20	-	<20	-	-	-	<20	-
VOC																					
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Volatile Organic Compounds - U																					
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos																					
FA- Comment	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
ACM - Comment	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
Asbestos fibres	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
Asbestos from ACM in Soil	%w/w							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Asbestos from FA & AF in Soil	%w/w							0	-	0	-	-	0	-	-	-	-	-	0	-	-
AF - Comment	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
Organic Fibres - Comment	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
Mass ACM	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass AF	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass Asbestos in ACM	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass Asbestos in AF	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass Asbestos in FA	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass Asbestos in FA & AF	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Mass FA	g							0	-	0	-	-	0	-	-	-	-	-	0	-	-
Respirable Fibres - Comment	Comment							0	-	1	-	-	1	-	-	-	-	-	1	-	-
Synthetic Fibres - Comment	Comment							1	-	1	-	-	1	-	-	-	-	-	1	-	-
BTEX																					
Benzene	mg/kg	0.1	16	4	1	2		-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1						-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1						-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2						-	<0.2	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1						-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3						-	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
C6-C10 less BTEX (F1)	mg/kg	20						-	<20	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Chlorinated Hydrocarbons																					
Chlorinated hydrocarbons EPAVic	mg/kg				1			-	-	-	-	-	-	-	-	-	-	-	-	<8.5	-
Other chlorinated hydrocarbons EPAVic	mg/kg		50	10				-	-	-	-	-	-	-	-	-	-	-	-	<7.5	-
1,1,1,2-tetrachloroethane	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,1,1-trichloroethane	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,1,2,2-tetrachloroethane	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,1,2-trichloroethane	mg/kg	0.04						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,1-dichloroethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,1-dichloroethene	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,2,3-trichloropropane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,2-dichloroethane	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,2-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,3-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Bromochloromethane	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	-
Carbon tetrachloride	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Chlorodibromomethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Chloroethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Chloroform	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Chloromethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
cis-1,2-dichloroethene	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
cis-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Dibromomethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Dichloromethane	mg/kg	0.4						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		1.4		-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Trichloroethene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Tetrachloroethene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
trans-1,2-dichloroethene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
trans-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Vinyl chloride	mg/kg	0.02	4.8	1.2		0.6		-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Halogenated Benzenes																					
1,2,4-trichlorobenzene	mg/kg	0.01						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,2-dichlorobenzene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,3-dichlorobenzene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
1,4-dichlorobenzene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
4-chlorotoluene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (2 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	991/GW01_0.0_0.1	991/GW01_3.2_3.4	991/GW02_0.1_0.2	991/GW03_0.0_0.1	991/GW03_3.0_3.1	991/SB01_0.0_0.1	991/SB02_0.0_0.1	991/SB02_0.4_0.5	991/SB03_0.0_0.1	991/SB03_0.4_0.5	991/SB04_0.0_0.1	991/SB05_0.2_0.3	991/SB05_0.3_0.4	991/SB06_0.1_0.2
							Sample Location	GW01	GW01	GW02	GW03	GW03	SB01	SB02	SB02	SB03	SB03	SB04	SB05	SB05	SB06
							Sample Depth	0-0.1	3.2-3.4	0.1-0.2	0-0.1	3-3.1	0-0.1	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1	0.2-0.3	0.3-0.4	0.1-0.2
							Monitoring_Round														
							SampleComments	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	FILL	NAT	FILL	FILL	NAT	FILL
							Sample Date	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Bromobenzene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Chlorobenzene	mg/kg	0.02						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Hexachlorobenzene	mg/kg	0.03						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Halogenated Hydrocarbons																					
1,2-dibromoethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Bromomethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Dichlorodifluoromethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Iodomethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Trichlorofluoromethane	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Halogenated Phenols																					
2,3,5,6-Tetrachlorophenol	mg/kg	0.03						-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05						-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
2,4,6-trichlorophenol	mg/kg	0.05						-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
2,4-dichlorophenol	mg/kg	0.03						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
2,6-dichlorophenol	mg/kg	0.03						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-chlorophenol	mg/kg	0.03						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Pentachlorophenol	mg/kg	0.2						-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
tetrachlorophenols	mg/kg	10						-	-	-	-	-	-	<10	-	<10	-	-	-	<10	-
Herbicides																					
Dinoseb	mg/kg	5						-	-	-	-	-	-	<20	-	<20	-	-	-	<20	-
Inorganics																					
% Moisture	%	1						19	15	-	11	14	17	16	8.5	14	7	14	12	9.3	13
Cyanide Total	mg/kg	1	10000	2500	50	160		-	-	-	-	-	-	<5	-	<5	-	-	-	<5	-
Fluoride	mg/kg	40	40000	10000	450	3000		-	-	-	-	-	-	<100	-	<100	-	-	-	<100	-
Moisture Content (dried @ 103°C)	%	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (aqueous extract)	pH_Units	0.1						-	-	-	-	-	-	7.4	-	9.3	-	-	-	8.9	-
MAH																					
Monocylic aromatic hydrocarbons EPAVic	mg/kg		240	70	7			-	-	-	-	-	<0.6	-	<0.6	-	<0.6	<0.6	<0.6	<1.1	<0.6
1,2,4-trimethylbenzene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Total MAH	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	-
Styrene	mg/kg	0.5						-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Metals																					
Arsenic	mg/kg	2	2000	500	20	14		-	7	-	-	2.9	16	9.2	13	7	2.5	5.5	<2	2.2	8.8
Barium	mg/kg	10						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.4	400	100	3	4		-	<0.4	-	-	<0.4	0.5	0.7	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium (hexavalent)	mg/kg	0.5	2000	500	1	100		-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
Chromium (III+VI)	mg/kg	2						-	89	-	-	21	16	17	6.8	21	<5	18	23	8.7	11
Cobalt	mg/kg	2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	20000	5000	100	4000		-	<5	-	-	<5	95	180	12	23	<5	19	33	14	39
Lead	mg/kg	5	6000	1500	300	20		-	6.6	-	-	6.4	1500	1900	120	120	21	23	<5	63	530
Manganese	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	300	75	1	2		-	<0.1	-	-	<0.1	1.6	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5
Molybdenum	mg/kg	2	4000	1000	40	100		-	-	-	-	-	-	<5	-	<5	-	-	-	<5	-
Nickel	mg/kg	2	12000	3000	60	40		-	19	-	-	7.5	16	21	<5	52	<5	31	110	34	19
Selenium	mg/kg	2	200	50	10	20		-	-	-	-	-	-	<2	-	<2	-	-	-	<2	-
Silver	mg/kg	0.2	720	180	10	200		-	-	-	-	-	-	0.4	-	<0.2	-	-	-	<0.2	-
Tin	mg/kg	5		500	50			-	-	-	-	-	-	29	-	<10	-	-	-	<10	-
Vanadium	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	140000	35000	200	6000		-	18	-	-	9.3	940	850	120	94	16	81	60	48	320
Organochlorine Pesticides																					
4,4-DDE	mg/kg	0.05						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
a-BHC	mg/kg	0.03						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Aldrin	mg/kg	0.03						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		0.6		-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
b-BHC	mg/kg	0.03						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
chlordane	mg/kg	0.03	16	4		2		-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Chlordane (cis)	mg/kg	0.03						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03						-	-	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.03						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
DDD	mg/kg	0.05						-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
DDT	mg/kg	0.05						-	-	-	-	-	-	0.14	-	<0.05	-	-	-	<0.05	-

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (3 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	991/GW01_0.0_0.1	991/GW01_3.2_3.4	991/GW02_0.1_0.2	991/GW03_0.0_0.1	991/GW03_3.0_3.1	991/SB01_0.0_0.1	991/SB02_0.0_0.1	991/SB02_0.4_0.5	991/SB03_0.0_0.1	991/SB03_0.4_0.5	991/SB04_0.0_0.1	991/SB05_0.2_0.3	991/SB05_0.3_0.4	991/SB06_0.1_0.2
							Sample Location	GW01	GW01	GW02	GW03	GW03	SB01	SB02	SB02	SB03	SB03	SB04	SB05	SB05	SB06
							Sample Depth	0-0.1	3.2-3.4	0.1-0.2	0-0.1	3-3.1	0-0.1	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1	0.2-0.3	0.3-0.4	0.1-0.2
							Monitoring_Round														
							SampleComments	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	FILL	NAT	FILL	FILL	NAT	FILL
							Sample Date	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
DDT+DDE+DDD	mg/kg	0.05	50	50		40	-	-	-	-	-	-	0.14	-	<0.05	-	-	-	<0.05	-
Dieldrin	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan	mg/kg	0.03					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan II	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan sulphate	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin aldehyde	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Heptachlor	mg/kg	0.03	4.8	1.2		0.6	-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Heptachlor epoxide	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Methoxychlor	mg/kg	0.03					-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	<0.05	-
Toxaphene	mg/kg	1					-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
PAH																				
Benzo(b+j)fluoranthene	mg/kg	0.5					-	<0.5	-	-	<0.5	6	24	0.6	0.8	<0.5	<0.5	<0.5	<0.5	3.3
PAH/Phenols																				
2,4-dimethylphenol	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
2,4-dinitrophenol	mg/kg	5					-	-	-	-	-	-	<5	-	<5	-	-	-	<5	-
2-methylphenol	mg/kg	0.2					-	-	-	-	-	-	<0.2	-	<0.2	-	-	-	<0.2	-
2-nitrophenol	mg/kg	0.5					-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
3-&4-methylphenol	mg/kg	0.4					-	-	-	-	-	-	<0.4	-	<0.4	-	-	-	<0.4	-
4,6-Dinitro-2-methylphenol	mg/kg	5					-	-	-	-	-	-	<5	-	<5	-	-	-	<5	-
4-chloro-3-methylphenol	mg/kg	0.03					-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
4-nitrophenol	mg/kg	5					-	-	-	-	-	-	<5	-	<5	-	-	-	<5	-
Acenaphthene	mg/kg	0.5					-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					-	<0.5	-	-	<0.5	1.4	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Anthracene	mg/kg	0.5					-	<0.5	-	-	<0.5	3.8	9.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
Benz(a)anthracene	mg/kg	0.5					-	<0.5	-	-	<0.5	8.5	27	0.6	0.6	<0.5	<0.5	<0.5	<0.5	3.8
Benzo(a) pyrene	mg/kg	0.5	20	5	1	0.02	-	<0.5	-	-	<0.5	9	32	0.8	0.6	<0.5	<0.5	<0.5	<0.5	4.5
Benzo(b+k)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5					-	<0.5	-	-	<0.5	4.7	21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4
Benzo(k)fluoranthene	mg/kg	0.5					-	<0.5	-	-	<0.5	6.9	23	0.8	1.2	<0.5	<0.5	<0.5	<0.5	4.1
Chrysene	mg/kg	0.5					-	<0.5	-	-	<0.5	8.7	24	0.7	0.7	<0.5	<0.5	<0.5	<0.5	3.9
Dibenz(a,h)anthracene	mg/kg	0.5					-	<0.5	-	-	<0.5	1.2	4.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
Fluoranthene	mg/kg	0.5					-	<0.5	-	-	<0.5	20	56	1	1.4	<0.5	<0.5	<0.5	<0.5	8.4
Fluorene	mg/kg	0.5					-	<0.5	-	-	<0.5	0.8	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					-	<0.5	-	-	<0.5	3.8	21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2
Naphthalene	mg/kg	0.5					-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	400	100			-	<0.5	-	-	<0.5	107.8	336.1	5.6	8.1	<0.5	<0.5	<0.5	<0.5	46.4
Phenanthrene	mg/kg	0.5					-	<0.5	-	-	<0.5	14	34	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	3
Phenol	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Pyrene	mg/kg	0.5					-	<0.5	-	-	<0.5	19	55	1.1	1.7	<0.5	<0.5	<0.5	<0.5	8.9
Phenolics																				
Phenols (Total Halogenated)	mg/kg	0.03					-	-	-	-	-	-	<1	-	<1	-	-	-	<1	-
Phenols (Total Non Halogenated)	mg/kg	1					-	-	-	-	-	-	<20	-	<20	-	-	-	<20	-
Polychlorinated Biphenyls																				
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	0.2	-	-	-	<0.1	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1	-
PCBs (Sum of total)	mg/kg	0.1	0	0	2		-	-	-	-	-	-	<0.1	-	0.2	-	-	-	<0.1	-
Solvents																				
Methyl Ethyl Ketone	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
4-Methyl-2-pentanone	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Acetone	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Allyl chloride	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Carbon disulfide	mg/kg	0.5					-	-	-	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-
Total Petroleum Hydrocarbons (TPHs)																				
C10-C16	mg/kg	50					-	<50	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C16-C34	mg/kg	100					-	<100	-	-	<100	480	1200	<100	<100	<100	<100	<100	<100	180
C34-C40	mg/kg	100					-	<100	-	-	<100	<100	150	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	mg/kg	50					-	<50	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C6 - C9	mg/kg	10	2600	650	100		-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10 - C14	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-
C15 - C28	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	-	-
C29-C36	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	-	-
+C10 - C36 (Sum of total)	mg/kg	50	40000	10000	1000		-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10 - C40 (Sum of total)	mg/kg	50					-	<100	-	-	<100	480	1350	<100	<100	<100	<100	<100	<100	180
C6-C10	mg/kg	20					-	<20	-	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20

Env Stds Comments

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (4 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	991/SB07_0.1_0.2	991/SB07_0.4_0.5	991/SB08_0.0_0.1	991/SB08_0.7_0.8	991/SB08_1.3_1.4	991/SB09_0.0_0.1	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.5_0.6	991/SB12_0.6_0.7	BH1-0.0	BH1-0.4
							Sample Location	SB07	SB07	SB08	SB08	SB08	SB09	SB10	SB10	SB11	SB12	SB12	SB12	BH1	BH1
							Sample Depth	0.1-0.2	0.4-0.5	0-0.1	0.7-0.8	1.3-1.4	0-0.1	0.4-0.5	0.8-0.9	0-0.1	0-0.1	0.5-0.6	0.6-0.7	0	0.4
							Monitoring_Round													Due Dilligence	Due Dilligence
							SampleComments	FILL	FILL	FILL	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	NAT		
							Sample Date	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	29/03/2011	29/03/2011
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5						1.2	4.6	1.2	2.2	1.2	4.6	3	1.2	1.2	5.2	-	1.2	-	-
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5						<0.5	4.1	<0.5	1.7	<0.5	4.6	2.4	<0.5	<0.5	5.2	-	<0.5	-	-
CEC	meq/100g	0.05						-	-	-	-	-	29	-	-	-	-	12	-	-	-
Mass of test sample	g							-	-	-	-	-	-	-	-	33	46	-	-	-	-
OCP																					
Organochlorine pesticides EPAVic	mg/kg				1			<1	-	<1	-	-	-	<1	-	-	-	-	-	<1.2	-
Other organochlorine pesticides EPAVic	mg/kg		50	10				<0.75	-	<0.75	-	-	-	<0.75	-	-	-	-	-	<0.8	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03						<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03						<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Polycylic aromatic hydrocarbons EPAVic	mg/kg				20			<7.5	29.1	4.85	-	<7.5	28.85	20.65	<7.5	<7.5	30.9	-	<7.5	15.1	<8
Phenols																					
Phenols (non-halogenated) EPAVic	mg/kg		2200	560	60	280		<37.2	-	<37.2	-	-	-	<37.2	-	-	-	-	-	<2	-
Phenols(halogenated) EPAVic	mg/kg		320	10	1	40		<5.5	-	<5.5	-	-	-	<5.5	-	-	-	-	-	<5	-
SVOC																					
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5						<20	-	<20	-	-	-	<20	-	-	-	-	-	-	-
VOC																					
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Volatile Organic Compounds - U																					
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos																					
FA- Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
ACM - Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
Asbestos fibres	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
Asbestos from ACM in Soil	%w/w							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Asbestos from FA & AF in Soil	%w/w							-	-	-	-	-	-	-	-	0	0	-	-	-	-
AF - Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
Organic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
Mass ACM	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass AF	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass Asbestos in ACM	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass Asbestos in AF	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass Asbestos in FA	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass Asbestos in FA & AF	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Mass FA	g							-	-	-	-	-	-	-	-	0	0	-	-	-	-
Respirable Fibres - Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
Synthetic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	1	1	-	-	-	-
BTEX																					
Benzene	mg/kg	0.1	16	4	1	2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.2	<0.2
Ethylbenzene	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5	<0.5
Toluene	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5	<0.5
Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.5	<0.5
Xylene (o)	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.5	<0.5
Xylene Total	mg/kg	0.3						<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-	-
C6-C10 less BTEX (F1)	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	-
Chlorinated Hydrocarbons																					
Chlorinated hydrocarbons EPAVic	mg/kg				1			<8.5	-	<8.5	-	-	-	<8.5	-	-	-	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg		50	10				<7.5	-	<7.5	-	-	-	<7.5	-	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,2-dichloropropane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Bromochloromethane	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	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Chloromethane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		1.4		<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Trichloroethene	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	4.8	1.2		0.6		<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Halogenated Benzenes																					
1,2,4-trichlorobenzene	mg/kg	0.01						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
4-chlorotoluene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (5 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20														
Sample Name							991/SB07_0.1_0.2	991/SB07_0.4_0.5	991/SB08_0.0_0.1	991/SB08_0.7_0.8	991/SB08_1.3_1.4	991/SB09_0.0_0.1	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.5_0.6	991/SB12_0.6_0.7	BH1-0.0	BH1-0.4
Sample Location							SB07	SB07	SB08	SB08	SB08	SB09	SB10	SB10	SB11	SB12	SB12	SB12	BH1	BH1
Sample Depth							0.1-0.2	0.4-0.5	0-0.1	0.7-0.8	1.3-1.4	0-0.1	0.4-0.5	0.8-0.9	0-0.1	0-0.1	0.5-0.6	0.6-0.7	0	0.4
Monitoring_Round																			Due Dilligence	Due Dilligence
SampleComments							FILL	FILL	FILL	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	NAT		
Sample Date							20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	29/03/2011	29/03/2011
Bromobenzene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Halogenated Hydrocarbons																				
1,2-dibromoethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Halogenated Phenols																				
2,3,5,6-Tetrachlorophenol	mg/kg	0.03					-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05					<1	-	<1	-	-	-	<1	-	-	-	-	-	<0.5	-
2,4,6-trichlorophenol	mg/kg	0.05					<1	-	<1	-	-	-	<1	-	-	-	-	-	<0.5	-
2,4-dichlorophenol	mg/kg	0.03					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-
2,6-dichlorophenol	mg/kg	0.03					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-chlorophenol	mg/kg	0.03					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-
Pentachlorophenol	mg/kg	0.2					<1	-	<1	-	-	-	<1	-	-	-	-	-	<2	-
tetrachlorophenols	mg/kg	10					<10	-	<10	-	-	-	<10	-	-	-	-	-	-	-
Herbicides																				
Dinoseb	mg/kg	5					<20	-	<20	-	-	-	<20	-	-	-	-	-	-	-
Inorganics																				
% Moisture	%	1					4.7	6.5	11	15	18	12	9.4	11	18	13	11	20	-	-
Cyanide Total	mg/kg	1	10000	2500	50	160	<5	-	<5	-	-	-	<5	-	-	-	-	-	-	-
Fluoride	mg/kg	40	40000	10000	450	3000	<100	-	<100	-	-	-	<100	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					-	-	-	-	-	-	-	-	-	-	-	-	9.7	17.8
pH (aqueous extract)	pH_Units	0.1					9.1	-	8.3	-	-	-	8.6	-	-	-	-	-	-	-
MAH																				
Monocylic aromatic hydrocarbons EPAVic	mg/kg		240	70	7		<1.1	<0.6	<1.1	-	<0.6	<0.6	<1.1	<0.6	<0.6	<0.6	-	<0.6	<2.2	<2.2
1,2,4-trimethylbenzene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Total MAH	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	-	-	-	-	-	-	-
Styrene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Metals																				
Arsenic	mg/kg	2	2000	500	20	14	<2	17	10	10	4.1	7.2	4.9	2.4	3	10	-	10	6	5
Barium	mg/kg	10					-	-	-	-	-	-	-	-	-	-	-	-	90	140
Beryllium	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	<1	<1
Cadmium	mg/kg	0.4	400	100	3	4	<0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.1	-	<0.4	<1	<1
Chromium (hexavalent)	mg/kg	0.5	2000	500	1	100	<1	-	<1	-	-	-	<1	-	-	-	-	-	<0.5	-
Chromium (III+VI)	mg/kg	2					32	20	11	13	28	19	21	5.3	6.3	19	-	37	13	16
Cobalt	mg/kg	2					-	-	-	-	-	-	-	-	-	-	-	-	3	5
Copper	mg/kg	5	20000	5000	100	4000	29	54	17	28	<5	40	26	7.2	23	180	-	15	68	15
Lead	mg/kg	5	6000	1500	300	20	<5	770	98	270	9.4	210	160	120	470	840	-	50	461	28
Manganese	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	56	29
Mercury	mg/kg	0.1	300	75	1	2	<0.1	0.4	0.1	0.3	<0.1	0.3	0.5	<0.1	0.2	0.7	-	0.1	0.4	0.1
Molybdenum	mg/kg	2	4000	1000	40	100	<5	-	<5	-	-	-	<5	-	-	-	-	-	-	-
Nickel	mg/kg	2	12000	3000	60	40	97	43	8.7	12	8.2	22	13	<5	<5	28	-	18	7	8
Selenium	mg/kg	2	200	50	10	20	<2	-	<2	-	-	-	<2	-	-	-	-	-	-	-
Silver	mg/kg	0.2	720	180	10	200	<0.2	-	<0.2	-	-	-	<0.2	-	-	-	-	-	-	-
Tin	mg/kg	5		500	50		<10	-	<10	-	-	-	<10	-	-	-	-	-	-	-
Vanadium	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	28	38
Zinc	mg/kg	5	140000	35000	200	6000	59	470	120	390	14	210	200	170	190	970	-	62	473	66
Organochlorine Pesticides																				
4,4-DDE	mg/kg	0.05					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
a-BHC	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Aldrin	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		0.6	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	-	-
b-BHC	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
chlordane	mg/kg	0.03	16	4		2	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Chlordane (cis)	mg/kg	0.03					-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
Chlordane (trans)	mg/kg	0.03					-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
d-BHC	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
DDD	mg/kg	0.05					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
DDT	mg/kg	0.05					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.2	-

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (6 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	991/SB07_0.1_0.2	991/SB07_0.4_0.5	991/SB08_0.0_0.1	991/SB08_0.7_0.8	991/SB08_1.3_1.4	991/SB09_0.0_0.1	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.5_0.6	991/SB12_0.6_0.7	BH1-0.0	BH1-0.4
							Sample Location	SB07	SB07	SB08	SB08	SB08	SB09	SB10	SB10	SB11	SB12	SB12	SB12	BH1	BH1
							Sample Depth	0.1-0.2	0.4-0.5	0-0.1	0.7-0.8	1.3-1.4	0-0.1	0.4-0.5	0.8-0.9	0-0.1	0-0.1	0.5-0.6	0.6-0.7	0	0.4
							Monitoring_Round													Due Dilligence	Due Dilligence
							SampleComments	FILL	FILL	FILL	FILL	NAT	FILL	FILL	NAT	FILL	FILL	NAT	NAT		
							Sample Date	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	29/03/2011	29/03/2011
DDT+DDE+DDD	mg/kg	0.05	50	50		40	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan	mg/kg	0.03					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan II	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan sulphate	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endrin	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endrin aldehyde	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Endrin ketone	mg/kg	0.05					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Heptachlor	mg/kg	0.03	4.8	1.2		0.6	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Heptachlor epoxide	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-
Methoxychlor	mg/kg	0.03					<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.2	-
Toxaphene	mg/kg	1					<1	-	<1	-	-	-	<1	-	-	-	-	-	-	-
PAH																				
Benzo(b+j)fluoranthene	mg/kg	0.5					<0.5	2.4	<0.5	1	<0.5	2.3	1.6	<0.5	<0.5	2.7	-	<0.5	-	-
PAH/Phenols																				
2,4-dimethylphenol	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-
2,4-dinitrophenol	mg/kg	5					<5	-	<5	-	-	-	<5	-	-	-	-	-	-	-
2-methylphenol	mg/kg	0.2					<0.2	-	<0.2	-	-	-	<0.2	-	-	-	-	-	<0.5	-
2-nitrophenol	mg/kg	0.5					<1	-	<1	-	-	-	<1	-	-	-	-	-	<0.5	-
3-&4-methylphenol	mg/kg	0.4					<0.4	-	<0.4	-	-	-	<0.4	-	-	-	-	-	<1	-
4,6-Dinitro-2-methylphenol	mg/kg	5					<5	-	<5	-	-	-	<5	-	-	-	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03					<1	-	<1	-	-	-	<1	-	-	-	-	-	<0.5	-
4-nitrophenol	mg/kg	5					<5	-	<5	-	-	-	<5	-	-	-	-	-	-	-
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	0.5	<0.5	<0.5	<0.5	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	0.7	<0.5	<0.5	<0.5	0.8	0.8	<0.5	<0.5	0.7	-	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	2.3	<0.5	1.1	<0.5	2.4	1.7	<0.5	<0.5	2.6	-	<0.5	1.1	<0.5
Benzo(a) pyrene	mg/kg	0.5	20	5	1	0.02	<0.5	3.2	<0.5	1.3	<0.5	3.1	1.9	<0.5	<0.5	3.5	-	<0.5	1.3	<0.5
Benzo(b+k)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	1.6	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	1.8	<0.5	0.9	<0.5	1.6	<0.5	<0.5	<0.5	1.9	-	<0.5	1	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	2.7	<0.5	1.1	<0.5	2.8	1.9	<0.5	<0.5	3.1	-	<0.5	0.6	<0.5
Chrysene	mg/kg	0.5					<0.5	2.7	<0.5	1.2	<0.5	2.6	1.5	<0.5	<0.5	3.1	-	<0.5	1.1	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	-	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5					<0.5	5.2	0.8	2.4	<0.5	5.1	4.2	<0.5	<0.5	5.3	-	<0.5	2.4	<0.5
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	1.3	<0.5	0.8	<0.5	1.3	<0.5	<0.5	<0.5	1.6	-	<0.5	0.8	<0.5
Naphthalene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	400	100			<0.5	30.5	1.6	13.1	<0.5	30.4	20.5	<0.5	<0.5	32.6	-	<0.5	-	-
Phenanthrene	mg/kg	0.5					<0.5	2	<0.5	0.9	<0.5	1.7	3.1	<0.5	<0.5	1.6	-	<0.5	1.2	<0.5
Phenol	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-
Pyrene	mg/kg	0.5					<0.5	5.7	0.8	2.4	<0.5	5.6	3.8	<0.5	<0.5	5.9	-	<0.5	2.5	<0.5
Phenolics																				
Phenols (Total Halogenated)	mg/kg	0.03					<1	-	<1	-	-	-	<1	-	-	-	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1					<20	-	<20	-	-	-	<20	-	-	-	-	-	-	-
Polychlorinated Biphenyls																				
Arochlor 1016	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1					<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	0	0	2		<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	-	<0.15	-
Solvents																				
Methyl Ethyl Ketone	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Acetone	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5					<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																				
C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	-
C16-C34	mg/kg	100					<100	180	130	140	<100	190	290	<100	<100	210	-	<100	-	-
C34-C40	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100	-	-
F2-NAPHTHALENE	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	-
C6 - C9	mg/kg	10	2600	650	100		-	-	-	-	-	-	-	-	-	-	-	-	<10	<10
C10 - C14	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	<50	<50
C15 - C28	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	<100	<100
C29-C36	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	140	<100
+C10 - C36 (Sum of total)	mg/kg	50	40000	10000	1000		-	-	-	-	-	-	-	-	-	-	-	-	140	<50
C10 - C40 (Sum of total)	mg/kg	50					<100	180	130	140	<100	190	290	<100	<100	210	-	<100	-	-
C6-C10	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	-

Env Stds Comments

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (7 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6
							Sample Location	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14	BH14	BH15	BH15	BH16	BH16
							Sample Depth	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0	0.5	0.1	0.4	0.1	0.6
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
							Sample Date	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
CEC	meq/100g	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of test sample	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP																					
Organochlorine pesticides EPAVic	mg/kg				1			<1.08	-	-	-	-	<0.6	1.73	-	-	-	-	-	<0.6	-
Other organochlorine pesticides EPAVic	mg/kg		50	10				<0.78	-	-	-	-	<0.39	0.5	-	-	-	-	-	<0.39	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03						<0.06	-	-	-	-	<0.03	1.31	-	-	-	-	-	<0.03	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03						<0.06	-	-	-	-	<0.03	0.14	-	-	-	-	-	<0.03	-
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Polycylic aromatic hydrocarbons EPAVic	mg/kg				20			4.1	<8	10.95	<8	54.35	<7	19.7	<8	76.85	<8	<8	<8	3.75	<8
Phenols																					
Phenols (non-halogenated) EPAVic	mg/kg		2200	560	60	280		<24	-	-	-	-	<24	<24	-	-	-	-	-	<24	-
Phenols(halogenated) EPAVic	mg/kg		320	10	1	40		<0.62	-	-	-	-	<0.45	<0.62	-	-	-	-	-	<0.45	-
SVOC																					
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5						<5	-	-	-	-	<5	<5	-	-	-	-	-	<5	-
VOC																					
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																					
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2						<0.2	-	-	-	-	<0.2	<0.2	-	-	-	-	-	<0.2	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
Asbestos																					
FA- Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w							-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass ACM	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass FA	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEX																					
Benzene	mg/kg	0.1	16	4	1	2		<0.2	-	-	-	-	<0.2	<0.2	-	-	-	-	-	<0.2	-
Ethylbenzene	mg/kg	0.1						<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-
Toluene	mg/kg	0.1						<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-
Xylene (m & p)	mg/kg	0.2						<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-
Xylene (o)	mg/kg	0.1						<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-
Xylene Total	mg/kg	0.3						<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-
C6-C10 less BTEX (F1)	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																					
Chlorinated hydrocarbons EPAVic	mg/kg				1			<0.68	-	-	-	-	<0.68	<0.68	-	-	-	-	-	<0.68	-
Other chlorinated hydrocarbons EPAVic	mg/kg		50	10				<0.64	-	-	-	-	<0.64	<0.64	-	-	-	-	-	<0.64	-
1,1,1,2-tetrachloroethane	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
1,1,1-trichloroethane	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
1,1,2,2-tetrachloroethane	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
1,1,2-trichloroethane	mg/kg	0.04						<0.04	-	-	-	-	<0.04	<0.04	-	-	-	-	-	<0.04	-
1,1-dichloroethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
1,2,3-trichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
1,2-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
Chlorodibromomethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
Chloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
cis-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4						<0.4	-	-	-	-	<0.4	<0.4	-	-	-	-	-	<0.4	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		1.4		<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
Trichloroethene	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
Tetrachloroethene	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
trans-1,2-dichloroethene	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
trans-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	4.8	1.2		0.6		<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
Halogenated Benzenes																					
1,2,4-trichlorobenzene	mg/kg	0.01						<0.01	-	-	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-
1,2-dichlorobenzene	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
1,3-dichlorobenzene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02						<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	<0.02	-
4-chlorotoluene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (8 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6
							Sample Location	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14	BH14	BH15	BH15	BH16	BH16
							Sample Depth	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0	0.5	0.1	0.4	0.1	0.6
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
							Sample Date	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
Bromobenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02					<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-	-	<0.02	-
Hexachlorobenzene	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	-	<0.03	-
Halogenated Hydrocarbons																					
1,2-dibromoethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Phenols																					
2,3,5,6-Tetrachlorophenol	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
2,4,5-trichlorophenol	mg/kg	0.05					<0.06	-	-	-	-	<0.05	<0.06	-	-	-	-	-	<0.05	-	
2,4,6-trichlorophenol	mg/kg	0.05					<0.06	-	-	-	-	<0.05	<0.06	-	-	-	-	-	<0.05	-	
2,4-dichlorophenol	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
2,6-dichlorophenol	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05					<0.12	-	-	-	-	<0.05	<0.12	-	-	-	-	-	<0.05	-	
2-chlorophenol	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
Pentachlorophenol	mg/kg	0.2					<0.2	-	-	-	-	<0.2	<0.2	-	-	-	-	-	<0.2	-	
tetrachlorophenols	mg/kg	10					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Herbicides																					
Dinoseb	mg/kg	5					<5	-	-	-	-	<5	<5	-	-	-	-	-	<5	-	
Inorganics																					
% Moisture	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cyanide Total	mg/kg	1	10000	2500	50	160	<1	-	-	-	-	-	<1	2	-	-	-	-	-	<1	-
Fluoride	mg/kg	40	40000	10000	450	3000	<40	-	-	-	-	-	220	360	-	-	-	-	-	180	-
Moisture Content (dried @ 103°C)	%	1					5.5	21.2	6.8	4.4	14	23.4	11.5	19.9	17.6	13.8	6.3	16.5	6.1	16.8	
pH (aqueous extract)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MAH																					
Monocylic aromatic hydrocarbons EPAVic	mg/kg		240	70	7		<2.7	-	-	-	-	<2.7	<2.7	-	-	-	-	-	<2.7	-	
1,2,4-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total MAH	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,3,5-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Isopropylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Styrene	mg/kg	0.5					<0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-	
Metals																					
Arsenic	mg/kg	2	2000	500	20	14	6	7	<5	<5	10	8	8	10	9	10	<5	<5	<5	13	
Barium	mg/kg	10					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Beryllium	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cadmium	mg/kg	0.4	400	100	3	4	<1	<1	<1	<1	2	<1	2	<1	<1	<1	<1	<1	<1	<1	
Chromium (hexavalent)	mg/kg	0.5	2000	500	1	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Chromium (III+VI)	mg/kg	2					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	mg/kg	2					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Copper	mg/kg	5	20000	5000	100	4000	15	5	12	<5	313	13	148	10	57	<5	26	<5	29	<5	
Lead	mg/kg	5	6000	1500	300	20	381	10	186	17	1360	51	1180	38	646	15	<5	15	7	11	
Manganese	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	mg/kg	0.1	300	75	1	2	0.5	<0.1	0.3	<0.1	1.1	0.1	0.7	0.1	0.5	<0.1	<0.1	0.1	<0.1	<0.1	
Molybdenum	mg/kg	2	4000	1000	40	100	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Nickel	mg/kg	2	12000	3000	60	40	5	6	3	<2	15	8	11	15	10	9	94	7	91	8	
Selenium	mg/kg	2	200	50	10	20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Silver	mg/kg	0.2	720	180	10	200	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Tin	mg/kg	5		500	50		7	<5	<5	<5	40	<5	42	<5	26	<5	<5	<5	<5	<5	
Vanadium	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Zinc	mg/kg	5	140000	35000	200	6000	321	11	114	19	1350	56	840	1060	231	23	50	12	54	8	
Organochlorine Pesticides																					
4,4-DDE	mg/kg	0.05					<0.06	-	-	-	-	<0.05	0.46	-	-	-	-	-	<0.05	-	
a-BHC	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
Aldrin	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		0.6	<0.06	-	-	-	-	<0.03	0.49	-	-	-	-	-	<0.03	-	
b-BHC	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
chlordane	mg/kg	0.03	16	4		2	<0.06	-	-	-	-	<0.03	0.14	-	-	-	-	-	<0.03	-	
Chlordane (cis)	mg/kg	0.03					<0.06	-	-	-	-	<0.03	0.06	-	-	-	-	-	<0.03	-	
Chlordane (trans)	mg/kg	0.03					<0.06	-	-	-	-	<0.03	0.08	-	-	-	-	-	<0.03	-	
d-BHC	mg/kg	0.03					<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-	
DDD	mg/kg	0.05					<0.06	-	-	-	-	<0.05	<0.06	-	-	-	-	-	<0.05	-	
DDT	mg/kg	0.05					<0.06	-	-	-	-	<0.05	0.22	-	-	-	-	-	<0.05	-	

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (9 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH10-0.01	BH10-0.7	BH11-0.2	BH11-0.4	BH12-0.0	BH12-0.7	BH13-0.0	BH13-0.5	BH14-0.0	BH14-0.5	BH15-0.1	BH15-0.4	BH16-0.1	BH16-0.6
							Sample Location	BH10	BH10	BH11	BH11	BH12	BH12	BH13	BH13	BH14	BH14	BH15	BH15	BH16	BH16
							Sample Depth	0.01	0.7	0.2	0.4	0	0.7	0	0.5	0	0.5	0.1	0.4	0.1	0.6
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11
							Sample Date	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
DDT+DDE+DDD	mg/kg	0.05	50	50		40		<0.06	-	-	-	-	<0.05	0.68	-	-	-	-	-	<0.05	-
Dieldrin	mg/kg	0.03						<0.06	-	-	-	-	<0.03	0.49	-	-	-	-	-	<0.03	-
Endosulfan	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Endosulfan sulphate	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Endrin	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Endrin aldehyde	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Heptachlor	mg/kg	0.03	4.8	1.2		0.6		<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Heptachlor epoxide	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Methoxychlor	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Toxaphene	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH																					
Benzo(b+j)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH/Phenols																					
2,4-dimethylphenol	mg/kg	0.5						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
2,4-dinitrophenol	mg/kg	5						<5	-	-	-	-	<5	<5	-	-	-	-	-	<5	-
2-methylphenol	mg/kg	0.2						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
2-nitrophenol	mg/kg	0.5						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
3-&4-methylphenol	mg/kg	0.4						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
4,6-Dinitro-2-methylphenol	mg/kg	5						<5	-	-	-	-	<5	<5	-	-	-	-	-	<5	-
4-chloro-3-methylphenol	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
4-nitrophenol	mg/kg	5						<5	-	-	-	-	<5	<5	-	-	-	-	-	<5	-
Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	2.2	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5						<0.5	<0.5	0.9	<0.5	4.2	<0.5	1.9	<0.5	6.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	20	5	1	0.02		<0.5	<0.5	1	<0.5	4.5	<0.5	2.5	<0.5	7.4	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+k)fluoranthene	mg/kg	0.5						0.6	-	-	-	-	<0.5	4	-	-	-	-	-	<0.5	-
Benzo(b)fluoranthene	mg/kg	0.5						-	<0.5	0.8	<0.5	3.7	-	-	<0.5	6.3	<0.5	<0.5	<0.5	-	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	0.6	<0.5	2.9	<0.5	1.6	<0.5	5.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5						-	<0.5	0.8	<0.5	3.8	-	-	<0.5	5.8	<0.5	<0.5	<0.5	-	<0.5
Chrysene	mg/kg	0.5						<0.5	<0.5	0.9	<0.5	4	<0.5	1.8	<0.5	6.3	<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	0.7	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5						0.5	<0.5	1.8	<0.5	8.3	<0.5	3.7	<0.5	11.8	<0.5	<0.5	<0.5	0.5	<0.5
Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	2.5	<0.5	1.4	<0.5	4.3	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	400	100				1.7	<0.5	9.2	<0.5	54.1	<0.5	22.2	<0.5	76.1	<0.5	<0.5	<0.5	0.5	<0.5
Phenanthrene	mg/kg	0.5						<0.5	<0.5	0.6	<0.5	6.6	<0.5	1.7	<0.5	6.3	<0.5	<0.5	<0.5	<0.5	<0.5
Phenol	mg/kg	0.5						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
Pyrene	mg/kg	0.5						0.6	<0.5	1.8	<0.5	7.9	<0.5	3.6	<0.5	12	<0.5	<0.5	<0.5	<0.5	<0.5
Phenolics																					
Phenols (Total Halogenated)	mg/kg	0.03						<0.06	-	-	-	-	<0.03	<0.06	-	-	-	-	-	<0.03	-
Phenols (Total Non Halogenated)	mg/kg	1						<1	-	-	-	-	<1	<1	-	-	-	-	-	<1	-
Polychlorinated Biphenyls																					
Arochlor 1016	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	0	0	2			<0.5	-	-	-	-	<0.1	<0.5	-	-	-	-	-	<0.1	-
Solvents																					
Methyl Ethyl Ketone	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																					
C10-C16	mg/kg	50						<50	-	-	-	-	<50	<50	-	-	-	-	-	<50	-
C16-C34	mg/kg	100						<100	-	-	-	-	<100	190	-	-	-	-	-	<100	-
C34-C40	mg/kg	100						<100	-	-	-	-	<100	110	-	-	-	-	-	<100	-
F2-NAPHTHALENE	mg/kg	50						-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10	2600	650	100			<10	-	-	-	-	<10	<10	-	-	-	-	-	<10	-
C10 - C14	mg/kg	50						<50	-	-	-	-	<50	<50	-	-	-	-	-	<50	-
C15 - C28	mg/kg	100						<100	-	-	-	-	<100	100	-	-	-	-	-	<100	-
C29-C36	mg/kg	100						<100	-	-	-	-	<100	120	-	-	-	-	-	<100	-
+C10 - C36 (Sum of total)	mg/kg	50	40000	10000	1000			<50	-	-	-	-	<50	220	-	-	-	-	-	<50	-
C10 - C40 (Sum of total)	mg/kg	50						<50	-	-	-	-	<50	300	-	-	-	-	-	<50	-
C6-C10	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-

Env Stds Comments

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (10 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5
							Sample Location	BH17	BH17	BH18	BH18	BH19	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6
							Sample Depth	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11										
							Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CEC	meq/100g	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of test sample	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP																							
Organochlorine pesticides EPAVic	mg/kg				1			-	<0.6	-	-	-	-	-	<1.2	-	-	-	<1.2	<1.2	-	-	<30
Other organochlorine pesticides EPAVic	mg/kg		50	10				-	<0.39	-	-	-	-	-	<0.8	-	-	-	<0.8	<0.8	-	-	<20
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03						-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03						-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Polycyclic aromatic hydrocarbons EPAVic	mg/kg				20			<8	<7	<8	20.1	<8	<8	15.1	<8	8.35	<8	30.85	<8	<8	<8	26.7	19.65
Phenols																							
Phenols (non-halogenated) EPAVic	mg/kg		2200	560	60	280		-	<24	-	-	-	-	-	<2	-	-	-	<2	<2	-	-	<2
Phenols(halogenated) EPAVic	mg/kg		320	10	1	40		-	<0.45	-	-	-	-	-	<5	-	-	-	<5	<5	-	-	<5
SVOC																							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5						-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																							
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U																							
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2						-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos																							
FA- Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass ACM	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass FA	g							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEX																							
Benzene	mg/kg	0.1	16	4	1	2		-	<0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.1						-	<0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.1						-	<0.5	-	-	-	-	<0.5	<0.5	<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	<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	<0.5	<0.5	<0.5
Xylene Total	mg/kg	0.3						-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6-C10 less BTEX (F1)	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																							
Chlorinated hydrocarbons EPAVic	mg/kg				1			-	<0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg		50	10				-	<0.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04						-	<0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4						-	<0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		1.4		-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	4.8	1.2		0.6		-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																							
1,2,4-trichlorobenzene	mg/kg	0.01						-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02						-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-chlorotoluene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (11 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5
							Sample Location	BH17	BH17	BH18	BH18	BH19	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6
							Sample Depth	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11										
							Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
Bromobenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02					-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Halogenated Hydrocarbons																							
1,2-dibromoethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Phenols																							
2,3,5,6-Tetrachlorophenol	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05					-	<0.05	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2,4,6-trichlorophenol	mg/kg	0.05					-	<0.05	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2,4-dichlorophenol	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2,6-dichlorophenol	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05					-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-chlorophenol	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
Pentachlorophenol	mg/kg	0.2					-	<0.2	-	-	-	-	-	-	<2	-	-	-	<2	<2	-	-	<2
tetrachlorophenols	mg/kg	10					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides																							
Dinoseb	mg/kg	5					-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																							
% Moisture	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1	10000	2500	50	160	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	mg/kg	40	40000	10000	450	3000	-	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					6.5	17	5.2	10.9	7	17.6	5.9	18.6	9.7	5.4	9.3	14.7	4	24.6	7.6	7.1	
pH (aqueous extract)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAH																							
Monocylic aromatic hydrocarbons EPAVic	mg/kg		240	70	7		-	<2.7	-	-	-	-	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	
1,2,4-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5					-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																							
Arsenic	mg/kg	2	2000	500	20	14	<5	6	<5	14	<5	9	<5	13	6	<5	6	10	<5	<5	18	10	
Barium	mg/kg	10					-	-	-	-	-	-	70	10	110	<10	90	<10	40	20	220	270	
Beryllium	mg/kg	1					-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Cadmium	mg/kg	0.4	400	100	3	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chromium (hexavalent)	mg/kg	0.5	2000	500	1	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5	
Chromium (III+VI)	mg/kg	2					-	-	-	-	-	-	5	28	6	<2	10	22	4	24	13	14	
Cobalt	mg/kg	2					-	-	-	-	-	-	2	4	2	<2	2	3	<2	2	7	6	
Copper	mg/kg	5	20000	5000	100	4000	25	7	28	59	24	6	68	8	28	<5	50	<5	10	<5	59	41	
Lead	mg/kg	5	6000	1500	300	20	<5	41	<5	552	12	10	405	20	770	<5	516	16	133	11	810	1120	
Manganese	mg/kg	5					-	-	-	-	-	-	70	16	97	<5	91	16	112	18	190	129	
Mercury	mg/kg	0.1	300	75	1	2	<0.1	0.1	<0.1	0.6	<0.1	0.1	0.8	<0.1	0.4	<0.1	0.7	<0.1	0.2	<0.1	0.7	0.4	
Molybdenum	mg/kg	2	4000	1000	40	100	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-	
Nickel	mg/kg	2	12000	3000	60	40	68	9	81	26	68	8	7	8	5	<2	8	6	3	7	24	21	
Selenium	mg/kg	2	200	50	10	20	<5	<5	<5	<5	<5	<5	-	-	-	-	-	-	-	-	-	-	
Silver	mg/kg	0.2	720	180	10	200	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-	
Tin	mg/kg	5		500	50		<5	<5	<5	11	<5	<5	-	-	-	-	-	-	-	-	-	-	
Vanadium	mg/kg	5					-	-	-	-	-	-	12	84	14	12	18	63	16	38	18	26	
Zinc	mg/kg	5	140000	35000	200	6000	41	21	40	631	44	11	344	12	323	<5	353	40	1500	17	661	607	
Organochlorine Pesticides																							
4,4-DDE	mg/kg	0.05					-	<0.05	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
a-BHC	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
Aldrin	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		0.6	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
b-BHC	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
chlordane	mg/kg	0.03	16	4		2	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chlordane (cis)	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
Chlordane (trans)	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
d-BHC	mg/kg	0.03					-	<0.03	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
DDD	mg/kg	0.05					-	<0.05	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25	
DDT	mg/kg	0.05					-	<0.05	-	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	-	-	<5	

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (12 of 15)

Analyte	Units	EQL	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20	Sample Name	BH17-0.1	BH17-0.5	BH18-0.1	BH18-0.5	BH19-0.1	BH19-0.5	BH2-0.1	BH2-0.4	BH3-0.05	BH3-0.45	BH4-0.1	BH4-0.4	BH5-0.1	BH5-0.65	BH6-0.05	BH6-0.5
							Sample Location	BH17	BH17	BH18	BH18	BH19	BH19	BH2	BH2	BH3	BH3	BH4	BH4	BH5	BH5	BH6	BH6
							Sample Depth	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.4	0.05	0.45	0.1	0.4	0.1	0.65	0.05	0.5
							Monitoring_Round	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence	Due Dilligence
							SampleComments	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11										
							Sample Date	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011	29/03/2011
DDT+DDE+DDD	mg/kg	0.05	50	50		40	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endosulfan	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endosulfan II	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endosulfan sulphate	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endrin	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endrin aldehyde	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
g-BHC (Lindane)	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Heptachlor	mg/kg	0.03	4.8	1.2		0.6	-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Heptachlor epoxide	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	<1.25
Methoxychlor	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	-	-	<5
Toxaphene	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH																							
Benzo(b+j)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH/Phenols																							
2,4-dimethylphenol	mg/kg	0.5					-	<1	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2,4-dinitrophenol	mg/kg	5					-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylphenol	mg/kg	0.2					-	<1	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
2-nitrophenol	mg/kg	0.5					-	<1	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
3-&4-methylphenol	mg/kg	0.4					-	<1	-	-	-	-	-	-	<1	-	-	-	<1	<1	-	-	<1
4,6-Dinitro-2-methylphenol	mg/kg	5					-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
4-nitrophenol	mg/kg	5					-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	1.6	<0.5	<0.5	1.1	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.2	1.5	
Benzo(a) pyrene	mg/kg	0.5	20	5	1	0.02	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	1.5	<0.5	0.7	<0.5	3.1	<0.5	<0.5	<0.5	2.9	2.1	
Benzo(b+k)fluoranthene	mg/kg	0.5					-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5					<0.5	-	<0.5	1.4	<0.5	<0.5	1.9	<0.5	0.6	<0.5	2.5	<0.5	<0.5	<0.5	2.2	1.5	
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	<0.5	<0.5	1.6	<0.5	<0.5	1.2	<0.5	0.5	<0.5	2.3	<0.5	<0.5	<0.5	2.2	1.5	
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	-	<0.5	1.8	<0.5	<0.5	0.6	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.2	1.6	
Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5	1.7	<0.5	<0.5	1.1	<0.5	0.6	<0.5	2.7	<0.5	<0.5	<0.5	2.1	1.5	
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	<0.5	
Fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	3	<0.5	<0.5	2.2	<0.5	1.2	<0.5	5	<0.5	<0.5	<0.5	3.7	2.7	
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	1.3	<0.5	<0.5	1	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	1.8	1.2	
Naphthalene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
PAHs (Sum of total)	mg/kg	0.5	400	100			<0.5	<0.5	<0.5	18.6	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	
Phenanthrene	mg/kg	0.5					<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.7	<0.5	0.6	<0.5	1.1	<0.5	<0.5	<0.5	1.3	1.2	
Phenol	mg/kg	0.5					-	<1	-	-	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	<0.5
Pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	3.1	<0.5	<0.5	2.3	<0.5	1.2	<0.5	4.9	<0.5	<0.5	<0.5	4	3.1	
Phenolics																							
Phenols (Total Halogenated)	mg/kg	0.03					-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1					-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																							
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	0	0	2		-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	<2.5
Solvents																							
Methyl Ethyl Ketone	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)																							
C10-C16	mg/kg	50					-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C16-C34	mg/kg	100					-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C34-C40	mg/kg	100					-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2-NAPHTHALENE	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10	2600	650	100		-	<10	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
C10 - C14	mg/kg	50					-	<50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28	mg/kg	100					-	<100	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100	<100	200	110
C29-C36	mg/kg	100					-	<100	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100	<100	230	160
+C10 - C36 (Sum of total)	mg/kg	50	40000	10000	1000		-	<50	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	430	270
C10 - C40 (Sum of total)	mg/kg	50					-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6-C10	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Env Stds Comments

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (13 of 15)

						Sample Name	BH7-0.05	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
						Sample Location	BH7	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
						Sample Depth	0.05	0.3	0.05	0.5	0.1	0.5	1	2	3
						Monitoring_Round	Due Dilligence	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
						SampleComments			23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
						Sample Date	29/03/2011	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
Analyte	**Units**	**EQL**	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20									
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5					-	-	-	-	-	-	-	-	-
CEC	meq/100g	0.05					-	-	-	-	-	-	-	-	-
Mass of test sample	g						-	-	-	-	-	-	-	-	-
OCP															
Organochlorine pesticides EPAVic	mg/kg				1		-	-	-	-	<0.6	-	-	-	-
Other organochlorine pesticides EPAVic	mg/kg		50	10			-	-	-	-	<0.39	-	-	-	-
Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)															
Polycylic aromatic hydrocarbons EPAVic	mg/kg				20		32.45	15	438.2	<8	<7	<8	35.85	33.7	<8
Phenols															
Phenols (non-halogenated) EPAVic	mg/kg		2200	560	60	280	-	-	-	-	<24	-	-	-	-
Phenols(halogenated) EPAVic	mg/kg		320	10	1	40	-	-	-	-	<0.45	-	-	-	-
SVOC															
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	5					-	-	-	-	<5	-	-	-	-
VOC															
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - U															
Sum of monocyclic aromatic hydrocarbons	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-
Sum of other chlorinated hydrocarbons	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
Sum of volatile chlorinated hydrocarbons	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
Asbestos															
FA- Comment	Comment						-	-	-	-	-	-	-	-	-
ACM - Comment	Comment						-	-	-	-	-	-	-	-	-
Asbestos fibres	Comment						-	-	-	-	-	-	-	-	-
Asbestos from ACM in Soil	%w/w						-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w						-	-	-	-	-	-	-	-	-
AF - Comment	Comment						-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment						-	-	-	-	-	-	-	-	-
Mass ACM	g						-	-	-	-	-	-	-	-	-
Mass AF	g						-	-	-	-	-	-	-	-	-
Mass Asbestos in ACM	g						-	-	-	-	-	-	-	-	-
Mass Asbestos in AF	g						-	-	-	-	-	-	-	-	-
Mass Asbestos in FA	g						-	-	-	-	-	-	-	-	-
Mass Asbestos in FA & AF	g						-	-	-	-	-	-	-	-	-
Mass FA	g						-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment						-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment						-	-	-	-	-	-	-	-	-
BTEX															
Benzene	mg/kg	0.1	16	4	1	2	<0.2	<0.2	-	-	<0.2	-	<0.2	-	-
Ethylbenzene	mg/kg	0.1					<0.5	<0.5	-	-	<0.5	-	<0.5	-	-
Toluene	mg/kg	0.1					<0.5	<0.5	-	-	<0.5	-	<0.5	-	-
Xylene (m & p)	mg/kg	0.2					<0.5	<0.5	-	-	<0.5	-	<0.5	-	-
Xylene (o)	mg/kg	0.1					<0.5	<0.5	-	-	<0.5	-	<0.5	-	-
Xylene Total	mg/kg	0.3					-	-	-	-	<0.5	-	-	-	-
C6-C10 less BTEX (F1)	mg/kg	20					-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons															
Chlorinated hydrocarbons EPAVic	mg/kg				1		-	-	-	-	<0.68	-	-	-	-
Other chlorinated hydrocarbons EPAVic	mg/kg		50	10			-	-	-	-	<0.64	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.04					-	-	-	-	<0.04	-	-	-	-
1,1-dichloroethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
1,2-dichloropropane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
Chlorodibromomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Chloroethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
Chloromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4					-	-	-	-	<0.4	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		1.4	-	-	-	-	<0.02	-	-	-	-
Trichloroethene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
Tetrachloroethene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Vinyl chloride	mg/kg	0.02	4.8	1.2		0.6	-	-	-	-	<0.02	-	-	-	-
Halogenated Benzenes															
1,2,4-trichlorobenzene	mg/kg	0.01					-	-	-	-	<0.01	-	-	-	-
1,2-dichlorobenzene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
4-chlorotoluene	mg/kg	0.5					-	-	-	-	-	-	-	-	-

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Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (14 of 15)

						Sample Name	BH7-0.05	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
						Sample Location	BH7	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
						Sample Depth	0.05	0.3	0.05	0.5	0.1	0.5	1	2	3
						Monitoring_Round	Due Dilligence	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
						SampleComments			23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
						Sample Date	29/03/2011	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
Analyte	**Units**	**EQL**	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20									
Bromobenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02					-	-	-	-	<0.02	-	-	-	-
Hexachlorobenzene	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Halogenated Hydrocarbons															
1,2-dibromoethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Halogenated Phenols															
2,3,5,6-Tetrachlorophenol	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
2,4,5-trichlorophenol	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-
2,4,6-trichlorophenol	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-
2,4-dichlorophenol	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
2,6-dichlorophenol	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-
2-chlorophenol	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Pentachlorophenol	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-
tetrachlorophenols	mg/kg	10					-	-	-	-	-	-	-	-	-
Herbicides															
Dinoseb	mg/kg	5					-	-	-	-	<5	-	-	-	-
Inorganics															
% Moisture	%	1					-	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1	10000	2500	50	160	-	-	-	-	<1	-	-	-	-
Fluoride	mg/kg	40	40000	10000	450	3000	-	-	-	-	140	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					4.8	5.8	5.6	9.4	5.7	7.8	11	18.9	6.6
pH (aqueous extract)	pH_Units	0.1					-	-	-	-	-	-	-	-	-
MAH															
Monocylic aromatic hydrocarbons EPAVic	mg/kg		240	70	7		<2.2	<2.2	-	-	<2.7	-	<2.2	-	-
1,2,4-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5					-	-	-	-	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5					-	-	-	-	<0.5	-	-	-	-
Metals															
Arsenic	mg/kg	2	2000	500	20	14	7	9	37	<5	<5	<5	6	9	<5
Barium	mg/kg	10					50	60	-	-	-	-	60	-	-
Beryllium	mg/kg	1					<1	<1	-	-	-	-	<1	-	-
Cadmium	mg/kg	0.4	400	100	3	4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (hexavalent)	mg/kg	0.5	2000	500	1	100	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Chromium (III+VI)	mg/kg	2					6	9	-	-	-	-	11	-	-
Cobalt	mg/kg	2					5	9	-	-	-	-	3	-	-
Copper	mg/kg	5	20000	5000	100	4000	15	24	28	<5	25	<5	44	232	25
Lead	mg/kg	5	6000	1500	300	20	230	315	493	7	<5	16	380	1070	22
Manganese	mg/kg	5					90	146	-	-	-	-	54	-	-
Mercury	mg/kg	0.1	300	75	1	2	<0.1	0.1	0.4	<0.1	<0.1	<0.1	0.2	1.1	<0.1
Molybdenum	mg/kg	2	4000	1000	40	100	-	-	<2	<2	<2	2	-	<2	<2
Nickel	mg/kg	2	12000	3000	60	40	14	34	25	<2	76	<2	6	13	68
Selenium	mg/kg	2	200	50	10	20	-	-	<5	<5	<5	<5	-	<5	<5
Silver	mg/kg	0.2	720	180	10	200	-	-	<2	<2	<2	<2	-	<2	<2
Tin	mg/kg	5		500	50		-	-	16	<5	<5	<5	-	52	<5
Vanadium	mg/kg	5					12	13	-	-	-	-	30	-	-
Zinc	mg/kg	5	140000	35000	200	6000	188	262	1060	13	41	18	320	786	58
Organochlorine Pesticides															
4,4-DDE	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-
a-BHC	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Aldrin	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		0.6	-	-	-	-	<0.03	-	-	-	-
b-BHC	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
chlordane	mg/kg	0.03	16	4		2	-	-	-	-	<0.03	-	-	-	-
Chlordane (cis)	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Chlordane (trans)	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
d-BHC	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
DDD	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-
DDT	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-

PETER J RAMSAY & ASSOCIATES

Table R3 Summary of Analytical Results for Soil Samples – Classification Criteria (15 of 15)

						Sample Name	BH7-0.05	BH7-0.3	BH8-0.05	BH8-0.5	BH9-0.1	BH9-0.5	DUP 1	DUP 2	DUP 3
						Sample Location	BH7	BH7	BH8	BH8	BH9	BH9	DUP	DUP	DUP
						Sample Depth	0.05	0.3	0.05	0.5	0.1	0.5	1	2	3
						Monitoring_Round	Due Dilligence	Due Dilligence	Soil Classification	Soil Classification	Soil Classification	Soil Classification	Due Dilligence	Soil Classification	Soil Classification
						SampleComments			23-Jun-11	23-Jun-11	23-Jun-11	23-Jun-11		23-Jun-11	23-Jun-11
						Sample Date	29/03/2011	29/03/2011	16/06/2011	16/06/2011	16/06/2011	16/06/2011	29/03/2011	16/06/2011	20/06/2011
Analyte	**Units**	**EQL**	EPAVic Cat B Upper Limit (TC2)	EPAVic Cat C Upper Limit (TC1)	EPAVic Fill Upper Limit (TC0)	EPAVic Cat C Leached x 20									
DDT+DDE+DDD	mg/kg	0.05	50	50		40	-	-	-	-	<0.05	-	-	-	-
Dieldrin	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endosulfan	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endosulfan I	mg/kg	0.05					-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endosulfan sulphate	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endrin	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endrin aldehyde	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Heptachlor	mg/kg	0.03	4.8	1.2		0.6	-	-	-	-	<0.03	-	-	-	-
Heptachlor epoxide	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Methoxychlor	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Toxaphene	mg/kg	1					-	-	-	-	-	-	-	-	-
PAH															
Benzo(b+j)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-
PAH/Phenols															
2,4-dimethylphenol	mg/kg	0.5					-	-	-	-	<1	-	-	-	-
2,4-dinitrophenol	mg/kg	5					-	-	-	-	<5	-	-	-	-
2-methylphenol	mg/kg	0.2					-	-	-	-	<1	-	-	-	-
2-nitrophenol	mg/kg	0.5					-	-	-	-	<1	-	-	-	-
3-&4-methylphenol	mg/kg	0.4					-	-	-	-	<1	-	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5					-	-	-	-	<5	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
4-nitrophenol	mg/kg	5					-	-	-	-	<5	-	-	-	-
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					0.6	<0.5	9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5					0.7	<0.5	13.1	<0.5	<0.5	<0.5	<0.5	0.8	<0.5
Benz(a)anthracene	mg/kg	0.5					2.7	1.2	39.5	<0.5	<0.5	<0.5	2.7	2.8	<0.5
Benzo(a) pyrene	mg/kg	0.5	20	5	1	0.02	3.4	1.4	41.3	<0.5	<0.5	<0.5	5	3.3	<0.5
Benzo(b+k)fluoranthene	mg/kg	0.5					-	-	-	-	<0.5	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5					2.6	1.1	49.2	<0.5	-	<0.5	6.4	2.7	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					2.3	0.8	24.2	<0.5	<0.5	<0.5	3.6	2.6	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					2.4	1.1	16.8	<0.5	-	<0.5	2	2.7	<0.5
Chrysene	mg/kg	0.5					2.6	1.2	30.5	<0.5	<0.5	<0.5	2.4	2.9	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					0.6	<0.5	4.1	<0.5	<0.5	<0.5	0.7	0.6	<0.5
Fluoranthene	mg/kg	0.5					4.8	2.4	74.8	<0.5	<0.5	<0.5	3.6	5	<0.5
Fluorene	mg/kg	0.5					<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					1.8	0.7	19.5	<0.5	<0.5	<0.5	3.1	2.1	<0.5
Naphthalene	mg/kg	0.5					<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	400	100			-	-	437	<0.5	<0.5	<0.5	-	32.7	<0.5
Phenanthrene	mg/kg	0.5					1.9	1.1	41.3	<0.5	<0.5	<0.5	0.6	2.2	<0.5
Phenol	mg/kg	0.5					-	-	-	-	<1	-	-	-	-
Pyrene	mg/kg	0.5					5.3	2.5	72.7	<0.5	<0.5	<0.5	4.5	5	<0.5
Phenolics															
Phenols (Total Halogenated)	mg/kg	0.03					-	-	-	-	<0.03	-	-	-	-
Phenols (Total Non Halogenated)	mg/kg	1					-	-	-	-	<1	-	-	-	-
Polychlorinated Biphenyls															
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	0	0	2		-	-	-	-	<0.1	-	-	-	-
Solvents															
Methyl Ethyl Ketone	mg/kg	0.5					-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5					-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (TPHs)															
C10-C16	mg/kg	50					-	-	-	-	<50	-	-	-	-
C16-C34	mg/kg	100					-	-	-	-	<100	-	-	-	-
C34-C40	mg/kg	100					-	-	-	-	<100	-	-	-	-
F2-NAPHTHALENE	mg/kg	50					-	-	-	-	-	-	-	-	-
C6 - C9	mg/kg	10	2600	650	100		<10	<10	-	-	<10	-	<10	-	-
C10 - C14	mg/kg	50					<50	<50	-	-	<50	-	<50	-	-
C15 - C28	mg/kg	100					180	<100	-	-	<100	-	440	-	-
C29-C36	mg/kg	100					290	180	-	-	<100	-	740	-	-
+C10 - C36 (Sum of total)	mg/kg	50	40000	10000	1000		470	180	-	-	<50	-	1180	-	-
C10 - C40 (Sum of total)	mg/kg	50					-	-	-	-	<50	-	-	-	-
C6-C10	mg/kg	20					-	-	-	-	-	-	-	-	-

Env Stds Comments

PETER J RAMSAY & ASSOCIATES

Table R4 Summary of Analytical Results for Leachate Samples – Classification Criteria (1 of 2)

					Sample Name	991/SB01_0.0_0.1	991/SB02_0.4_0.5	991/SB03_0.4_0.5	991/SB04_0.0_0.1	991/SB05_0.2_0.3	991/SB05_0.3_0.4	991/SB06_0.1_0.2	991/SB07_0.1_0.2	991/SB07_0.4_0.5	991/SB08_0.0_0.1	991/SB09_0.0_0.1
					Location ID	SB01	SB02	SB03	SB04	SB05	SB05	SB06	SB07	SB07	SB08	SB09
					Sample Date	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
			EPAVic Cat B Leached	EPAVic Cat C Leached												
Analyte	**Units**	**EQL**														
ASLP for Non & Semivolatile An																
Initial pH	pH Unit	0.1				9	9.1	9.6	8.3	5.9	9.3	9.3	9.1	9.2	8.8	8.9
Inorganics																
pH (aqueous extract)	pH_Units	0.1				5.8	4.9	5	6.5	5.7	5.2	5.3	5.1	6.3	5.2	6.3
Lead																
Lead	mg/L	0.01	4	1		0.44	0.59	0.05	<0.01	-	0.04	0.26	-	0.09	0.04	0.02
Metals																
Arsenic	mg/L	0.01	2.8	0.7		0.01	<0.01	-	-	-	-	-	-	0.06	-	-
Nickel	mg/L	0.01	8	2		-	-	-	-	0.02	-	-	0.03	0.01	-	-
PAH/Phenols																
Benzo(a) pyrene	µg/L	1	4	1		<1	<1	-	-	-	-	<1	-	<1	-	<1
Env Stds Comments																

Table R4 Summary of Analytical Results for Leachate Samples – Classification Criteria (2 of 2)

				Sample Name	991/SB10_0.4_0.5	991/SB10_0.8_0.9	991/SB11_0.0_0.1	991/SB12_0.0_0.1	991/SB12_0.6_0.7
				Location ID	SB10	SB10	SB11	SB12	SB12
				Sample Date	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
			EPAVic Cat B Leached	EPAVic Cat C Leached					
Analyte	**Units**	**EQL**							
ASLP for Non & Semivolatile An									
Initial pH	pH Unit	0.1			7.8	7.6	6.5	7	8.5
Inorganics									
pH (aqueous extract)	pH_Units	0.1			5.2	5.1	5.1	5.5	5.1
Lead									
Lead	mg/L	0.01	4	1	0.11	0.21	0.13	0.24	0.04
Metals									
Arsenic	mg/L	0.01	2.8	0.7	-	-	-	-	-
Nickel	mg/L	0.01	8	2	-	-	-	-	-
PAH/Phenols									
Benzo(a) pyrene	µg/L	1	4	1	<1	-	-	<1	-

Env Stds Comments

Table R5 Results of Quality Control – Split/Blind Replicate Soil Samples (1 of 1)

	Sample Type	Primary Sample	Blind Replicate		Primary Sample	Blind Replicate		Primary Sample	Split Duplicate		Primary Sample	Split Duplicate	
	Field ID	991/SB06_0.1_0.2	991/DUP02	RPD	991/SB04_0.0_0.1	991/DUP03	RPD	991/SB06_0.1_0.2	991/SB06_0.1_0.2	RPD	991/SB04_0.0_0.1	991/SB04_0.0_0.1	RPD
	Sampled Date/Time	20/05/2020	20/05/2020		20/05/2020	20/05/2020		20/05/2020	20/05/2020		20/05/2020	20/05/2020	
Analyte	**Units**	**EQL**											
Monocyclic Aromatic Hydrocarbons (MAHs)													
Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.2	0
Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.5	0
Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.5	0
C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<10.0	0
Metals													
Arsenic	mg/kg	2 (Primary): 5 (Interlab)	8.8	17.0	64	5.5	6.6	18	8.8	12.0	31	5.5	6.0	9
Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<1.0	0
Chromium (III+VI)	mg/kg	5 (Primary): 2 (Interlab)	11.0	24.0	74	18.0	21.0	15	11.0	8.0	32	18.0	13.0	32
Copper	mg/kg	5	**39.0**	**83.0**	**72**	19.0	24.0	23	39.0	33.0	17	19.0	44.0	79
Lead	mg/kg	5	**530.0**	**360.0**	**38**	23.0	31.0	30	530.0	495.0	7	23.0	23.0	0
Mercury	mg/kg	0.1	**0.5**	**0.2**	**86**	<0.1	<0.1	0	0.5	0.4	22	<0.1	<0.1	0
Nickel	mg/kg	5 (Primary): 2 (Interlab)	19.0	25.0	27	31.0	42.0	30	19.0	12.0	45	31.0	36.0	15
Zinc	mg/kg	5	320.0	270.0	17	81.0	93.0	14	**320.0**	**489.0**	**42**	81.0	64.0	23
Polycyclic Aromatic Hydrocarbons (PAHs)													
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		
Acenaphthylene	mg/kg	0.5	0.6	<0.5	18	<0.5	<0.5	0	0.6			<0.5		
Anthracene	mg/kg	0.5	0.8	0.6	29	<0.5	<0.5	0	0.8			<0.5		
Benz(a)anthracene	mg/kg	0.5	3.8	2.3	49	<0.5	<0.5	0	3.8			<0.5		
Benzo(a) pyrene	mg/kg	0.5	4.5	3.1	37	<0.5	<0.5	0	4.5			<0.5		
Benzo(b+j)fluoranthene	mg/kg	0.5	3.3	2.4	32	<0.5	<0.5	0	3.3			<0.5		
Benzo(g,h,i)perylene	mg/kg	0.5	2.4	1.5	46	<0.5	<0.5	0	2.4			<0.5		
Benzo(k)fluoranthene	mg/kg	0.5	4.1	3.0	31	<0.5	<0.5	0	4.1			<0.5		
Chrysene	mg/kg	0.5	3.9	2.7	36	<0.5	<0.5	0	3.9			<0.5		
Dibenz(a,h)anthracene	mg/kg	0.5	0.7	0.6	15	<0.5	<0.5	0	0.7			<0.5		
Fluoranthene	mg/kg	0.5	8.4	5.6	40	<0.5	<0.5	0	8.4			<0.5		
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	2.0	1.4	35	<0.5	<0.5	0	2.0			<0.5		
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0	<0.5	<1.0	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0	<0.5	<1.0	0
PAHs (Sum of total)	mg/kg	0.5	**46.4**	**30.5**	**41**	<0.5	<0.5	0	46.4			<0.5		
Phenanthrene	mg/kg	0.5	3.0	1.5	67	<0.5	<0.5	0	3.0			<0.5		
Pyrene	mg/kg	0.5	8.9	5.8	42	<0.5	<0.5	0	8.9			<0.5		
Benzo(a)pyrene TEQ calc (LOR)	mg/kg	0.5	6.6	4.7	34	1.2	1.2	0	6.6			1.2		
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	6.6	4.7	34	<0.5	<0.5	0	6.6			<0.5		
Total Recoverable Hydrocarbons (TRHs)													
C10-C16	mg/kg	50	<50.0	59.0	17	<50.0	<50.0	0	<50.0	80.0	46	<50.0	<50.0	0
C16-C34	mg/kg	100	180.0	220.0	20	<100.0	<100.0	0	180.0	200.0	11	<100.0	<100.0	0
C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
F2-NAPHTHALENE	mg/kg	50	<50.0	59.0	17	<50.0	<50.0	0	<50.0	80.0	46	<50.0	<50.0	0
C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	180.0	279.0	43	<100.0	<100.0	0	180.0	280.0	43	<100.0	<50.0	0
C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<10.0	0
Inorganics													
% Moisture	%	1	13.0	12.0	8	14.0	13.0	7	13.0			14.0		

Bold RPDs exceed the ASC NEPM 1999 (as amended 2013) assessment criterion of 30%.

RPDs shaded in grey exceed the adopted acceptance criteria of 50% for inorganic compounds and 70% for organic compounds.

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table R6 - Results of Quality Control - Blank Samples (1 of 2)

Lab Report Number	721768
Field ID	991/RB01
Sample Date	26/05/2020
Sample Type	Rinsate

Analyte	Units	EQL	
Tokuthion	mg/l	0.002	<0.002
BTEX			
Benzene	µg/l	1	<1
Ethylbenzene	µg/l	1	<1
Toluene	µg/l	1	<1
Xylene (m & p)	µg/l	2	<2
Xylene (o)	µg/l	1	<1
Xylene Total	µg/l	3	<3
C6-C10 less BTEX (F1)	mg/l	0.02	<0.02
Halogenated Benzenes			
Hexachlorobenzene	µg/l	0.1	<0.1
Organochlorine Pesticides			
4,4-DDE	µg/l	0.1	<0.1
a-BHC	µg/l	0.1	<0.1
Aldrin	µg/l	0.1	<0.1
Aldrin + Dieldrin	µg/l	0.1	<0.1
b-BHC	µg/l	0.1	<0.1
chlordane	µg/l	1	<1
d-BHC	µg/l	0.1	<0.1
DDD	µg/l	0.1	<0.1
DDT	µg/l	0.1	<0.1
DDT+DDE+DDD	µg/l	0.1	<0.1
Dieldrin	µg/l	0.1	<0.1
Endosulfan I	µg/l	0.1	<0.1
Endosulfan II	µg/l	0.1	<0.1
Endosulfan sulphate	µg/l	0.1	<0.1
Endrin	µg/l	0.1	<0.1
Endrin aldehyde	µg/l	0.1	<0.1
Endrin ketone	µg/l	0.1	<0.1
g-BHC (Lindane)	µg/l	0.1	<0.1
Heptachlor	µg/l	0.1	<0.1
Heptachlor epoxide	µg/l	0.1	<0.1
Methoxychlor	µg/l	0.1	<0.1
Toxaphene	mg/l	0.01	<0.01
Organophosphorous Pesticides			
Azinophos methyl	µg/l	2	<2
Bolstar (Sulprofos)	µg/l	2	<2
Chlorfenvinphos	µg/l	2	<2
Chlorpyrifos	µg/l	20	<20
Chlorpyrifos-methyl	mg/l	0.002	<0.002
Coumaphos	µg/l	20	<20
Demeton-O	µg/l	2	<2
Demeton-S	µg/l	20	<20
Diazinon	µg/l	2	<2
Dichlorvos	µg/l	2	<2
Dimethoate	µg/l	2	<2
Disulfoton	µg/l	2	<2
Ethion	µg/l	2	<2
Ethoprop	µg/l	2	<2

Table R6 - Results of Quality Control - Blank Samples (2 of 2)

Lab Report Number	721768
Field ID	991/RB01
Sample Date	26/05/2020
Sample Type	Rinsate

Analyte	Units	EQL	
Fenitrothion	µg/l	2	<2
Fensulfothion	µg/l	2	<2
Fenthion	µg/l	2	<2
Malathion	µg/l	2	<2
Merphos	mg/l	0.002	<0.002
Methyl parathion	µg/l	2	<2
Mevinphos (Phosdrin)	µg/l	2	<2
Monocrotophos	µg/l	2	<2
Naled (Dibrom)	µg/l	2	<2
Omethoate	µg/l	2	<2
Phorate	µg/l	2	<2
Pyrazophos	µg/l	2	<2
Ronnel	µg/l	2	<2
Terbufos	µg/l	2	<2
Trichloronate	µg/l	2	<2
Tetrachlorvinphos	mg/l	0.002	<0.002
PAH/Phenols			
Naphthalene	µg/l	1	<10
Pesticides			
Parathion	µg/l	2	<2
Pirimiphos-methyl	mg/l	0.02	<0.02
Polychlorinated Biphenyls			
Arochlor 1016	µg/l	1	<1
Arochlor 1221	µg/l	1	<1
Arochlor 1232	µg/l	1	<1
Arochlor 1242	µg/l	1	<1
Arochlor 1248	µg/l	1	<1
Arochlor 1254	µg/l	1	<1
Arochlor 1260	µg/l	1	<1
PCBs (Sum of total)	µg/l	1	<1
SVOCs			
EPN	µg/l	2	<2
Total Petroleum Hydrocarbons (TPHs)			
C10-C16	mg/l	0.05	<0.05
C16-C34	mg/l	0.1	<0.1
C34-C40	mg/l	0.1	<0.1
F2-NAPHTHALENE	mg/l	0.05	<0.05
C10 - C40 (Sum of total)	µg/l	100	<100
C6-C10	mg/l	0.02	<0.02

Table R7 - Results of Quality Control - Blind Leachate Samples (1 of 1)

			Sample Type	Primary Sample	Blind Replicate	
			Lab Report Number	722026	722026	
			Field ID	991/SB06_0.1_0.2	991/DUP02	RPD
			Sample Date	20/05/2020	20/05/2020	
Analyte	**Units**	**EQL**				
ASLP for Non & Semivolatile An (leached)						
Initial pH	pH Unit	0.1		9.3	8.0	15
Inorganics (leached)						
pH (aqueous extract)	pH_Units	0.1		5.3	5.1	4
Lead (leached)						
Lead	mg/l	0.01		0.26	0.39	40
PAH/Phenols (leached)						
Benzo(a) pyrene	µg/l	1		<1.0	<1.0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (1-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those u

Table R8 Results of Quality Control - Blank Samples (Soil) (Page 1 of 1)

		SDG	991.4/PCOC1
		Sample Name	991/RB01
		Sample Date	19/05/2020
		Sample Type	Rinsate
Analyte	**Units**	**EQL**	
Metals			
Arsenic	mg/l	0.001	<0.001
Cadmium	mg/l	0.0002	<0.0002
Chromium (III+VI)	mg/l	0.001	<0.001
Copper	mg/l	0.001	<0.001
Lead	mg/l	0.001	<0.001
Mercury	mg/l	0.0001	<0.0001
Nickel	mg/l	0.001	<0.001
Zinc	mg/l	0.005	<0.005
PAHs			
Naphthalene	µg/l	10	<10
Total Recoverable Hydrocarbons (TRHs)			
C6-C10	mg/l	0.02	<0.02
C10-C16	mg/l	0.05	<0.05
C16-C34	mg/l	0.1	<0.1
C34-C40	mg/l	0.1	<0.1
C6-C10 less BTEX (F1)	mg/l	0.02	<0.02
F2-NAPHTHALENE	mg/l	0.05	<0.05
C10 - C40 (Sum of total)	µg/l	100	<100

Table R9 - Results of Quality Control - Blank Samples (Groundwater) (1 of 2)

Lab Report Number	721768
Field ID	991/RB01
Sample Date	26/05/2020
Sample Type	Rinsate

Analyte	Units	EQL	
BTEX			
Benzene	µg/l	1	<1
Ethylbenzene	µg/l	1	<1
Toluene	µg/l	1	<1
Xylene (m & p)	µg/l	2	<2
Xylene (o)	µg/l	1	<1
Xylene Total	µg/l	3	<3
C6-C10 less BTEX (F1)	mg/l	0.02	<0.02
Halogenated Benzenes			
Hexachlorobenzene	µg/l	0.1	<0.1
Organochlorine Pesticides			
4,4-DDE	µg/l	0.1	<0.1
a-BHC	µg/l	0.1	<0.1
Aldrin	µg/l	0.1	<0.1
Aldrin + Dieldrin	µg/l	0.1	<0.1
b-BHC	µg/l	0.1	<0.1
chlordane	µg/l	1	<1
d-BHC	µg/l	0.1	<0.1
DDD	µg/l	0.1	<0.1
DDT	µg/l	0.1	<0.1
DDT+DDE+DDD	µg/l	0.1	<0.1
Dieldrin	µg/l	0.1	<0.1
Endosulfan I	µg/l	0.1	<0.1
Endosulfan II	µg/l	0.1	<0.1
Endosulfan sulphate	µg/l	0.1	<0.1
Endrin	µg/l	0.1	<0.1
Endrin aldehyde	µg/l	0.1	<0.1
Endrin ketone	µg/l	0.1	<0.1
g-BHC (Lindane)	µg/l	0.1	<0.1
Heptachlor	µg/l	0.1	<0.1
Heptachlor epoxide	µg/l	0.1	<0.1
Methoxychlor	µg/l	0.1	<0.1
Tokuthion	mg/l	0.002	<0.002
Toxaphene	mg/l	0.01	<0.01
Organophosphorous Pesticides			
Azinophos methyl	µg/l	2	<2
Bolstar (Sulprofos)	µg/l	2	<2
Chlorfenvinphos	µg/l	2	<2
Chlorpyrifos	µg/l	20	<20
Chlorpyrifos-methyl	mg/l	0.002	<0.002
Coumaphos	µg/l	20	<20
Demeton-O	µg/l	2	<2
Demeton-S	µg/l	20	<20
Diazinon	µg/l	2	<2
Dichlorvos	µg/l	2	<2
Dimethoate	µg/l	2	<2
Disulfoton	µg/l	2	<2
Ethion	µg/l	2	<2
Ethoprop	µg/l	2	<2
Fenitrothion	µg/l	2	<2
Fensulfothion	µg/l	2	<2
Fenthion	µg/l	2	<2
Malathion	µg/l	2	<2
Merphos	mg/l	0.002	<0.002
Methyl parathion	µg/l	2	<2
Mevinphos (Phosdrin)	µg/l	2	<2
Monocrotophos	µg/l	2	<2
Naled (Dibrom)	µg/l	2	<2
Omethoate	µg/l	2	<2
Phorate	µg/l	2	<2
Pyrazophos	µg/l	2	<2
Ronnel	µg/l	2	<2
Terbufos	µg/l	2	<2
Trichloronate	µg/l	2	<2
Tetrachlorvinphos	mg/l	0.002	<0.002

Table R9 - Results of Quality Control - Blank Samples (Groundwater) (2 of 2)

Lab Report Number	721768
Field ID	991/RB01
Sample Date	26/05/2020
Sample Type	Rinsate

Analyte	Units	EQL	
PAH/Phenols			
Naphthalene	µg/l	1	<10
Pesticides			
Parathion	µg/l	2	<2
Pirimiphos-methyl	mg/l	0.02	<0.02
Polychlorinated Biphenyls			
Arochlor 1016	µg/l	1	<1
Arochlor 1221	µg/l	1	<1
Arochlor 1232	µg/l	1	<1
Arochlor 1242	µg/l	1	<1
Arochlor 1248	µg/l	1	<1
Arochlor 1254	µg/l	1	<1
Arochlor 1260	µg/l	1	<1
PCBs (Sum of total)	µg/l	1	<1
SVOCs			
EPN	µg/l	2	<2
Total Petroleum Hydrocarbons (TPHs)			
C10-C16	mg/l	0.05	<0.05
C16-C34	mg/l	0.1	<0.1
C34-C40	mg/l	0.1	<0.1
F2-NAPHTHALENE	mg/l	0.05	<0.05
C10 - C40 (Sum of total)	µg/l	100	<100
C6-C10	mg/l	0.02	<0.02