



Site Audit Report

**138 and 140 Campbell Hill Road,
Chester Hill NSW 2162**

Prepared for

Abel Tasman Village Association Ltd

James Davis

NSW EPA Accredited Contaminated Land Site Auditor

Accreditation Number: 0301

Final Report

November 2023

Report Reference: 600218_0301-2307

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Chester Hill NSW 2162**

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Executive Summary

This Site Audit Report and subsequent Site Audit Statement have been produced to document the findings of a Site Audit, conducted by James Davis of Enviroview Pty Ltd, a New South Wales Environmental Protection Authority (NSW EPA) Contaminated Land Accredited Site Auditor on the subject site identified as 138 and 140 Campbell Hill Road, Chester Hill NSW 2162.

The Site Audit has been conducted following a request from representatives of Abel Tasman Village Association Limited to review the assessment, remediation and validation works and determine whether the site is considered suitable for the proposed use which is defined as residential with minimal opportunities for soil access. The Site Audit is not a specific requirement of a development consent under the *Environmental Planning and Assessment Act 1979* and therefore has been conducted as a non-Statutory Site Audit as defined by s 47(c) of the *Contaminated Land Management Act 1997*.

The objective and scope of the Site Audit was to independently review the remediation and validation works and the environmental consultant's reports relating to site contamination that have been prepared and to determine whether the site is suitable for the proposed use.

The outcome of the Site Audit is this Site Audit Report and subsequent Site Audit Statement, (SAS number 0301-2307) a copy of which is attached to the back (following the appendices) of this report.

To achieve the objective of the Site Audit, the Site Auditor inspected the site and reviewed the relevant site assessment works, remedial planning and site validation works completed as reported by the consultant. The Site Audit assessed if the consultant's work complied with relevant procedures and guidelines and whether it provides a robust basis for determining whether the objective has been met regarding the suitability of the land for the proposed use as an aged care facility.

The investigation works, remediation and validation work reported and reviewed are considered to have generally met the requirements of NSW EPA *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)* (NSW EPA, 2017) and other guidelines approved under s.105 of the *Contaminated Land Management Act 1997* and the objectives of the Site Audit. The Site Auditor is satisfied that the soil remediation and validation works were satisfactory for the purpose of making the site suitable for the proposed land use.

The NSW EPA *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)* prescribe that during an assessment of the suitability of a site in an urban context, Site Auditors should follow the decision-making process for assessing urban redevelopment sites provided in the guidelines.

The remediation and validation works have been reviewed against the decision-making process prescribed in the guidelines by the Site Auditor and the site is considered suitable for the proposed use in that regard.

In conclusion, a Site Audit Statement will be issued certifying that, in the opinion of the Site Auditor that the site is suitable for residential with minimal opportunity for soil access, secondary school, park, recreational open space, playing field as well as those uses with the equivalent or less sensitive land use, including commercial and industrial use.

Acronyms and Abbreviations

ACM	asbestos containing material
AEC	areas of environmental concern
AF/FA	Asbestos Fines / Friable Asbestos
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
BTEX	benzene, toluene, ethylbenzene, and xylenes
BGL	below ground level
COC	Chain of Custody (can also be contaminants of concern)
COPC	contaminants of potential concern
DA	Development Application
DQO	Data Quality Objectives
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DP	Deposited Plan
HILs	health-based investigation levels
IA	Interim Advice
LOR	limit of reporting
m	metre
MW	monitoring well
NATA	National Association of Testing Authorities
NEHF	National Environmental Health Forum
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCPs	organochlorine pesticides
OEH	The NSW Office of Environment and Heritage
OPPs	organophosphorus pesticides
PAH	polycyclic aromatic hydrocarbons
PFAS	Per- and Poly- Fluoroalkyl Substances
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PID	photoionisation detector
RAP	Remedial Action Plan
RL	relative level
RPD	relative per cent difference
SAR	Site Audit Report
SAS	Site Audit Statement
TPH	total petroleum hydrocarbons
TRH	total recoverable hydrocarbons
VOCs	volatile organic compounds
WHS	work health safety

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1 Introduction

1.1 Overview

This Site Audit Report and subsequent Site Audit Statement have been produced to document the findings of a Site Audit, conducted by James Davis of Enviroview Pty Ltd, a New South Wales Environment Protection Authority¹ (NSW EPA) Contaminated Land Accredited Site Auditor accredited under Part 4 of the *Contaminated Land Management Act 1997* as a Site Auditor.

The Site Audit has been conducted in accordance with the requirements of the *Contaminated Land Management Act 1997* (the 'Act'). The Act defines the Site Audit as follows:

"site audit" means a review:

- (a) that relates to management (whether under this Act or otherwise) of the actual or possible contamination of land, and
- (b) that is conducted for the purpose of determining any one or more of the following matters:
 - (i) the nature and extent of any contamination of the land,
 - (ii) the nature and extent of any management of actual or possible contamination of the land,
 - (iii) whether the land is suitable for any specified use or range of uses,
 - (iv) what management remains necessary before the land is suitable for any specified use or range of uses,
 - (v) the suitability and appropriateness of a plan of management, long-term management plan or a voluntary management proposal.

Furthermore, the Act provides the following relevant definitions:

"Site Audit Report" means a site audit report prepared by a site auditor in accordance with Part 4 [of the Act].

"site audit statement" means a site audit statement prepared by a site auditor in accordance with Part 4 [of the Act].

The *Contaminated Sites: Guidelines for the NSW Auditor Scheme (3rd edition)*, (NSW EPA, 2017) describes the site assessment and Site Audit process where the consultant is commissioned to assess the contamination and the Site Auditor reviews the consultant's work.

The Site Auditor inspected the site and reviewed relevant documents prepared by the consultant's relating to the remediation planning, remediation and validation works completed for the site.

¹ The NSW EPA has undergone several name changes; however certain statutory functions and powers have always and continue to be exercised in the name of the Environmental Protection Authority (NSW EPA). The NSW EPA is responsible for environmental regulation and associated activities throughout NSW including those activities regulated under the Contaminated Land Management Act 1997. The use of the names NSW Department of Environment and Conservation (NSW DEC), NSW Department of Environment and Climate Change (NSW DECC), NSW Department of Environment, Climate Change and Water (NSW DECCW), NSW Office of Environment and Heritage (NSW OEH) and NSW EPA in this report are used regarding the name relevant at the time and context of the reference but are considered generally interchangeable and can be interpreted as one and the same.

1.2 Guideline Documents

Guidelines made or approved by the NSW EPA under section 105 of the Act at the time of the completion of the Site Audit include:

- Contaminated Land Guidelines: Sampling Design Guidelines, NSW EPA, 2022 (NSW EPA, 2022)
- Contaminated Land Guidelines: Consultants Reporting on Contaminated Land, NSW EPA, 2020 (NSW EPA, 2020)
- Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases, NSW EPA, 2019 (NSW EPA, 2019)
- Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition), NSW EPA, 2017 (NSW EPA, 2017)
- Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, NSW DECC, 2015 (NSW EPA, 2015)
- Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination, NSW DEC, 2007 (NSW DEC, 2007)
- Contaminated Sites: Guidelines for Assessing Former Orchards and Market Gardens, NSW DEC 2005 (NSW DEC, 2005)
- Contaminated Sites: Guidelines for Assessing Banana Plantation Sites, NSW EPA, 1997 (NSW EPA, 1997)
- Contaminated Sites: Guidelines for the vertical mixing of soil on former broad-acre agricultural land, NSW EPA, 1995 (NSW EPA, 1995)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018), (ANZG, 2018) (except for the water quality for primary industries component, which still refer to the ANZECC & ARMICANZ 2000 guidelines)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, 2000 (ANZECC/ARMICANZ, 2000) (primary industries only)
- Composite Sampling. Lock, W. H., National Environmental Health Forum Monographs, Soil Series No.3, 1996, SA Health Commission, Adelaide (NEHF, 1996)
- Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards. Department of Health and Ageing and EnHealth Council, Commonwealth of Australia, 2012 (EnHealth, 2012)
- National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999 (Amended May 2013) (NEPC, 1999, Amended 2013)
- Guidelines for the Assessment and Clean Up of Cattle Tick Dip Sites for Residential Purposes, NSW Agriculture and CMPS&F Environmental, February 1996 (NSW Agr., 1996)

- Australian Drinking Water Guidelines. National Health and Medical Research Council and Natural Resource Management Ministerial Council, 2011 (NHRMC/NRMMC, 2011)

From time to time the NSW EPA may amend the guidelines made or approved under s.105 of the Act.

Several additional technical notes and guidance is also provided by the NSW EPA that may not be made or approved under the *Contaminated Land Management Act 1997* that may be relevant to the site contamination management, where relevant these have been considered and include the following:

- Technical Note: Investigation of Service Station Sites (NSW EPA, 2014)
- Waste Classification Guidelines Parts 1-4 (Classifying Waste, Immobilisation of Waste, Waste Containing Radioactive Material, and Acid Sulfate Soils). NSW Environment Protection Authority, 2014 (NSW EPA, 2014b)
- Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation. NSW DECCW, 2009. (NSW DECCW, 2009)

1.3 Site Auditor

James Davis of Enviroview Pty Ltd, is a NSW EPA Contaminated Land Accredited Site Auditor (NSW EPA Accreditation Number 0301) and conducted the Site Audit. The Site Auditor was assisted by staff of Enviroview and where relevant specialist Audit support from contractors to Enviroview; however, full responsibility for the Audit remains with the Accredited Site Auditor.

The Site Audit was initiated by a request from representatives of Abel Tasman Village Association Ltd who engaged the Site Auditor in March 2023.

1.4 Type of Site Audit

The Site Audit is not required by a statutory instrument such as condition of planning approval or other order or notice under any other Act, consequently, the site has been conducted as a non-Statutory Site Audit as defined by section 47(c) of the *Contaminated Land Management Act 1997*.

1.5 Objective and Scope of the Site Audit

The objective of the Site Audit was to independently review the environmental consultant's remediation and validation reports prepared for the site and to determine whether the site is suitable for the proposed land use. The proposed land use is commensurate with residential land use with minimal opportunities for soil access. Other equivalent or less sensitive land uses have also been considered.

To achieve the objective of the Site Audit, the Site Auditor inspected the site and reviewed the relevant site assessment works, remediation planning and site validation works completed as reported by the consultants. The Site Audit assessed if the consultant's work complied with relevant procedures and guidelines and whether it provides a robust basis for

determining whether the objective has been met regarding the suitability of the land for the proposed land use.

The outcome of the Site Audit is this Site Audit Report and subsequent Site Audit Statement, (SAS number 0301-2307) a copy of which is attached to the back (following the appendices) of this report.

1.6 Documents Reviewed

The following documents was reviewed as part of this Site Audit:

Environmental Strategies Pty Ltd. *Environmental Site Assessment, 138-140 Campbell Hill Road, Chester Hill NSW*. Document reference: 13126RP01_Rev1, dated March 2014. (Environmental Strategies, 2014)

Environmental Strategies Pty Ltd. *Remediation Action Plan, 138-140 Campbell Hill Road, Chester Hill, NSW*. Document reference: 16166 RAP (Rev1), dated 23 August 2016. (Environmental Strategies, 2016)

Reditus Consulting Pty Ltd. *Detailed Site Investigation, Abel Tasman Village, 222 Waldron Road, 138 & 140 Campbell Hill Road, Chester Hill NSW*. Document Reference: 22065RP01, dated 17 June 2022. (Reditus, June 2022)

Reditus Consulting Pty Ltd. *Remedial Action Plan, Abel Tasman Village, 138 & 140 Campbell Hill Road, Chester Hill NSW*. Document Reference: 22065RP02, dated 18 May 2023. (Reditus, May 2023)

Reditus Consulting Pty Ltd. *UPSS Decommissioning & Validation Report*. Report reference: 22137RP02, dated 31 October 2023. (Reditus, October 2023)

1.7 Site Audit Inspections

In relation to the Site Audit two site inspections was conducted. The following table lists the details of the inspection of the site conducted by the Site Auditor.

Table 1-1 Site Inspections

Date	Attendance
31 May 2023	Site inspection undertaken by Site Auditor James Davis of Enviroview Pty Ltd prior to commencement of remediation
20 July 2023	Site inspection undertaken by the Site Auditor James Davis of Enviroview Pty Ltd during remediation

1.8 Audit Correspondence

Correspondence in the form of Site Audit Interim Advice was issued regarding the Site Audit to clarify and request additional information and to provide guidance on the Site Audit requirements. Site Audit Interim Advice is provided in **Appendix A**.

1.9 Chronology of Site Assessment and Audit Works

The process of site assessment, Site Auditor review and preparation of final Site Audit Statement and report undertaken at the site has been summarised in the following table.

Table 1-2 Chronology of Events

Date	Action
March 2014	<i>Environmental Site Assessment</i> report for 138-140 Campbell Hill Road issued by Environmental Strategies
23 August 2016	<i>Remedial Action Plan</i> for 138-140 Campbell Hill Road issued by Environmental Strategies
17 June 2022	<i>Detailed Site Investigation</i> report for 222 Waldron Road, 138 & 140 Campbell Hill Road issued by Reditus
28 March 2023	Engagement of James Davis of Enviroview Pty Ltd to conduct a Site Audit by Abel Tasman Village Association Ltd
17 May 2023	Preparation of Interim Audit Advice 01 (0301-2307_01) providing comments following review of the RAP (Reditus, May 2023) by the Site Auditor
18 May 2023	Finalised <i>Remedial Action Plan</i> for 138 & 140 Campbell Hill Road issued by Reditus
18 May 2023	Preparation of Interim Audit Advice 02 (0301-2307_02) providing endorsement of following review of the Reditus RAP by the Site Auditor
31 May 2023	Site inspection undertaken by Site Auditor James Davis of Enviroview Pty Ltd prior to commencement of remediation
July – August 2023	Remediation works.
20 July 2023	Site inspection undertaken by Site Auditor James Davis of Enviroview Pty Ltd during remediation
12 October 2023	Preparation of Interim Audit Advice 03 (0301-2307_03) providing comments following review of the draft <i>UPSS Decommissioning and Validation Report</i> by the Site Auditor
30 October 2023	Preparation of Interim Audit Advice 04 (0301-2307_04) providing comments following review of the revised <i>UPSS Decommissioning and Validation Report</i> by the Site Auditor
31 October 2023	Finalised <i>UPSS Decommissioning & Validation Report</i> for 138 & 140 Campbell Hill Road issued by Reditus
8 November 2023	Preparation of a Site Audit Statement and Site Audit Report for Site Audit 0301-2307 conducted by James Davis of Enviroview Pty Ltd regarding the remediation and validation works conducted on the site and its suitability for the proposed land use

2 Site Identification

A summary of the site identification details is provided in **Table 2-1**.

Table 2-1 Summary Site Detail

Street Address:	138 and 140 Campbell Hill Road, Chester Hill NSW 2162
Lot and DP:	Lots 5, 6 and 7 in DP 30305
Zoning:	B2 – Local Centre
Local Government Area:	Canterbury Bankstown Council
Property Size:	2,193 m ² (approx.)

Located within **Appendix B** is a figure depicting the Site Audit site.

The site is within the local government area of Canterbury Bankstown Council. Prior to the remedial works, Lot 6 and 7 comprised a disused service station and Lot 5 was vacant land neighbouring the service station.

3 Site Investigation

Site assessment works were undertaken at the site by Environmental Strategies and Reditus, as reported in the *Environmental Site Assessment* (Environmental Strategies, 2014) and the *Detailed Site Investigation* (Reditus, June 2022) reports. The findings of the investigations are presented in the following sections.

3.1 Environmental Site Assessment (Environmental Strategies, 2014)

Environmental Strategies was engaged to undertake a Phase 1 and Phase 2 Environmental Site Assessment (ESA) of the site in 2014. The objective of the ESA was to assess the potential for contamination to exist at the site and whether the site would be suitable for future commercial/industrial or residential (medium density with minimal access to soils) redevelopment.

The scope of works comprised the following:

- Desktop study including review of available current and historical information, site walkover, historical aerial photograph review, and collection of anecdotal information from discussions with site representatives.
- Intrusive investigation comprising the collection of ten soil samples from ten boreholes located across the site.
- Conversion of three boreholes to groundwater monitoring wells and sampling to assess groundwater quality downgradient of the underground storage tanks (USTs).
- Soil and groundwater sampling and analysis.
- Data assessment and reporting including comparison with relevant EPA made or endorsed guidelines.

3.1.1 Preliminary Desktop Study

As part of the site history review and desktop study, the consultant reported the following publicly available resources were reviewed:

- geology, hydrogeology, and topographical maps
- historical aerial photographs
- historical land title ownership records
- NSW EPA contaminated land database
- Council records and planning certificates
- groundwater bore search
- WorkCover NSW dangerous goods search

The desktop study was utilised to establish the potential for contamination at the site and the findings are summarised in the following sections.

3.1.2 Site Condition and Surrounding Environment

The consultant Environmental Strategies (Environmental Strategies, 2014) provided a review of the site conditions at the time of their investigation and reported that the site is split into three lots and two visibly separate site uses, being a disused service station and a vacant block of land. The site occupies a total area of approximately 2193m².

The service station site (Lot 6 DP 30305 and Lot 7 DP 30305) occupies an area of 1625.1m² and comprised former service station infrastructure, a former retail shop building and a vacant automotive workshop. The site was mesh fenced with former infrastructure still in situ (comprising three disconnected bowsters and an unconfirmed number of USTs).

The third allotment (Lot 5 DP 30305) lies directly north and adjacent to Lots 6 and 7 and comprised a vacant, turfed area with a surrounding mesh fence.

The reported aboveground and underground infrastructure was observed to be in place on the day of the site inspection except for an AST gas cylinder reported in the dangerous goods licence information.

The underground tanks are understood to have been installed circa 1972 based on information provided by a WorkCover NSW dangerous goods search. The consultant's discussions with the site owner identified that tank replacement was performed around 2001. The consultant noted that the reported installation of a 75KL UST circa 2001 was not identified on the dangerous goods licence (dated April 2000), indicating the licence information is likely out of date and not entirely accurate.

The surrounding land uses to the site were identified as:

- North: Low density residential land uses
- South: Waldron Road then medium density residential housing
- East: Campbell Hill Road then commercial businesses, including a former service station to the south-east of the site on Waldron Road.
- West: Educational campus buildings

3.2 Topography and Hydrology

The site is situated on a low relief plain with a shallow gradient to the south-west. The nearest water courses were identified as the Duck River, approximately 1500m north-east of the site and an unnamed, channelised headwater tributary of Prospect Creek above the Georges River, approximately 600m south-west of the site.

3.3 Soils, Geology and Hydrogeology

The consultant reported the site is located approximately 180m NNW of the Fairfield Basin Geosyncline in plain sediments underlain by the Bringelly Shale (shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coral, and tuff), which is the uppermost unit of the Wianamatta Group.

Soil classification data for the site was obtained from the Bicentennial Atlas of NSW *Soils of NSW* data available through the NSW Natural Resources Atlas database (viewed 8 January 2014). The map identifies soils at the site as Deep Structured Red Clay Loams based on information compiled from soil landscape, land system, geology, or geomorphological maps.

A groundwater bore search was conducted through the NSW Natural Resource Atlas database (viewed 8 January 2013). The search revealed four registered groundwater bores located approximately 300m west of the subject site for private use. No groundwater depth or quality data was recorded in the bore information records. Groundwater was inferred to flow in a south-westerly direction based on the regional topography.

3.4 Site History

Site history information was gathered and presented by the consultant (Environmental Strategies, 2014).

A search of the historical land title ownership records was carried out and a summary of the ownership record showed that various individuals of the McHale family had owned the property since 1936. The Shell Company of Australia had leased part of the property between 1958 and 1968.

Planning certificates were issued by Bankstown City Council for Lots 5, 6 and 7 in DP 30305. With respect to matters as prescribed by Schedule 4 of the *Environmental Planning and Assessment Regulation 2000*, and arising under the *Contaminated Land Management Act 1997*, the certificates advised that the land to which each certificate relates at that time was not subject to any orders or proposals and not the subject of a Site Audit Statement.

The EPA searches indicated that no notices are present for the site nor licences issued, and the site is not on the published list of NSW contaminated sites.

A search of the WorkCover NSW dangerous goods licences reported dangerous goods licences being issued for the site. The consultant provided the following table summarising the dangerous goods licence information.

Table 3-1 WorkCover NSW Dangerous Good Search Summary

Depot Number	Type of Depot	Licensed maximum storage capacity	UN Number	Product or common name	Historical products identified
Details of license at 29 April 2000					
1	Underground storage tank	27276 L	1203	Premium unleaded	Leaded petrol
2	Underground storage tank	13638 L	1203	Unleaded petrol	Leaded petrol
3	Underground storage tank	9092 L	1203	Super	Unleaded petrol
4	Underground storage tank	9092 L	1203	Diesel	Unleaded petrol
5	Underground storage tank	12273 L	1203	Not in use	Leaded petrol
6	Aboveground storage tank	4500 L	OOC1	Not in use	Diesel
7	Decanting cylinder (AST)	190 kg	1075	LPG	LPG

A selection of historical aerial photographs was sourced from the NSW Department of Lands. The earliest available photograph was 1928. Environmental Strategies provided the following summary of findings from the aerial photograph review.

Table 3-2 Historical Aerial Photograph Review

Date	Description of Subject Site	Description of Surrounding Land
RUN 10 10-12-05 199-221	Paved service station refuelling area with fuel bowser approximately in centre of Lot 7. Service station buildings and an extension (possible automotive workshop) and parking areas occupying Lot 6. Lot 5 is a vacant, grassed area. All lots are on DP 30305.	North: Residential East: Road, residential South: Commerical/industrial across road West: School
RUN 11 29-09-98 130-154	Paved service station refuelling area with fuel bowser approximately in centre of Lot 7. Service station buildings and an extension (possible automotive workshop) and parking areas occupying Lot 6. Lot 5 is a vacant, grassed area. All lots are on DP 30305.	North: Residential East: Residential across road South: Commercial/industrial across road West: School
RUN 23 6-8-82 3420-28	Paved service station refuelling area with fuel bowser approximately in centre of Lot 7. Service station building and an extension (possible automotive workshop) and parking areas occupy Lot 6. Lot 5 is a vacant, grassed area. All lots are on DP 30305.	North: Residential East: Residential, light industry across road South: Paved parking lot West: One school building, field, rivulet runs from Lot 5 into school yard.
RUN 21W 29-8-65 1404-5122	Paved service station refuelling area with fuel bowser approximately in centre of Lot 7. Service station building and parking areas occupy Lot 6. Lot 5 is a vacant, grassed area. All lots are on DP 30305.	North: Residential East: Residential, light industry South: Vacant paved lot across road West: Vacant, possible small ephemeral watercourse
RUN 22 6-8-55 224-5116	Vacant bushland with an ephemeral creek and access road which led to a construction site further to the NW.	North: Vacant, undeveloped East: Residential across road South: Vacant, undeveloped West: Vacant, ephemeral watercourse

3.4.1 Conceptual Site Model

A conceptual site model (CSM) (by another name) was prepared by the consultant in developing the sampling program for the site investigation (Reditus, June 2022) which identified the Areas of Environmental Concern (AEC), identified the associated contaminants of potential concern (COPC) and the potential contamination migration pathways. The CSM, as required by the NEPC (NEPC, 1999, Amended 2013), is an iterative process constantly being updated during the investigation as more information becomes available.

The consultant summarised the areas of concern and associated COPC in the following table.

Table 3-3 Areas of Concern and Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)	Likely sources of potential contamination
Four former bowser islands	TPH, BTEX, PAH, Pb	Possible localised spills and leaks, or fuel line leakages
Four existing underground storage tanks and one former underground storage tank	TPH, BTEX, PAH, Pb	Possible leaks from tanks or refuelling lines
Former above ground storage tank historically located north of the wire mesh fence and west of the building	TPH, BTEX, PAH	Former diesel storage tank, possible localised spills and leaks
Waste oil tank on the northern wall of the mechanic's workshop	TPH, BTEX, PAH	Possible leaks or spills
Fill material on the Site, below concrete slab	TPH, BTEX, PAH, Metals-8, Asbestos	Imported contamination from fill brought onsite
Fill material in vacant lot, Lot 5, DP 30305	Potential asbestos cement in fill materials TPH, BTEX, PAH, Pb	Potential storage and vehicle wash-down area
Fill material in vacant area west of the building	Potential asbestos cement in fill materials, or associated with building refuse stored on the Site TPH, BTEX, PAH, Pb	Potential storage and vehicle wash-down area
Groundwater below the Site	TPH, BTEX, PAH, Pb	Potential environmental receptor of contamination through infiltration of rain or storm water and leaching of contaminants in surface and subsurface media.

3.4.2 Investigation Program

The consultant prepared a sampling plan based on the site history and site features at the time using both a grid and target-based sampling pattern to assess the AECs identified.

A total of 10 boreholes were advanced to a maximum depth of 7.5m using a track-mounted drill rig. Three boreholes were converted to groundwater monitoring wells.

The consultant provided description of the sampling and analysis methodology, rationale for borehole locations, description of field equipment used, decontamination procedures, field and laboratory quality assurance and control protocols, laboratory analytical methods and sample preservation. All works were reportedly conducted in accordance with Environmental Strategies standard operating procedures and Australian and industry standards.

Investigation and monitoring well locations are shown in the consultant's figure in **Appendix C**.

3.4.3 Assessment Criteria

The results of laboratory analyses for this investigation were compared with published Australian contamination assessment criteria, namely criteria presented in the National Environmental Protection (Assessment of Contaminated Sites) Protection Measure (NEPM) (NEPC, 1999, Amended 2013).

The assessment works compared soil analytical results to health-based investigation levels (HILs) for residential land use with minimal opportunities for soil access (HIL-B).

The NEPM criteria includes Health Screening Levels (HSL) which have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. For the purposes of assessing the contamination status of the site for TRH, BTEX and PAH, the consultant used the HSL-A and -B (Low to high-density residential) criteria.

Ecological investigation level (EIL) and ecological screening levels (ESL) criteria for an urban residential land use setting were also applied.

Groundwater analytical results were compared against the HSLs, and groundwater investigation levels prescribed by the NEPM (NEPC, 1999, Amended 2013).

The adopted criteria are presented in the consultant's analytical tables provided in **Appendix D**.

3.4.4 Summary of Findings and Analytical Results

The following observations and analytical results were reported.

- The subsurface geology observed across the site during the ESA was as follows:
 - Hardstand was present across the site to a depth of 0.15m, except in the vacant lot (Lot 5) and the area west of the building in Lot 6.
 - Fill was observed to be present below the hardstand to a depth between 0.2 to 0.4m across the site.
 - West of the building, a surficial layer of concrete rubble and road base fill was observed to 0.05m above natural material.
 - In the vacant lot (Lot 5), concrete cobbles and refuse (glass fragments, radiator parts) were observed within a 0.2m gravelly silty sand surficial fill layer, vegetated by grass, above natural material.
 - Reworked natural material below the fill layer was generally a blueish grey to orange silty clay, above brown to greyish-brown silty clays. Weathered silty claystone to clayey siltstone was present at depths below approximately 6.0-7.0m with solid flight auger refusal occurring at 6.8-7.5m.
- PID measurements ranged between 0.1ppm and 953.3ppm. PID measurements >20ppm were recorded at BH6 (maximum 120ppm) and BH2 (maximum 953.3ppm).

- The standing water level measured in monitoring wells MW1, MW2 and MW3 ranged from 1.195 to 1.45m below the ground level.
- All concentrations of contaminants of concern in soil were reported below the adopted soil assessment criteria in all samples analysed.
- The concentrations of contaminants of concern in groundwater were reported below the adopted groundwater assessment criteria in all samples, apart from lead, which was reported above the adopted criteria (3.4 mg/L) in MW1 (16 mg/L) and MW3 (6 mg/L). The consultant considered the levels were reflective of background conditions and not likely to pose a risk to site users or ecological receptors.
- No asbestos and no respirable fibres were detected in the samples submitted for analysis.

3.5 Consultant's Conclusions and Recommendations

The consultant provided the following conclusion and recommendations.

- The vapour hotspot identified in PID screening at BH2 would require excavation during tank removal works prior to construction. The required depth of excavation is likely to be no greater than 1.5m based on the depths of elevated PID measurements and laboratory analytical data obtained from BH2.
- The results of laboratory analysis indicated no gross contamination from tanks has impacted groundwater at the Site. However, removal of tanks and associated infrastructure on the site would be required to assess the impacts of potential contamination on local backfill sands. Following removal of underground infrastructure, additional observational assessments should be undertaken to characterise soils directly around backfilled infrastructure to ensure no risk remains to human health or the environment.
- No gross contamination has been found on the site. As such, the extent of remediation required is likely to be limited to the immediate area around the tanks and removal of the PID hotspot at BH2.
- All waste generated on the site during remediation would need to be assessed under the NSW waste classification guidelines prior to material handling, management, and disposal.

3.6 Supplementary Detailed Site Investigation (Reditus, June 2022)

An additional Detailed Site Investigation (DSI) was undertaken by consultant Reditus with the purpose of informing the development application for the proposed redevelopment of the Abel Tasman Village facility. Although the focus of the assessment was primarily the property adjacent the site audit site (222 Waldrone Road), the investigation included the installation of one groundwater monitoring well (MW4) and groundwater sampling from existing wells on the site audit site (MW1, MW2 and MW3). The investigation sampling locations are provided on the consultant's figure included in **Appendix E**. Information relevant to the site audit site is provided following.

Standing groundwater levels measured during the investigation were reported between 1.145 (MW1) and 1.345 (MW3) metres below top of well casing. The consultant noted that

the water levels and encountered subsurface geology indicates shallow groundwater at the site is likely to be under confined to semi-confined conditions.

Light non aqueous phase liquids (LNAPL), hydrocarbon odours or sheens were not identified in any of the four groundwater wells sampled.

The consultant noted that due to the approximate linear arrangement of the wells at the site, and absence of triangulation, meaningful groundwater contours were not able to be produced. However, the groundwater flow direction was inferred to flow to the southwest, conforming with local topography.

All concentrations of contaminants in groundwater samples were reported below the adopted groundwater assessment criteria except for copper, reported in MW2, marginally above the ANZG ecological criteria (ANZG, 2018). However, due to the marginality of the exceedance and the reported concentration being within an order of magnitude of concentrations typically found within the urban environment (ambient urban conditions), the reported concentration of copper in MW2 was not considered to warrant further investigation. The reported concentration of copper was not considered to pose a risk to the proposed redevelopment at the site.

The analytical summary tables from the DSI are provided in **Appendix F**.

The consultant concluded that the results of the groundwater investigation demonstrated that the former service station and UPPS infrastructure present of 140 Campbell Hill Road was not a source of contamination that would preclude the proposed redevelopment of 222 Waldron Road.

3.7 Audit Discussion of Investigation Review

The information provided by the consultant (Environmental Strategies, 2014) regarding the site condition and surrounding environment has been checked against and meets the requirements of NSW EPA guidelines (NSW EPA, 2020) and is considered adequate for the purposes of identifying potential contamination issues at the site.

The consultant (Environmental Strategies, 2014) identified potential contamination issues at the site based on the findings of desktop studies and site inspection conducted. The potential contaminants identified are considered to have been suitably comprehensive noting the site location and history.

The fieldwork program conducted by Environmental Strategies (Environmental Strategies, 2014) was found to be adequate for site characterisation purposes based on the findings of the site history information and site inspection conducted.

Soil sampling locations conducted as part of the ESA (Environmental Strategies, 2014) were focused on the areas of concern, with some locations selected to provide general site coverage. The number of sample locations is considered adequate for site characterisation purposes.

The suite of laboratory analysis was considered suitable for site investigation purposes based upon the available site information.

Sufficient intra-laboratory and inter-laboratory duplicate samples were collected and analysed as part of the investigation programs and reported acceptable RPDs. Field trip blanks and trip spikes were not collected and analysed. No rinse samples were collected.

The laboratory QA/QC results have been reviewed and the results indicate that the laboratory analytical program was achieving adequate levels of precision and accuracy during the time when samples from the site were being analysed. Matrix spike recoveries and surrogate spike recoveries reported by the laboratory were within the control limits indicating that the accuracy of the results is acceptable for assessing the suitability of the environmental condition of the site.

Overall, the Auditors review of the QA/QC measures employed by the consultants and the laboratories utilised was found to provide adequate information for the purpose of characterising the site.

The assessment criteria utilised for the assessment of the site were derived from the NEPM (NEPC, 1999, Amended 2013) and considered a high-density residential land use scenario. Consideration was given to HILs, HSLs and ecological criteria for the assessment of soils and GILs for the assessment of groundwater.

The consultant provided tables that summarised the soil and groundwater analytical results. The reported concentrations of contaminants by the consultant were reviewed and found to be consistent with those reported by the laboratory. The laboratory procedures were appropriate for the identified potential contaminants of concern.

The site plans provided by the consultants adequately identified the sampling locations relevant to the main site features such as the existing buildings, boundaries, and roads.

The soil investigation identified potential hydrocarbon impacts in the vicinity of the underground fuel storage tanks at the site. The soil impacts identified during the assessment of the site indicated the impacts appear relatively confined to the vicinity of the tanks and are not widespread.

The investigation of groundwater at the site did not identify impacts to groundwater associated with the fuel storages on the site.

Removal of the underground fuel infrastructure was identified as being required for development of the site. It was recommended that further assessment of potential contamination issues in the vicinity of the tanks be conducted at that time. The conclusions reached by the consultant regarding the site assessment are considered appropriate given the data obtained from the site.

4 Remediation

Remediation of the site comprised the removal of the fuel infrastructure, excavation of impacted soil and groundwater, and validation of residual soils. It is noted that remedial works were only conducted at the former service station site (Lots 6 and 7). Remedial works were not required on the vacant lot (Lot 5).

4.1 Remedial Action Plans

Following completion of the ESA (Environmental Strategies, 2014) in 2014, a Remediation Action Plan (RAP) (Environmental Strategies, 2016) was prepared by Environmental Strategies to facilitate removal of the underground petroleum storage system (UPSS) infrastructure at the site. The RAP was subsequently revised and updated by Reditus in 2023 (Reditus, May 2023) to address statutory requirements that had taken effect since the development of the initial RAP in 2016. This revised RAP (Reditus, May 2023) was reviewed by the Site Auditor and is considered to form the plan for remediation of the site.

4.2 Remediation Works

Remediation works were undertaken during July and August 2023 and comprised the removal of the UPSS infrastructure and validation of the residual soils.

Removal of the six (6) USTs, two fuel dispensers, triple interceptor trap and hoist area was undertaken by the principal contractor RMA Group. Two of the small USTs, identified as Tank 1 and Tank 2, were unexpected finds and were assumed to have historically been used for the collection of waste oil.

All tanks were certified as 'gas free' on the 13 July 2023. Tank 1 and Tank 2 were destroyed on-site and Tanks 3, 4, 5 and 6 were transported to Sims Metal where they were destroyed. Certificates of gas freeing and tank destruction were provided with the validation report.

The removal of the UPSS resulted in one large excavation across the site and small trenches where the fuel delivery lines were removed.

Remnant backfill sands were also excavated and stockpiled on a HDPE plastic liner. Natural clays were noted to be present along the walls of the excavation. Natural clays and weather shale bedrock were present on the excavation base.

Groundwater ingress into the excavation was noted and water was pumped out and disposed off-site prior to validation sampling being conducted.

The consultant provided the following summary of the schedule of remediation works.

Table 4-1 Schedule of Remediation Works

DATE	DESCRIPTION OF SITE ACTIVITIES AND OBSERVATIONS
20 July 2023	- Water accumulated in open tank pits pumped out using vacuum truck. - Remnant tank pit sands removed and stockpiled (SP01 and SP02). - Validation samples V1 to V47 collected from the six tank pits, delivery line locations, and former dispenser locations. - Hydrocarbon impacted soil identified at sample location V22_0.3 (Tank Pit 6) further chased out and additional validation samples collected. - Begin excavation of in-situ TIT. - Impacted soil encountered beneath TIT excavated and stockpiled separately (SP03). - Sampling of SP01, SP02, and SP03. - Surveying extent of excavations.
21 July 2023	- Further excavation and stockpiling of impacted soil beneath the former TIT. - Validation samples collected from completed TIT excavations. - Hydrocarbon impacted soil identified at sample location V15_0.3 (Tank Pit 4) further chased out and additional validation samples collected. - Additional soil sample collected from SP02 of V15 chased out material. - Further surveying extent of excavations.
1 August 2023	- Further excavations of the northern wall of the TIT excavation after validation sample V50-0.6 reported elevated hydrocarbon concentrations. - Additional validation sample V50a-0.6 collected after a further 0.3 m excavated from the northern wall of the TIT excavation. - The Principal Contractor (RMA) advised that the liquid waste facility had detected VOCs in wastewater and wash waters from the two additional tanks identified during UPSS decommissioning works. The material within stockpiles SP01 and SP02 consisting of soil excavated from around the two additional tanks had already been confirmed as suitable from placement back into the excavations. During discussion with the with the Site Auditor on 1 August 2023 it was agreed that a minimum of 25% of the samples (still within holding time) would be analysed for VOCs to confirm suitability to remain in the excavation. Soil validation samples collected from around the two additional tanks, still within holding times, were also re-batched for VOC analysis.
2 August 2023	- Excavation of former hoist location post completion of demolition works. - Collection of validation samples V56 to V60 from hoist area excavations. - Creation and sampling of SP04 from excavated material.
8 August 2023	- Further excavations of northern wall of the TIT excavation after validation sample V50a-0.6 still reported elevated hydrocarbon concentrations. - Additional validation sample V50b-0.6 collected after a further 1.5 m excavated from the northern wall of the TIT excavation. - Creation and sampling of SP05 from excavated material.

4.3 Validation Criteria

It is proposed that the site be redeveloped for use as a high-density residential aged care facility, considered commensurate with residential land use with minimal opportunities for soil access (high-density residential). The soil criteria utilised by the consultant to guide the remedial works was adopted from the NEPM (NEPC, 1999, Amended 2013) and comprised a combination of HILs for residential land use (HIL-B), HSLs for vapour intrusion for residential land use in clay soils (HSL-B) and Management Limits for residential/parkland for a fine soil texture.

Ecological investigation levels (EILs) and ecological screening levels (ESLs) for residential land use settings were referred to for completeness.

All material designated for disposal off the site was classified in accordance with the NSW EPA (2014) Waste Classification Guidelines (NSW EPA, 2014b).

4.4 Soil Validation

Following excavation of the UPSS infrastructure, backfill sands and accumulated groundwater, soil validation samples were collected from the walls and base of the resultant tank pit excavation, product delivery lines, dispenser locations, interceptor pit excavation, and former hoist area.

All soil validation samples were collected from the excavation using an excavator, with soil being collected directly from the excavator bucket. The soil samples were collected into a laboratory supplied glass jars using fresh nitrile gloves for each sample to avoid cross-contamination, with the details of the sample, including the sample name, the job number, the date of sample and the sample depth. A portion of the sample was placed into a dedicated zip-lock bag for field screening with a photoionisation detector (PID) to detect the presence and magnitude of volatile compounds in the sample.

Samples were immediately placed and stored in an ice filled esky below 4°C, prior to being couriered to the laboratory under chain of custody (COC) procedures.

Each soil validation sample was logged in general accordance with the Unified Soil Classification System and details of any discolouration, staining, odours, or other indicators of contamination were also noted.

Stockpiles were placed on black HDPE plastic and wrapped to prevent the run-off and leaching of contaminants from the stockpile to the underlying ground.

Stockpile samples were collected using either an excavator or directly with a nitrile gloved hand. Sample material was selected such that it was representative of conditions at least halfway into the stockpile.

All validation samples submitted for laboratory analysis were analysed from TRH, BTEX, PAH and heavy metals. Selected samples were analysed for VOCs and phenols. The following table provided by the consultant summarises the validation samples collected. Sample locations are provided on the consultant's figure included in **Appendix G**.

Table 4-2 Validation Sample Register

LOCATION	ANALYTES	TYPE	SAMPLE ID
Tank Pit 1	TRH, BTEX, PAH, metals (8)	Wall	V26-0.3, V26-2.5, V27-0.3, V27-2.5
		Base	V32-3.0
Tank Pit 2	VOCs & phenols (limited)	Wall	V25-0.3, V25-2.5
		Base	V33-3.0
Tank Pit 3	TRH, BTEX, PAH, metals (8)	Wall	V12-0.3, V12-2.5, V13-0.3, V13-2.5, V14-0.3, V14-2.5, V28-0.3, V28-2.5, V29-0.3, V29-2.5
		Base	V1-3.0, V2-3.0, V3-3.0
Tank Pit 4	TRH, BTEX, PAH, metals (8)	Wall	V15-3.0, V24-0.3, V24-2.5, V53-0.3, V54-1.0
		Base	V4-3.5, V5-3.0, V55-0.6
		Exceedance	V15-0.3 (<i>field screening with PID</i>)
Tank Pit 5	TRH, BTEX, PAH, metals (8)	Wall	V16-0.3, V16-2.5, V23-0.3, V23-2.5, V31-0.3, V31-2.5
		Base	V6-3.0, V7-3.5
Tank Pit 6	TRH, BTEX, PAH, metals (8)	Wall	V17-0.3, V17-3.0, V18-0.3, V18-3.0, V19-0.3, V19-3.0, V20-0.3, V20-3.0, V21-0.3, V21-3.0, V22-3.0, V30-0.3, V30-3.0, V34-0.5, V35-0.5, V36-0.5
		Base	V8-3.0, V9-3.0, V10-3.0, V11-3.0, V40-1.0
		Exceedance	V22-0.3 (<i>field screening with PID</i>)
Delivery Lines	TRH, BTEX, PAH, metals (8)	Base	V37-0.3, V38-0.3, V39-0.3, V41-0.3, V42-0.3, V45-0.5, V46-0.5, V47-0.5
Fuel Dispensers	TRH, BTEX, PAH, metals (8)	Base	V43-0.3, V44-0.5
Triple Interceptor Trap (TIT)	TRH, BTEX, PAH, metals (8), phenols	Wall	V49-0.6, V51-0.6, V52-0.6, V61-1.8, V62-0.9, V63-0.9, V50b-0.6
		Base	V48-1.2
		Exceedance	V50-0.6, V50a-0.6 (<i>laboratory analytical results</i>)
Hoist	TRH, BTEX, PAH, metals (8), phenols	Wall	V56-0.2, V56-2.0, V57-0.5, V57-2.0, V58-0.5, V58-2.0, V59-0.5, V59-2.0,
		Base	V60-2.0
SP01	TRH, BTEX, PAH, metals (8)	-	SP01-1, SP01-2, SP01-3, SP01-4
SP02	TRH, BTEX, PAH, metals (8), VOCs (limited)	-	SP02-1, SP02-2, SP02-3, SP02-4, SP02-5, SP02-6, SP02-7, SP02-8, SP02-9, SP02-10, SP02-11, SP02-12, SP02-13

Table 4-2 Continued.

LOCATION	ANALYTES	TYPE	SAMPLE ID
SP03	TRH, BTEX, PAH, metals (8), phenols, OCP, OPP, PCB, asbestos (ID)	-	SP03-1, SP03-2, SP03-3
SP04	TRH, BTEX, PAH, metals (8), phenols	-	SP04-1, SP04-2, SP04-3
SP05	TRH, BTEX, PAH, metals (8), asbestos (ID)	-	SP05-1, SP05-2, SP05-3

Where potential exceedances were identified in the field (through field screening with PID) or reported in the initial laboratory results, additional excavation and validation works were undertaken until all COPC concentrations were reported below the adopted validation criteria. The consultant's analytical summary tables are provided in **Appendix H**. A summary of the reported exceedances and re-validation samples was provided by the consultant in the following table.

Table 4-3 Summary of Validation Sample Exceedances and Re-Validation Samples

SAMPLE ID	RATIONALE FOR FURTHER REMEDIATION	CRITERIA EXCEEDED	LOCATION	ADDITIONAL VALIDATION SAMPLES COLLECTED AFTER FURTHER EXCAVATION COMPLETED
V15-0.3	Field Screening with PID 108 ppm	-	Tank Pit 4 Southern Wall	V53-0.3, V54-1.0, V55-0.6
V22-0.3	Field Screening with PID 1,750 ppm	-	Tank Pit 6 Northern Wall	V34-0.5, V35-0.5, V36-0.5, V40-1.0
V50-0.6	Laboratory analytical results TRH F2 >C ₁₀ -C ₁₆ 1600 mg/kg	ML	TIT Northern Wall	V50a-0.6
V50a-0.6	Laboratory analytical results TRH F2 >C ₁₀ -C ₁₆ 1600 mg/kg	ML	TIT Northern Wall	V50b-0.6

All analytical results from the final soil validation samples were reported below the adopted validation criteria.

4.5 Stockpile Management and Reinstatement

Five soil stockpiles were generated during the UPSS remediation works and chase out of hydrocarbon impacted soils at the site. These stockpiles are summarised in the following table.

Table 4-4 Soil Stockpile Summary

STOCKPILE	SOURCE	APPROX. VOLUME	REINSTATED ON-SITE / DISPOSED OFF-SITE
SP01	Excavated tank pit sands	75 m ³	Reinstated on-site
SP02	Excavated tank pit sands	250 m ³	Reinstated on-site
SP03	Excavated TIT soils	13.5 m ³	Disposed off-site as GSW
SP04	Excavated hoist soils	5 m ³	Approximately 2.95 m ³ disposed off-site as GSW and 2.05 m ³ retained on-site
SP05	Excavated additional TIT soils	45 m ³	Reinstated on-site

All stockpile sampling frequencies conformed with the validation sampling plan outlined within the RAP (Reditus, May 2023).

Stockpiles SP01, SP02, and SP05 were deemed chemically suitable for reuse on-site and were reinstated into the tank pit excavation.

It was noted by the consultant that sample SP05-3, included in the material reinstated on-site, did exceed the Residential A/B HSL for vapour intrusion in Clay (0-1m) and the ESL for Urban Residential, Fine Soil (0-2 m) for TRH C₁₀-C₁₆ Fraction (F2).

However, given soils from SP05 were reinstated in the resultant large tank pit excavation at a depth greater than 2m below the ground surface, the exceedance of the HSL criteria was not considered applicable to the soil. Additionally, given the depth of reinstatement and the proposed development incorporating the entirety of the site located at 140 Campbell Hill Road (Lots 6 and 7 in DP30305), the ESL exceedance was not considered significant.

Stockpile SP03 was disposed of off-site as General Solid Waste (GSW) due to the elevated TRH concentrations which exceeded the validation criteria.

The soil sample analytical results for stockpile SP04 reported elevated TRH concentrations which exceeded the validation criteria in soil sample SP04-1 and SP04-2. Sample SP04-3 reported all analytical results below the validation criteria. It is noted that the total volume of stockpile SP04 was estimated to be approximately 5 m³, equivalent to approximately 10 tonnes (t). Given the soil analytical results, Reditus advised the contractor to remove the impacted soils unsuitable for reuse on-site to the cleanest sample location, being SP04-3. This resulted in a total of 5.9 t (or 2.95 m³) being disposed off-site, and equivalent to almost two-thirds of the total volume of the stockpile. Given the over excavation of the TRH impacted soils in stockpile SP04, Reditus are satisfied that the soil which was retained on-site (approximate 4.1 t or 2.05 m³) was suitable for on-site reuse. It is also noted that the additional material generated during the excavation and validation of sample location V50a-0.6 was added to SP04 and included in the material disposed off-site.

4.6 Groundwater

Groundwater ingress was present at the bottom of the excavation, and pooled groundwater was in the process of being pumped out by a suction truck.

Following removal of the underground infrastructure, groundwater ingress was observed at the bottom of the tank pit excavation. The water was pumped out by suction truck prior to validation and disposed off-site. Liquid disposal documentation was appended to the validation report.

Regarding the remediation of groundwater, previous assessment of the site reported all contaminants of concern in groundwater below the adopted groundwater assessment criteria, except for lead and copper which reported concentrations that were considered representative of concentrations typically found within the urban environment (ambient urban conditions). Furthermore, concentrations of BTEX, TRH/TPH, PAH and VOCs reported during the 2022 groundwater monitoring event (GME) conducted as part of the DSI (Reditus, June 2022) reported all concentrations below the laboratory limit of reporting (LOR).

Given groundwater at this site is thought to be under confined to semi-confined conditions (DSI, 2022), and the tank pit excavations predominately encountered natural clay with some weathered shale bedrock exposed at the base of the excavations, potential migration of any residual hydrocarbon contamination that may be present is considered unlikely and is not considered to warrant for further assessment or remediation of groundwater at the site.

4.7 Waste Classification and Disposal

Exhumation and disposal of the tanks was conducted by the principal contractor, RMA Group. Tank destruction certificates were appended to the validation report. Tank 1 and Tank 2 were destroyed on-site, and photographs were provided. Tanks 3, 4, 5 and 6 were transported to Sims Metal where they were confirmed to be destroyed for metal reclamation only.

A total mass of 30 t (approximately 18.5m³) of soil was disposed off-site as GSW in accordance with the Waste Classification Reports prepared by Reditus and appended to the validation report.

Waste disposal records indicate that the waste soil was transported to Sydney Recycling Park, Kemps Creek NSW, who were licensed to receive the material.

A total of 21,152 litres of liquid waste was disposed off-site during the UPSS decommissioning and remediation works. The liquid waste removed from the site included:

A total volume of approximately 21,152 litres of liquid waste was disposed of off-site during the UPSS decommissioning and validation works, which included:

- 14.2 t of J120 (waste oily water)
- 6,000 L of G110 (residual petrol and diesel waste)
- 952 kg of G150 (residual solvent waste)

A summary of the liquid waste disposed from the site is summarised in the following table.

Table 4-5 Summary of Liquid Waste to the Waste Facilities

DATE	WASTE TYPE	SOURCE	QUANTITY	TRANSPORTER	DISPOSAL FACILITY
13 July 2023	-	Residual UST liquids pumped to IBCs (disposed on 26 July 2023)	-	-	-
	J120	UST wash out water	0.52 t	Rangedale Drainage & Industrial Services Pty Ltd	Bulk Recovery Solutions – Ingleburn 16 Kerr Road, Ingleburn NSW 2565
20 July 2023	J120	Water accumulated in open tank pits	13.68 t		
26 July 2023	G110	Residual petrol waste in IBCs	4,000 L	Cleanaway Operations Pty Ltd	Cleanaway Operations Pty Ltd 8 Rayben Street, Glendenning NSW 2761
	G110	Residual diesel waste in IBCs	2,000 L		
	G150	Residual solvent waste in IBC	952 kg		

All waste disposal and related tipping dockets associated with the remediation works are presented in an appendix the validation report.

UPSS infrastructure was disposed to Sims Metals, St Marys NSW. Tank destruction certificates were provided and appended to the validation report.

4.8 Data Quality Assurance and Quality Control

A QA/QC assessment was prepared by the consultant and provided within the validation report. A total of seven intra-laboratory and inter-laboratory duplicates were collected as part of the validation and stockpile sampling, exceeding the frequency required by the DQIs. The RPDs were calculated and reported some exceedances, which were attributed to sample heterogeneity.

One trip spike and one trip blank sample was collected and analysed during the validation program and reported acceptable results. Rinsate samples were not collected or analysed as disposable sampling equipment was utilised. A review of holding times, documentation and laboratory data quality was provided by the consultant. Overall, the consultant concluded that the data was suitable for the purposes of the validation assessment.

4.9 Ongoing Management

No ongoing management is required at the site following completion of the remediation and validation works.

4.10 Consultant's Conclusion

The consultant concluded that based on the review of the historical contamination assessment reports, observations made on-site, the remedial works conducted and the assessment of the validation laboratory analytical data that the UPSS and redundant infrastructure at the site had been successfully decommissioned, destroyed, and removed from the site. The resultant excavations have been successfully validated such that no further

assessment or remediation is required to render the site suitable for Residential B (high-density) land use.

5 Audit Evaluation of Validation Report

The following sections provide discussion of the Site Audit findings of the remediation and validation works reported.

5.1.1 Remediation and Validation Work Program

The remediation work program, as documented in the RAP (Reditus, May 2023) and as described in the validation report prepared by Reditus (Reditus, October 2023) was found to be appropriate for the site.

The remedial works comprised the excavation and removal of fuel infrastructure, interceptor trap and hoist area present on Lots 6 and 7. Remediation of Lot 5 was not deemed necessary, which is appropriate based on the available soil analytical data for the site.

Following removal of all aboveground and underground infrastructure, all backfill sands and any evidence of residual contamination was excavated and assessed for on-site reuse or off-site disposal.

The contamination observed during the excavation and remediation works was consistent with expected conditions based upon the desktop study findings and site conditions observed during the site investigation works.

The consultant undertook the remediation and subsequent validation sampling and analysis in a systematic way. The consultant's actions to address the remediation areas was appropriate, thorough, and met the objectives of the remediation and validation program.

The validation sampling program was based on systematic sampling of the remediation excavations.

5.1.2 Validation Data Quality Assurance and Quality Control

A QA/QC program was implemented to provide data of an appropriate quality and validity to meet the objectives. The program consisted of field QA/QC measures and laboratory QA/QC procedures.

QA/QC in the field consisted of the following procedures:

- monitoring and guiding of validation work by experienced environmental consultants with experience in the assessment and remediation of contamination sites.
- collection of soil samples with disposable nitrile gloves with a fresh pair used for each sample location
- samples collected into appropriate laboratory supplied glass jars
- transporting samples under COC conditions to a laboratory that is a NATA accredited for the analysis performed

Laboratory QA/QC for non-asbestos related analysis was in accordance with the following procedures:

- analysis and reporting of laboratory duplicate samples
- analysis and reporting of laboratory method blank samples
- analysis and reporting of laboratory control samples or certified control samples

- analysis and reporting of laboratory control spikes, matrix spikes and surrogate spikes

The QA/QC undertaken during the validation sampling and reported by the consultant has been reviewed by the Site Auditor in reference to the parameters of precision, accuracy, representativeness, comparability, and completeness (the PARCC parameters) which are a useful tool for evaluating the quality control techniques used.

The following table summarises the QA/QC in relation to the PARCC parameters.

Table 5-1 Validation QA/QC Summary

Quality Indicator	Frequency & Acceptable Quality Parameter	Auditor Review of Quality Parameter Acceptance
Precision		
Intra-laboratory duplicates	Greater than 5 % for COPC analytes Results <30-50 % RPD	Yes. RPDs – acceptable
Inter-laboratory duplicates	Greater than 5 % for COPC analytes Results <30-50 % RPD	Yes. RPDs – acceptable
Laboratory duplicates	1 in 20 samples, <50 % RPD (>10xEQL), <75 % RPD (5-10xEQL), <100 % RPD (<5xEQL)	RPDs – acceptable
Accuracy		
Matrix spikes	70-130 %	Acceptable*
Certified reference material or Laboratory Control Sample	70-130 %	Acceptable*
Surrogate Spikes	70-130 %	Acceptable*
Representativeness		
Sampling appropriate for media and analytes	As per NEPM and AS 4482.1	Yes
Rinsate blanks	1 per sample batch <LOR	N/A - acceptable*
Trip spikes/trip blanks	1 per sample batch 70-130 % / <LOR	Yes - acceptable*
Laboratory blanks	1 per 20 or 1 per batch <LOR	<LOR – Yes
Samples extracted and analysed within holding times	Extracted within holding times	Yes
Comparability		
Standard operating procedures used for sample collection and handling	Suitable description of sampling procedures	Yes
Standard analytical methods used for all analyses	Analytical methods are referenced and NATA accredited	Yes
Consistent field conditions, sampling staff and laboratory analysis	Consistent fieldwork team, single primary laboratory used	Yes
Limits of reporting appropriate and consistent	Reporting limits less than the appropriate site criteria	Yes
Completeness		
Appropriate and complete COC documentation	Supplied in report	Yes
Satisfactory frequency and result for QC samples	As per NEPM and AS 4482.1	Yes*
Data from critical samples is considered valid	COC	Yes

Table Notes: * specifically discussed in Auditor comments

The field QA/QC program implemented by the consultant was considered adequate for the validation program conducted.

Analysis was completed by Envirolab and ALS Environmental. A review of laboratory quality control results was completed by the consultant and included with the validation report (Reditus, October 2023).

Overall, in the context of the scope of remediation, the quality measures reviewed were found to be adequate and deemed acceptable for the scope of work performed.

5.1.3 Site Validation Criteria

The site remediation validation criteria have been derived from sources approved by the NSW DECCW under s.105 of the *Contaminated Land Management Act 1997* and are considered appropriate for the protection of human health and the environment at the site with consideration to the site land use.

It is noted the NEPM is an endorsed guidance for the *assessment* of contamination and the investigation criteria contained within are not intended for use as remediation criteria. However, with the lack of appropriate alternative remediation criteria the NEPM is often utilised for remediation applications.

The criteria adopted by the consultant are appropriate in the context of the primary contaminants of concern.

5.1.4 Validation Results

The consultant discussed the results and provided tables that adequately presented the analytical results from the laboratory reports. Check of the concentrations of contaminants reported by the consultant was undertaken and found to be consistent with those reported by the laboratory. The laboratory procedures were appropriate for the identified contaminants of concern and the adopted remediation criteria against which the results were compared.

The remediation plans and sample location records provided by the consultant were detailed and adequately identified the validation sampling locations in relation to the remediation area.

The conclusions reached by the consultant in relation to the validation of the remediation conducted and required to render the site suitable for the proposed land use are considered appropriate.

5.1.5 Waste Management

The Site Auditor has reviewed waste management information provided within the site validation report and the associated tank destruction and waste disposal dockets provided as an attachment to the report. Overall, the waste management approach adopted during the remediation and validation works appears to have been reasonable and robust with waste removed off the site to appropriately licensed waste management facilities.

6 Evaluation of Site Land Use Suitability

The NSW EPA (2017) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)* prescribe that during an assessment of the suitability of a site for an existing or proposed land use in an urban context, Site Auditors must follow the decision-making process for assessing urban redevelopment sites of the Site Audit guidelines (NSW EPA, 2017).

For the purposes of this Site Audit the objective is to determine whether the site is suitable for an aged care facility commensurate with **residential with minimal opportunity for soil access, secondary school, park, recreational open space, playing field and commercial/industrial use.**

The findings of the Site Audit are presented for each requirement of the decision process:

All site assessment, remediation and validation reports follow NSW EPA (1997) *Contaminated sites: Guidelines for consultants reporting on contaminated sites.*

The documents provided by the consultant generally meet the requirements of the Site Audit in relation to the guidelines for consultants reporting on contaminated sites (NSW EPA, 2020).

Any aesthetic issues relating to site soils have been adequately addressed.

Aesthetic issues have been considered in the works undertaken at the site with the consultant confirming the removal of all underground fuel infrastructure and impacted fill materials and soil from the site and absence of staining, odours, and anthropogenic inclusions in the residual material. Validation has included detailed visual inspection and soil sampling to confirm suitability.

Soils have been assessed against relevant health-based investigation levels and potential for migration of contamination from soils to groundwater has been considered.

Soils were typically assessed against the appropriate and equivalent HIL during assessment and remediation works. Validation results have confirmed that the fill material exceeding the relevant assessment criteria has been removed from the site and the natural materials and fill remaining on the site do not present an unacceptable risk to human health. The initial assessment works focused on a wider range of potential contaminants of concern appropriate for historical site uses.

The assessment of groundwater at the site has reported concentrations of contaminants of concern below the adopted groundwater assessment criteria, apart from lead and copper which reported concentrations that were considered representative of concentrations typically found within the urban environment. No evidence of gross contamination or migration to groundwater from the underground fuel infrastructure have been identified during the assessment or remediation of the site.

Given the reported analytical results for the site across the various programs of work, the site geology and observations made during remediation of the site, the potential for migration of contamination from soils to groundwater is low.

Groundwater (where relevant) has been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered.

Groundwater has been assessed against relevant health-based criteria. Groundwater impacted with petroleum hydrocarbons has not been identified at the site. Concentrations of copper and lead were reported in excess of the adopted assessment criteria; however, the concentrations were considered representative of concentrations typically found within the urban environment. No potential impacts to buildings or structures were identified.

Based on the remedial works conducted, observations made, and analytical data obtained, it was considered that there was unlikely to be any significant or widespread groundwater contamination on the site and, as such, groundwater was not subject to additional remedial works or further validation.

Hazardous ground gases (where relevant) have been assessed against relevant health-based investigation levels and screening values.

Volatile contaminants such as volatile fractions of TRH and BTEX which may represent a potential vapour migration risk have been assessed across various programs of work at the site. All impacted soils exceeding the relevant health-based guidance values were excavated and disposed off the site as part of the remediation program. No evidence of staining or odours was identified in the residual material remaining on the site.

Any issues relating to local area background soil concentrations that exceed relevant investigation levels have been adequately addressed in the site assessments report(s).

No local background soil concentrations above the appropriate criteria were identified as an issue.

The impacts of chemical mixtures have been assessed.

No issues relating to chemical mixtures in relation to the identified contaminants of concern are expected.

Any potential ecological risk has been assessed.

Soils were assessed against the appropriate and equivalent ecological investigation levels during assessment works. Remediation of soil reporting exceedances of the ecological criteria was conducted and validation sampling of remaining site surfaces following the removal of impacted fill has confirmed that the residual fill and natural materials meet with the nominated assessment criteria and do not present an unacceptable risk to ecological health.

Any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier.

There is not considered to be any evidence of, or potential for, off-site migration of contaminants identified at the site.

The site management strategy (where relevant) is appropriate including post-remediation environmental plans.

It is considered that all known contamination has been addressed with the completed remediation and validation works at the site, and further management will not be required.

The remediation and validation works have been reviewed and the decision-making process prescribed has been applied regarding those reported works and the site is considered suitable for residential with minimal opportunity for soil access, secondary school, park,

recreational open space, playing field. Further, the application of the decision-making process requirements for those uses with the equivalent or less sensitive land use, including commercial and industrial use are also satisfied.

7 Conclusions

The investigation, remediation and validation work reported and reviewed are considered to have met the requirements of NSW EPA (NSW EPA, 2017) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)* and other guidelines endorsed under s.105 of the *Contaminated Land Management Act 1997* and the objectives of the Site Audit.

The Site Auditor is satisfied that the soil remediation and validation works have been appropriately undertaken.

The NSW EPA Site Audit guidelines (NSW EPA, 2017) prescribe that during an assessment of the suitability of a site for an existing or proposed land use in an urban context, Site Auditors should follow the decision-making process for assessing urban redevelopment sites provided in the guidelines.

The remediation and validation works have been reviewed, and the decision-making process prescribed has been followed by the Site Auditor and the site is considered suitable for the proposed land use as an aged care facility commensurate with residential use without access to soil.

In conclusion, a Site Audit Statement will be issued certifying that, in the opinion of the Site Auditor that the site is suitable for residential with minimal opportunity for soil access, secondary school, park, recreational open space, playing field as well as those uses with the equivalent or less sensitive land use, including commercial and industrial use.

8 Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief and has been based in part on information obtained from the client and other parties. Enviroview Pty Ltd or the Site Auditor accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client; or amended in any way without prior approval by the Site Auditor, and should not be relied upon by other parties, who should make their own enquires, except for regulatory and planning authorities as required under the *Contaminated Land Management Act 1997* and *State Environmental Planning policy (Resilience and Hazards) 2021*.

The data used to support the conclusions reached in this report have been obtained by other consultants and have been audited with a reasonable level of scrutiny, care, and diligence. Every reasonable effort has been made to identify and obtain all relevant data, reports and other information that provide evidence about the condition of the site, and those that were held by the client and the client's consultants, or that were readily available. No liability can be accepted for unreported omissions, alterations or errors in the data collected and presented by other consultants. Accordingly, the data and information presented by others are taken and interpreted in good faith.

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

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

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

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

9 References

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- Environmental Strategies. (2016). *Remediation Action Plan, 138-140 Campbell Hill Road, Chester Hill, NSW*. Document reference: 16166 RAP(Rev1), dated 23 August 2016.
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- NSW DEC. (2005). *Contaminated Sites: Guidelines for Assessing Former Orchards and Market Gardens*.
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- NSW EPA. (2014). *Technical Note: Investigation of Service Station Sites*.
- NSW EPA. (2014b). *Waste Classification Guidelines - Parts 1-4 (Classifying Waste, Immobilisation of Waste, Waste Containing Radioactive Material, and Acid Sulfate Soils)*.
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NSW EPA. (2019). *Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases*.

NSW EPA. (2020). *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land*.

Reditus. (June 2022). *Detailed Site Investigation, Abel Tasman Village, 222 Waldron Road, 138 & 140 Campbell Hill Road, Chester Hill NSW. Document Reference: 22065RP01, dated 17 June 2022*.

Reditus. (May 2023). *Remedial Action Plan, Abel Tasman Village, 138 & 140 Campbell Hill Road, Chester Hill NSW. Document Reference: 22065RP02, dated 18 May 2023*.

Reditus. (October 2023). *UPSS Decommissioning & Validation Report. Report reference: 22137RP02, dated 31 October 2023*.

Appendix A: Audit Interim Advice

17 May 2023

Nick Winberg
Abel Tasman Village Association Ltd
C/- Centurion Project Management
Level 36, 1 Farrer Place
SYDNEY NSW 2000

Via email only: nick.winberg@centuriongroup.com.au

Dear Mr Winberg,

RE: Interim Site Audit Advice – Review of Remedial Action Plan, Abel Tasman Village 138 & 140 Campbell Hill Road, Chester Hill NSW.

James Davis of Enviroview Pty Ltd has been engaged to provide the services of a NSW EPA Contaminated Land Accredited Site Auditor, accredited under Part 4 of the *Contaminated Land Management Act 1997* (NSW) (the Act), to conduct a Site Audit at the site located on Campbell Hill Road, Chester Hill, NSW, (the 'site'), in accordance with the Act and relevant guidelines made or approved under s 105 of that Act.

The objective of the Site Audit is to review reports relating to the assessment and remediation. This will include contaminated site assessment reports, a remedial action plan, and validation reports and to determine whether the site is suitable for the proposed residential land use, and to prepare a Site Audit Report and issue a Site Audit Statement, certifying that the site is suitable for that use. The Site Audit is not currently a statutory requirement (i.e., is not a condition of a planning approval or other statutory requirement).

A Site Audit Interim Advice is provided at a particular stage of the Site Audit to enable review of reports during the Site Audit to assist in the management of contamination issues and the requirements of the Site Audit. An Interim Advice does not constitute a Site Audit Statement or a Site Audit Report and should not be considered pre-emptive of the final audit conclusions. A Site Audit Report and Site Audit Statement will be prepared at the conclusion of the Site Audit.

The purpose of this Interim Advice is to provide comments by the Site Auditor regarding the review of the following report:

Reditus Consulting Pty Ltd (Reditus) (August 2022). *Remedial Action Plan Abel Tasman Village, Chester Hill NSW*. Report Ref: 22065RP02 Version 1 dated 4 August 2022 (the RAP)

In support of the review of the RAP, the Auditor has also considered information presented in the following reports:

Environmental Strategies (ES) (March 2014) *Environmental Site Assessment, 138-140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 13126RP01_Rev1 dated 26 March 2014.

ES (August 2016) *Remedial Action Plan (RAP). 138-140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 16166 RAP(Rev1) dated 23 August 2016.

Reditus. (June 2022) *Detailed Site Investigation Abel Tasman Village, Chester Hill NSW*. Report Ref: 22065RP01 Version 1 dated 17 June 2022. (the DSI)

Review Comments – Remedial Action Plan

- 1) General Comment: As the RAP only relates to work required to remediate the former service station site (138 and 140 Campbell Hill Road). It would be preferable for all the details of the property, past investigations etc., to only detail that relevant to this property i.e., remove reference to 222 Waldron Road entirely from the report including summaries of the GHD reports etc..
- 2) Section 8.1: Please fix internal document reference errors.
- 3) Figure 2 Inferred UPSS Remediation Area: The figure does not include the Reditus monitoring well MW04 reported as being installed in the DSI. Please correct.
- 4) Figure 2 Inferred UPSS Remediation Area: The figure which provides an indication of the location of UPSS infrastructure does not provide any indication of a 'remediation area'. While this will be determined during infrastructure removal, perhaps some indication of the anticipated excavation extent to remove the tanks and backfill sands, areas of placement for classification/validation etc.. could be shown.

Thank you for your time regarding this matter. I look forward to seeing these points addressed. I am available to discuss any of these points and issues identified with yourself or your consultant if required.

If you require additional information or clarification, please do not hesitate to contact me.

Yours sincerely



James Davis
NSW EPA Contaminated Land Site Auditor
Enviroview Pty Ltd

18 May 2023

Nick Winberg
Abel Tasman Village Association Ltd
C/- Centurion Project Management
Level 36, 1 Farrer Place
SYDNEY NSW 2000

Via email only: nick.winberg@centuriongroup.com.au

Dear Mr Winberg,

RE: Interim Site Audit Advice – Approval of Remedial Action Plan, Abel Tasman Village 138 & 140 Campbell Hill Road, Chester Hill NSW.

James Davis of Enviroview Pty Ltd has been engaged to provide the services of a NSW EPA Contaminated Land Accredited Site Auditor, accredited under Part 4 of the *Contaminated Land Management Act 1997* (NSW) (the Act), to conduct a Site Audit at the site located on Campbell Hill Road, Chester Hill, NSW, (the 'site'), in accordance with the Act and relevant guidelines made or approved under s 105 of that Act.

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The purpose of this Interim Advice is to provide approval by the Site Auditor the following report, which has previously been reviewed by the Site Auditor with comments from that review addressed satisfactorily:

Reditus Consulting Pty Ltd (Reditus) (August 2022). *Remedial Action Plan Abel Tasman Village, Chester Hill NSW*. Report Ref: 22065RP02 Version 2 dated 17 May 2023 (the revised RAP)

In support of the approval of the revised RAP, the Auditor has also considered information presented in the following reports:

Environmental Strategies (ES) (March 2014) *Environmental Site Assessment, 138-140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 13126RP01_Rev1 dated 26 March 2014.

ES (August 2016) *Remedial Action Plan (RAP). 138-140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 16166 RAP(Rev1) dated 23 August 2016.

Reditus. (June 2022) *Detailed Site Investigation Abel Tasman Village, Chester Hill NSW*. Report Ref: 22065RP01 Version 1 dated 17 June 2022. (the DSI)

Remediation Action Plan Requirements

According to the NSW EPA *Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020) a RAP should:

- summarise the findings of the preliminary and detailed site investigations and risk assessment (where applicable), and present the refined conceptual site model
- document the identified contamination risks to human health and/or the environment
- set remediation objectives that ensure the remediated site will be suitable for its current and/or proposed use and which will result in no unacceptable risk to human health or to the environment and state remediation criteria
- define the extent of remediation required across the site
- assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of the principles of ecologically sustainable development
- document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use
- identify the need for and reporting requirements of remedial technology pilot trials (if applicable)
- establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour, and aesthetics)
- address contingencies and unexpected finds protocols
- identify the necessary approvals and licences required by regulatory authorities including any items contained in development consent conditions
- clearly outline waste classification, handling, and tracking requirements in accordance with the Guidelines for the NSW Site Auditor Scheme and Waste Classification Guidelines (EPA 2014)
- ensure remediation is consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the RAP

- identify how successful implementation of the RAP will be demonstrated, for example the validation requirements by documentation of site works and sampling and analysis
- identify the need for, and nature of, any long-term management and/or monitoring following the completion of remediation and, if required, provide an outline of an environmental management plan, and include this in the RAP.

Remedial Action Plan Summary

The key points included in the revised RAP are as follows:

- The RAP discusses the applicable remediation options and presents the rationale for the selection of the preferred option, which is the removal of the underground petroleum storage system (UPSS) tanks and pump delivery lines, the excavation of backfill sands, assessment, and waste classification and either reuse or off-site disposal as required.
- The remediation goal for the site to be made suitable for the proposed land use has been made with reference to criteria made or approved by the NSW EPA. The criteria referenced is for residential land use which is commensurate with what is understood to be the proposed use as an aged-care facility.
- The process of validation, the sampling and analysis programme, quality assurance and quality control and validation reporting are provided.
- The revised RAP discusses environmental management and occupational health and safety (work health safety) controls that will need to be considered in the implementation of the remediation.
- The requirements for permits and licenced contractors is identified. The remediation is proposed to be undertaken as 'Category 2 Remediation' (not requiring development approval) with the required notification to Council in accordance with Chapter 4 of the Resilience and Hazards SEPP 2021.

Site Auditor Opinion and Approval of the Remedial Action Plan

The assessment reports that inform the remediation are sufficiently comprehensive to identify contamination of land.

The key contamination requiring remediation is petroleum hydrocarbons in soils. This is expected to be limited to the back fill soils surrounding the UPSS infrastructure. Groundwater contamination was not found indicating the expected limited extent of contamination at the site.

The exposure pathway for hydrocarbons in soils is via direct dermal contact and inhalation of vapour.

The proposed remediation comprises excavation of impacted soil or fill and where these exceed the site criteria for the proposed land use, removal from the site, thus removing the exposure pathway. The soil or fill will be disposed as a waste off-site to a facility licenced to accept the waste under the relevant classification. This approach is appropriate for the site regarding the nature of the contamination identified and the proposed use of the land. The

excavated areas will be validated by the collection and analysis of soil samples and comparison of those results against appropriate criteria.

Based on the review of the site investigation works, and the review and revision of earlier versions of the RAP, the above-referenced revised RAP is approved by the Site Auditor, and it is the opinion of the Site Auditor that if implemented the site can be made suitable for the proposed land use.

Closing

Thank you for your time regarding this matter. If you require additional information or clarification, please do not hesitate to contact me.

Yours sincerely



James Davis
NSW EPA Contaminated Land Site Auditor
Enviroview Pty Ltd



Ref: 0301-2307_03

12 October 2023

Nick Winberg
Abel Tasman Village Association Ltd
C/- Centurion Project Management
Level 36, 1 Farrer Place
SYDNEY NSW 2000

Via email only: nick.winberg@centuriongroup.com.au

Dear Mr Winberg,

RE: Interim Site Audit Advice – Review of UPSS Decommissioning and Validation Report, Abel Tasman Village, 140 Campbell Hill Road, Chester Hill NSW.

James Davis of Enviroview Pty Ltd has been engaged to provide the services of a NSW EPA Contaminated Land Accredited Site Auditor, accredited under Part 4 of the *Contaminated Land Management Act 1997* (NSW) (the Act), to conduct a Site Audit at the site located on Campbell Hill Road, Chester Hill, NSW, (the 'site'), in accordance with the Act and relevant guidelines made or approved under s 105 of that Act.

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The purpose of this Interim Advice is to provide comments by the Site Auditor regarding the review of the following report:

Reditus Consulting Pty Ltd. *UPSS Decommissioning & Validation Report, 140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 22137RP02 Version 1, dated 8 September 2023.

Review Comments

- 1) Section 5.1 Soil Validation Criteria. Clarification and further information is required regarding the adopted validation criteria for the site, as it differs significantly from what was proposed by the RAP.

The RAP prescribed the use of residential land use criteria, ecological criteria, and selection of criteria for coarse grained soils. The validation report utilises commercial/industrial land use criteria, states that ecological criteria is not applicable and adopted criteria for fine-grained soils. These deviations from the RAP need to be discussed and further justified.

The consultant justifies the selection of validation criteria for a commercial/industrial setting based on the proposed development comprising basement carparking and the current land zoning for the site, which is not appropriate. For the purpose of the site audit, the suitability of the site for the proposed land use is being considered.

Will the basement car park encompass the entire site? The RAP indicated there would be areas of accessible soil and landscaped gardens, and therefore proposed the use of residential and ecological criteria may still prevail. In addition, the basement construction at this time is not part of the remediation and the completion of remediation and suitability of the site for future land use needs to be considered in isolation of this occurring. I apologise that these may seem like semantics and can appreciate the absurdity, but the acceptance of a criteria contingent a future construction is not consistent with the objective of the remediation.

- 2) Section 8 Field Observations.
 - a) The '*large and predominantly continuous excavation*' resulting from the removal of the tanks had implications on the number and location of wall validation samples collected. The methodology adopted for the location of the validation samples collected should be discussed, as well as the adequacy (or otherwise) of the validation sampling frequency. Any deviations from the validation plan proposed by the RAP should be discussed and justified.
 - b) 5th bullet point states that two stockpiles were present on the site however the report discusses the classification and management of five stockpiles. Please clarify.
 - c) Noting the hydrocarbon impacts identified during the remedial works and reported groundwater ingress into the excavations, the report should provide discussion and justification for no further groundwater assessment or groundwater remedial works being conducted. The report should demonstrate that the potential for groundwater contamination has been considered, including potential contaminant migration from soils to groundwater.
- 3) Section 11 Soil Stockpiles.
 - a) Please provide comment on the adequacy (or otherwise) of the stockpile sampling frequency achieved and conformance with the RAP.
 - b) The first paragraph following Table 9 incorrectly states the land use setting for the site is commercial/industrial. Although commercial/industrial criteria may be applied for portions of the site owing to the presence of basement car parking, it is not considered commensurate with the proposed development of the site or site audit objectives. Please confirm the suitability of the material reused on the site with consideration of the relevant land use criteria, and location of the material placed regarding the proposed development (i.e., is it within proposed basement footprint?).
- 4) Section 12.2 Soils. Please provide the waste classification reports mentioned for the soils disposed off the site.

Thank you for your time regarding this matter. I look forward to seeing these points addressed. I am available to discuss any of these points and issues identified with yourself or your consultant if required.

If you require additional information or clarification, please do not hesitate to contact me.

Yours sincerely



James Davis
NSW EPA Contaminated Land Site Auditor
Enviroview Pty Ltd

30 October 2023

Nick Winberg
Abel Tasman Village Association Ltd
C/- Centurion Project Management
Level 36, 1 Farrer Place
SYDNEY NSW 2000

Via email only: nick.winberg@centuriongroup.com.au

Dear Mr Winberg,

RE: Interim Site Audit Advice – Review of Revised UPSS Decommissioning and Validation Report, Abel Tasman Village, 140 Campbell Hill Road, Chester Hill NSW.

James Davis of Enviroview Pty Ltd has been engaged to provide the services of a NSW EPA Contaminated Land Accredited Site Auditor, accredited under Part 4 of the *Contaminated Land Management Act 1997* (NSW) (the Act), to conduct a Site Audit at the site located on Campbell Hill Road, Chester Hill, NSW, (the 'site'), in accordance with the Act and relevant guidelines made or approved under s 105 of that Act.

The objective of the Site Audit is to review reports relating to the assessment and remediation. This will include contaminated site assessment reports, a remedial action plan, and validation reports and to determine whether the site is suitable for the proposed residential land use, and to prepare a Site Audit Report and issue a Site Audit Statement, certifying that the site is suitable for that use. The Site Audit is not currently a statutory requirement (i.e., is not a condition of a planning approval or other statutory requirement).

A Site Audit Interim Advice is provided at a particular stage of the Site Audit to enable review of reports during the Site Audit to assist in the management of contamination issues and the requirements of the Site Audit. An Interim Advice does not constitute a Site Audit Statement or a Site Audit Report and should not be considered pre-emptive of the final audit conclusions. A Site Audit Report and Site Audit Statement will be prepared at the conclusion of the Site Audit.

The purpose of this Interim Advice is to provide comments by the Site Auditor regarding the review of the following report:

Reditus Consulting Pty Ltd. *UPSS Decommissioning & Validation Report, 140 Campbell Hill Road, Chester Hill NSW*. Report Ref: 22137RP02 Version 2, dated 26 October 2023.

Review Comments

An earlier version of the report was reviewed with comments provided in Interim Advice 0301-2307_03 (dated 12 October 2023). Following issue of the Interim Advice, the report was revised to

address the Auditors comments and provide additional information and clarity around the works conducted. All the comments were addressed except for the following issues, which will need to be addressed to enable completion of the site audit.

- 1) Soil Validation Criteria. Following the Auditor's comments regarding the selection of land use criteria for the assessment of validation data, the consultant included criteria for high-density residential land use in the revised report. The discussion of results and concluding statement still refer to commercial/ industrial criteria as being the most applicable.

The consultant justifies the selection of validation criteria for a commercial/industrial setting based on the proposed development comprising basement carparking and the current land zoning for the site.

This unfortunately is not considered appropriate. For the purposes of the site audit, the suitability of the site for the *proposed* land use needs to be considered. The basement construction at this time is not part of the remediation, the suitability of the site for future land use needs to be considered in isolation of this occurring and cannot be conditional on the construction of the basement. The Site Auditor is not able to provide a site audit statement certifying that the site is suitable on the condition that a basement is constructed.

Regarding the zoning – there is not a direct connection between zoning from a planning perspective and proposed land use from the exposure risk scenario perspective. I encourage you to review Schedule B7 of the NEPM, Section 3.5.2.3 and the notes on the application of the commercial/industrial land use scenario. It was with consideration to this point and the proposed land use that the criteria presented in the RAP was deemed appropriate and the commercial/industrial criteria is not.

- 2) Waste Classification Certificates. The waste classification reports were not attached to the revised report as stated. Please provide the waste classification reports reference in the document, being:
 - Reditus (2 August 2023) Waste Classification, 138-140 Campbell Hill Road, Chester Hill NSW
 - Reditus (9 August 2023) Waste Classification, 138-140 Campbell Hill Road, Chester Hill NSW

Thank you for your time regarding this matter. I look forward to seeing these points addressed. I am available to discuss any of these points and issues identified with yourself or your consultant if required.

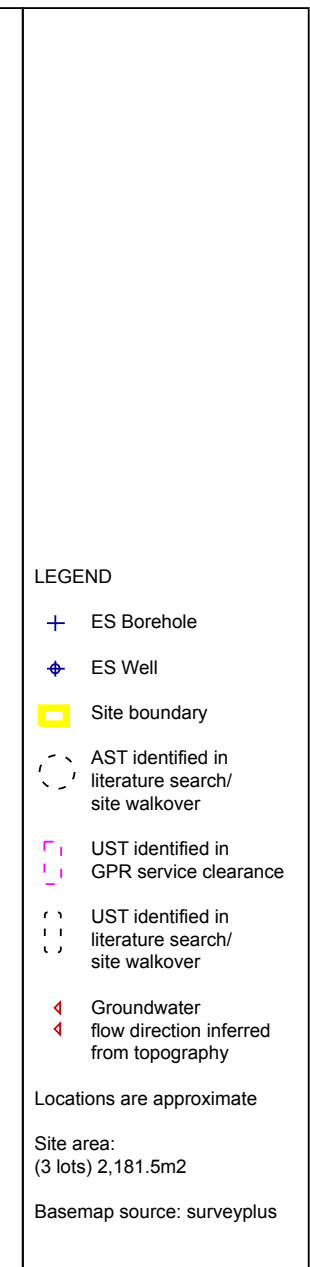
If you require additional information or clarification, please do not hesitate to contact me.

Yours sincerely

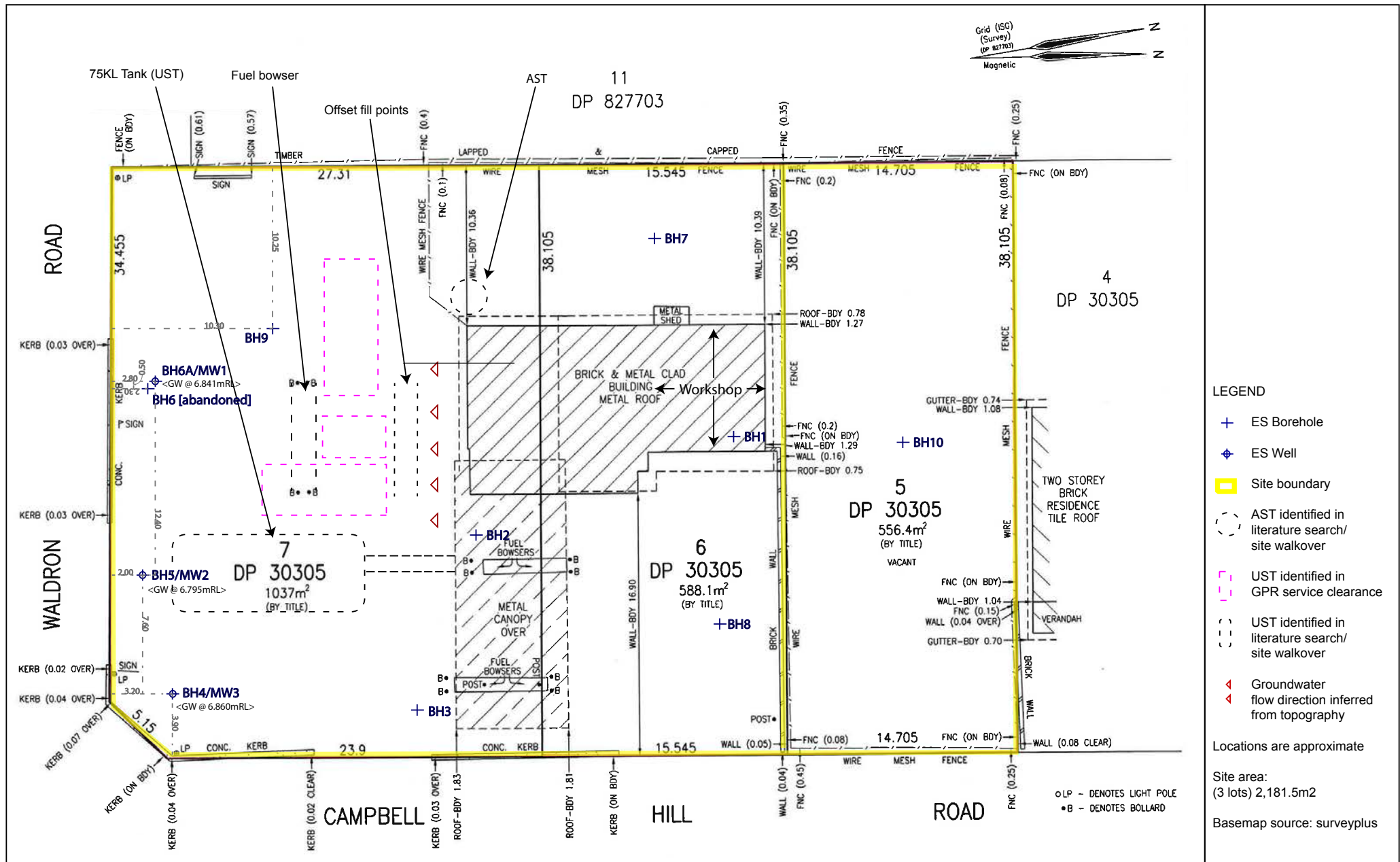


James Davis
NSW EPA Contaminated Land Site Auditor
Enviroview Pty Ltd

Appendix B: Site Location Plans



Appendix C: Environmental Site Assessment (Environmental Strategies, 2014) Figures



Appendix D:
Environmental Site Assessment (Environmental Strategies,
2014) Analytical Tables



Location	Depth	NFPM 2013 Lithology	pH	CEC	Logged Lithology																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Location	Depth	NEP# 2013 Lithology	pH	CEC	Logged Lithology																			
BH1	0.5	CLAY			Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	22
BH1	0.5	CLAY			Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	23
BH10	15	CLAY	5.3	15	Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	5.3	15
BH1	1	CLAY			Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	16
BH4	1	CLAY			Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	15
BH5	1	CLAY			Silty CLAY/Weathered SHALE	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	13
BH9	1	CLAY			Silty CLAY	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	12
BH6A	6.8	CLAY			Silty SHALE	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	13
BH5	7.5	CLAY			Silty CLAY/Weathered SHALE	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	11
BH6A	1	SILT			Silty CLAY/Weathered SILTSTONE	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	10
BH7	1	SILT			SILTSTONE	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	8
BH8	4	SILT			Weathered Siltstone	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	9.2
BH9	7	SILT			Clayey SILTSTONE/Silty CLAY above refusal	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	11
BH7	0.1	SAND			Roadbase	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	7	20
BH2	1.5	SAND			Silty CLAY above 50% lithics	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	22
BH2		SAND			Silty CLAY above Bolivar	<25	<50	<100	<100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<3	<1	-	13

[illegible]

Comments
A. Investigation levels apply to typical slightly-moderately disturbed systems.
B. GRAB1 was a screening sample of seepage water at MW1 which did not conform to standard QAQC procedures for water sampling. Different analytical methods were used and the sample should not be directly compared with groundwater well samples
#1 pH>6.5
#2 Criteria based on hardness value of 30mg/L CaCO₃

Appendix E: Detailed Site Investigation (Reditus, June 2022) Figures



Map 22065_rp01_f02_samplelocs_v01		Legend  Hand Auger Locations  Reditus Monitoring Well  Surface Potential Asbestos Containing Material (SPACM)  Existing Monitoring Wells - Environmental Strategies (2014)  Boreholes - Environmental Strategies (2014)	Figure 2 - Sample Locations 222 Waldron Rd, 138 & 140 Campbell Hill Rd, Chester Hill, NSW, 2162 22065 - Detailed Site Investigation Asset Geotechnical Engineering Pty Ltd
Date of Export 26/05/2022	Map Scale (approx. at A3) 1:677		
Author KS	Approver GB		
Data Source Metromap, Google Maps, Open Street			



Map 22065_rp01_f03_gwflow_v01		Legend  Site Boundary PS  Reditus Monitoring Well  Existing Monitoring Wells - Environmental Strategies (2014)  Inferred Flow Direction	Figure 3 - Groundwater SWLs and Inferred Flow Direction 222 Waldron Rd, 138 & 140 Campbell Hill Rd, Chester Hill, NSW, 2162 22065 - Detailed Site Investigation Asset Geotechnical Engineering Pty Ltd
Date of Export 14/06/2022	Map Scale (approx. at A3) 1:300		
Author KS	Approver GB		
Data Source Metromap, Google Maps, Open Street			

Appendix F: Detailed Site Investigation (Reditus, June 2022) Analytical Tables

Table 1 - Soil Results

Field ID	Date	Depth	Matrix Type	Asbestos		BTEX							TRH							TPH				
				Asbestos Identification - Soil	Asbestos Identification - Material	Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C40-C40 Fraction (Sum)	C6-C9 Fraction	C10-C14 Fraction	C15-C18 Fraction	C19-C26 Fraction	C10-C16 Fraction (Sum)
				Detect		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						1	0.2	0.5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
NEPM 2013 Table 1A(1) HILs Res A Soil																								
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >0m, <1m																								
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space						3	0.5	160	55			40		45 ^{#7}		110 ^{#8}								
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil						170																		
>0m, <2m							50	85	20			105		180 ^{#7}	120 ^{#8}	120 ^{#9}	300	2 300						
HA01	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA01	3/05/2022	0.5	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA02	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA03	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA03	3/05/2022	0.5	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA04	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	200	<100	200	<25	<50	140	<100	140
HA05	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	250	<100	250	<25	<50	170	110	280
HA05	3/05/2022	0.7	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA06	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	120	<100	120	<25	<50	<100	<100	<50
HA07	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA07	3/05/2022	0.6	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA08	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA08	3/05/2022	0.6	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA09	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA10	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA10	3/05/2022	0.6	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA11	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA12	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA12	3/05/2022	0.6	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA13	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA13	4/05/2022	0.7	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA13	4/05/2022	1	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA14	3/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA15	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA16	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA17	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA17	4/05/2022	0.4	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA18	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA19	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA19	4/05/2022	0.4	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA20	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
HA21	4/05/2022	0.1	Soil	ND		<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	100	100
HA21	4/05/2022	0.5	Soil			<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
SPACM1	3/05/2022	-	Other	AD																				
SPACM2	4/05/2022	-	Other	ND																				

Comments

- #1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
- #2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
- #3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
- #4 Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
- #5 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
- #6 Derived soil HSL exceeds soil saturation concentration
- #7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #8 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
- #9 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
- #10 ERRATA Updated 30 April 2014. Naphthalene should not be subtracted.
- #11 Errata 30 April 2014. Naphthalene should not be subtracted from >C
- AD = Asbestos Detect
- ND = Non-detect

Environmental Standards

- 2013, NEPM 2013 Table 1A(1) HILs Res A Soil
- 2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
- 2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

				PAH																	MC	Metals										
				Benz(b+g+h)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benz(a)pyrene	Benz(b)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzofluoranthene TEQ calc (half)	Benzofluoranthene TEQ (LOR)	Benzofluoranthene TEQ calc (Zero)	PAHs (Sum of positives)	Moisture Content	Aromatic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.2	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.05	0.1	4	0.4	1	1	1	0.1	1	1	
NEPM 2013 Table 1A(1) HILS Res A Soil																			3 ^{HI}	3 ^{HI}	3 ^{HI}			100 ^{HI}	20	100	6,000	300 ^{HI}	40 ^{HI}	400	7,400	
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m																3																
NEPM 2013 Table 1B(5) Generic EL - Urban Res & Public Open Space																170									100 ^{HI}		400		1100			
NEPM 2013 Table 1B(6) ESU for Urban Res, Coarse Soil >=0m, <2m									0.7																							
Field ID	Date	Depth	Matrix Type																													
HA01	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	15	6	<0.4	31	27	39	<0.1	33	69	
HA01	3/05/2022	0.5	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	22	<0.4	<0.4	17	37	17	<0.1	14	47	
HA02	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	21	7	<0.4	22	24	26	<0.1	11	37	
HA03	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	10	7	<0.4	36	21	22	<0.1	29	46	
HA03	3/05/2022	0.5	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	17	9	<0.4	22	26	21	<0.1	26	41	
HA04	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	12	5	<0.4	28	45	18	0.2	25	63	
HA05	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	20	7	<0.4	31	35	29	0.1	26	79	
HA05	3/05/2022	0.7	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05	19	8	<0.4	20	20	17	<0.1	9	31	
HA06	3/05/2022	0.1	Soil	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1																			

Table 1 - Soil Results

[illegible]

Table 1 - Soil Results

	Organophosphorous Pesticides													PCBs							
	Azinophos methyl	Bromophos ethyl	Chlorpyrifos	Chlorpyrifos methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Romnel	Anchlor 1016	Anchlor 1221	Anchlor 1232	Anchlor 1242	Anchlor 1248	Anchlor 1254	Anchlor 1260	PCBs (Sum of total)	
COL	mg/kg	mg/kg	me/kg	mg/kg	mg/kg	mg/kg	me/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
NEPMI 2013 Table 1A(1) HILs Res A Soil	0.1	0.1	160										0.1	0.1	0.1	0.1	0.1	0.1	0.1	1 ¹⁶	
NEPMI 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m																					
NEPMI 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																					
NEPMI 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil >=0m, <2m																					
Field ID	Date	Depth	Matrix Type																		
HA01	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA01	3/05/2022	0.5	Soil																		
HA02	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA03	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA03	3/05/2022	0.5	Soil																		
HA04	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA05	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA05	3/05/2022	0.7	Soil																		
HA06	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA07	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA07	3/05/2022	0.6	Soil																		
HA08	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA08	3/05/2022	0.6	Soil																		
HA09	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA10	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA10	3/05/2022	0.6	Soil																		
HA11	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA12	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA12	3/05/2022	0.6	Soil																		
HA13	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA13	4/05/2022	0.7	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA13	4/05/2022	1	Soil																		
HA14	3/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA15	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA16	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA17	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA17	4/05/2022	0.4	Soil																		
HA18	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA19	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA19	4/05/2022	0.4	Soil																		
HA20	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA21	4/05/2022	0.1	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
HA21	4/05/2022	0.5	Soil																		
SPACM1	3/05/2022	-	Other																		
SPACM2	4/05/2022	-	Other																		

Table 2 - Groundwater Results

	BTEX						TRH							TPH				
	Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	C6- C10 Fraction (F1)	C6- C10 (F1 minus BTEX)	>C10- C16 Fraction (F2)	>C10- C16 Fraction (F2 minus Naphthalene)	>C16- C34 Fraction (F3)	>C34- C40 Fraction (F4)	>C10- C40 Fraction (Sum)	C6- C9 Fraction	C10- C14 Fraction	C15- C28 Fraction	C29- C36 Fraction	C10- C36 Fraction (Sum)
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL	1	1	1	1	2	1	10	10	50	50	100	100	50	10	50	100	100	50
ANZG (2018) Freshwater 95% LOSP Toxicant DGVs	16 ^{#1}	950 ^{#1}	180 ^{#1}	80 ^{#1}		350 ^{#1}												
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand																		
>=2m, <4m	NL	800	NL	NL				1,000 ^{#9}		1,000 ^{#10}								
>=4m, <8m	NL	800	NL	NL				1,000		1,000								
>=8m	NL	900	NL	NL				1,000		1,000								
Field ID	Date	Matrix Type																
MW1_170522	17/05/2022	Water	<1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100
MW2_170522	17/05/2022	Water	<1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100
MW3_170522	17/05/2022	Water	<1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100
MW4_170522	17/05/2022	Water	<1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100

Comments

- #1 Low reliability
- #2 Moderate reliability
- #3 Unknown reliability. Recommended for application for slightly to moderately disturbed ecosystems.
- #4 Unknown reliability
- #5 Very high reliability
- #6 High reliability
- #7 Low reliability. DGV may not protect key test species from chronic toxicity (this refers to experimental chronic values or geometric mean for species). Check toxicant DGV technical brief for spread of data and its significance.
- #8 Very Low reliability
- #9 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Environmental Standards

ANZG, March 2021, ANZG (2018) Freshwater 95% LOSP Toxicant DGVs
2013, NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand

Table 2 - Groundwater Results

			PAH																
			Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ	PAHs (Sum of positives)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL			0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.5	0.1
ANZG (2018) Freshwater 95% LOSP Toxicant DGVs						0.4 ^{RI}		0.2 ^{RI}				1.4 ^{RI}			16 ^{RI}	2 ^{RI}			
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand																			
>=2m, <4m															NL				
>=4m, <8m															NL				
>=8m															NL				
Field ID	Date	Matrix Type																	
MW1_170522	17/05/2022	Water	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.5	<0.1
MW2_170522	17/05/2022	Water	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.5	<0.1
MW3_170522	17/05/2022	Water	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.5	<0.1
MW4_170522	17/05/2022	Water	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.5	<0.1

[illegible]

Table 2 - Groundwater Results

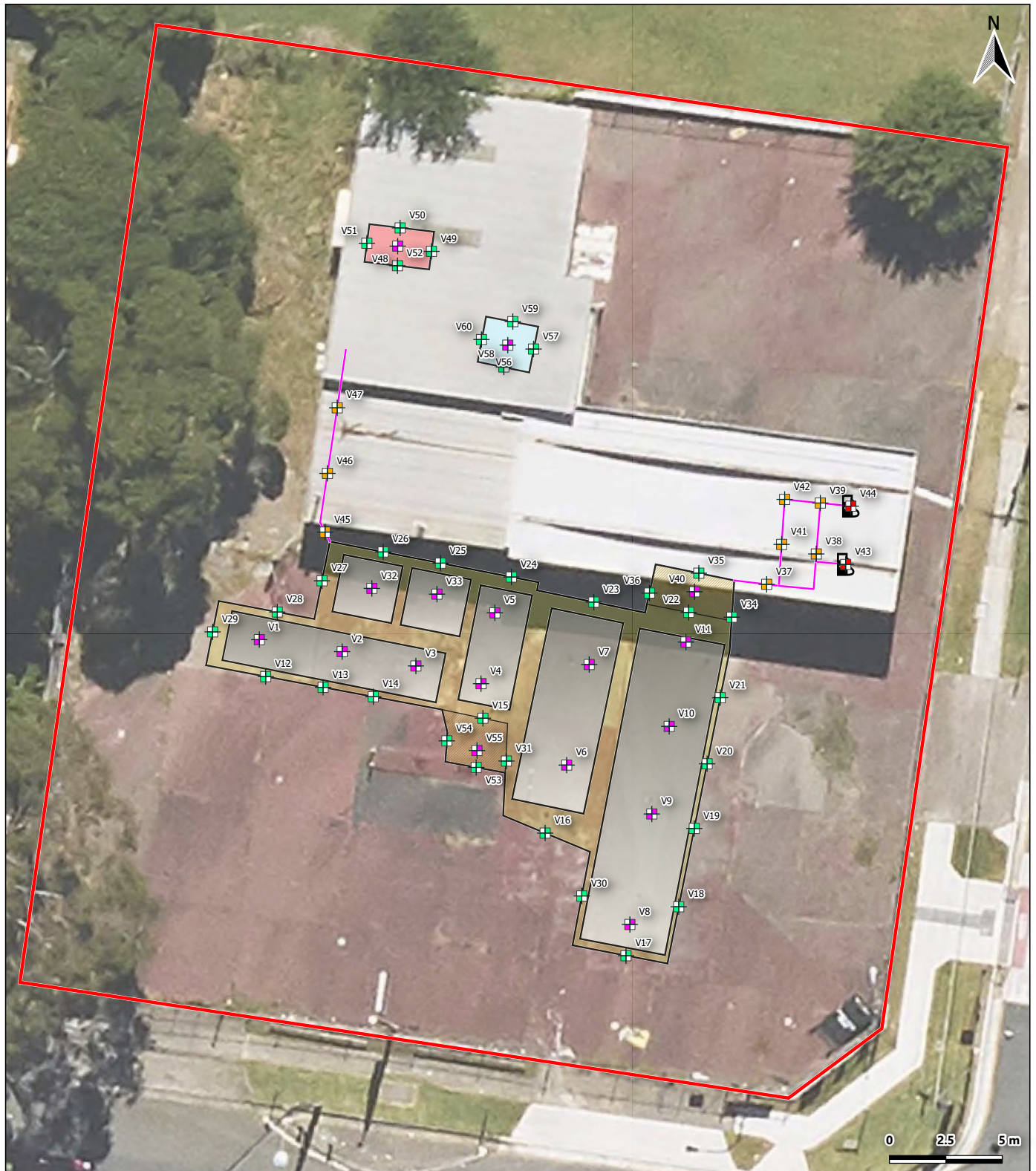
			VOCs																				
			1,2-dibromo-3-chloropropane	1,2-dibromoethane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,1,3,5-trimethylbenzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	10
ANZG (2018) Freshwater 95% LOSP Toxicant DGVs					160 ¹⁰²	1,900 ¹⁰³	900 ¹⁰³		260 ¹⁰²	1,100 ¹⁰³	60 ¹⁰³									240 ¹⁰³	55 ¹⁰³		
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand																							
>=2m, <4m																							
>=4m, <8m																							
>=8m																							
Field ID	Date	Matrix Type																					
MW1_170522	17/05/2022	Water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<10
MW2_170522	17/05/2022	Water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<10
MW3_170522	17/05/2022	Water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<10
MW4_170522	17/05/2022	Water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<10

[illegible]

Appendix G: Validation Report (Reditus, October 2023) Figures



Map 22137_RP02_f02_sitelayout_v01		Legend Site Boundary UST Locations TIT Location Hoist Location Dispenser Locations Delivery Lines Surveyed UST Excavation Surveyed UST Excavation Chase Out Areas		Figure 2 - Site Layout 140 Campbell Hill Road, Chester Hill NSW 22137 - UPSS Decomissioning & Validation Report The Abel Tasman Village Association Limited	
Date of Export	Map Scale (approx. at A3)				
08/09/2023	1:180				
Author	Approver				
JP	GB				
Data Source Metromap, Google Maps, Open Street Map,					



Map 22137_RP02_f03_valsamples_v01		Legend		Figure 3 - Validation Sample Locations 140 Campbell Hill Road, Chester Hill NSW 22137 - UPSS Decomissioning & Validation Report The Abel Tasman Village Association Limited	
Date of Export 08/09/2023	Map Scale (approx. at A3) 1:170	 Site Boundary  UST Locations  TIT Location  Hoist Location  Dispenser Locations	Delivery Lines  Surveyed UST Excavation  UST Excavation Chase Out Areas		Validation Sample Locations  Wall Sample  Base Sample  Dispenser Sample  Delivery Line Sample
Author JP	Approver GB				
Data Source Metromap, Google Maps, Open Street Map, Geoscience Australia					



Map 22137_RP02_f04_spsamples_v01		Legend  Site Boundary  Stockpile Locations  Stockpile Samples Locations	Figure 4 - Stockpile Sample Locations 140 Campbell Hill Road, Chester Hill NSW 22137 - UPSS Decomissioning & Validation Report The Abel Tasman Village Association Limited
Date of Export 08/09/2023	Map Scale (approx. at A3) 1:170		
Author JP	Approver GB		
Data Source Metromap, Google Maps, Open Street Map, Geoscience Australia			

Appendix H: Validation Report Tables

Table 1

Final Soil Validation Results
(Residential B Criteria)

						Asbestos	BTEX								TRH								TPH							
						Asbestos Identification in Soil																								
						Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylenes (m & p)	Xylenes (o)	Xylenes Total	Total BTEX	Chloro Fraction (F1)	Chloro Fraction (F2)	Chloro Fraction (F2 minus Naphthalene)	Chloro Fraction (F3)	Chloro Fraction (F4)	Chloro Fraction (Sum)	Chloro Fraction	Chloro Fraction	Chloro Fraction	Chloro Fraction (Sum)							
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
LOR						1	0.2	0.5	0.5	0.5	0.5	0.5	0.2	10	10	50	50	100	100	50	10	10	100	100						
NEPM 2013 Table 1A(1) HILs Res B Soil																														
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																														
>=0m, <1m						5	0.7	480	NL ¹⁷			110				50 ¹⁸	280 ¹⁹													
>=1m, <2m						NL ¹⁷	1	NL ¹⁷	NL			310				90	NL ¹⁷													
>=2m, <4m						NL	2	NL	NL			NL ¹⁷				150	NL													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space						170																								
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2 m)							65	105	125			45				180 ¹⁴	120 ¹⁵	120 ¹⁴	1,300	5,000										
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil													800 ¹⁴		1,000 ¹⁴			3,500	10,000											
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																									
V1	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V1 - (TRIPLICATE)	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
DUP1	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
TRIP1	3	20 Jul 2023	ES2324574	Soil		<1	<0.2	<0.5	<1	<2	<1	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V3	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V4	3.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V5	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V6	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
DUP2	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
TRIP2	3	20 Jul 2023	ES2324574	Soil		<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V7	3.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V8	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V9	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V10	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V11	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V11 - (TRIPLICATE)	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V12	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V12	2.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
DUP3	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
TRIP3	0.3	20 Jul 2023	ES2324574	Soil		<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V13	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V13	2.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V14	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V14	2.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V15	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V16	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V16	2.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V16 - (TRIPLICATE)	2.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V17	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V17	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V18	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V18	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V19	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V19	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V20	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V20	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V21	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V21	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V21 - (TRIPLICATE)	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100						
V22	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<							

Table 1
Final Soil Validation Results
(Residential B Criteria)

					Asbestos	BTEX										TRH										TPH				
					Asbestos Identification in Soil	Naphthalene (BTEX)		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	Cl-C10 Fraction (F1)	Cl-C10 (F1 minus BTEX)	Cl-C16 Fraction (F2)	Cl-C16 Fraction (F2 minus Naphthalene)	Cl-C14 Fraction (F3)	Cl-C14 Fraction (F4)	Cl-C10 Fraction (Sum)	Cl-C9 Fraction	Cl-C14 Fraction	Cl-C15-C18 Fraction	Cl-C15-C18 Fraction (Sum)					
					Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
LOR						1	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.2	10	10	50	50	100	100	50	10	50	100	100	50				
NEPM 2013 Table 1A(1) Hills Res B Soil																														
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																														
>=0m, <1m						5	0.7	480	NL ^{#7}			110				50 ^{#8}		280 ^{#9}												
>=1m, <2m						NL ^{#7}	1	NL ^{#7}	NL			310				90		NL ^{#7}												
>=2m, <4m						NL	2	NL	NL			NL ^{#7}				150		NL												
NEPM 2013 Table 1B(6) Generic EIL - Urban Res & Public Open Space						170				125			45																	
NEPM 2013 Table 1B(6) EILs for Urban Res, Fine Soil (0-2 m)							65	105																						
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil															800 ^{#14}	180 ^{#11}	120 ^{#12}	120 ^{#13}	1,300	5,600										
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																									
V32	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V32	3	20 Jul 2023	328660-B	Soil		<1	<0.2	<0.5	<1	<2	<1			<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V33	3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V33	3	20 Jul 2023	328660-B	Soil		<1	<0.2	<0.5	<1	<2	<1			<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V34	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V35	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V36	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V37	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V38	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V39	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V40	1	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V41	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V42	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V43	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
DUP4	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
TRIP4	0.3	20 Jul 2023	ES2324574	Soil		<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50					
V44	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V45	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V46	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V47	0.5	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V50b	0.9	08 Aug 2023	329997	Soil										<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V53	0.3	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V53 (TRIPLICATE)	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V54	1	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V55	0.6	20 Jul 2023	328660	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V56 0.5	0.5	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V56 2.0	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V57 0.5	0.5	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V57 2.0	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V58 0.5	0.5	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	220	<100	220	<25	<50	220	<100	220					
V58 2.0	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V59 0.5	0.5	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	340	<100	340	<25	<50	320	<100	320					
DUPS	02 Aug 2023	329488	Soil			<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
TRIPS	02 Aug 2023	ES2325940	Soil			<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50					
V59 2.0	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	290	110	400	<25	<50	120	230	350					
V60	2	02 Aug 2023	329488	Soil		<1	<0.2	<0.5	<1	<2	<1	<1		<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V61	1.8	08 Aug 2023	329997	Soil										<25	<25	75	<50	80	<25	64	<25	<50	<100	<100	60					
V62	0.9	08 Aug 2023	329997	Soil										<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					
V63	0.9	08 Aug 2023	329997	Soil										<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50					

Comments

ND = Non-detect

- #1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEF calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
- #2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEF HIL) & naphthalene (should meet relevant HSL)
- #3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
- #4 Lead: HILs A,B,C based on blood lead models (EILB) & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
- #5 Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
- #6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
- #7 Derived soil HSL exceeds soil saturation concentration
- #8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #9 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.
- #10 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
- #11 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
- #12 ERRATA Updated 30 April 2014. Naphthalene should not be subtracted.
- #13 Errata 30 April 2014. Naphthalene should not be subtracted from <C
- #14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
- #15 NEPM HIL-B criteria for Chromium (VI) adopted in the absence of criteria for Chromium (III-VI)

Environmental Standards

2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) EILs for Urban Res, Fine Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

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Table 1
Final Soil Validation Results
(Residential B Criteria)

					PAH																		Metals											
					Benzo(b)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc. (half)	Benzo(a)pyrene TEQ (LOR)	PAHs (Sum of total)	PAHs (Sum of positives)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR					0.2	0.1	0.1	0.1	0.1	0.05	0.5	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	400 ^{#1}	0.05	500 ^{#2}	150	500 ^{#3}	30,000	1,200 ^{#4}	120 ^{#5}	1,200	60,000
NEPM 2013 Table 1A(1) HILs Res B Soil																																		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																																		
>=0m, <1m																																		
>=1m, <2m																																		
>=2m, <4m																																		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2 m)										0.7																								
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																																		
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																													
V32	3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	<4	<0.4	10	40	21	<0.1	17	63	
V32	3	20 Jul 2023	328660-B	Soil																														
V33	3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	<4	<0.4	6	27	18	<0.1	39	70	
V33	3	20 Jul 2023	328660-B	Soil																														
V34	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	18	<0.4	17	35	20	<0.1	5	30	
V35	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	18	<0.4	20	37	21	<0.1	5	27	
V36	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	6	<0.4	7	40	12	<0.1	3	21	
V37	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	12	<0.4	16	31	17	<0.1	4	23	
V38	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	12	<0.4	30	24	22	<0.1	7	33	
V39	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	15	<0.4	17	29	16	<0.1	5	40	
V40	1	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	<4	<0.4	4	29	13	<0.1	3	22	
V41	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	10	<0.4	25	22	19	<0.1	7	46	
V42	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	14	<0.4	19	35	19	<0.1	4	23	
V43	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	15	<0.4	17	32	20	<0.1	4	31	
DUP4	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	16	<0.4	22	34	22	<0.1	4	23	
TRIP4	0.3	20 Jul 2023	ES2324574	Soil		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5								
V44	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	12	<0.4	13	26	13	<0.1	3	19	
V45	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	9	<0.4	18	24	19	<0.1	4	36	
V46	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	9	<0.4	25	17	16	<0.1	6	27	
V47	0.5	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	15	<0.4	27	26	38	<0.1	8	280	
V50b	0.9	08 Aug 2023	329997	Soil																														
V53	0.3	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	6	<0.4	15	25	12	<0.1	6	29	
V53 - (TRIPLICATE)	2	02 Aug 2023	329488	Soil																														
V54	1	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	18	<0.4	9	14	5	<0.1	24	65	
V55	0.6	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	7	<0.4	13	46	24	<0.1	7	78	
V56	0.5	02 Aug 2023	329488	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	10	<0.4	25	20	15	<0.1	7	27	
V56	2.0	2	02 Aug 2023	329488	Soil																													
V57	0.5	02 Aug 2023	329488	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	7	<0.4	14	25	17	<0.1	4	21	
V57	2.0	2	02 Aug 2023	329488	Soil																													
V58	0.5	02 Aug 2023	329488	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	10	<0.4	15	35	20	<0.1	3	22	
V58	2.0	2	02 Aug 2023	329488	Soil																													
V59	0.5	02 Aug 2023	329488	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	9	<0.4	10	12	5	<0.1	26	150	
DUPS	0.2	02 Aug 2023	329488	Soil		<0.2	<0																											

Comments
ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 conc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appro
#4 Lead: HILs A,B,C based on blood lead models (TELRL & HIL D on adult lead model) where 5

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Environmental Standards
 2013, NEPM 2013 Table 1A(1) Hills Res B Soil
 2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
 2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil
 NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

[illegible]

Table 1
Final Soil Validation Results
(Residential B Criteria)

						VOCs																								
						Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Cyclohexane	Dibromomethane	Dichlorodifluoromethane	Hexachlorocyclopentadiene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	Trichloroethene	tert-butylbenzene	Tetrachloroethene	trans-1,2-dichloroethane	trans-1,3-dichloropropene	Trichlorofluoromethane	Vinyl chloride	
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(1) HILs Res B Soil																														
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																														
>=0m, <1m																														
>=1m, <2m																														
>=2m, <4m																														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2 m)																														
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																														
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																									
V32	3	20 Jul 2023	328660	Soil																										
V32	3	20 Jul 2023	328660-B	Soil		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
V33	3	20 Jul 2023	328660-B	Soil		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
V34	0.5	20 Jul 2023	328660	Soil																										
V35	0.5	20 Jul 2023	328660	Soil																										
V36	0.5	20 Jul 2023	328660	Soil																										
V37	0.3	20 Jul 2023	328660	Soil																										
V38	0.3	20 Jul 2023	328660	Soil																										
V39	0.3	20 Jul 2023	328660	Soil																										
V40	1	20 Jul 2023	328660	Soil																										
V41	0.3	20 Jul 2023	328660	Soil																										
V42	0.3	20 Jul 2023	328660	Soil																										
V43	0.3	20 Jul 2023	328660	Soil																										
DUP4	0.3	20 Jul 2023	328660	Soil																										
TRIP4	0.3	20 Jul 2023	ES2324574	Soil																										
V44	0.5	20 Jul 2023	328660	Soil																										
V45	0.5	20 Jul 2023	328660	Soil																										
V46	0.5	20 Jul 2023	328660	Soil																										
V47	0.5	20 Jul 2023	328660	Soil																										
V50b	0.9	08 Aug 2023	329997	Soil																										
V53	0.3	20 Jul 2023	328660	Soil																										
V53 - (TRIPLICATE)	2	02 Aug 2023	329488	Soil																										
V54	1	20 Jul 2023	328660	Soil																										
V55	0.6	20 Jul 2023	328660	Soil																										
V56_0.5	0.5	02 Aug 2023	329488	Soil																										
V56_2.0	2	02 Aug 2023	329488	Soil																										
V57_0.5	0.5	02 Aug 2023	329488	Soil																										
V57_2.0	2	02 Aug 2023	329488	Soil																										
V58_0.5	0.5	02 Aug 2023	329488	Soil																										
V58_2.0	2	02 Aug 2023	329488	Soil																										
V59_0.5	0.5	02 Aug 2023	329488	Soil																										
DUP5		02 Aug 2023	329488	Soil																										
TRIP5		02 Aug 2023	ES2325940	Soil																										
V59_2.0	2	02 Aug 2023	329488	Soil																										
V60	2	02 Aug 2023	329488	Soil																										
V61	1.8	08 Aug 2023	329997	Soil																										
V62	0.9	08 Aug 2023	329997	Soil																										
V63	0.9	08 Aug 2023	329997	Soil																										

Comments
ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAH:
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where asprc
#4 Lead: HILs A,B,C based on blood lead models (EUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-s
#5 Elemental mercury: HIL does not address elemental mercury, a site-specific assessment should be considered if elemental mercur
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exp
#7 Derived soil HSL exceeds soil saturation concentration
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract naphthalene from the <C10 - C16 fraction.
#10 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#11 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#12 ERRATA Updated 30 April 2014 : Naphthalene should not be subtracted.
#13 Errata 30 April 2014. Naphthalene should not be subtracted from <C
#14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fractio
#15 NEPM HIL-B criteria for Chromium (VI) adopted in the absence of criteria for Chromium (III+VI)

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

Table 1
Final Soil Validation Results
(Residential B Criteria)



						Phenols												
						3,6,4-Methylphenol (m&g-cresol)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Phenol	Phenols Total
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LCR						1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	130	45,000	5
NEPM 2013 Table 1A(1) HILs Res B Soil																		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																		
>>0m, <1m																		
>>1m, <2m																		
>>2m, <4m																		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2 m)																		
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																		
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code													
V1	3	20 Jul 2023	328660	Soil														
V1 - (TRIPPLICATE)	3	20 Jul 2023	328660	Soil														
DUP1	3	20 Jul 2023	328660	Soil														
TRIP1	3	20 Jul 2023	ES2324574	Soil														
V2	3	20 Jul 2023	328660	Soil														
V3	3	20 Jul 2023	328660	Soil														
V4	3.5	20 Jul 2023	328660	Soil														
V5	3	20 Jul 2023	328660	Soil														
V6	3	20 Jul 2023	328660	Soil														
DUP2	3	20 Jul 2023	328660	Soil														
TRIP2	3	20 Jul 2023	ES2324574	Soil														
V7	3.5	20 Jul 2023	328660	Soil														
V8	3	20 Jul 2023	328660	Soil														
V9	3	20 Jul 2023	328660	Soil														
V10	3	20 Jul 2023	328660	Soil														
V11	3	20 Jul 2023	328660	Soil														
V11 - (TRIPPLICATE)	3	20 Jul 2023	328660	Soil														
V12	0.3	20 Jul 2023	328660	Soil														
V12	2.5	20 Jul 2023	328660	Soil														
DUP3	0.3	20 Jul 2023	328660	Soil														
TRIP3	0.3	20 Jul 2023	ES2324574	Soil														
V13	0.3	20 Jul 2023	328660	Soil														
V13	2.5	20 Jul 2023	328660	Soil														
V14	0.3	20 Jul 2023	328660	Soil														
V14	2.5	20 Jul 2023	328660	Soil														
V15	3	20 Jul 2023	328660	Soil														
V16	0.3	20 Jul 2023	328660	Soil														
V16	2.5	20 Jul 2023	328660	Soil														
V16 - (TRIPPLICATE)	2.5	20 Jul 2023	328660	Soil														
V17	0.3	20 Jul 2023	328660	Soil														
V17	3	20 Jul 2023	328660	Soil														
V18	0.3	20 Jul 2023	328660	Soil														
V18	3	20 Jul 2023	328660	Soil														
V19	0.3	20 Jul 2023	328660	Soil														
V19	3	20 Jul 2023	328660	Soil														
V20	0.3	20 Jul 2023	328660	Soil														
V20	3	20 Jul 2023	328660	Soil														
V21	0.3	20 Jul 2023	328660	Soil														
V21	3	20 Jul 2023	328660	Soil														
V21 - (TRIPPLICATE)	3	20 Jul 2023	328660	Soil														
V22	3	20 Jul 2023	328660	Soil														
V23	0.3	20 Jul 2023	328660	Soil														
V23	2.5	20 Jul 2023	328660	Soil														
V24	0.3	20 Jul 2023	328660	Soil														
V24	2.5	20 Jul 2023	328660	Soil														
V25	0.3	20 Jul 2023	328660	Soil														
V25	0.3	20 Jul 2023	328660-8	Soil														<5
V25	2.5	20 Jul 2023	328660	Soil														
V25	2.5	20 Jul 2023	328660-8	Soil														<5
V26	0.3	20 Jul 2023	328660	Soil														
V26	0.3	20 Jul 2023	328660-8	Soil														<5
V26	2.5	20 Jul 2023	328660	Soil														
V26	2.5	20 Jul 2023	328660-8	Soil														<5
V26 - (TRIPPLICATE)	2.5	20 Jul 2023	328660	Soil														
V27	0.3	20 Jul 2023	328660	Soil														
V27	0.3	20 Jul 2023	328660-8	Soil														<5
V27	2.5	20 Jul 2023	328660	Soil														
V27	2.5	20 Jul 2023	328660-8	Soil														<5
V28	0.3	20 Jul 2023	328660	Soil														
V28	2.5	20 Jul 2023	328660	Soil														
V29	0.3	20 Jul 2023	328660	Soil														
V29	2.5	20 Jul 2023	328660	Soil														
V30	0.3	20 Jul 2023	328660	Soil														
V30	3	20 Jul 2023	328660	Soil														
V31	0.3	20 Jul 2023	328660	Soil														
V31	2.5	20 Jul 2023	328660	Soil														

Comments

ND - Not detected

#1 Carcinogenic PAHs: HI, based on Co. C. PAHs & their TEFs (ref to BaP /ref Schedule 7) BaP TEQ calc by multiplying the conc of each PAH by its TEF and sum of 16 most common reported (WHO RB) HI. Application should consider presence of carcinogenic PAHs

#3 Arsenic: HI assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate

#4 Lead: HI uses A,B,C based on blood lead levels (IEUBK & HI, D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability may be important

#5 Elemental mercury: HI does not address elemental mercury. A site-specific assessment should be considered if elemental mercury is present

#6 PCBs: HI refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure is required

#7 Dieldrin soil HSE, exceeds soil saturation concentration

#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#9 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

#10 AGE values apply to arsenic contamination present in soil > 2 years. Refer Moderate RSCs for < 2 years.

#11 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#12 ERRATA Updated 30 April 2014. Naphthalene should not be subtracted.

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#14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fraction

#15 NEPM HI-L criteria for Chromium (VII) adopted in the absence of criteria for Chromium (III+VI)

Environmental Standards

2013, NEPM 2013 Table 1A(1) HI-Ls Res Soil

2013, NEPM 2013 Table 1A(3) Res A/B Soil For Vapour Intrusion, Clay

2013, NEPM 2013 Table 1A(7) ESs for Urban Res, Fine Soil

2013, NEPM 2013 Table 1A(7) Management Limits for Urban Res, Fine Soil

2013, NEPM 2013 Table 1A(7) Management Limits for Urban Res, Fine Soil

Table 2
Soil Stockpile Analytical Results
(Residential B Criteria)

						Asbestos										BTEX										TPH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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						Naphthalene (BTEX)										Benzene										Toluene										Ethylbenzene										Xylene (m & p)										Xylene (o)										Xylene Total										Total BTEX										GC-C10 Fraction (F1)										GC-C10 (F1 minus BTEX)										GC-C10-C16 Fraction (F2)										GC-C10-C16 Fraction (F2 minus Naphthalene)										GC-C15-C18 Fraction (F3)										GC-C14-C18 Fraction (F4)										GC-C10-C18 Fraction (Sum)										GC-C9 Fraction										GC-C14-Fraction										C15-C18 Fraction										C19-C18 Fraction										C10-C16 Fraction (Sum)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Comments

- ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEQ (ref Table 1A(1)) & summing
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL)
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered). Site-specific bioavailability should be considered where appropriate.
#5 Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#7 Derived soil HSL exceeds soil saturation concentration
#8 To obtain F1 subtract the sum of BTEX concentrations from the GC - C10 fraction.
#9 To obtain F2 subtract naphthalene from the <C10 - C16 fraction.
#10 Aged values apply to arsenic contamination

Table 2
Soil Stockpile Analytical Results
(Residential B Criteria)



PAH																		Metals														
	Benzo(b)-h-fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(g,h,i)-perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (H4H)	Benzo(a)pyrene TEQ (LOQ)	PM10 (sum of total)	PM10 (sum of positive)	Arsenic	Cadmium	Chromium (B+V)	Copper	Lead	Mercury	Nickel	Zinc					
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
NEPM 2013 Table 1A(1) HILS Res B Soil	0.2	0.1	0.1	0.1	0.1	0.05	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	400 ^{HL}	0.05	500 ^{HL}	150	500 ^{HL}	30,000	1,200 ^{HL}	120 ^{HL}	1,200	60,000					
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																																
>0m, <1m													5																			
>1m, <2m													NL ^{HL}																			
>2m, <4m													NL																			
NEPM 2013 Table 1B(5) Generic EL - Urban Res & Public Open Space																																
NEPM 2013 Table 1B(6) ESUs for Urban Res, Fine Soil (0-2 m)						0.7							170							100 ^{HL}												
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																																
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																											
Soils Reinstated On Site																																
SP01-1	0.3	20 Jul 2023	328659	Soil	SP01	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		<0.05	<4	<0.4	5	7	24	<0.1	4	44	
SP01-1 - (TRIPPLICATE)	0.3	20 Jul 2023	328659	Soil																				<4	<0.4	4	7	23	<0.1	4	41	
SP-DUP1	0.6	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	4	6	18	<0.1	3	35		
SP-THP1	0.6	20 Jul 2023	ES2324578	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	5	6	25	<0.1	3	38		
SP01-2	0.3	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	3	1	3	<0.1	1	20		
SP01-3	0.3	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	10	9	51	<0.1	4	90		
SP01-4	0.3	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	10	<0.4	20	15	16	<0.1	6	21		
SP02-1	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	5	5	9	<0.1	4	30		
SP02-1	1	20 Jul 2023	328659-A	Soil																												
SP02-2	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	3	4	7	<0.1	2	24	
SP02-3	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	3	2	3	<0.1	2	8	
SP02-4	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.2	6	<0.4	13	17	37	<0.1	5	240	
SP02-4	1	20 Jul 2023	328659-A	Soil																												
SP02-5	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	4	7	24	<0.1	4	31	
SP02-6	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	5	23	13	<0.1	10	39	
SP02-7	1	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.1	<4	<0.4	2	2	3	<0.1	3	8	
SP02-7 - (TRIPPLICATE)	1	20 Jul 2023	328659	Soil																												
SP02-8	1	20 Jul 2023	328659	Soil		SP02	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	3	4	3	<0.1	4	11
SP02-8	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	9	<0.4	20	20	<0.1	7	30		
SP02-9	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	4	8	8	<0.1	5	32	
SP02-10	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	11	<0.4	15	31	14	<0.1	4	22	
SP02-10	1	20 Jul 2023	328659-A	Soil																												
SP02-11	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	7	<0.4	21	25	20	<0.1	8	42	
SP02-12	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.1	<4	<0.4	4	10	20	<0.1	3	62	
SP02-13	1	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.1	8	<0.4	11	39	20	<0.1	8	54	
SP02-13	1	20 Jul 2023	328659-A	Soil																												
SP04-1	0.2 Aug 2023	329488	Soil	SP04	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.1	<4	<0.4	8	22	7	<0.1	22	81		
SP05-1	08 Aug 2023	329997	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	12	<0.4	10	57	28	<0.1	10	87		
SP05-2	08 Aug 2023	329997	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	7	3	17	140	200	<0.1	23	300		
SP05-3	08 Aug 2023	329997	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.1	<4	<0.4	8	36	13	<0.1	13	79		
Soils Disposed Off-site																																
SP03-1	0.5	20 Jul 2023	328659	Soil	SP03	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5		1.9	15	<0.4	15	28	15	<0.1	5	26	
SP-DUP3	20 Jul 2023	328659	Soil	<0.2		<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	0.50	<4	0.4	7	46	65	<0.1	8	91		
SP-THP3	0.6	21 Jul 2023	ES2324578	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5		<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.6	1.2	<0.5	<4	<0.4	7	12	36	30	<0.1	9	91
SP03-2	0.5	20 Jul 2023	328659	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	9	15	9	<0.1	23	91	
SP03-3	0.5	20 Jul 2023	328659	Soil		<0.1	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	8	5	26	79	<0.1	3	82	
V48			328660-A	Soil																												
V48	1.2	20 Jul 2023	328660	Soil		<0.2	<0.1	<0.1	<0.1	<0.1	<0.05		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	<4	<0.4	9	18	10	<0.1	13	89	
V49			328660-A	Soil																												
V49	0.6	20 Jul 2023																														

Table 2

Soil Stockpile Analytical Results (Residential B Criteria)

[illegible]

Comments

ND - Not detected

X1 Carcinogenic: PAHs, HPL based on carb. PAHs and their TEFs (ref to BaP and MeB[a]P) BaP TEF calc by multiplying the conc of each PAH by its TEF and sum of 16 most common reported (WHO SB). Hs application should consider presence of carcinogenic PAHs

X2 Arocloric: Hs assumes 70% bioavailability. Site-specific bioavailability schedule may be considered and should be considered where appropriate

X3 Lead: Hs, AEs based on blood lead models (EILUK & H) Do adult lead model for where 50% bioavailability is considered. Site-specific bioavailability schedule may be considered and should be considered where appropriate

X4 PCBs: Hs based on non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure is required

X7 Derived soil Hs, exceeds soil saturation concentration

X8 To obtain F12 subtract the sum of BTEX concentration from the C6 - C10 fraction

X9 To obtain F2 subtract naphthalene from the C6 - C10 fraction

X10 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B6 for C6 - C10 years.

X11 Moderate reliability: To obtain F1 subtract the sum of soil > 2 years. Refer Schedule B6 for C6 - C10 years.

X12 ERBA (Updated 30 April 2014). Naphthalene should be subtracted from the C6 - C10 fraction

X13 Erasta 30 April 2014. Naphthalene should not be subtracted from C6 - C10

X14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fraction

Environmental Standards

2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil
NEPM NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

Table 2
Soil Stockpile Analytical Results
(Residential B Criteria)

						VOCs																						SVOCs				
						Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	o-1,2-dichlorobenzene	p-1,2-dichlorobenzene	Cyclohexane	Dibromomethane	Dibromodifluoromethane	Hexachlorobutadiene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropylbenzene	sec-butylbenzene	Styrene	Trichloroethane	tert-butylbenzene	Tetrachloroethane	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane	Vinyl chloride	Benzenes	Phthalene	
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.05	0.1
NEPM 2013 Table 1A(1) Hills Res B Soil																																
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																																
>=0m, <1m																																
>=1m, <2m																																
>=2m, <4m																																
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																																
NEPM 2013 Table 1B(6) ESUs for Urban Res, Fine Soil (0-2 m)																																
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																																
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																											
Soils Reinstated On-Site																																
SP01-1	0.3	20 Jul 2023	328659	Soil	SP01																											
SP01-1 - (TRIPPLICATE)	0.3	20 Jul 2023	328659	Soil																												
SP-DUP1	0.6	20 Jul 2023	ES2324578	Soil																												
SP01-2	0.3	20 Jul 2023	328659	Soil																												
SP01-3	0.3	20 Jul 2023	328659	Soil																												
SP01-4	0.3	20 Jul 2023	328659	Soil																												
SP02-1	1	20 Jul 2023	328659	Soil																												
SP02-2	1	20 Jul 2023	328659-A	Soil		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
SP02-3	1	20 Jul 2023	328659	Soil																												
SP02-4	1	20 Jul 2023	328659	Soil																												
SP02-5	1	20 Jul 2023	328659-A	Soil	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
SP02-6	1	20 Jul 2023	328659	Soil																												
SP02-7	1	20 Jul 2023	328659	Soil																												
SP02-7	1	20 Jul 2023	328659-A	Soil	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
SP02-7 - (TRIPPLICATE)	1	20 Jul 2023	328659	Soil																												
SP02-8	1	20 Jul 2023	328659	Soil																												
SP02-9	1	20 Jul 2023	328659	Soil																												
SP02-10	1	20 Jul 2023	328659	Soil																												
SP02-11	1	20 Jul 2023	328659-A	Soil	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
SP02-12	1	20 Jul 2023	328659	Soil																												
SP02-13	1	20 Jul 2023	328659	Soil																												
SP02-13	1	20 Jul 2023	328659-A	Soil	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
SP04-1	02 Aug 2023	329488	Soil	SP04																												
SP05-1	08 Aug 2023	329997	Soil																													
SP05-2	08 Aug 2023	329997	Soil																													
SP05-3	08 Aug 2023	329997	Soil																													
Soils Disposed Off-site																																
SP03-1	0.5	20 Jul 2023	328659	Soil	SP03																										<0.1	<0.1
SP-DUP3	20 Jul 2023	328659	Soil																												<0.1	<0.1
SP-TMP3	0.6	21 Jul 2023	ES2324578	Soil																											<0.05	<0.05
SP03-2	0.5	20 Jul 2023	328659	Soil																											<0.1	<0.1
SP03-3	0.5	20 Jul 2023	328659	Soil																											<0.1	<0.1
V48	20 Jul 2023	328660-A	Soil																													
V48	1.2	20 Jul 2023	328660	Soil																												
V49	20 Jul 2023	328660-A	Soil																													
V49	0.6	20 Jul 2023	328660	Soil																												
V50	20 Jul 2023	328660-A	Soil																													
V50	0.6	20 Jul 2023	328660	Soil																												
V51	20 Jul 2023	328660-A	Soil																													
V51	0.6	20 Jul 2023	328660	Soil																												
V52	20 Jul 2023	328660-A	Soil																													
V52	0.6	20 Jul 2023	328660	Soil																												
V50a	01 Aug 2023	329413	Soil	SP04																												
SP04-1	02 Aug 2023	329488	Soil																													
SP04-2	02 Aug 2023	329488	Soil																													
SP04-2 - (TRIPPLICATE)	02 Aug 2023	329488	Soil																													

Comments
ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific
#5 Elemental mercury: HIL does not address elemental mercury. A site-specific assessment should be considered if elemental mercury
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure
#7 Derived soil HSL exceeds soil saturation concentration
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract naphthalene from the <C10 - <C16 fraction.
#10 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule 85c for < 2 years.
#11 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#12 ERATA Updated 30 April 2014. Naphthalene should not be subtracted.
#13 Erata 30 April 2014. Naphthalene should not be subtracted from <C
#14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fraction
#15 NEPM HIL-B criteria for Chromium (VI) adopted in the absence of criteria for Chromium (III+VI)

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESUs for Urban Res, Fine Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

[illegible]

Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code
Soils Reinstated On-Site					
SP01-1	0.3	20 Jul 2023	328659	Soil	SPO1
SP01-1 - [TRIPPLICATE]	0.3	20 Jul 2023	328659	Soil	
SP-DUP1		20 Jul 2023	328659	Soil	
SP-THRP1	0.6	20 Jul 2023	ES2324578	Soil	
SP01-2	0.3	20 Jul 2023	328659	Soil	
SP01-3	0.3	20 Jul 2023	328659	Soil	
SP01-4	0.3	20 Jul 2023	328659	Soil	
SP02-1	1	20 Jul 2023	328659	Soil	SPO2
SP02-1	1	20 Jul 2023	328659-A	Soil	
SP02-2	1	20 Jul 2023	328659	Soil	
SP02-3	1	20 Jul 2023	328659	Soil	
SP02-4	1	20 Jul 2023	328659	Soil	
SP02-4	1	20 Jul 2023	328659-A	Soil	
SP02-5	1	20 Jul 2023	328659	Soil	
SP02-6	1	20 Jul 2023	328659	Soil	SPO2
SP02-7	1	20 Jul 2023	328659	Soil	
SP02-7	1	20 Jul 2023	328659-A	Soil	
SP02-7 - [TRIPPLICATE]	1	20 Jul 2023	328659	Soil	
SP02-8	1	20 Jul 2023	328659	Soil	
SP02-9	1	20 Jul 2023	328659	Soil	
SP02-10	1	20 Jul 2023	328659	Soil	
SP02-10	1	20 Jul 2023	328659-A	Soil	SPO4
SP02-11	1	20 Jul 2023	328659	Soil	
SP02-12	1	20 Jul 2023	328659	Soil	
SP02-13	1	20 Jul 2023	328659	Soil	
SP02-13	1	20 Jul 2023	328659-A	Soil	
SP04-3		02 Aug 2023	329488	Soil	
SP05-1		08 Aug 2023	329997	Soil	SPO5
SP05-2		08 Aug 2023	329997	Soil	
SP05-3		08 Aug 2023	329997	Soil	
Soils Disposed Off-site					
SP03-1	0.5	20 Jul 2023	328659	Soil	SPO3
SP-DUP3		20 Jul 2023	328659	Soil	
SP-THRP3	0.6	21 Jul 2023	ES2324578	Soil	
SP03-2	0.5	20 Jul 2023	328659	Soil	
SP03-3	0.5	20 Jul 2023	328659	Soil	
V48		20 Jul 2023	328660-A	Soil	
V48	1.2	20 Jul 2023	328660	Soil	
V49		20 Jul 2023	328660-A	Soil	SPO3
V49	0.6	20 Jul 2023	328660	Soil	
V50		20 Jul 2023	328660-A	Soil	
V50	0.6	20 Jul 2023	328660	Soil	
V51		20 Jul 2023	328660-A	Soil	
V51	0.6	20 Jul 2023	328660	Soil	
V52		20 Jul 2023	328660	Soil	
V50a		01 Aug 2023	329413	Soil	SPO4
SP04-1		02 Aug 2023	329488	Soil	
SP04-2		02 Aug 2023	329488	Soil	
SP04-2 - [TRIPPLICATE]		02 Aug 2023	329488	Soil	

Comments

#D - Not Based

#C Carcinogenic Path: HsL based on 8 cases; PAN; and Hrs; TEFs (in to BzP of Schedule 7) BzP TEQ calc by multiplying the conc of each carcinogen by its TEF and sum of all most common reported (WHO BS). HsL application should consider presence of carcinogenic PAHs.

#S Arsenic: HsL assumes 70% oral bioavailability. Site-specific bioavailability may important and should be considered where appropriate.

#C Lead: HsL is based on blood lead models (IEUHL & HsL) to do adult lead model for 50% bioavailability considered. Site-specific bioavailability may be important and should be considered.

#S PCBs: HsL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to Dioxin and PCBs should be considered.

#D Derived soil HsL exceeds soil saturation concentration

#D To obtain F1 subtract the sum of BTXZ concentrations from the C6 - C10 fraction.

#D To obtain F2 subtract the sum of BTXZ concentrations from the C6 - C10 fraction.

#D Values agree up to arsenic concentration present in soil > 2 years. Refer Schedule B5C for < 2 years.

#D1 Moderately relevant. To obtain F1 subtract the sum of BTXZ concentrations from the C6 - C10 fraction.

#D1 ERBATA (Updated 30 April 2014). Naphthalene should not be subtracted from C6 - C10 fraction.

#D1 Errata 30 April 2014. Naphthalene should not be subtracted from C6 - C10 fraction.

#D1 Separate management limits for BTXZ & naphthalene are not available because they cannot be subtracted from the relevant fraction.

2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

Table 2
Soil Stockpile Analytical Results
(Residential B Criteria)

						Organophosphorous Pesticides																						Pesticides			
						Atazaphos-methyl	Bromophos-ethyl	Cisphosphorothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Cumaphos	Diazinon	Dibromos	Dinosebate	Disulfoton	Ethion	Fenitrothion	Fenitrothion	Malathion	Methidathion	Methyl parathion	Mevinphos (Phosdin)	Monocrotophos	Permethrin	Phorate	Practico	Ronnel	Demeton-S-methyl	Pyrimphos-ethyl	
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Res B Soil						0.05	0.05	0.05	0.05		340	0.05	0.1	0.05		0.05	0.1	0.05	0.1	0.05	0.05	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.05	0.1	0.05
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																															
>=0m, <1m																															
>=1m, <2m																															
>=2m, <4m																															
NEPM 2013 Table 1B(5) Generic EL - Urban Res & Public Open Space																															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2 m)																															
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																															
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																										
Soils Reinstated On-Site																															
SP01-1	0.3	20 Jul 2023	328659	Soil	SP01																										
SP01-1 - (TRIPLICATE)	0.3	20 Jul 2023	328659	Soil																											
SP-DUP1		20 Jul 2023	328659	Soil																											
SP-TRIP1	0.6	20 Jul 2023	ES2324578	Soil																											
SP01-2	0.3	20 Jul 2023	328659	Soil																											
SP01-3	0.3	20 Jul 2023	328659	Soil																											
SP01-4	0.3	20 Jul 2023	328659	Soil																											
SP02-1	1	20 Jul 2023	328659	Soil																											
SP02-1	1	20 Jul 2023	328659-A	Soil																											
SP02-2	1	20 Jul 2023	328659	Soil	SP02																										
SP02-3	1	20 Jul 2023	328659	Soil																											
SP02-4	1	20 Jul 2023	328659	Soil																											
SP02-4	1	20 Jul 2023	328659-A	Soil																											
SP02-5	1	20 Jul 2023	328659	Soil																											
SP02-6	1	20 Jul 2023	328659	Soil																											
SP02-7	1	20 Jul 2023	328659	Soil																											
SP02-7	1	20 Jul 2023	328659-A	Soil																											
SP02-7 - (TRIPLICATE)	1	20 Jul 2023	328659	Soil																											
SP02-8	1	20 Jul 2023	328659	Soil																											
SP02-9	1	20 Jul 2023	328659	Soil																											
SP02-10	1	20 Jul 2023	328659	Soil																											
SP02-10	1	20 Jul 2023	328659-A	Soil																											
SP02-11	1	20 Jul 2023	328659	Soil																											
SP02-12	1	20 Jul 2023	328659	Soil																											
SP02-13	1	20 Jul 2023	328659	Soil																											
SP02-13	1	20 Jul 2023	328659-A	Soil																											
SP04-3	02 Aug 2023	329488	Soil	SP04																											
SP05-1	08 Aug 2023	329997	Soil		SP05																										
SP05-2	08 Aug 2023	329997	Soil																												
SP05-3	08 Aug 2023	329997	Soil																												
Soils Disposed Off-site																															
SP03-1	0.5	20 Jul 2023	328659	Soil	SP03	<0.1	<0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
SP-DUP3		20 Jul 2023	328659	Soil		<0.1	<0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
SP-TRIP3	0.6	21 Jul 2023	ES2324578	Soil		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP03-2	0.5	20 Jul 2023	328659	Soil		<0.1	<0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
SP03-3	0.5	20 Jul 2023	328659	Soil		<0.1	<0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
V48		20 Jul 2023	328660-A	Soil																											
V48	1.2	20 Jul 2023	328660	Soil																											
V49		20 Jul 2023	328660-A	Soil																											
V49	0.6	20 Jul 2023	328660	Soil																											
V50		20 Jul 2023	328660-A	Soil																											
V50	0.6	20 Jul 2023	328660	Soil																											
V51		20 Jul 2023	328660-A	Soil	SP04																										
V51	0.6	20 Jul 2023	328660	Soil																											
V52		20 Jul 2023	328660-A	Soil																											
V52	0.6	20 Jul 2023	328660	Soil																											
V50a	01 Aug 2023	329413	Soil																												
SP04-1	02 Aug 2023	329488	Soil																												
SP04-2	02 Aug 2023	329488	Soil	SP04																											
SP04-2 - (TRIPLICATE)	02 Aug 2023	329488	Soil																												

Comments
ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each c
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where approp
#4 Lead: HILs A,B,C based on blood lead models (EUK & HIL D on adult lead model for where 50% bioavailability considered. Site-spe
#5 Elemental mercury: HIL does not address elemental mercury, a site specific assessment should be considered if elemental mercury
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of expos
#7 Derived soil HSL exceeds soil saturation concentration
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract naphthalene from the <C10 - C16 fraction.

Table 2
Soil Stockpile Analytical Results
(Residential B Criteria)

						Phenols													PCBs													
						3,4-Methylenediphenol (m-BaP or soil)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,6-Dichlorophenol	2-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	Phenolics Total	Arachlor 1016	Arachlor 1201	Arachlor 1202	Arachlor 1204	Arachlor 1206	Arachlor 1208	Arachlor 1210	Arachlor 1212	Arachlor 1214	Arachlor 1216	PCBs (Sum of total)			
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
NEPM 2013 Table 1A(1) HILs Res B Soil						1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1*		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																130	45,000															
>=0m, <1m																																
>=1m, <2m																																
>=2m, <4m																																
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																																
NEPM 2013 Table 1B(6) ESIs for Urban Res, Fine Soil (0-2 m)																																
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																																
Field ID	Depth	Date	Lab Report Number	Matrix Type	Location Code																											
Soils Reinstated On-Site																																
SP01-1	0.3	20 Jul 2023	328659	Soil	SP01																											
SP01-1 - [TRIPLICATE]	0.3	20 Jul 2023	328659	Soil																												
SP-DUP1		20 Jul 2023	328659	Soil																												
SP-TRIP1	0.6	20 Jul 2023	E52324578	Soil																												
SP01-2	0.3	20 Jul 2023	328659	Soil																												
SP01-3	0.3	20 Jul 2023	328659	Soil																												
SP01-4	0.3	20 Jul 2023	328659	Soil																												
SP02-1	1	20 Jul 2023	328659	Soil																												
SP02-1	1	20 Jul 2023	328659-A	Soil																												
SP02-2	1	20 Jul 2023	328659	Soil																												
SP02-3	1	20 Jul 2023	328659	Soil																												
SP02-4	1	20 Jul 2023	328659	Soil																												
SP02-4	1	20 Jul 2023	328659-A	Soil																												
SP02-5	1	20 Jul 2023	328659	Soil																												
SP02-6	1	20 Jul 2023	328659	Soil																												
SP02-7	1	20 Jul 2023	328659	Soil																												
SP02-7	1	20 Jul 2023	328659-A	Soil																												
SP02-7 - [TRIPLICATE]	1	20 Jul 2023	328659	Soil																												
SP02-8	1	20 Jul 2023	328659	Soil																												
SP02-9	1	20 Jul 2023	328659	Soil																												
SP02-10	1	20 Jul 2023	328659	Soil																												
SP02-10	1	20 Jul 2023	328659-A	Soil																												
SP02-11	1	20 Jul 2023	328659	Soil																												
SP02-12	1	20 Jul 2023	328659	Soil																												
SP02-13	1	20 Jul 2023	328659	Soil																												
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SP04-3		02 Aug 2023	329488	Soil	SP04																											
SP05-1		08 Aug 2023	329997	Soil	SP05																											
SP05-2		08 Aug 2023	329997	Soil																												
SP05-3		08 Aug 2023	329997	Soil																												
Soils Disposed Off-site																																
SP03-1	0.5	20 Jul 2023	328659	Soil	SP03																											
SP-DUP3		20 Jul 2023	328659	Soil																												
SP-TRIP3	0.6	21 Jul 2023	E52324578	Soil		<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
SP03-2	0.5	20 Jul 2023	328659	Soil																												
SP03-3	0.5	20 Jul 2023	328659	Soil																												
V48		20 Jul 2023	328660-A	Soil																												
V48	1.2	20 Jul 2023	328660	Soil																												
V49		20 Jul 2023	328660-A	Soil																												
V49	0.6	20 Jul 2023	328660	Soil																												
V50		20 Jul 2023	328660-A	Soil																												
V50	0.6	20 Jul 2023	328660	Soil																												
V51		20 Jul 2023	328660-A	Soil																												
V51	0.6	20 Jul 2023	328660	Soil																												
V52		20 Jul 2023	328660-A	Soil																												
V52	0.6	20 Jul 2023	328660	Soil																												
V50a		01 Aug 2023	329413	Soil																												
SP04-1		02 Aug 2023	329488	Soil	SP04																											
SP04-2		02 Aug 2023	329488	Soil																												
SP04-2 - [TRIPLICATE]		02 Aug 2023	329488	Soil																												

Comments
ND = Non-detect
#1 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (ref to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each t
#2 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs
#3 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropr
#4 Lead: HILs A,B,C based on blood lead models (ELUB & HIL D on adult lead model for where 50% bioavailability considered. Site-spr
#5 Elemental mercury: HIL does not address elemental mercury. > site specific assessment should be considered if elemental mercury
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of expos
#7 Derived soil HSL exceeds soil saturation concentration
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract naphthalene from the <C10 - C16 fraction.
#10 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#11 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#12 ERATA Updated 30 April 2014. Naphthalene should not be subtracted.
#13 Errata 30 April 2014. Naphthalene should not be subtracted from <C
#14 Separate management limits for BTEX & naphthalene are not available hence should not be subtracted from the relevant fraction
#15 NEPM HIL-B criteria for Chromium (VI) adopted in the absence of criteria for Chromium (III+VI)

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESIs for Urban Res, Fine Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

**Site Audit Statement
(Attached)**



NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. 0301-2307

This site audit is a:

- ☐ statutory audit
- ☒ **non-statutory audit**

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name	James Davis		
Company	Enviroview Pty Ltd		
Address	PO Box 327		
	GLADESVILLE	NSW	Postcode 2110
Phone	0467 375 481		
Email	james.davis@enviroview.com.au		

Site details

Address	138 and 140 Campbell Hill Road		
	CHESTER HILL	NSW	Postcode 2162

Property description

(Attach a separate list if several properties are included in the site audit.)

Lots 5, 6 and 7 in DP 30305

Local government area	Canterbury Bankstown Council
Area of site (include units, e.g. hectares)	2,193 m ²
Current zoning	B2 – Local Centre

Regulation and notification

To the best of my knowledge:

- ☐ **the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)
- ☐ Declaration no. _____
- ☐ Order no. _____
- ☐ Proposal no. _____
- ☐ Notice no. _____
- ☒ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

- ☐ the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*
- ☒ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name	Paul Hilberding			
Company	The Abel Tasman Village Association Ltd			
Address	222 WALDRON ROAD			
	CHESTER HILL	NSW	Postcode	2162
Phone	02 9645 3388			
Email	gen.mgr@abeltasman.com.au			

Contact details for contact person (if different from above)

Name Nick Winberg

Phone 02 9256 2560

Email nick.winberg@centuriongroup.com.au

Nature of statutory requirements (not applicable for non-statutory audits)

- ☐ Requirements under the *Contaminated Land Management Act 1997*
(e.g. management order; please specify, including date of issue)

- ☐ Requirements imposed by an environmental planning instrument
(please specify, including date of issue)

- ☐ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

- ☐ Requirements under other legislation (please specify, including date of issue)

Purpose of site audit

- ☒ **A1** To determine land use suitability

Intended uses of the land: **Residential without access to soil (Aged Care Facility)**

OR

- ☐ **A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land: _____

OR

(Tick all that apply)

- ☐ **B1** To determine the nature and extent of contamination

- ☐ **B2** To determine the appropriateness of:

☐ an investigation plan

☐ a remediation plan

☐ a management plan

- ☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

- ☐ **B4** To determine the compliance with an approved:

☐ **voluntary management proposal** or

☐ **management order** under the *Contaminated Land Management Act 1997*

- ☐ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land: _____

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Environmental Strategies Pty Ltd, Reditus Consulting Pty Ltd

Titles of reports reviewed:

Environmental Strategies Pty Ltd. Environmental Site Assessment, 138-140 Campbell Hill Road, Chester Hill NSW. Document reference: 13126RP01_Rev1, dated March 2014.

Environmental Strategies Pty Ltd. Remediation Action Plan, 138-140 Campbell Hill Road, Chester Hill, NSW. Document reference: 16166 RAP (Rev1), dated 23 August 2016.

Reditus Consulting Pty Ltd. Detailed Site Investigation, Abel Tasman Village, 222 Waldron Road, 138 & 140 Campbell Hill Road, Chester Hill NSW. Document Reference: 22065RP01, dated 17 June 2022.

Site Audit Statement

Reditus Consulting Pty Ltd. Remedial Action Plan, Abel Tasman Village, 138 & 140 Campbell Hill Road, Chester Hill NSW. Document Reference: 22065RP02, dated 18 May 2023.

Reditus Consulting Pty Ltd. UPSS Decommissioning & Validation Report. Report reference: 22137RP02, dated 31 October 2023.

Other information reviewed, including previous site audit reports and statements relating to the site:

N/A

Site audit report details

Title	Site Audit Report, 138 and 140 Campbell Hill Road, Chester Hill NSW 2162
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Report no.	600218_0301-2307
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Date	8 November 2023
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Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section.
(Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
 - (B1) the nature and extent of contamination, and/or
 - (B2) the appropriateness of an investigation, remediation or management plan¹, and/or
 - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
 - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
 - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

¹ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ☐ ~~Residential, including substantial vegetable garden and poultry~~
 - ☐ ~~Residential, including substantial vegetable garden, excluding poultry~~
 - ☒ **Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry**
 - ☒ **Day care centre, preschool, primary school**
 - ☒ **Residential with minimal opportunity for soil access, including units**
 - ☒ **Secondary school**
 - ☒ **Park, recreational open space, playing field**
 - ☒ **Commercial/industrial**
 - ☐ ~~Other (please specify):~~
-

OR

- ☐ ~~I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.~~

Overall comments:

Section A2

~~I certify that, in my opinion:~~

~~Subject to compliance with the **attached** environmental management plan² (EMP), the site is suitable for the following uses:~~

~~(Tick all appropriate uses and strike out those not applicable.)~~

- ☐ ~~Residential, including substantial vegetable garden and poultry~~
 - ☐ ~~Residential, including substantial vegetable garden, excluding poultry~~
 - ☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
 - ☐ ~~Day care centre, preschool, primary school~~
 - ☐ ~~Residential with minimal opportunity for soil access, including units~~
 - ☐ ~~Secondary school~~
 - ☐ ~~Park, recreational open space, playing field~~
 - ☐ ~~Commercial/industrial~~
 - ☐ ~~Other (please specify):~~
-

~~EMP details~~

~~Title~~

~~Author~~

~~Date~~

~~No. of pages~~

~~EMP summary~~

~~This EMP (attached) is required to be implemented to address residual contamination on the site.~~

~~The EMP: (Tick appropriate box and strike out the other option.)~~

- ☐ ~~requires operation and/or maintenance of **active** control systems³~~
- ☐ ~~requires maintenance of **passive** control systems only³.~~

² Refer to Part IV for an explanation of an environmental management plan.

³ Refer to Part IV for definitions of active and passive control systems.

Site Audit Statement

Purpose of the EMP:

Description of the nature of the residual contamination:

Summary of the actions required by the EMP:

How the EMP can reasonably be made to be legally enforceable:

How there will be appropriate public notification:

Overall comments:

Section B

Purpose of the plan⁴ which is the subject of this audit:

I certify that, in my opinion:

(B1)

- ☐ The nature and extent of the contamination ~~has~~ been appropriately determined
- ☐ The nature and extent of the contamination ~~has not~~ been appropriately determined

AND/OR (B2)

- ☐ The investigation, remediation or management plan ~~is~~ appropriate for the purpose stated above
- ☐ The investigation, remediation or management plan ~~is not~~ appropriate for the purpose stated above

AND/OR (B3)

- ☐ The site testing plan:
- ☐ ~~is~~ appropriate to determine
 - ☐ ~~is not~~ appropriate to determine
- ~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

AND/OR (B4)

- ☐ The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):
- ☐ ~~have~~ been complied with
 - ☐ ~~have not~~ been complied with.

*voluntary management proposal no. _____

**management order no. _____

AND/OR (B5)

- ☐ The site ~~can be made suitable~~ for the following uses:
- (Tick all appropriate uses and strike out those not applicable.)
- ☐ ~~Residential, including substantial vegetable garden and poultry~~
 - ☐ ~~Residential, including substantial vegetable garden, excluding poultry~~

⁴ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Site Audit Statement

- ☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ☐ ~~Day care centre, preschool, primary school~~
- ☐ ~~Residential with minimal opportunity for soil access, including units~~
- ☐ ~~Secondary school~~
- ☐ ~~Park, recreational open space, playing field~~
- ☐ ~~Commercial/industrial~~
- ☐ ~~Other (please specify):~~

~~IF the site is remediated/managed* in accordance with the following plan (attached):~~

~~*Strike out as appropriate~~

~~Plan title~~

~~Plan author~~

~~Plan date~~

~~No. of pages~~

~~SUBJECT to compliance with the following condition(s):~~

~~Overall comments:~~

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*.

Accreditation no. 0301

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997*, and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.



Signed

Date 8 November 2023

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of the *Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**:
nswauditors@epa.nsw.gov.au or as specified by the EPA

AND

- the **local council** for the land which is the subject of the audit.