

Site Validation Report

Neighbourhood: Aorere	Stage: 2	Superlot: AO-015
<p>Introduction (Objective and scope):</p> <p>This Site Validation Report (SVR) has been prepared for the Piritahi site located across 29, 31, 33, and 35 Winthrop Way and 70, 72, 74, and 76 Mayflower Close (Ao-015). The site, which covers a total area of approximately 5,614 m², will be part of a larger residential housing re-development. The purpose of this report is to verify that identified impacted soil has been removed from the subject site. This SVR summarises the remedial ground works programme, the validation process, and documents the condition of the site post the earthworks undertaken to remove the impacted soil.</p> <p>Pre-remediation site contamination</p> <p>The pre-remediation site contamination conditions are detailed in the Piritahi, Site Specific Remediation and Management Plan¹ (SSR&MP) AO-015. In summary, the following soils requiring remediation were identified:</p> <ul style="list-style-type: none"> Metals (specifically cadmium, copper and lead) were reported above NESCS² residential (10% produce) land use soil contaminant standard (SCS); and Isolated asbestos impacted soil above BRANZ³ residential guideline value. <p>The remedial areas and associated soil sample results (investigation / pre-validation) are presented in Figures 1 and 2 and are summarised in Table 1.</p>		<p>Remedial goal:</p> <p><u>Impacted but not a risk</u> - remaining soil concentrations at/or below:</p> <ul style="list-style-type: none"> NESCS⁴ residential (10% produce) soil contaminant standard (SCS) and the AUP permitted activity (PA) criteria⁵ for metals; and BRANZ residential soil guideline value for asbestos in soil. <p>Site remediation method:</p> <ul style="list-style-type: none"> To remediate land by removing identified contamination exceeding the remedial goal for disposal to a facility consented to accept that level of contamination.
<p>Applicable consent conditions</p> <p>This report has been prepared in accordance with Section 8 of the Site wide Soil Management Plan⁶ (SSMP) and to meet the requirements outlined in Condition 66 of BUN60354164⁷ (the consents).</p> <p>For this project, validation comprised confirmation that works were undertaken in accordance with the SSMP and SSRAP (Condition 21 of the consents), visual and laboratory confirmation via soil sampling overseen by a suitably qualified and experienced practitioner (SQEP⁸) (Condition 22 of the consents), and documentation that the excavated materials were managed and disposed to an appropriate disposal facility (Condition 28 of the consents).</p>		
<p>Other reference documents:</p> <p>Piritahi Land Remediation Investigation Report – Aorere Development – Stages 1, 2, 3, & 4⁹</p>		
<p>Applicability</p> <p>This report has been prepared by the Piritahi Alliance. It is acknowledged that this report will be relied upon by Auckland Council for the purpose of undertaking its regulatory functions in relation to the work of the Piritahi Alliance. However, this report may not be relied upon in other contexts or for any other purpose, or by any other person, without the prior written agreement of the Piritahi Alliance.</p> <p>Recommendations and opinions contained in this report are based on our visual inspection and sampling of material within the remedial works area. The nature and continuity of the contamination away from the inspection and sampling locations is inferred but it must be appreciated that actual conditions may vary from the assumed model.</p>		

¹ Piritahi 2022. Site Specific Remediation and Management Plan, Aorere, AO-015, Prepared for Kāinga Ora by the Piritahi Alliance, dated 2 March 2022.

² Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

³ Building Research Association New Zealand New Zealand “Guidelines for Assessing and Managing Asbestos in Soil”, 2017 (BRANZ).

⁴ Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

⁵ Auckland Unitary Plan (AUP) Standard E30.6.1.4.

⁶ Piritahi 2021. Site-Wide Soil Management Plan, Version 4, Aorere Development, Prepared for Kāinga Ora by the Piritahi Alliance, dated September 2021.

⁷ Comprising land use consent LUC60354165 and discharge consent DIS60354166.

⁸ Suitably qualified and experienced practitioner (SQEP) – as defined in the Ministry for the Environment “Users’ Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health”, 2012.

⁹ Piritahi 2020. Land Remediation Investigation Report, Superlot AO-015, Prepared for Kāinga Ora by the Piritahi Alliance, dated March 2020.

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Summary of works

Location and dimensions:	Remedial works comprised the excavation and removal of surficial soil as follows: <ul style="list-style-type: none"> Type 5 soil to a depth of 300 mm bgs with an area of approximately 143 m² at the rear of 29 Winthrop Way; Type 3 soil up to approximately 300 mm bgs or natural area of approximately 148 m² at the house footprint of 74 Mayflower Close; Type 4 soil up to approximately 300 mm bgs or natural area of approximately 132 m² at the house footprint of 72 Mayflower Close; in addition, soil surrounding redundant utility service that was removed during the works were removed as type 4 soil; Type 1 soil surrounding redundant utility service trenches was also removed during the works.
Variations from the SSRAP	No variations from the approved SSRAP occurred during these works.
Asbestos Management:	The following asbestos-in-soils management was implemented in accordance with the BRANZ guidelines during the works: <ul style="list-style-type: none"> Class B asbestos soil removal in the footprint of 74 Mayflower Close, as shown on Figure 2 overpage. Class B asbestos soil removal in areas surrounding redundant utility service trenches. Asbestos related work involving removal of low-level asbestos impacted soil at the footprint of 74 Mayflower Close. <p>In accordance with Piritahi procedures, unlicensed asbestos works controls were implemented across the remainder of the Superlot.</p>
Duration of remedial works:	Works commenced on 13 April 2022 and were completed on 20 May 2022.
Soil removal and disposal:	370 Tonnes (See attached Disposal Summary)
EnviroFill South	Some 70 tonnes were disposed at EnviroFill South as trace asbestos soil.
Hampton Downs	A total of some 155 tonnes was disposed to Hampton Downs Landfill, some 60 tonnes as metals contaminated with asbestos and some 95 tonnes as metals contaminated soil.
Whitford Landfill	Some 145 tonnes of class B asbestos soil were disposed to Whitford Landfill from the footprint of 72 Mayflower Close and surrounding redundant utility service trenches from various locations across AO-15.
Imported material:	No soil was imported to site (Condition 30 of the consents)
Unexpected discoveries:	No unexpected discoveries outside of expected soil contamination were reported during the remediation works.
Complaints and incidents	No complaints or safety or environmental incidents related to soil contamination were reported during the remediation works.

Validation results (refer to validation plan):

The validation work performed follows the general reporting and investigation methodology presented in the:

- Ministry for the Environment (MfE) Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021);
- MfE Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils (Revised 2021); and
- BRANZ Guidelines for Assessing and Managing Asbestos in Soil (2017)

This SVR was completed under the direction of a SQEP.

The requirements of the SSMP and SSRAP were being followed and applicable resource consent conditions listed above were being met during site inspections completed by a Land Remediation staff member (SQEP).

A visual inspection of the cut surface was undertaken prior to the collection of validation samples. A total of two validation soil samples (V01 and V02) were collected from the AO-015 remediated area (all other locations were pre-validated during investigation). The validation samples were analysed for the presence / absence of asbestos by International Accreditation New Zealand (IANZ) accredited laboratories using industry standard methods. Laboratory transcripts are provided Appendix A and tabulated below.

Soil samples collected and analysed as part of the validation works reported no asbestos detections.

In summary, the remediation was successful as validation soil samples reported results meeting the remedial goal.

Final site condition:

- Identified impacted soil has been successfully removed from the site and validation samples indicate that the remediation goal was achieved.
- The site is suitable for standard density (10% produce) residential development. No future development implications associated with consenting and/or disposal of those soils apply. No additional monitoring or management (beyond standard earthwork controls) is deemed to be required for the proposed development of the site.

Pre-Validation sampling plan



Figure 1 - Pre-validation sampling plan

 SuperLot

Remedial excavation plan(s)

Figure 2: Off-site soil disposal plan and asbestos controls



Note that all "R" areas were pre-validated except locations S05 and S09, which were validated for asbestos post soil removal

Validation sampling plan



Figure 3 - Validation sampling plan

 SuperLot

Validation results table

Table 1: Soil analytical results - asbestos

					Asbestos ¹		
					Asbestos Containing Material (ACM) (Presence / absence and type)	Asbestos Containing Material (ACM) (% w/w)	Fibrous asbestos (FA) / Asbestos fines (AF) (% w/w)
					-	%w/w	%w/w
NES Soil - Residential (10% produce)²					NA	0.01%	0.001%
Auckland Unitary Plan Permitted activity criteria³					NA	NA	NA
Auckland Background Concentrations (volcanic range)⁵					NAD	<LoR	<LoR
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date			
72 Mayflower Close	V01	0.00	Natural	9/06/2022	Asbestos NOT detected	-	-
74 Mayflower Close	V02	0.00	Natural	9/06/2022	Asbestos NOT detected	-	-

Comments

1 = BRANZ soil guideline value for asbestos based on relevant land use

2 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

3 = Auckland Unitary Plan Operative in part E30 Contaminated Land. Permitted Activity Soil Criteria Table E30.6.1.4.1

5 = Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils for

NA = Not Applicable.

<LoR - below laboratory reporting limits.

- BOLD :** exceeded NES:CS SCS and AUP PA soil acceptance criteria
- BOLD :** exceeded one or more NES:CS SCS soil acceptance criteria
- BOLD :** exceeded AUP PA soil acceptance criteria
- Orange background:** above background concentrations
- :** not tested for
- m bgl:** metre below ground level

Photos



Sample location V01



Sample location V02

Disposal Summary

Material Description	Date	Disposal Facility	Docket number	Rego Number	Tonnes
TRACE ASBESTOS	13/04/2022	Envirofill South	WB00198846	NAS912	10.60
TRACE ASBESTOS	13/04/2022	Envirofill South	WB00198781	GML396	10.24
TRACE ASBESTOS	13/04/2022	Envirofill South	WB00198819	LEF356	12.40
TRACE ASBESTOS	13/04/2022	Envirofill South	WB00199232	GML396	13.52
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00198220	NAS912	10.84
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00198250	LEF356	10.66
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00197629	NAS912	11.48
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00197622	LEF356	12.04
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00197641	LZW86	12.48
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00197657	GML396	12.14
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00198364	GML396	12.50
METAL CONTAMINATED	13/04/2022	Hampton Downs	WB00198212	LZW86	12.90
TRACE ASBESTOS	14/04/2022	Envirofill South	WB00200625	LZW86	11.84
TRACE ASBESTOS	14/04/2022	Envirofill South	WB00200563	GML396	14.22
TRACE ASBESTOS AND METALS	16/04/2022	Hampton Downs	WB00202260	LZW86	10.54
TRACE ASBESTOS AND METALS	16/04/2022	Hampton Downs	WB00202254	DLG35	11.54
TRACE ASBESTOS AND METALS	16/04/2022	Hampton Downs	WB00202248	LEF356	10.86
TRACE ASBESTOS AND METALS	16/04/2022	Hampton Downs	WB00202241	LZW86	11.98
TRACE ASBESTOS AND METALS	16/04/2022	Hampton Downs	WB00202243	GML396	12.30
ASBESTOS CONTAMINATED	16/05/2022	Whitford Landfill	1639929	LHS871	11.94
ASBESTOS CONTAMINATED	16/05/2022	Whitford Landfill	1639975	LHS871	10.80
ASBESTOS CONTAMINATED	17/05/2022	Whitford Landfill	1640147	LHS871	11.60
ASBESTOS CONTAMINATED	17/05/2022	Whitford Landfill	1640169	LHS871	11.36
ASBESTOS CONTAMINATED	17/05/2022	Whitford Landfill	1640092	LHS871	11.08
ASBESTOS CONTAMINATED	17/05/2022	Whitford Landfill	1640120	LHS871	11.26
ASBESTOS CONTAMINATED	18/05/2022	Whitford Landfill	1640292	LHS871	8.84
ASBESTOS CONTAMINATED	18/05/2022	Whitford Landfill	1640233	LHS871	9.30
ASBESTOS CONTAMINATED	19/05/2022	Whitford Landfill	1640447	LHS871	8.92
ASBESTOS CONTAMINATED	19/05/2022	Whitford Landfill	1640476	LHS871	9.66
ASBESTOS CONTAMINATED	19/05/2022	Whitford Landfill	1640388	LHS871	10.40
ASBESTOS CONTAMINATED	20/05/2022	Whitford Landfill	1640537	LHS871	10.72
ASBESTOS CONTAMINATED	20/05/2022	Whitford Landfill	1640610	LHS871	7.98
ASBESTOS CONTAMINATED	20/05/2022	Whitford Landfill	1640578	LHS871	10.34

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Detail of Unexpected discoveries/Complaints

No	Description of discovery	Date	Outcome
N/A			

Document Control

Date	Version	Prepared by	Reviewed by	Authorised by
15 March 2023	1	A. Ardourel	C. Westerbur	S. Schiess

Appendix A: Validation Sample Laboratory Transcripts



Certificate of Analysis

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Client: Piritahi Alliance	Lab No: 3010467 A2PV1
Contact: Aaron Ardourel	Date Received: 09-Jun-2022
C/- Piritahi Alliance	Date Reported: 13-Jun-2022
Level 8, 139 Quay Street	Quote No: 94501
Auckland Central	Order No: K0002336
Auckland 1010	Client Reference: 1007708.2086
	Add. Client Ref: COC1008189
	Submitted By: Aaron Ardourel

Sample Type: Soil

Sample Name	Lab Number	As Received Weight (g)	Dry Weight (g)	<2mm Subsample Weight* (g dry wt)	Asbestos Presence / Absence	Description of Asbestos Form
AO-15_V01_0.00m-0.01m	3010467.1	230.0	177.2	50.6	Asbestos NOT detected.	-
AO-15_V02_0.00m-0.01m	3010467.3	232.3	167.4	50.1	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 3
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 3
<2mm Subsample Weight*	Sample ashed at 400°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1, 3
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1, 3
Description of Asbestos Form	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1, 3



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 10-Jun-2022 and 13-Jun-2022. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

A handwritten signature in blue ink, appearing to read 'Danielle Carter', with a stylized flourish at the end.

Danielle Carter BSc, PGDipSci, MSc
Laboratory Technician - Asbestos