REPORT

Tonkin+Taylor

Preliminary Site Investigation/Detailed Site Investigation

7-15 Church Street, Ashburton

Prepared for
Kāinga Ora Homes and Communities
Prepared by
Tonkin & Taylor Ltd
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Executive summary

Tonkin & Taylor Ltd (T+T) was engaged by Kāinga Ora Homes and Communities (Kāinga Ora) to undertake the investigation at, and preparation of this preliminary site investigation/detailed site investigation (PSI/DSI) for 7-15 Church Street, Ashburton ('the site').

The findings of this investigation are summarised as follows:

Consideration	Findings
Site history *See Sections 2 and 3*	• The site has been in residential use for approximately 70 years. Prior to that, it was in pastoral use. • Site history review indicates that the site has not been subjected to an activity on the Hazardous Activities and Industry List (HAIL).
Redevelopment proposal *See Section 2.1*	• The site will undergo a scrape to 0.3 m below existing ground level (bgl) as part of its high-density residential redevelopment for geotechnical/ constructability reasons.
Redevelopment environmental and health and safety implications *See Section 7 & 8*	• At sampling location 15 Church Street, cell HA5 at 0.1 m bgl (representing soils from 0 to 0.3 m bgl), arsenic was recorded above its high-density residential and commercial/industrial (human health based) land use criteria. • In accordance with the Kāinga Ora SAP[1] and CSM[2], and in the absence of further information for soils within the existing dwelling footprints, the site ground conditions meet the CSM in respective dwelling halos until further analysis proves otherwise. Kāinga Ora may complete additional soil sampling and analysis at the dwelling footprints and under the various hard surfaces on site following demolition and clearance of the existing structures, to further understand soil disposal options in these site areas.
Soil disposal implications *See Section 8*	• Asbestos in soil was not detected in surficial soil samples analysed. • Soils displaced from earthwork across the site require disposal to managed fill (e.g., Burwood Landfill, Wheatsheaf, Leggett Road) depending on location and depth across the site (refer Figures 2-6). • Concentrations of one or more of the metals analysed were recorded above their published background concentration in surface soil samples (0 to 0.3 m bgl) from across the site. • Soils underneath the current dwellings, and ancillary structure footprint areas should be inspected and cleared by a competent person under the Asbestos Regulations[3] prior to soil disturbance in these areas and disposal of this material offsite. • More detailed information pertaining to soil disposal (e.g., estimated volumes) will be provided in the WI for this site.
Regulatory implications *See Section 7*	• Restricted discretionary consent under the NESCS[4] is required for the site's redevelopment.

[1] Kāinga Ora, July 2022. Residential Property – Soil Sampling and Analysis Plan (SAP). Version 7.
[2] Kāinga Ora, July 2022. Conceptual Site Model- Residential Properties. Version 4.
[3] Health and Safety a Work (Asbestos) Regulations, 2016.
[4] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

Consideration	Findings
	• As an activity or industry described in Schedule 3 of the Land and Water Regional Plan (LWRP) has *not* been undertaken on the site, the site is not considered to meet the definition of potentially contaminated land under the LWRP. **The project planner should confirm the full planning requirements and need for consent(s) under the LWRP.** • A Work Instruction (WI) will be prepared for the project earthwork to set out health and safety and environmental controls and offsite disposal options which the earthwork contractor must employ during the redevelopment. The WI will also provide mitigation controls to manage unexpected discovery of contamination, including asbestos containing materials (ACM).

1 Introduction

Tonkin & Taylor Ltd (T+T) has been engaged by Kāinga Ora Homes and Communities (Kāinga Ora) to prepare a preliminary site investigation/detailed site investigation (PSI/DSI) at 7, 9, 11, 13 and 15 Church Street, Ashburton (herein referred to as 'the site') to support Kāinga Ora's site redevelopment.

The work for the PSI/DSI was undertaken in accordance with our Housing Delivery System (HDS) Christchurch contract authorised 8 November 2022. The scope of work follows a standard contaminated site assessment protocol developed by Kāinga Ora. The key aims of the PSI/DSI were to determine whether:

- Activities detailed on the HAIL[5], are or have more likely than not been undertaken on the site.
- Historical land use is likely to have resulted in ground contamination.
- Establish soil contamination conditions at the site.

The contaminated site assessment work performed follows the general reporting and investigation methodology presented in the Ministry for the Environment's (MfE's) CLMG No. 1[6] and No. 5[7] for a preliminary site investigation/detailed site investigation. In addition, the requirements outlined in the Asbestos in Soil Guidelines[8] has also been followed where appropriate.

The persons undertaking, managing, reviewing, and certifying this investigation are suitably qualified and experienced practitioners (SQEP), as required by the NESCS and defined in the NESCS Users' Guide[9].

Kāinga Ora plans to re-develop the site for a high-density residential land use.

2 Site description

The site is accessed off Church Street in Ashburton. At the time of PSI/DSI site work, the site contained three standalone dwellings and a duplex (semi-detached) dwelling (specifically 11 and 13 Church Street) with ancillary structures at the side and rear of each dwelling (e.g., shed, concrete driveway and footpaths).

The site identification details are presented in Table 2.1.

Table 2.1: Site identification

Address	Legal description	Area (m^2)
7 Church Street, Ashburton	Lot 1 DP 16102	933
9 Church Street, Ashburton	Lot 2 DP 16102	994
11/13 Church Street, Ashburton	Lot 3 DP 16102	1224
15 Church Street, Ashburton	Lot 4 DP 16102	887
		4,038

[5] Hazardous Activities and Industries List (HAIL), MfE, revised 2021.
[6] MfE, Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021).
[7] MfE, Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils (Revised 2021).
[8] New Zealand Guidelines for Assessing and Managing Asbestos in Soil- BRANZ, November 2017.
[9] MfE, 2012, Users Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

2.1 Client provided information

As part of HDS Christchurch, a draft work order (DWO) was issued to all consultants involved with the site's redevelopment[10]. The DWO provides a summary of the known Kāinga Ora information on the site, the following of which is considered relevant:

- The existing standalone dwelling at 7 Church Street has a 120 m^2 floor area and was built in 1951. The dwelling has duroc clad walls (a potential asbestos containing material (PACM)) and a concrete tile roof.
- The existing standalone dwelling at 9 Church Street has a 90 m^2 floor area and was built in 1951.
- The existing duplex dwelling at 11/13 Church Street has a 140 m^2 floor area and was built in 1951.
- The existing standalone dwelling at 15 Church Street has a 100 m^2 floor area and was built in 1951.
- The anticipated redevelopment is for a 5 to 13 uplift factor.
- The DWO records asbestos found on property, taken to mean there are asbestos containing materials present at each structure.
- The DWO indicates that the site is "not a HAIL site", meaning it is not recorded on Environment Canterbury's (ECan's) Listed Land Use Register (LLUR).

Information relating to the depth of soil disturbance for the site's redevelopment will be provided in a Work Instruction (see Section 8); Kāinga Ora plan for the site to undergo a scrape to 0.3 m bgl as part of its high-density residential redevelopment for geotechnical/ constructability reasons.

2.2 Site geography and hydrogeology

The site is generally flat. Stormwater runoff generated at the site is expected to discharge to soakage through the garden and landscaped areas. The existing stormwater drainage generated from the dwelling and ancillary structures will drain to the existing offsite local network until site clearance of these features.

Published geological information[11] indicates that the site is underlain by alluvial deposits of gravel, sand, and silt.

2.3 Site condition

A site walkover was undertaken on 12 July 2023 by a T+T Environmental Scientist. Relevant observations on the site condition and surrounding land use made at this time are summarised in Table 2.2 below, and in Section 5.1. Selected photographs are included in Appendix A.

Table 2.2: Site condition

Condition	Observation
Surface water	None.
Nearest surface water body	Unnamed streams approximately 500 m to the east/south-east of the site and Ashburton River approximately 1 km south-west of the site.

[10] DRAFT Redevelopment Work Order (Church St 7-15, Hamstead, Ashburton) AR109524 (7 July 2023).

[11] Begg, J.G.; Jones, K.E.; Barrell, D.J.A. (compilers) 2015. Geology and geomorphology of urban Christchurch and eastern Canterbury.

Condition	Observation
Site description	7 Church Street: The dwelling is constructed on a timber and concrete foundation and has duroc cement sheet clad walls and a concrete tile roof. Ancillary structures include a shed (weatherboard cladding and sheet metal roof on concrete pad) and concrete footpaths/driveway. PACMs observed at the dwelling's exterior include the cement sheet duroc cladding, soffits, textured stucco coating on concrete sections of the foundation, and wall and ceiling panelling around the entryway/vestibule. 9 Church Street: The dwelling is constructed on a timber and concrete foundation, with weatherboard cladding and concrete tile roof. Ancillary structures include a shed (weatherboard and sheet metal cladding and sheet metal roof on concrete pad), concrete footpaths and a gravel driveway. PACMs observed at the dwelling's exterior include cement sheet soffits, textured stucco coating on concrete sections of the foundation, and wall and ceiling panelling around the entryway/vestibule. 11/13 Church Street: This duplex dwelling is constructed on a concrete and timber foundation and has duroc cement sheet clad walls and a sheet metal roof. Ancillary structures include concrete driveway, footpaths, garage (timber and PACM cement sheet cladding with sheet metal roof) and shed (combination of weatherboard and cement sheet cladding, sheet metal roof and concrete pad foundation). PACMs observed at the dwelling and ancillary structure's exteriors include the cement sheet cladding, soffits, textured stucco coating on concrete sections of the foundation, and wall and ceiling panelling around the entryway/vestibules. 15 Church Street: The dwelling is constructed on a stucco textured concrete foundation and has brick walls and a sheet metal roof. Ancillary structures include a shed (weatherboard/cement sheet cladding and sheet metal roof on concrete pad), and concrete footpaths/driveway. PACMs observed at the dwelling and ancillary structure exteriors include cement sheet soffits and wall and ceiling panelling entryway/vestibule.
Visible signs of plant stress	None observed.
Visible signs of potential contamination sources	None other than the PACMs observed at the exterior of the structures as discussed above.

Table 2.3: Surrounding land use

Direction	Observation
North	Residential properties and Oxford Street beyond.
South	Church Street and residential properties beyond.
East	

Direction	Observation
West	Residential properties and Beach Road beyond.

3 Site history

Historical information relating to the site has been collected from a variety of sources including the ECan LLUR and historical aerial photographs. This history focuses on the aerial photograph review where comments are provided on readily observable surrounding land use. The information reviewed is summarised in the following sections.

3.1 Aerial photograph review

T+T has reviewed historical aerial photographs dating back to the 1940s held on the Canterbury Maps online repository12. Relevant features of the site and surrounds are summarised from each aerial photograph below, with copies of aerials provided in Appendix B.

Table 3.1: Summary of historical aerial photograph review

Year	Onsite observations	Surrounding land use observations
1941	The site is vacant.	Surrounding properties are residential or vacant. Configuration of roads as present day (i.e., Church Street, Oxford Street, Beach Road).
1956	The site is developed with dwellings and ancillary structures (sheds and footpaths) as their present day locations.	Further residential development.
1981	No significant changes observed, except for the addition of a driveway at 13 Church Street.	
1987	Poor quality aerial imagery.	
1995		
2004	No significant changes observed, except for the addition of a driveway at 7 Church Street.	Residential development (new dwelling at property's rear) visible at the property to the south-west of 7 Church Street.
2012	Possible shed (structure) absent from north-west part of 15 Church Street.	No significant changes observed.
2017	No significant changes observed, except for the addition of a shed (structure) to the north-west corner of the rear garden of 15 Church Street.	
2020	No significant changes observed, except for the absence of the previous shed (c. 2017) in the north-west corner of the rear garden of 15 Church Street.	

3.2 ECan LLUR

The site is *not* recorded on the ECan LLUR as contaminated or potentially contaminated land. A copy of the ECan LLUR statement for the site is provided in Appendix C.

[12] https://mapviewer.canterburymaps.govt.nz/

4 Potential for ground contamination

Site history review indicates that the site has *not* been subjected to a HAIL activity.

However, the following potential sources of ground contamination have been identified from the site walkover, site history review, and Kāinga Ora's standard Conceptual Site Model[2] for residential sites:

- Based on the age of the dwellings and their ancillary structures on site, there is the potential for the use of asbestos and/or lead based paint on or in the structures providing a potential contamination source to surrounding soils. Depending on weathering and maintenance, site soils (including within the 'halos' of the dwellings) could be impacted by these potential contaminants. The ancillary structures (e.g., the sheds) may have their own localised impacts if they were constructed of similar materials such as ACM etc.

The presence of asbestos and/or elevated concentrations of metals of site soils from the above activities could be considered a HAIL activity (specifically activity I[13]) if found in sufficient concentrations that exceed the land use criteria for the proposed high-density residential land use.

5 Soil sampling and analysis plan

The sampling and analysis plan (SAP) was based on the findings of the desktop assessment, the potential for ground contamination at the site and the established Kāinga Ora site investigation methodology sampling protocols. The SAP for the site is provided in Table 5.1.

Soil sampling has been undertaken mainly to inform soil disposal requirements and earthwork controls as the proposed redevelopment earthwork (including foundations) will require the removal of surface soil from the site. Soil sampling and equipment decontamination was undertaken by a T+T Environmental Scientist in general accordance with the Kāinga Ora methodology as well as CLMG No. 5 and the Asbestos in Soil Guidelines.

Investigation locations prefaced HA in Table 5.1 below were undertaken by hand auger, with initially a shallow test pit hand dug to approximately 0.1 m bgl (lifting a sod of soil/lawn). The ground level to 0.1 m depth materials were examined for evidence of PACMs. On completion of the augering, surplus soils were returned to the hole and soil/lawn reinstated. Dwelling halo investigation was undertaken by hand excavation.

Table 5.1: Soil sampling and analysis plan

Sample number/ID	Sample type (per cell)	Sample design	Depths (m bgl)	Sample analysis*
7, 9 and 15 Church Street HA1 – HA6	One sample within each sampling cell (general coverage of yard and garden areas).	Systematic	Surface to 0.1+, 0.3, 0.5, 0.7, and 1.0 m bgl unless refusal encountered.	Metals screen. Asbestos presence/ absence.
11 Church Street HA1 – HA4				
13 Church Street HA1 – HA3				

[13] I. Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.

Sample number/ID	Sample type (per cell)	Sample design	Depths (m bgl)	Sample analysis*
7, 9, 11 and 15 Church Street Halo A - D	Sample of halo/ curtilage[14] area from each side of the dwelling.	Targeted	Surface	Metals screen (composite of samples). Asbestos presence/absence. Asbestos semi quantitative.**

Notes:

+ Surface to 0.1 m bgl sample consists of one soil sample from a designated sample cell.

* Analysis was performed on deeper primary sample(s) (0.3 and 0.5 m depths) where shallow sample results (surface to 0.1 m) reported elevated concentrations above background levels.

** Semi-quantitative asbestos analysis was performed on 500 ml samples (primary location only) where asbestos presence/absence samples returned positive test results.

The soil investigation was undertaken by T+T on 12 July 2023. Soil analyses were carried out by an IANZ accredited laboratory using industry standard methods. The soil sampling locations are illustrated in Figure 1.

5.1 Ground conditions

The following observations were made during the field investigations. Soil logs are provided in Appendix D.

- Topsoil was observed from the surface and generally to 0.3 m bgl across the investigation locations and consisted of an organic brown silt with traces of sand and/or gravel.
- Underlying soils comprised sandy silt or silty sands to the maximum investigation depth of 1.0 m.
- Manmade materials were encountered at various locations on site including:
  - 9 Church Street:
    - HA4 – lime chip/decorative garden stones at 0.2 to 0.3 m bgl.
    - HA5 – concrete at 0.25 to 0.45 m bgl.
  - 15 Church Street:
    - HA4 – miscellaneous materials including carpet, metal, lino, plastic at 0.15 to 0.4 m bgl.
    - HA5 – miscellaneous materials including netting, soft/hard plastics, nails) at 0.0 to 0.2 m bgl.
    - HA6 – miscellaneous materials including aluminium can tab, plastic, glass, metal at 0.0 to 0.2 m bgl.
- No other visual or olfactory indicators of contamination (e.g., staining or odours) were observed across the investigation locations.

5.2 Data quality

A quality assurance and quality control (QA/QC) programme was implemented as part of field procedures to confirm data was fit for purpose and included:

- Decontamination of sampling equipment between sampling locations.

[14] The halo or curtilage of a dwelling is defined as the space between 1-2 m from the building edge, as defined in the Kāinga Ora SAP and CSM.

- Appropriate preservation of samples during transport from the field to the laboratory.
- Transportation of samples with accompanying chain of custody documentation.
- Compliance with sample holding times.

Eurofins Environmental Testing NZ Limited (Eurofins), the analytical laboratory used for this DSI also conducts its own internal quality control on selected samples (Appendix E). The laboratory QC results of method blanks, duplicates, matrix spikes, and laboratory control samples were all within the laboratories' accepted ranges. This included a relative percent difference (RPD) of duplicate samples within the range of <1 and >30 %. The laboratory reported the >30% RPDs were attributable to sample heterogeneity and the data is satisfactory.

5.3 Analytical results

The soil sample results are presented in Table 5.2 below. Laboratory reports are attached in Appendix E.

5.3.1 Assessment criteria

Soil sample results were compared against criteria for the assessment of regulatory requirements, the proposed high-density residential land use and acceptance criteria for local soil disposal sites to meet the objectives of the investigation. The adopted assessment acceptance criteria included:

- For the protection of human health:
  - NESCS Soil Contaminants Standards (SCS) and national/international guideline values incorporated by reference for high-density residential land use.
  - NESCS SCS and national/international guideline values incorporated by reference for commercial/industrial land use, used for the protection of outdoor workers (involved in soil disturbance at the site).
  - Human health soil guideline values for asbestos for the above land uses, as presented in the Asbestos in Soil Guidelines.
- Published background concentrations[15] to assess the suitability of site soils for cleanfill disposal.
- Disposal facility acceptance criteria to assess alternative spoil disposal options:
  - Leggett Road cleanfill and controlled fill located at 81 Leggett Road, Templeton, whose criteria are based on the published background concentrations for the 'recent rural' soil type for western Christchurch. Asbestos is accepted at up to 5% ACM and 0.1% w/w AF/FA[16].
  - The Wheatsheaf Quarry and managed fill facility operated by Selwyn Quarries Limited (SQL) and is located on Selwyn Road, Broadfield. The acceptance criteria are based on NESCS SCS for rural residential/lifestyle block. Asbestos is not accepted. We understand that for disposal to this facility:
    - Averaging across samples is not acceptable to Wheatsheaf. Only material represented by individual samples which comply with the quarry's acceptance criteria can be accepted.
    - Wheatsheaf will not accept material from *within* the dwelling footprint or from large areas of the site not sampled (e.g., underneath paved driveways, outbuildings) until the material is sampled and compliance with the acceptance criteria confirmed.

[15] Environment Canterbury GIS, Trace Elements Level 2.
[16] Asbestos Fines/Fibrous Asbestos.

- Burwood Landfill in Burwood, Christchurch with acceptance criteria based on NESCS recreational land use criteria. It is noted that Burwood Landfill is approaching the end of its lifecycle regarding waste acceptance. Asbestos is not accepted.
- We note that other facilities may become consented and operational, with different waste acceptance criteria, in the foreseeable future. This may change the disposal options discussed below. Prior to construction a review of available managed fill facilities should be undertaken.

5.3.2 Analytical results summary

The findings are summarised in Table 5.2 below and as follows:

Land use (protection of human health) and workplace health and safety

- Except for the following, analysed soils recorded concentrations of the metals tested **below** NESCS high-density residential land use and commercial/industrial criteria. The recorded exceedance is at:
  - 15 Church Street, cell HA5 at 0.1 m bgl where arsenic was recorded above its NESCS SCS for both high density residential and commercial/industrial land uses.
- Asbestos in soil (via presence/absence analysis) was not detected in the samples analysed collected from across the site.

Offsite disposal

Based on the recorded concentrations of the metals analysed, soils displaced by the redevelopment work will, depending on location and depth, require disposal to manged fill. Figures 2-6 (attached below) outline the soil disposal options for the site.

The dwelling halo composite samples collected at 7 and 15 Church Street recorded concentrations of one or more of the metals analysed above their respective Wheatsheaf managed fill acceptance criterion, but below Burwood Landfill's acceptance criteria.

The composite samples collected from the dwelling halos at 9, and 11+13 Church Street (the latter being a duplex structure) recorded concentrations of the metals analysed above published background values, but below Wheatsheaf managed fill's acceptance criteria.

In the absence of further information within the footprints of the existing dwellings, the same contamination conditions should be assumed within each footprint as within its respective halos to a depth of 0.3 m bgl as implied in the Kāinga Ora SAP and CSM. **Kāinga Ora may undertake further sampling and analysis within the footprints of the current dwellings after their demolition to understand/refine soil disposal options at these areas of the site.**

Table 5.2: Soil analytical results summary: 7-15 Church Street, Hampstead, Ashburton

				Asbestos[1]			Heavy Metals - Screen						
				Asbestos Containing Material (ACM) (Presence / absence and type)	Asbestos Containing Material (ACM) (% w/w)	Fibrous asbestos (FA) / Asbestos fines (AF) (% w/w)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
				% w/w	% w/w	% w/w	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Laboratory Limit of Reporting				0.01	0.01	0.001	0.1	0.01	0.1	0.1	0.1	0.1	5
Background (YGE Regional)[2]				**NAD**	**NAD**	**NAD**	**4.9**	**0.13**	**16.9**	**12.4**	**21.3**	**13.1**	**69.6**
NESCS - Commercial / Industrial[3]				-	0.05	0.001	70	1,300	6,300	>10,000	3,300	6,000 [4]	400,000 [4]
NESCS - High Density Residential[3]				-	0.04	0.001	45	230	1,500	>10,000	500	1,200 [4]	60,000 [4]
Waste acceptance criteria - Leggett Road Cleanfill and Controlled Fill Facility[5]				-	5	0.1	12.58	0.19	22.7	20.3	40.96	20.7	93.94
Waste Acceptance Criteria - Wheatsheaf Managed Fill[6]				NAD	NAD	NAD	17	0.8	290	>10,000	160	400 [4]	7,400 [4]
Waste Acceptance Criteria- Canterbury Enviro Solutions Temuka[8]				NAD	NAD	NAD	70	1,300	6,000	>10000	3,300	6,000	400,000
Waste Acceptance Criteria - Burwood Landfill[7]				NAD	NAD	NAD	80	400	2,700	>10,000	880	6,000	14,000
Property Address	**Sample ID**	**Sample depth (m bgl)**	**Material Type**										
7 Church St	HA1	0.1	Soil	NAD	-	-	**7.1**	**0.14**	**23**	**16**	**65**	**17**	**110**
		0.3		-	-	-	**6**	0.06	**25**	**16**	21	**19**	**86**
		0.5		-	-	-	**5.1**	-	**21**	**14**	-	**16**	**71**
		0.7		-	-	-	**5.6**	-	**20**	**16**	-	**15**	**61**
	HA2	0.1	Soil	NAD	-	-	**9.4**	**0.17**	**25**	**19**	**84**	**19**	**120**
		0.3		-	-	-	**5.6**	0.08	**23**	**15**	**24**	**17**	**84**
		0.5		-	-	-	**5.9**	-	**24**	**18**	**22**	**18**	**78**
		0.7		-	-	-	**5.6**	-	**23**	**16**	19	**17**	**71**
		1.0		-	-	-	-	-	**26**	-	-	-	-
	HA3	0.1	Soil	NAD	-	-	**8.9**	**0.27**	**22**	**21**	**180**	**15**	**180**
		0.3		-	-	-	**5.9**	**0.14**	**22**	**16**	**57**	**17**	**110**
		0.5		-	-	-	**5.6**	0.06	**24**	**15**	21	**18**	**77**
		0.7		-	-	-	**5.7**	0.07	**24**	**15**	**25**	**17**	**90**
		1.0		-	-	-	-	-	**21**	-	-	-	-
	HA4	0.1	Soil	NAD	-	-	**13**	**0.26**	**25**	**27**	**350**	**16**	**230**
		0.3		-	-	-	**11**	**0.23**	**26**	**21**	**200**	**15**	**180**
		0.5		-	-	-	**6.8**	**0.18**	**25**	**22**	**66**	**18**	**200**
		0.7		-	-	-	4.1	0.07	**20**	**13**	13	**15**	**87**
	HA5	0.1	Soil	NAD	-	-	**6.1**	**0.33**	**23**	**25**	**93**	**15**	**210**
		0.3		-	-	-	**5.2**	0.09	**22**	**15**	**25**	**17**	**96**
		0.5		-	-	-	4.7	-	**22**	**14**	15	**16**	64
		0.7		-	-	-	4.1	-	**20**	**13**	14	**15**	59
	HA6	0.1	Soil	NAD	-	-	**5**	**0.15**	**22**	**17**	**28**	**17**	**100**
		0.3		-	-	-	**5.5**	**0.25**	**23**	**20**	**58**	**16**	**140**
		0.5		-	-	-	**5**	0.08	**22**	**15**	**22**	**17**	**83**
		0.7		-	-	-	**5.4**	0.06	**24**	**16**	21	**17**	**78**
		1.0		-	-	-	-	-	**25**	-	-	-	-
	Composite Halo A-D 0.1	0.1	Topsoil	-	-	-	**8**	**0.35**	**25**	**81**	**300**	**15**	**230**
	Halo A 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo B 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo C 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo D 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
9 Church St	HA1	0.1	Soil	NAD	-	-	3.2	0.03	**20**	9.3	12	13	49
		0.3		-	-	-	**9.7**	**0.17**	**29**	**34**	**51**	**22**	**130**
		0.5		-	-	-	**5.9**	0.1	**22**	**20**	**39**	**16**	**88**
		0.7		-	-	-	**5.2**	0.06	**21**	**15**	17	**16**	69
	HA2	0.1	Soil	NAD	-	-	**7.6**	**0.25**	**21**	**43**	**75**	**15**	**150**
		0.3		-	-	-	**5**	0.1	**20**	**16**	**29**	**15**	**88**
		0.5		-	-	-	4.4	-	**21**	**14**	18	**16**	**72**
		0.7		-	-	-	4.8	-	**23**	**15**	18	**17**	67
	HA3	0.1	Soil	NAD	-	-	**9.6**	**0.35**	**23**	**50**	**92**	**16**	**160**
		0.3		-	-	-	**7.1**	**0.31**	**23**	**78**	**81**	**17**	**160**
		0.5		-	-	-	**6.2**	0.08	**24**	**23**	20	**18**	**110**
		0.7		-	-	-	**6.2**	0.06	**25**	**21**	21	**18**	**92**
		1.0		-	-	-	-	-	**20**	**14**	-	-	-
	HA4	0.1	Soil	NAD	-	-	**5.5**	**0.19**	**20**	**15**	**32**	12	**91**
		0.3		-	-	-	**19**	**0.36**	**30**	**55**	**140**	**19**	**230**
		0.5		-	-	-	**10**	0.12	**27**	**28**	**38**	**19**	**120**
		0.7		-	-	-	**9.7**	**0.16**	**23**	**28**	**84**	**15**	**110**
		1.0		-	-	-	-	-	**19**	**14**	15		56
	HA5	0.1	Soil	NAD	-	-	**24**	**0.44**	**33**	**130**	**190**	**26**	**260**
		0.3		-	-	-	**7.6**	0.09	**22**	**16**	**24**	**17**	**120**
		0.5		-	-	-	**7.1**	-	**21**	**17**	**28**	**16**	**120**
		0.7		-	-	-	4.4	-	**20**	**14**	17	**14**	69
	HA6	0.1	Soil	NAD	-	-	**14**	**0.28**	**22**	**29**	**88**	**16**	**700**
		0.3		-	-	-	**5.3**	0.06	**20**	**13**	17	**16**	**75**
		0.5		-	-	-	3.9	-	**18**	11	11	**14**	58
		0.7		-	-	-	**18**		**17**	11	16	13	**79**
		1.0		-	-	-	**34**		**19**	9.9	11	**14**	49
	Composite Halo A-D 0.1	0.1	Topsoil	-	-	-	**13**	**0.4**	**25**	**61**	**140**	**16**	**180**
	Halo A 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo B 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo C 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo D 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	HA1	0.1	Soil	NAD	-	-	**6.8**	**0.14**	**26**	**18**	**36**	**19**	**100**
		0.3		-	-	-	**6.3**	0.12	**26**	**17**	**30**	**19**	**96**
		0.5		-	-	-	4.9	-	**20**	**13**	20	**15**	**70**
		0.7		-	-	-	**5.9**	-	**25**	**16**	**24**	**18**	**84**
		1.0		-	-	-	-	-	**24**	-	-	-	-
	HA2	0.1	Soil	NAD	-	-	**7.4**	0.1	**25**	**14**	**29**	13	**84**
		0.3		-	-	-	**8.3**	0.13	**26**	**24**	**42**	**20**	**110**
		0.5		-	-	-	**9.5**	-	**32**	**26**	**44**	**22**	**120**

		0.7		-	-	-	**6.4**	-	**24**	**19**	**44**	**17**	**99**
		1.0		-	-	-	-	-	**22**	-	-	-	-
11 Church St	HA3	0.1	Soil	NAD	-	-	**8.2**	**0.25**	**23**	**26**	**81**	**14**	**210**
		0.3		-	-	-	**8.3**	**0.22**	**28**	**27**	**150**	**19**	**200**
		0.5		-	-	-	**5.3**	0.1	**25**	**21**	**95**	**16**	**130**
		0.7		-	-	-	4.1	0.08	**21**	**14**	**37**	**14**	**84**
	HA4	0.1	Soil	NAD	-	-	**10**	**0.34**	**24**	**33**	**80**	**15**	**190**
		0.3		-	-	-	**14**	**0.34**	**26**	**38**	**86**	**17**	**190**
		0.5		-	-	-	**7.8**	0.09	**23**	**19**	**25**	**17**	**88**
		0.7		-	-	-	**8.7**	**0.14**	**25**	**24**	**42**	**19**	**110**
		1.0		-	-	-	-	-	**22**	-	-	-	-
	Composite Halo A-D 0.1	0.1	Topsoil	-	-	-	**9.8**	**0.28**	**25**	**43**	**120**	**16**	**220**
	Halo A 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo B 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo C 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo D 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
13 Church St	HA1	0.1	Soil	NAD	-	-	**17**	**0.27**	**27**	**35**	**62**	**17**	**150**
		0.3		-	-	-	**14**	**0.15**	**26**	**73**	**52**	**19**	**110**
		0.5		-	-	-	**8.9**	0.13	**26**	**22**	**36**	**18**	**100**
		0.7		-	-	-	**5.7**	0.06	**24**	**16**	19	**18**	**77**
		1.0		-	-	-	-	-	**24**	-	-	-	-
	HA2	0.1	Soil	NAD	-	-	**17**	**0.34**	**30**	**49**	**230**	**17**	**250**
		0.3		-	-	-	**10**	**0.25**	**26**	**28**	**83**	**18**	**180**
		0.5		-	-	-	**5.5**	0.07	**21**	**15**	21	**16**	**90**
		0.7		-	-	-	**6.4**	0.09	**25**	**18**	**27**	**18**	**100**
		1.0		-	-	-	-	-	**23**	-	-	-	**78**
	HA3	0.1	Soil	NAD	-	-	**8.7**	**0.46**	**26**	**35**	**84**	**17**	**240**
		0.3		-	-	-	**6.1**	**0.23**	**23**	**24**	**44**	**17**	**140**
		0.5		-	-	-	**5.4**	**0.14**	**23**	**20**	**33**	**16**	**110**
		0.7		-	-	-	4.3	0.09	**19**	**14**	19	**14**	**73**
15 Church St	HA1	0.1	Soil	NAD	-	-	**11**	0.08	**20**	**13**	**28**	**14**	**88**
		0.3		-	-	-	**8.1**	0.07	**25**	**19**	**27**	**18**	**96**
		0.5		-	-	-	**8.1**	0.06	**26**	**19**	**25**	**19**	**90**
		0.7		-	-	-	4.8	0.05	**24**	**15**	20	**16**	**71**
		1.0		-	-	-	-	-	**24**	-	-	-	-
	HA2	0.1	Soil	NAD	-	-	**9.6**	0.15	**28**	**23**	**69**	**20**	**130**
		0.3		-	-	-	**6.4**	0.1	**24**	**18**	**34**	**18**	**90**
		0.5		-	-	-	**5.8**	-	**25**	**16**	**28**	**19**	**86**
		0.7		-	-	-	**6.5**	-	**27**	**18**	21	**20**	**80**
		1.0		-	-	-	-	-	**19**	-	-	-	-
	HA3	0.1	Soil	NAD	-	-	**7.5**	**0.25**	**24**	**130**	**70**	**17**	**230**
		0.3		-	-	-	**5.2**	0.09	**19**	**14**	15	**14**	**150**
		0.5		-	-	-	3	-	**20**	12	16	**15**	**190**
		0.7		-	-	-	**5.6**	-	**23**	**15**	20	**15**	**110**
		1.0		-	-	-	-	-	**27**	-	-	-	**88**
	HA4	0.1	Soil	NAD	-	-	**6.5**	**0.16**	**19**	**20**	**40**	12	**150**
		0.3		-	-	-	**8.5**	**0.41**	**22**	**21**	**100**	**14**	**320**
		0.5		-	-	-	4.1	0.06	**23**	**14**	17	**16**	**70**
		0.7		-	-	-	**7.1**	0.05	**32**	**17**	**29**	**19**	**100**
		1.0		-	-	-	-	-	**25**	-	-	-	**89**
	HA5	0.1	Soil	NAD	-	-	**71**	**0.39**	**69**	**77**	**120**	13	**220**
		0.3		-	-	-	**9.2**	0.09	**18**	**15**	**32**	13	**86**
		0.5		-	-	-	**8.6**	-	**23**	**17**	21	**15**	**85**
		0.7		-	-	-	**21**	-	**31**	**31**	**68**	**18**	**150**
		1.0		-	-	-	**7.9**	-	**23**	**14**	19	-	68
	HA6	0.1	Soil	NAD	-	-	**11**	**0.31**	**21**	**35**	**320**	**16**	**270**
		0.3		-	-	-	**6.9**	**0.18**	**19**	**17**	**160**	**14**	**160**
		0.5		-	-	-	4.6	0.09	**22**	**13**	**26**	**15**	**100**
		0.7		-	-	-	4.3	0.08	**23**	**12**	16	**16**	**77**
		1.0		-	-	-	-	-	**23**	-	-	-	-
	Composite Halo A-D 0.1	0.1	Topsoil	-	-	-	**29**	**0.27**	**39**	**81**	**160**	**16**	**180**
	Halo A 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo B 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo C 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
	Halo D 0.1	0.1	Topsoil	NAD	-	-	-	-	-	-	-	-	-
Average all soils at 0.1 m bgl							**12.2**	**0.2**	**25.6**	**36.4**	**101.5**	**16.0**	**186.9**
Average all soils at 0.3 m bgl							**8.2**	**0.2**	**23.7**	**26.0**	**63.3**	**17.1**	**137.1**
Average all soils at 0.5 m bgl							**6.1**	0.1	**23.2**	**17.5**	**29.5**	**16.8**	**98.8**
Average all soils at 0.7 m bgl							**6.8**	0.1	**23.3**	**16.9**	**27.1**	**16.4**	**85.9**
Average all soils at 1.0 m bgl							**13.0**	-	**22.6**	**13.3**	16.7	13.0	**76.3**

Key:
NAD = No Asbestos Detected.
NGV = no guideline value.
<LoR = below laboratory Limit of Reporting.
'-' Denotes not analysed or not applicable.
m bgl = metres below ground level.

BOLD	exceeds published background concentrations at the site
	exceeds NES:CS SCS commercial/industrial criteria
	exceeds NES:CS SCS high density residential
	exceeds landfill screening acceptance criteria for Leggett Road
Underlined	exceeds landfill screening acceptance criteria for Wheatsheaf Quarries
	exceeds landfill screening acceptance criteria for Canterbury Enviro Solutions Temuka
	exceeds landfill screening acceptance criteria for Burwood Landfill

References:
Results are in milligrams per kilogram (mg/kg) unless specified.
1. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, BRANZ 2017. Soil guideline values for ACM and AF/FA based on relevant land use.
2. Environment Canterbury GIS, Trace Elements Level 2. Background concentrations at the site, from "Background concentrations of selected trace elements in Canterbury soils" prepared for Environment Canterbury by Tonkin & Taylor Ltd, July 2006.
3. MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Commercial/industrial land use criteria as a conservative proxy for construction worker health and safety, and high-density residential land use criteria.

4. In the absence of availbale NESCS criterion for nickel and zinc, the criterion has been adopted from Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.

5. Backfill Management Plan- 81 Leggett Road, Templeton (September 2019). Prepared for Protranz Earthmoving Ltd by Tonkin & Taylor Ltd.

6. Selwyn Quaries Limited resource consent CRC145183, Condition 24 (2014). Values based on NES Soil SCS for Rural residential/lifestyle block 25% produce.

7. Christchurch City Council (CCC) Burwood Landfill acceptance criteria, based on NESCS SCS for recreational land use.

8. Canterbury Enviro Solutions Ltd, Temuka. 45 Wilmshurst Road, Temuka facility, CRC212189, cleanfill levels and maximum limits.

6 Conceptual site model

A conceptual site model (CSM) as defined by the MfE's CLMG No. 5, sets out known and potential sources of ground contamination, potential exposure pathways, and potential receptors for a site. For there to be an effect to the proposed activity there has to be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

The CSM (used as a screening assessment) based on our review of available ECan ground contamination related information, review of aerial photographs, the proposed high-density residential land use, and assessment of the soil laboratory test results, is presented below in Table 6.1.

Table 6.1: Conceptual site model

Source	Exposure pathway	Potential receptor	Complete pathway?
Asbestos in soil from ACMs used in the construction of the structures on site (as ACM and/or AF/FA from construction, renovation activities and/or weather/degradation).	Inhalation of asbestos fines/fibres. Offsite disposal.	Site re-development workers. Future site users. Surrounding residents. Receiving environment (in surrounds and at disposal facility).	**No.** Asbestos in soil was not detected in the samples collected and analysed.
Metal concentrations in soil from anthropogenic activity.	Direct contact. Ingestion of soil. Inhalation of airborne dust. Off-site discharge.	Site re-development workers. Future site users. Surrounding residents. Receiving environment (in surrounds and at disposal facility).	**YES – *for construction workers only.*** For the following locale only: 15 Church Street, cell HA5, 0 to 0.3 m bgl (arsenic recorded above its commercial/industrial land use criterion). The redevelopment earthwork including the site scrape to 0.3 m bgl will remove this contaminant 'source' from the site, prior to its occupation for a high-density residential land use, and thus eliminating the pathway to *future* site users. Earthwork will be undertaken under appropriate management controls (see Section 8 below).

7 Regulatory requirements

The project planner should confirm the interpretation and applicability of all rules in the LWRP for the entire site redevelopment.

7.1 NESCS

The NESCS applies to a piece of land which an activity or industry on the HAIL has been, is being, or is 'more likely than not' to have been undertaken on it.

Review of historical aerial photographs and council records indicates that the site has *not* been subjected to an activity on the HAIL.

While some impact from anthropogenic activity has been identified on site, this would only be considered a HAIL if contamination was present in sufficient quantity that it could be a risk to human health (i.e., HAIL category I). This investigation has recorded an (one) isolated instance of the concentration of arsenic recorded above its high-density residential and commercial/industrial land use criterion, and concentrations of one or more of the metals analysed recorded above their background levels. *If* the isolated instance of arsenic impacted soil (i.e., cell 15 HA5, 0.1 m bgl) was *not* removed from site it *would* meet the threshold for HAIL category I. However, this impacted material will be removed from the site in accordance with Kāinga Ora's site redevelopment policy, and the earthwork undertaken following suitable management and controls (see Section 8). As this contaminant source is being removed prior to the site's high-density residential land use, HAIL category I would not apply following its redevelopment.

It is therefore considered that the NESCS *does not apply* (and consent under the NESCS is not required) for the site redevelopment.

Updated October 2023 – post communication with Ashburton District Council (ADC)[17]; the council do not agree with the above interpretation of the NESCS's applicability to the site's redevelopment (i.e., Category I *does* apply). On this premise, restricted discretionary consent under the NESCS is required for the site's redevelopment from ADC.

7.2 Canterbury Land and Water Regional Plan

The LWRP [18] defines a contaminated site as, "*land that has a hazardous substance in or on it that; a) has significant adverse effects on the environment; or b) is reasonably likely to have significant adverse effects on the environment".*

Whilst locally within the site, concentrations of the parameters analysed have been recorded above their published background concentrations and at a single locale, above high-density residential and commercial/industrial land use criteria, they have *not* been recorded in a sufficient quantity or magnitude to be of risk to human health or to have significant adverse effects on the environment.

Potentially contaminated land is defined as, *"part of a site where an activity or industry described in the list in Schedule 3 of this Plan has been or is being undertaken on it or where it is more likely than not that an activity or industry described in the list in Schedule 3 of this Plan is being or has been undertaken on it, but excludes any site where a detailed site investigation has been completed and reported and which demonstrates that any contaminants in or on the site are at, or below, background concentrations".*

[17] ADC, 15 September 2023 – Resource Consent Application, Rejection – LUC23/0070 – Land use consent at 7, 9, 11, 13, 15 Church Street to address non-compliance associated with the proposed construction of thirteen residential units in Residential C zone.

[18] Canterbury Land and Water Regional Plan, Volume 1, 2018.

As an activity or industry described in Schedule 3 (i.e., a HAIL) has not been undertaken at the site, the site is *not* considered to meet the definition of potentially contaminated land, and therefore rules relating to land contamination in the LWRP are not considered to apply.

8 Remedial work, material handling requirement

This section summarises the areas of the site requiring specific management, remediation, handling, or disposal. The specific requirements for each area should be detailed in a work instruction (WI).

8.1 Contamination remediation, management, and onsite reuse

Based on the investigation results, widespread ground contamination related remediation of the site is *not* required. The planned site scrape to 0.3 m bgl will see the removal of soils at the one location where arsenic was recorded above its high-density residential and commercial/industrial land use criteria.

Except for the following location, based on the data collected to date, soils on site are suitable for reuse from a ground contamination perspective under the proposed high-density residential land use scenario:

- 15 Church Street, cell HA5 0.0 to 0.3 m bgl.

Across the site, asbestos was not detected, and for the metals analysed, the results recorded are below assessment criteria for the protection of outdoor workers, and so standard earthwork health and safety controls are suitable for workers involved in soil disturbance of these materials.

Vigilance for indicators of potential ground contamination (including the presence of ACM) will be required during site earthworks. Discovery of ACM on site, within structure footprints may require additional health and safety controls to be implemented.

8.2 Soil disposal options

Soils requiring offsite disposal for constructability requirements will, based on the laboratory test results and their assessment, need to be disposed to managed fill, as outlined in Table 8.1 below.

It should be noted that the soil disposal options listed below are based on the inferred lowest cost disposal option (gate fee) for the different areas (cells) of the site, and not necessarily the optimal practicality of excavation/transport or costs associated with transport to the disposal facility.

Additional sampling in the footprints of the structures on site could be undertaken following their demolition to assess actual soil contamination conditions and whether material in the footprints could be disposed to a lower cost facility. However, there is no guarantee that actual contaminant concentrations are lower than those currently assumed.

As access in the footprint of the exiting dwellings was not possible, the contamination condition of these areas is currently unknown. At this stage it is assumed that soils in the footprint of the dwellings have the same contamination conditions as within their respective halos. This is based on the assumption that following demolition of the structures, each footprint is cleared for the presence of ACM/asbestos by a competent person[19]. **Kāinga Ora may undertake further soil sampling and analysis in the dwelling footprints/driveway areas to understand soil disposal options in these areas, following their demolition and clearance by the competent person.**

[19] Competent person as defined in the Asbestos Regulations 2016, Regulation 41(3).

All offsite disposal is subject to the prior written approval from a facility operator. The results of this PSI/DSI and the WI should be provided to a disposal facility's operator before movement of material from the site.

Table 8.1: Soil disposal options

Soil disposal area	Depth (m bgl)	Disposal facility (subject to operator acceptance)
Soil disposal within dwelling footprints at 7 and 15 Church Street	0.0 to 0.3	**TBC- Further testing may be undertaken.** *In the absence of current information from the dwelling and/or ancillary structure footprints, disposal to **Burwood Landfill** managed fill is assumed based on data collected from the dwelling halo AND following post demolition asbestos clearance by a Competent Person.*
Soil disposal within dwelling footprints at 9 and 11/13 Church Street	0.0 to 0.3	**TBC- Further testing may be undertaken.** *In the absence of current information from the dwelling and/or ancillary structure footprints, disposal to **Wheatsheaf** managed fill is assumed based on data collected from the dwelling halo AND following post demolition asbestos clearance by a Competent Person.*
Soil disposal within all dwelling footprints (7, 9, 11/13 and 15 Church Street)	0.3 to 0.5	**TBC- Further testing may be undertaken.** *In the absence of current information from the dwelling and/or ancillary structure footprints, disposal to **Burwood Landfill** manged fill is assumed based on the site wide average (noting Wheatsheaf managed fill does not accept material based on average concentrations) AND following post demolition asbestos clearance by a Competent Person.*
	0.5 to 0.7	
	0.7 to 1.0	
	>1.0	
Soil disposal within the dwelling halo at 7 and 15 Church Street	0.0 to 0.3	**Burwood Landfill** manged fill.
Soil disposal within the dwelling halo at 9 and 11/13 Church Street	0.0 to 0.3	**Wheatsheaf** managed fill.
7 Church Street, cells HA3 and HA4 **9 Church Street, cell HA5** **13 Church Street, cell HA2** **15 Church Street, cells HA5 and HA6**	0.0 to 0.3	**Burwood Landfill** manged fill.
9 Church Street, cells HA1 and HA4 **15 Church Street, cell HA1**	0.0 to 0.3	**Leggett Road** manged (controlled) fill.

Soil disposal area	Depth (m bgl)	Disposal facility (subject to operator acceptance)
All other cells (see Figure 2)	0.0 to 0.3	**Wheatsheaf** managed fill.
7 Church Street, cell HA4	0.3 to 0.5	**Burwood Landfill** manged fill.
9 Church Street, cells HA2 and HA6 **15 Church Street, cell HA5**	0.0 to 0.3	**Leggett Road** manged (controlled) fill.
All other cells (see Figure 3)	0.3 to 0.5	**Wheatsheaf** managed fill.
7 Church Street, cells HA1 and HA5 **9 Church Street, cells HA1, HA2, HA4 and HA6** **11 Church Street, cell HA1** **13 Church Street, cell HA2**	0.5 to 0.7	**Leggett Road** managed (controlled) fill.
All other cells (see Figure 4)	0.5 to 0.7	**Wheatsheaf** managed fill.
7 Church Street, cells HA1 and HA4, HA5 **9 Church Street, cells HA1-HA2 and HA5** **11 Church Street, cell HA3** **13 Church Street, cell HA3**	0.7 to 1.0	**Leggett Road** managed (controlled) fill.
All other cells (see Figure 5)	0.7 to 1.0	**Wheatsheaf** managed fill.
7 Church Street, cells HA1, HA3, HA4 and HA5 **9 Church Street, HA1-HA5 (inclusive)** **11 Church Street, cell HA3** **13 Church Street, cell HA3** **15 Church Street, cell HA2**	>1.0	**Leggett Road** managed (controlled) fill.
All other cells (see Figure 6)	>1.0	**Wheatsheaf** managed fill.

Vigilance regarding the presence of visible ACM in site soils and within the current dwelling and/or ancillary structure footprints is required from the Contractor undertaking earthwork on the site. The WI and Kāinga Ora generic CSMP[20] outlines accidental discovery protocols for suspect/unexpected contamination discoveries. If ACM/asbestos materials are discovered under the structure footprints following their demolition, this will incur additional disposal costs as material will require disposal as asbestos waste to a suitably licensed facility.

Additional disposal figures and estimated volumes will be provided in the WI.

[20] Kāinga Ora (December 2021) Generic Contaminated Site Management & Contaminated Soil Discovery Guideline. 13 December 2021.

8.3 Soil excavation volume estimates

Information relating to soil excavation volume estimates for materials displaced by the site's redevelopment based on the sample results of this investigation shall be provided in the WI.

9 Recommendations

Based on the PSI/DSI findings, T+T recommends the following:

- A WI is needed to outline health, environmental and safety controls, mitigation controls to manage unexpected discovery of contaminants, including ACM, and summarise offsite disposal options for excavated soil based on the available laboratory results and their assessment. The WI should be read in conjunction with the Kāinga Ora 2021 CSMP.
- A site work completion report showing excavated areas and soil disposal dockets should be prepared upon completion of the earthwork.
- Except for the following, ground contamination related remediation of the site is not required for the proposed high-density residential land use. The exception is:
  - Removal of arsenic contaminated soils at 15 Church Street, cell HA5 0.0 to 0.3 m bgl (which will be undertaken during the site scrape exercise).
- Across the rest of the site, standard earthwork health and safety controls are suitable for workers involved in soil disturbance. More information relating to earthwork controls and procedures will be included in the WI.
- Vigilance for the presence of any ACM or other signs of contamination is required during site earthwork, as this may alter where soils can be disposed offsite, and/or the need for additional (i.e., asbestos specific) health and safety controls.
- A pre-deconstruction asbestos survey is recommended to be undertaken on the dwellings/other structures on site prior to their demolition in accordance with the requirements of the Asbestos Regulations.
- **Following demolition of the existing dwellings and ancillary structures on site, a hold point shall occur prior to soil disturbance at their footprints for a competent person to inspect that ACM/asbestos material is not present**. If asbestos material is suspected/discovered, no soil disturbance or reworking across the demolition footprint(s) should occur until further assessment by a SQEP.

10 Applicability

This report has been prepared for the exclusive use of our client Kāinga Ora Homes and Communities, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of subsoil away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

We understand and agree that our client will submit this report as part of an application for resource consent and that Ashburton District Council and/or Environment Canterbury as the consenting authorities will use this report for the purpose of assessing that application.

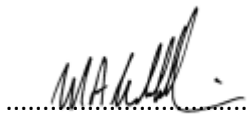
Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:

.....

Colter Carson
Environmental Consultant

Authorised for Tonkin & Taylor Ltd by:



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Michael Mechaelis
Project Director

Report technically reviewed by a SQEP as prescribed in the NESCS Users' Guide:

.....

Mark Morley
Environmental Geologist

COCA
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Figures

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LOCATION PLAN

			APPROVED	DATE
PROJECT No.	1018898.2000			
DESIGNED	COCA	JUL.23		
DRAWN	-WEB-	JUL.23		
CHECKED				

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
GROUND CONTAMINATION INVESTIGATION PLAN

SCALE (A3) 1:550 FIG No. FIGURE 1. REV 0

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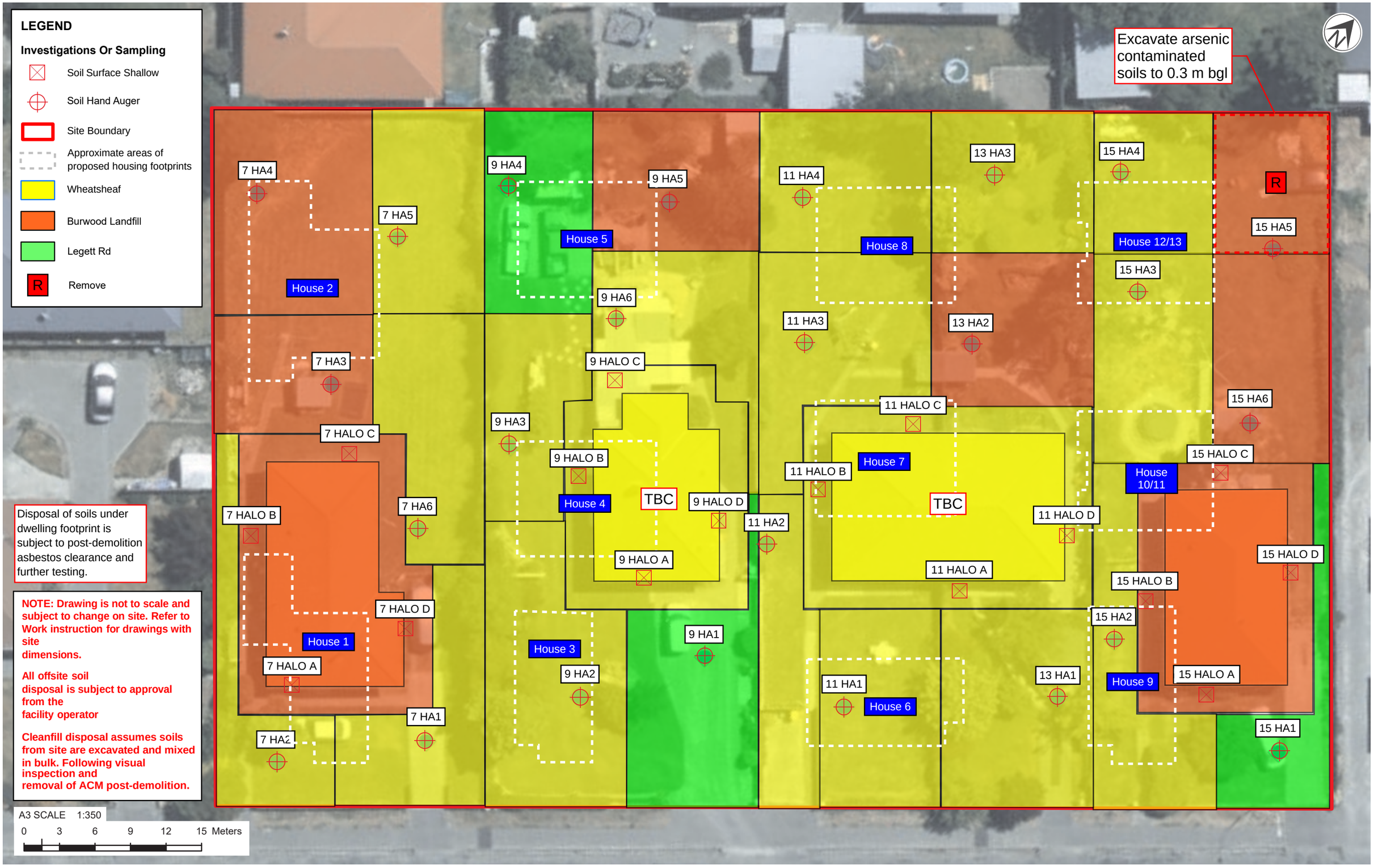

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LOCATION PLAN

			APPROVED	DATE
PROJECT No.	1018898.2000			
DESIGNED	COCA	JUL.23		
DRAWN	-WEB-	JUL.23		
CHECKED				

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
SOIL DISPOSAL 0.0 - 0.3 M BGL

SCALE (A3) 1:350 FIG No. FIGURE 2. REV 0

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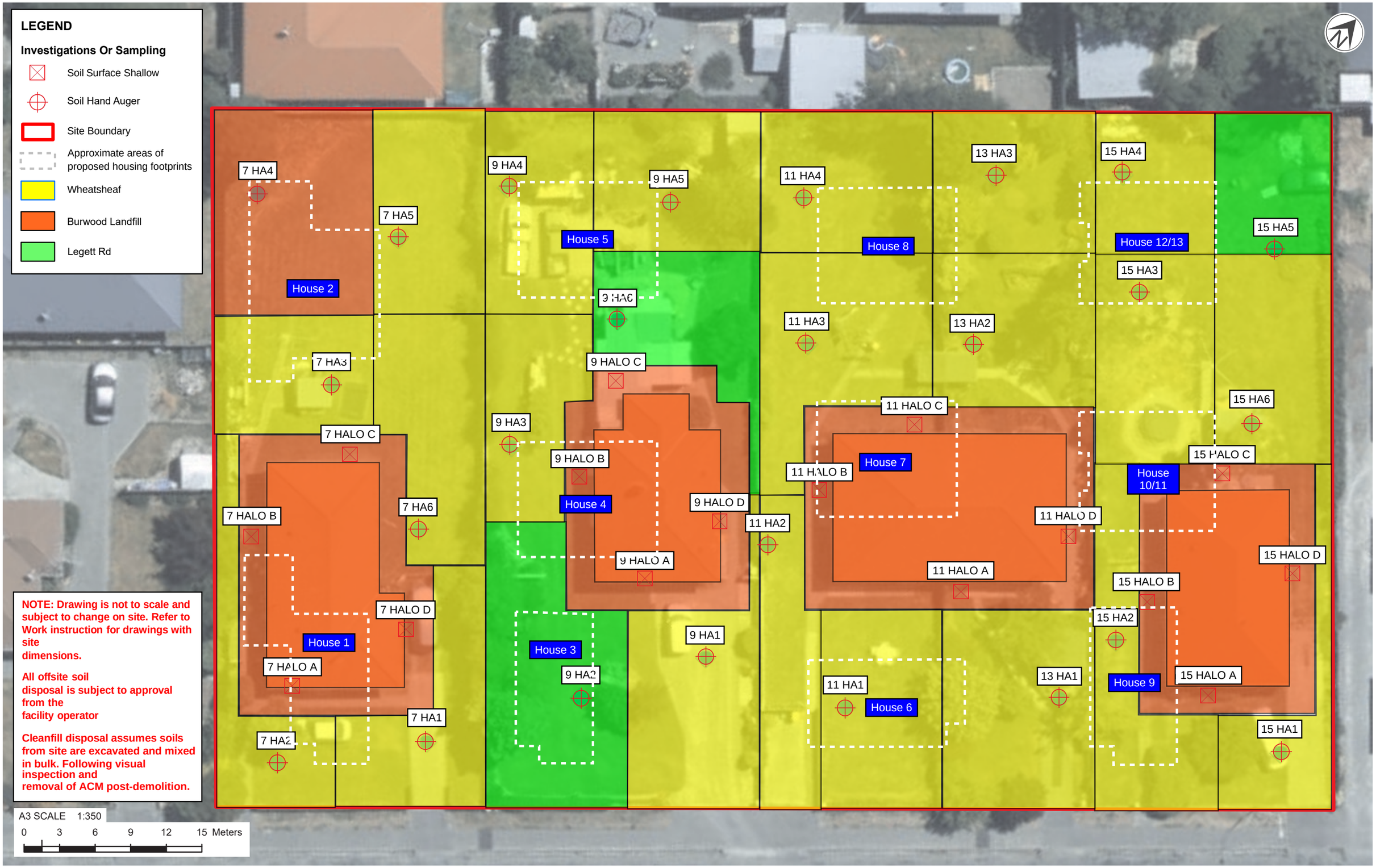

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LOCATION PLAN

PROJECT No.	1018898.2000		
DESIGNED	COCA	JUL.23	
DRAWN	-WEB-	JUL.23	
CHECKED			
	APPROVED	DATE	

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
SOIL DISPOSAL 0.3 - 0.5 M BGL

SCALE (A3) 1:350 FIG No. FIGURE 3. REV 0

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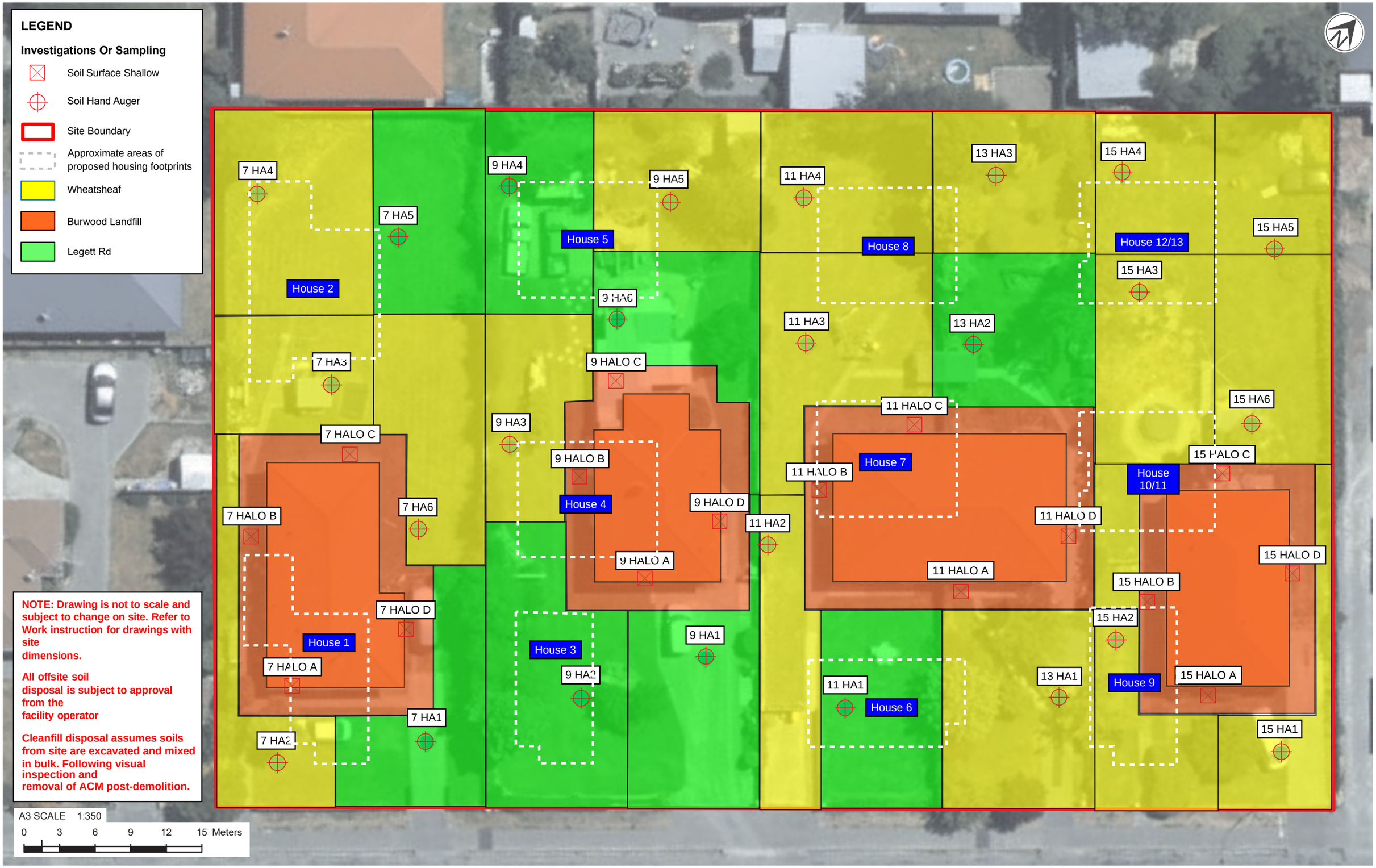

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LOCATION PLAN

PROJECT No.	1018898.2000		
DESIGNED	COCA	JUL.23	
DRAWN	-WEB-	JUL.23	
CHECKED			
APPROVED		DATE	

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
SOIL DISPOSAL 0.5 - 0.7 M BGL

SCALE (A3) 1:350 FIG No. FIGURE 4. REV 0

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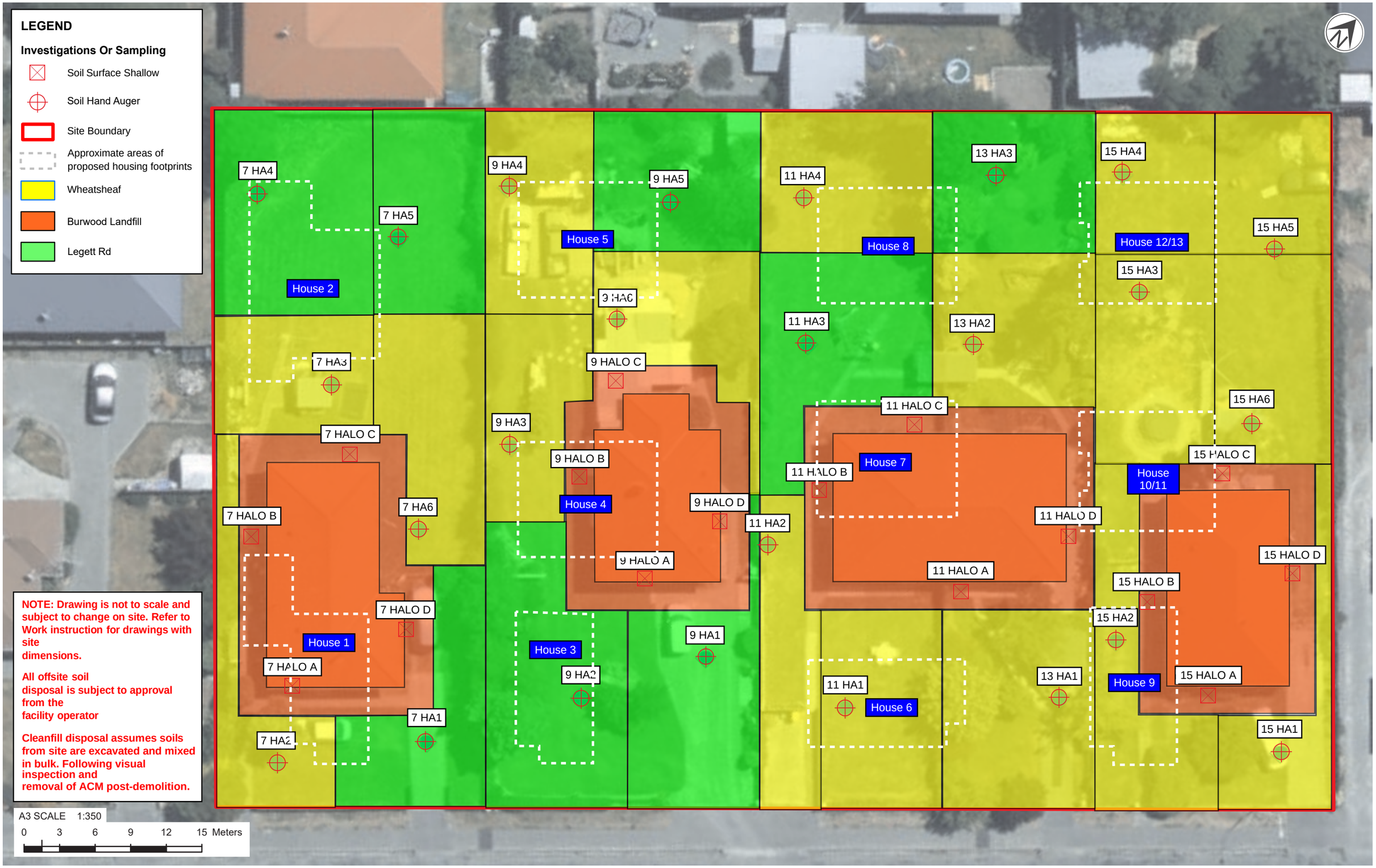

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LOCATION PLAN

PROJECT No.	1018898.2000		
DESIGNED	COCA	JUL.23	
DRAWN	-WEB-	JUL.23	
CHECKED			
APPROVED		DATE	

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
SOIL DISPOSAL 0.7 - 1.0 M BGL

SCALE (A3) 1:350 FIG No. FIGURE 5. REV 0

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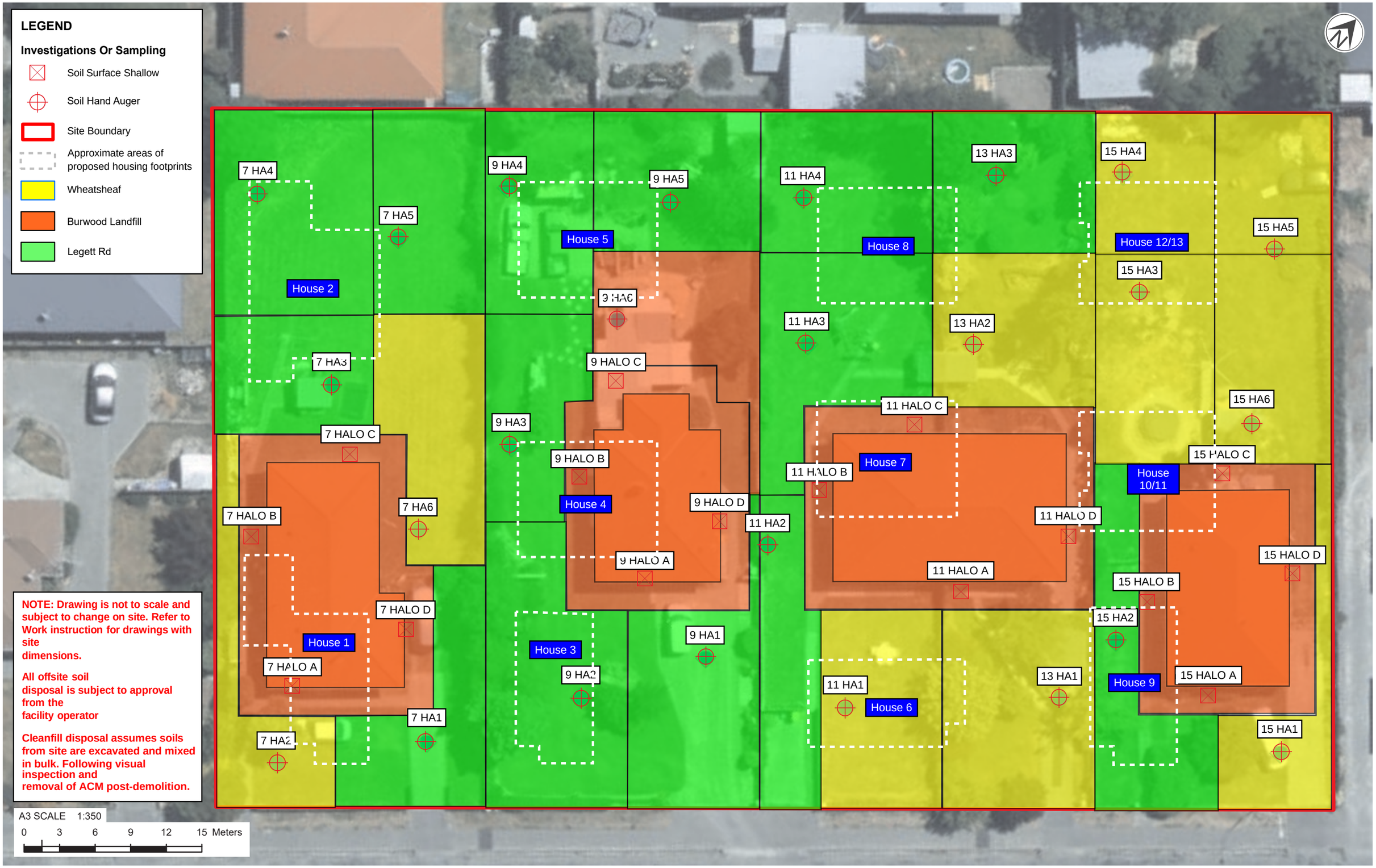

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LOCATION PLAN

			APPROVED	DATE
PROJECT No.	1018898.2000			
DESIGNED	COCA	JUL.23		
DRAWN	-WEB-	JUL.23		
CHECKED				

CLIENT KAINGA ORA- HOMES AND COMMUNITIES

PROJECT HOUSING DELIVERY SYSTEM MBU1

TITLE 7-15 CHURCH ST, ASHBURTON
SOIL DISPOSAL >1.0 M BGL

SCALE (A3) 1:350 FIG No. FIGURE 6. REV 0

Appendix A Site photographs

- **All photographs taken 12 July 2023.**

7 Church St

Photograph Appendix A.1: Front (south-eastern) elevation of dwelling (facing north-west).

Photograph Appendix A.2: Rear (north-western) and side (north-eastern) elevations of dwelling (facing south).

Photograph Appendix A.3: Shed detail (facing south-east).

Photograph Appendix A.4: Rear (north-western) property border (facing north-west).

Photograph Appendix A.5: Foundation detail including textured (stucco) render (facing north-west).

Photograph Appendix A.6: Cladding and soffit detail.

Photograph Appendix A.7: Entryway vestibule detail (facing west).

9 Church Street

Photograph Appendix A.8: Front garden and front (south-eastern) elevation of dwelling (facing west).

Photograph Appendix A.9: South-western property border and elevation of dwelling (facing north-west).

Photograph Appendix A.10: North-eastern property border and elevation of dwelling (facing north-west).

Photograph Appendix A.11: Rear garden of property (facing north-west).

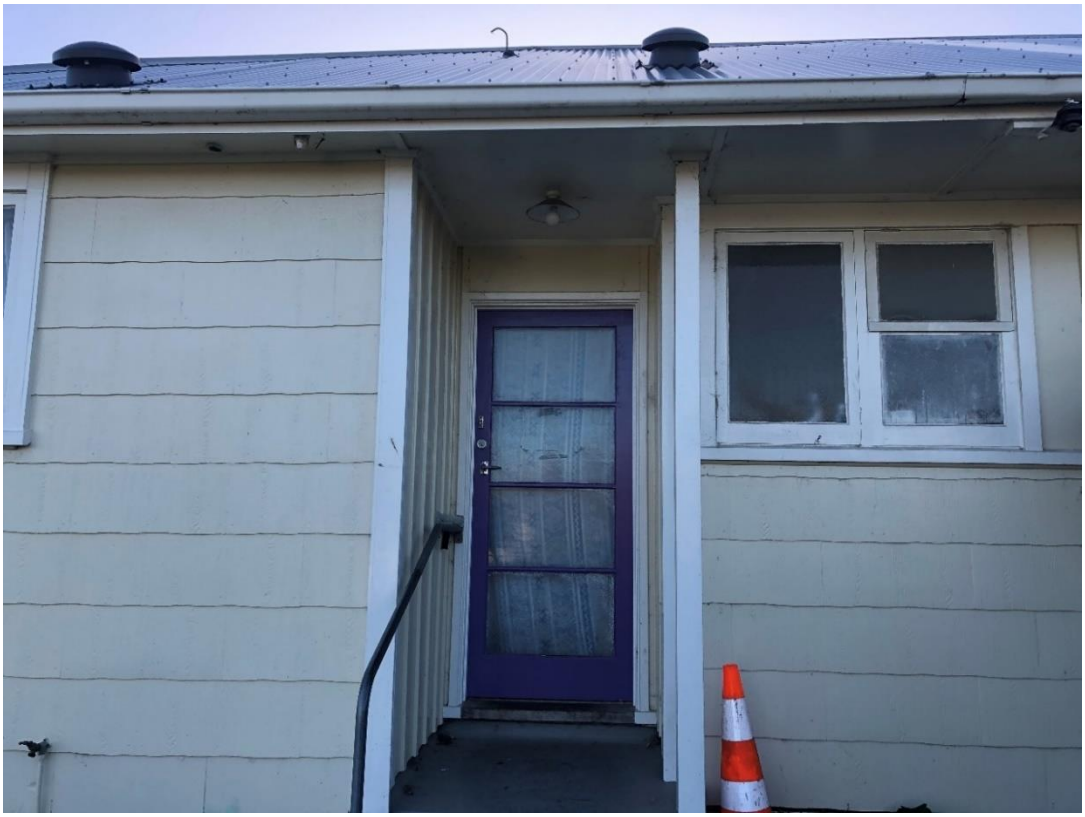
Photograph Appendix A.9: Shed and north-western elevation of dwelling (facing south-east).

Photograph Appendix A.13: Soffit detail (facing south-east).

11 Church Street:

Photograph Appendix A.14: Front (south-eastern) elevation of dwelling (facing north-west).

Photograph Appendix A.15: Front elevation of dwelling (facing north-west).



Photograph Appendix A.16: Entryway vestibule detail (facing north-west).

Photograph Appendix A.17: Side (south-western) and rear (north-western) elevations of dwelling (facing east).

Photograph Appendix A.18: Back garden and rear elevation of dwelling (facing south-east).

Photograph Appendix A.19: Shed detail (facing north-east).

13 Church Street

Photograph Appendix A.20: Front garden and front (south-eastern) elevation of dwelling (facing north-west).

Photograph Appendix A.21: Front elevation of dwelling (facing north-west).

Photograph Appendix A.22: Entryway vestibule detail (facing north-west).

Photograph Appendix A.23: Side (north-eastern) elevation of dwelling (facing north-west).

Photograph Appendix A.24: Rear (north-western) elevation of dwelling (facing south-east).

Photograph Appendix A.25: Rear garden (facing north-west).

Photograph Appendix A.26: Rear garden and rear elevation of dwelling (facing south-east).

15 Church Street

Photograph Appendix A.27: Front garden and front (south-eastern) elevation of dwelling (facing north-west).

Photograph Appendix A.28: Side (south-western) elevation of dwelling (facing north).

Photograph Appendix A.29: Rear (north-western) elevation of dwelling and shed (facing south-east).

Photograph Appendix A.30: Rear garden (facing south-east).

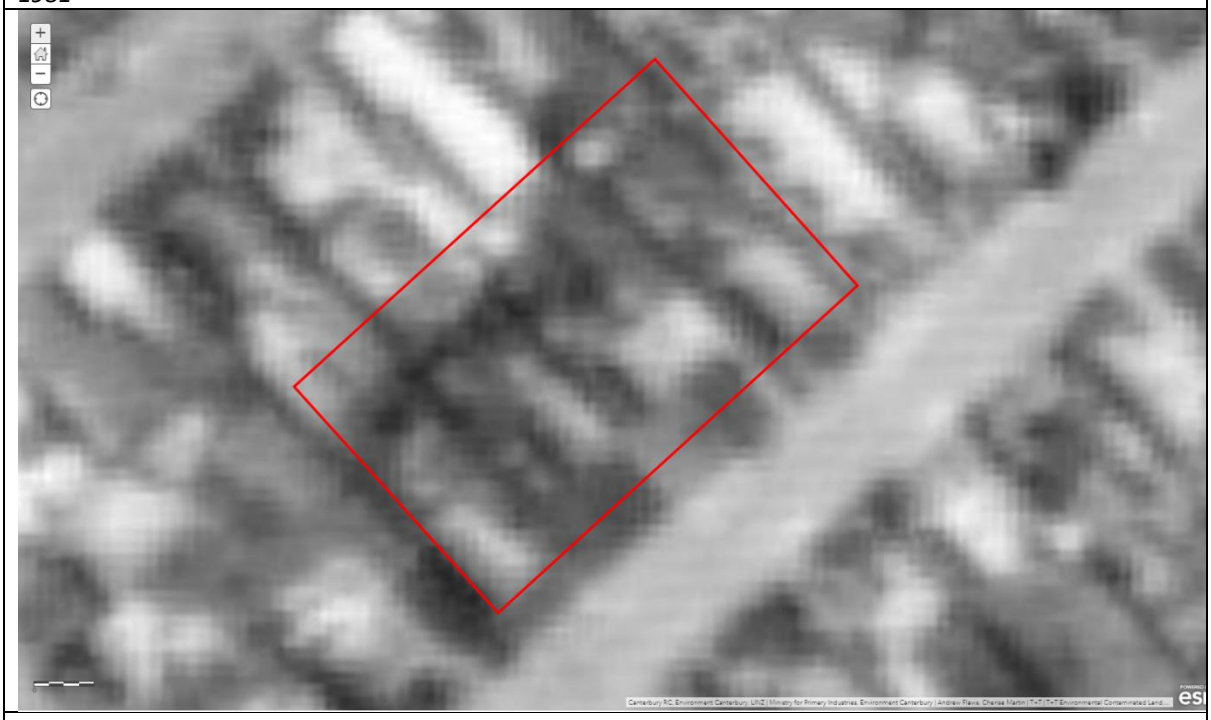
Appendix B Historical aerial photographs

- **Aerial images sourced from Canterbury Maps Viewer.**
- **Approximate site boundaries are shown in red.**
- **Top of image is north facing.**

1941

1956

1981



1987

1995

2004

2012

2017

2020

Appendix C ECan LLUR statement

Environment Canterbury
Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear Sir/Madam

Thank you for submitting your property enquiry from our Listed Land Use Register (LLUR). The LLUR holds information about sites that have been used or are currently used for activities which have the potential to cause contamination.

The LLUR statement shows the land parcel(s) you enquired about and provides information regarding any potential LLUR sites within a specified radius.

Please note that if a property is not currently registered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR database is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; additional relevant information may be held in other files (for example consent and enforcement files).

Please contact Environment Canterbury if you wish to discuss the contents of this property statement.

Yours sincerely

Contaminated Sites Team

Property Statement
from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ348866

Date generated: 10 July 2023
Land parcels: Lot 4 DP 16102
Lot 2 DP 16102
Lot 3 DP 16102
Lot 1 DP 16102

The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Sites at a glance

Sites within enquiry area

There are no sites associated with the area of enquiry.

More detail about the sites

There are no sites associated with the area of enquiry.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Listed Land Use Register

What you need to know

Everything is connected

What is the Listed Land Use Register (LLUR)?

The LLUR is a database that Environment Canterbury uses to manage information about land that is, or has been, associated with the use, storage or disposal of hazardous substances.

Why do we need the LLUR?

Some activities and industries are hazardous and can potentially contaminate land or water. We need the LLUR to help us manage information about land which could pose a risk to your health and the environment because of its current or former land use.

Section 30 of the Resource Management Act (RMA, 1991) requires Environment Canterbury to investigate, identify and monitor contaminated land. To do this we follow national guidelines and use the LLUR to help us manage the information.

The information we collect also helps your local district or city council to fulfil its functions under the RMA. One of these is implementing the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil, which came into effect on 1 January 2012.

For information on the NES, contact your city or district council.

How does Environment Canterbury identify sites to be included on the LLUR?

We identify sites to be included on the LLUR based on a list of land uses produced by the Ministry for the Environment (MfE). This is called the Hazardous Activities and Industries List (HAIL)[1]. The HAIL has 53 different activities, and includes land uses such as fuel storage sites, orchards, timber treatment yards, landfills, sheep dips and any other activities where hazardous substances could cause land and water contamination.

We have two main ways of identifying HAIL sites:

- We are actively identifying sites in each district using historic records and aerial photographs. This project started in 2008 and is ongoing.
- We also receive information from other sources, such as environmental site investigation reports submitted to us as a requirement of the Regional Plan, and in resource consent applications.

[1] The Hazardous Activities and Industries List (HAIL) can be downloaded from MfE's website www.mfe.govt.nz, keyword search HAIL

How does Environment Canterbury classify sites on the LLUR?

Where we have identified a HAIL land use, we review all the available information, which may include investigation reports if we have them. We then assign the site a category on the LLUR. The category is intended to best describe what we know about the land use and potential contamination at the site and is signed off by a senior staff member.

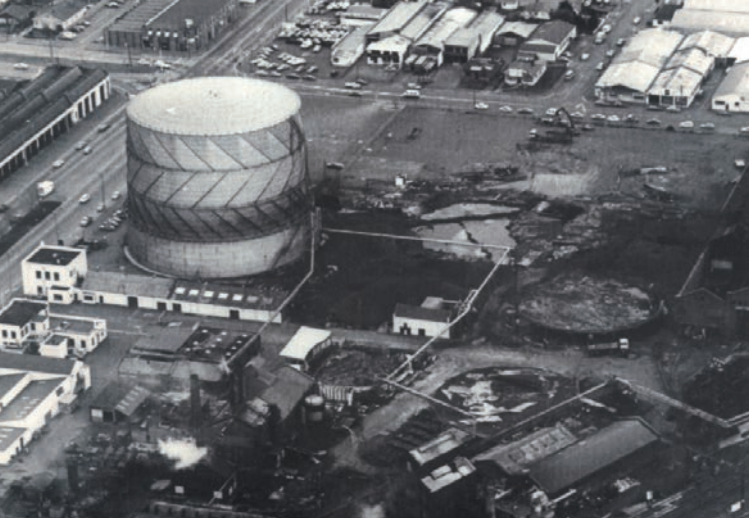
Please refer to the Site Categories and Definitions factsheet for further information.

What does Environment Canterbury do with the information on the LLUR?

The LLUR is available online at www.llur.ecan.govt.nz. We mainly receive enquiries from potential property buyers and environmental consultants or engineers working on sites. An inquirer would typically receive a summary of any information we hold, including the category assigned to the site and a list of any investigation reports.

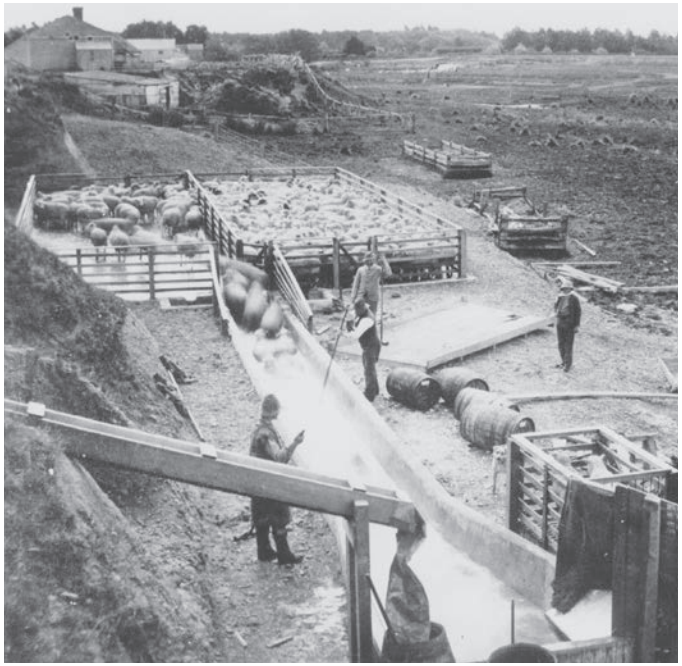
We may also use the information to prioritise sites for further investigation, remediation and management, to aid with planning, and to help assess resource consent applications. These are some of our other responsibilities under the RMA.

If you are conducting an environmental investigation or removing an underground storage tank at your property, you will need to comply with the rules in the Regional Plan and send us a copy of the report. This means we can keep our records accurate and up-to-date, and we can assign your property an appropriate category on the LLUR. To find out more, visit www.ecan.govt.nz/HAIL.



IMPORTANT!

The LLUR is an online database which we are continually updating. A property may not currently be registered on the LLUR, but this does not necessarily mean that it hasn't had a HAIL use in the past.



Sheep dipping (ABOVE) and gas works (TOP) are among the former land uses that have been identified as potentially hazardous. (Photo above by Wheeler & Son in 1987, courtesy of Canterbury Museum.)

My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.

I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:
Calling from Christchurch: (03) 353 9007
Calling from any other area: 0800 EC INFO (32 4636)

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Everything is connected

Promoting quality of life through balanced resource management.

www.ecan.govt.nz E13/101

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment Canterbury for further information:

(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

E13/102

Appendix D Soil logs

Appendix D Table 1: Soil log table

7 Church Street

Sampling point	Soil depth (m bgl)	Soil description[1]
HA1	0.0 – 0.15	Concrete core.
	0.15 – 0.4	SILT w trace fine sand; brown.
	0.4 – 1.0	Silty fine SAND; yellow brown.
HA2	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	Silty fine SAND; yellow brown.
HA3	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 0.5	SILT; brown.
	0.5 – 1.0	SAND fine; orange yellow brown.
HA4	0.0 – 0.2	Organic topsoil; Silty SAND with minor plant material (bark/organics); brown.
	0.2 – 0.3	Silty coarse SAND; grey.
	0.3 – 0.5	SILT; brown.
	0.5 – 1.0	SAND fine; orange yellow brown.
HA5	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 0.5	SILT; brown.
	0.5 – 1.0	SAND fine; orange yellow brown.
HA6	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	Sandy (f) SILT; light brown.
Halo A	0.0 – 0.1	Topsoil. Silt; brown.
Halo B		
Halo C		
Halo D		

9 Church Street

Sampling point	Soil depth (m bgl)	Soil description[1]
HA1	0.0 – 0.15	Sandy fine GRAVEL (a); yellowish brown; sand fine to coarse.
	0.15 – 0.65	SILT with trace sand (f-m); brown, dark brown mottled.
	0.65 – 1.0	GRAVEL (f-m, sa-sr).
HA2	0.0 – 0.3	SILT with minor sand; brown.
	0.3 – 1.0	SILT with minor sand; yellowish brown.
HA3	0.0 – 0.1	SILT with trace sand and fine gravel (sa-sr); brown.
	0.1 – 0.2	SILT with minor (f-m) gravel.
	0.2 – 0.3	SILT; brown.
	0.3 – 0.5	SILT with some sand (f-m); mottled boundary to yellowish brown.
	0.5 – 1.0	Sandy SILT; yellowish brown.
HA4	0.0 – 0.2	SILT with minor-some sand (f-m); brown/dark brown.

Sampling point	Soil depth (m bgl)	Soil description[1]
	0.2 – 0.3	FILL; lime chip/decorative garden stones (a); white.
	0.3 – 0.7	SILT with trace sand (f-m); brown/yellowish brown.
	0.7 – 1.0	Sandy SILT; yellowish brown.
HA5	0.0 – 0.1	SILT with minor sand (f-m); brown/dark brown.
	0.1 – 0.25	Minor concrete (m gravel sized, soft, wet, breaking down); orange stained.
	0.25 – 0.45	Sandy SILT; yellowish brown.
	0.45 – 0.6	SAND (f-m); yellowish brown mottled orange.
	0.6 – 0.8	Silty SAND (f-m); yellowish brown mottled orange.
	0.8 – 1.0	Silty SAND (f-m) with trace to minor SILT; brownish grey mottled orange.
HA6	0.0 – 0.5	SILT with minor to some sand and gravel (sa-sr); brown/dark brown.
	0.5 – 0.8	SAND (f-m) with minor silt; yellowish brown.
	0.8 – 1.0	SAND with some gravel (f-m, sa-sr); yellowish brown.
Halo A	0.0 – 0.1	Silt with minor to trace sand (f-m); brown.
Halo B		Silt with minor to trace sand (f-m); light brown.
Halo C		Sandy GRAVEL (f, sr-a) with trace silt; fine to coarse sand; light brown.
Halo D		Silt with minor to trace sand (f-m); brown.

11 Church Street

Sampling point	Soil depth (m bgl)	Soil description[1]
HA1	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	Sandy (f) SILT; light brown.
HA2	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	Sandy (f) SILT; light brown.
HA3	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 0.8	SILT with trace fine sand; light brown
	0.8 – 1.0	SAND with trace silt; orange brown.
HA4	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 0.8	SILT with trace fine sand; light brown.
	0.8 – 1.0	SAND with trace silt; orange brown.
Halo A	0.0 – 0.1	Topsoil. Silt; brown.
Halo B		
Halo C		
Halo D		

13 Church Street

Sampling point	Soil depth (m bgl)	Soil description[1]
HA1	0.0 – 0.6	Organic topsoil; SILT; brown .
	0.6 – 1.0	SILT with trace fine sand; light brown.

Sampling point	Soil depth (m bgl)	Soil description[1]
HA2	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	SILT; yellow brown.
HA3	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 1.0	SILT; yellow brown.

15 Church Street

Sampling point	Soil depth (m bgl)	Soil description[1]
HA1	0.0 – 0.15	Concrete core.
	0.15 – 0.4	SILT with trace coarse rounded gravel; brown.
	0.4 – 0.8	Sandy SILT; yellow brown.
	0.8 – 1.0	SAND; light brown.
HA2	0.0 – 0.3	SILT with some sand (f-m) and trace-minor gravel (sa-sr); brown to dark brown.
	0.3 – 0.5	SILT with some sand (f-m); brown to dark brown.
	0.5 – 0.75	SILT with trace sand (f-m); yellowish brown.
	0.75 – 0.85	Silty SAND (f-m); yellowish brown.
	0.85 – 1.0	SAND (f-m) with minor silt; yellowish brown.
HA3	0.0 – 0.3	Organic topsoil; SILT; brown.
	0.3 – 0.8	Medium SAND with trace silt; light brown grading to yellow orange mottled.
	0.8 – 1.0	SILT with trace clay; orange grey yellow mottled.
HA4	0.0 – 0.15	SILT with some sand; brown to dark brown.
	0.15 – 0.4	SILT with some sand and rubbish (carpet, metal, lino, plastic); yellowish brown.
	0.4 – 0.6	Sandy SILT; yellowish brown.
	0.6 – 1.0	SILT with trace sand; yellowish brown.
HA5	0.0 – 0.2	SILT with trace sand; piece of netting, trace soft and hard plastics; nails; brown to dark brown.
	0.2 – 0.5	SILT with trace sand; brown to dark brown.
	0.5 – 0.7	SILT with trace sand; mottled yellowish brown.
	0.7 – 1.0	SILT with trace sand; yellowish brown.
HA6	0.0 – 0.2	SILT with minor-some sand (f-m), minor rubbish (aluminium can tab, plastic, glass, metal), trace gravel (f-c, sa-sr); brown.
	0.2 – 0.5	SILT with minor-some sand (f-m); brown.
	0.5 – 0.7	SILT with some sand (f-m); brown.
	0.7 – 0.8	SILT with some sand (f-m); brown mottled yellowish brown.
	0.8 – 1.0	SILT with some sand (f-m); yellowish brown.
Halo A	0.0 – 0.1	Topsoil. Silt; brown.
Halo B		
Halo C		
Halo D		

[1]Abbreviations:

Gravel and sand descriptions: f – fine, m – medium, c – coarse, SA – sub – angular, SR – sub-rounded.

Appendix E Laboratory certificates

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention:	Colter Carson
Report	1007299-AID
Project Name	15 CHURCH STREET ASHBURTON
Project ID	1018898.2000
Received Date	Jul 13, 2023
Date Reported	Aug 11, 2023

Methodology:

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

Project Name 15 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Date Sampled Jul 12, 2023
Report 1007299-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
15 HA1 0.1	23-Jl0023902	Jul 12, 2023	Approximate Sample 271g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HA2 0.1	23-Jl0023904	Jul 12, 2023	Approximate Sample 112g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HA3 0.1	23-Jl0023906	Jul 12, 2023	Approximate Sample 203g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HA4 0.1	23-Jl0023908	Jul 12, 2023	Approximate Sample 108g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HA5 0.1	23-Jl0023910	Jul 12, 2023	Approximate Sample 177g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HA6 0.1	23-Jl0023912	Jul 12, 2023	Approximate Sample 127g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HALO A	23-Jl0023914	Jul 12, 2023	Approximate Sample 76g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HALO B	23-Jl0023915	Jul 12, 2023	Approximate Sample 169g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
15 HALO C	23-Jl0023916	Jul 12, 2023	Approximate Sample 121g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
15 HALO D	23-Jl0023917	Jul 12, 2023	Approximate Sample 143g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Jul 13, 2023	Indefinite

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 15 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 15 CHURCH STREET
Report #: 1007299
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X							
Tauranga Laboratory - IANZ# 1402														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	15 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023902		X						X	X
2	15 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023903								X	X
3	15 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023904		X						X	X
4	15 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023905								X	X
5	15 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023906		X						X	X
6	15 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023907								X	X
7	15 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023908		X						X	X
8	15 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023909								X	X
9	15 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023910		X						X	X
10	15 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023911								X	X
11	15 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023912		X						X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X							
Tauranga Laboratory - IANZ# 1402														
12	15 HA6 0.3	Jul 12, 2023		Soil	Z23-Jl0023913								X	X
13	15 HALO A	Jul 12, 2023		Soil	Z23-Jl0023914		X							
14	15 HALO B	Jul 12, 2023		Soil	Z23-Jl0023915		X							
15	15 HALO C	Jul 12, 2023		Soil	Z23-Jl0023916		X							
16	15 HALO D	Jul 12, 2023		Soil	Z23-Jl0023917		X							
17	COMPOSITE OF 15 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0023918								X	X
18	15 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0023919								X	X
19	15 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0023920								X	X
20	15 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0023921			X					X	
21	15 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0023922	X		X	X	X	X	X	X	
22	15 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0023923	X		X	X	X	X	X	X	
23	15 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0023924			X					X	

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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X							
Tauranga Laboratory - IANZ# 1402														
24	15 HA3 0.5	Jul 12, 2023		Soil	Z23-JI0023925	X		X	X	X	X	X	X	
25	15 HA3 0.7	Jul 12, 2023		Soil	Z23-JI0023926	X		X	X	X	X	X	X	
26	15 HA3 1.0	Jul 12, 2023		Soil	Z23-JI0023927			X				X	X	
27	15 HA4 0.5	Jul 12, 2023		Soil	Z23-JI0023928								X	X
28	15 HA4 0.7	Jul 12, 2023		Soil	Z23-JI0023929								X	X
29	15 HA4 1.0	Jul 12, 2023		Soil	Z23-JI0023930			X				X	X	
30	15 HA5 0.5	Jul 12, 2023		Soil	Z23-JI0023931	X		X	X	X	X	X	X	
31	15 HA5 0.7	Jul 12, 2023		Soil	Z23-JI0023932	X		X	X	X	X	X	X	
32	15 HA5 1.0	Jul 12, 2023		Soil	Z23-JI0023933	X		X	X	X		X	X	
33	15 HA6 0.5	Jul 12, 2023		Soil	Z23-JI0023934								X	X
34	15 HA6 0.7	Jul 12, 2023		Soil	Z23-JI0023935								X	X
35	15 HA6 1.0	Jul 12, 2023		Soil	Z23-JI0023936			X					X	
Test Counts						7	10	12	7	7	6	9	31	19

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

Units

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

Calculations

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

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

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

Terms

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

Comments

Sample Integrity

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

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

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

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention: **Colter Carson**

Report **1007299-S**
Project name 15 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Received Date Jul 13, 2023

Client Sample ID			**15 HA1 0.1**	**15 HA1 0.3**	**15 HA2 0.1**	**15 HA2 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023902**	**Z23-JI0023903**	**Z23-JI0023904**	**Z23-JI0023905**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	11	8.1	9.6	6.4
Cadmium	0.01	mg/kg	0.08	0.07	0.15	0.10
Chromium	0.1	mg/kg	20	25	28	24
Copper	0.1	mg/kg	13	19	23	18
Lead	0.1	mg/kg	28	27	69	34
Nickel	0.1	mg/kg	14	18	20	18
Zinc	5	mg/kg	88	96	130	90
Sample Properties						
% Moisture	1	%	18	15	29	21

Client Sample ID			**15 HA3 0.1**	**15 HA3 0.3**	**15 HA4 0.1**	**15 HA4 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023906**	**Z23-JI0023907**	**Z23-JI0023908**	**Z23-JI0023909**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	7.5	5.2	6.5	8.5
Cadmium	0.01	mg/kg	0.25	0.09	0.16	0.41
Chromium	0.1	mg/kg	24	19	19	22
Copper	0.1	mg/kg	130	14	20	21
Lead	0.1	mg/kg	70	15	40	100
Nickel	0.1	mg/kg	17	14	12	14
Zinc	5	mg/kg	230	150	150	320
Sample Properties						
% Moisture	1	%	25	14	32	32

Client Sample ID			15 HA5 0.1	15 HA5 0.3	15 HA6 0.1	15 HA6 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023910	Z23-JI0023911	Z23-JI0023912	Z23-JI0023913
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	71	9.2	11	6.9
Cadmium	0.01	mg/kg	0.39	0.09	0.31	0.18
Chromium	0.1	mg/kg	69	18	21	19
Copper	0.1	mg/kg	77	15	35	17
Lead	0.1	mg/kg	120	32	320	160
Nickel	0.1	mg/kg	13	13	16	14
Zinc	5	mg/kg	220	86	270	160
Sample Properties						
% Moisture	1	%	34	19	26	14

Client Sample ID			COMPOSITE OF 15 HALO A-D	15 HA1 0.5	15 HA1 0.7	15 HA1 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023918	Z23-JI0023919	Z23-JI0023920	Z23-JI0023921
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	29	8.1	4.8	-
Cadmium	0.01	mg/kg	0.27	0.06	0.05	-
Chromium	0.1	mg/kg	39	26	24	-
Copper	0.1	mg/kg	81	19	15	-
Lead	0.1	mg/kg	160	25	20	-
Nickel	0.1	mg/kg	16	19	16	-
Zinc	5	mg/kg	180	90	71	-
Sample Properties						
% Moisture	1	%	28	19	17	20
Heavy Metals						
Chromium	0.1	mg/kg	-	-	-	24

Client Sample ID			15 HA2 0.5	15 HA2 0.7	15 HA2 1.0	15 HA3 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023922	Z23-JI0023923	Z23-JI0023924	Z23-JI0023925
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	18	13	9.0
Heavy Metals						
Chromium	0.1	mg/kg	25	27	19	20
Copper	0.1	mg/kg	16	18	-	12
Nickel	0.1	mg/kg	19	20	-	15
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	5.8	6.5	-	3.0
Lead	0.1	mg/kg	28	21	-	16
Zinc	5	mg/kg	86	80	-	190

Client Sample ID			15 HA3 0.7	15 HA3 1.0	15 HA4 0.5	15 HA4 0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023926	Z23-JI0023927	Z23-JI0023928	Z23-JI0023929
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	4.1	7.1
Cadmium	0.01	mg/kg	-	-	0.06	0.05
Chromium	0.1	mg/kg	-	-	23	32
Copper	0.1	mg/kg	-	-	14	17
Lead	0.1	mg/kg	-	-	17	29
Nickel	0.1	mg/kg	-	-	16	19
Zinc	5	mg/kg	-	-	70	100
Sample Properties						
% Moisture	1	%	16	19	17	23
Heavy Metals						
Chromium	0.1	mg/kg	23	27	-	-
Copper	0.1	mg/kg	15	-	-	-
Nickel	0.1	mg/kg	15	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	5.6	-	-	-
Lead	0.1	mg/kg	20	-	-	-
Zinc	5	mg/kg	110	88	-	-

Client Sample ID			15 HA4 1.0	15 HA5 0.5	15 HA5 0.7	15 HA5 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023930	Z23-JI0023931	Z23-JI0023932	Z23-JI0023933
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	21	20	23	17
Heavy Metals						
Chromium	0.1	mg/kg	25	23	31	23
Copper	0.1	mg/kg	-	17	31	14
Nickel	0.1	mg/kg	-	15	18	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	8.6	21	7.9
Lead	0.1	mg/kg	-	21	68	19
Zinc	5	mg/kg	89	85	150	68

Client Sample ID			15 HA6 0.5	15 HA6 0.7	15 HA6 1.0
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023934	Z23-JI0023935	Z23-JI0023936
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit			
Metals M7 (NZ MfE)					
Arsenic	0.1	mg/kg	4.6	4.3	-
Cadmium	0.01	mg/kg	0.09	0.08	-
Chromium	0.1	mg/kg	22	23	-
Copper	0.1	mg/kg	13	12	-
Lead	0.1	mg/kg	26	16	-
Nickel	0.1	mg/kg	15	16	-
Zinc	5	mg/kg	100	77	-

Client Sample ID			15 HA6 0.5	15 HA6 0.7	15 HA6 1.0
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023934**	**Z23-JI0023935**	**Z23-JI0023936**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	19	19	16
Heavy Metals					
Chromium	0.1	mg/kg	-	-	23

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M7 (NZ MfE)	Auckland	Jul 21, 2023	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Heavy Metals	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 (NZ MfE)	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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NATA# 2377 Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 15 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 15 CHURCH STREET
Report #: 1007299
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Jul 18, 2023
Priority: 2 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327								X	X
Christchurch Laboratory - IANZ# 1290						X	X		
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	15 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023902	X		X	X
2	15 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023903			X	X
3	15 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023904	X		X	X
4	15 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023905			X	X
5	15 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023906	X		X	X
6	15 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023907			X	X
7	15 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023908	X		X	X
8	15 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023909			X	X
9	15 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023910	X		X	X
10	15 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023911			X	X
11	15 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023912	X		X	X
12	15 HA6 0.3	Jul 12, 2023		Soil	Z23-Jl0023913			X	X

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Auckland Laboratory - IANZ# 1327								X	X
Christchurch Laboratory - IANZ# 1290						X	X		
External Laboratory									
13	15 HALO A	Jul 12, 2023		Soil	Z23-Jl0023914	X			
14	15 HALO B	Jul 12, 2023		Soil	Z23-Jl0023915	X			
15	15 HALO C	Jul 12, 2023		Soil	Z23-Jl0023916	X			
16	15 HALO D	Jul 12, 2023		Soil	Z23-Jl0023917	X			
17	COMPOSITE OF 15 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0023918			X	X
18	15 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0023919		X		
19	15 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0023920		X		
20	15 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0023921		X		
21	15 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0023922		X		
22	15 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0023923		X		
23	15 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0023924		X		
24	15 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0023925		X		

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Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327								X	X
Christchurch Laboratory - IANZ# 1290						X	X		
External Laboratory									
25	15 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0023926		X		
26	15 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0023927		X		
27	15 HA4 0.5	Jul 12, 2023		Soil	Z23-Jl0023928		X		
28	15 HA4 0.7	Jul 12, 2023		Soil	Z23-Jl0023929		X		
29	15 HA4 1.0	Jul 12, 2023		Soil	Z23-Jl0023930		X		
30	15 HA5 0.5	Jul 12, 2023		Soil	Z23-Jl0023931		X		
31	15 HA5 0.7	Jul 12, 2023		Soil	Z23-Jl0023932		X		
32	15 HA5 1.0	Jul 12, 2023		Soil	Z23-Jl0023933		X		
33	15 HA6 0.5	Jul 12, 2023		Soil	Z23-Jl0023934		X		
34	15 HA6 0.7	Jul 12, 2023		Soil	Z23-Jl0023935		X		
35	15 HA6 1.0	Jul 12, 2023		Soil	Z23-Jl0023936		X		
Test Counts						10	18	13	13

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M7 (NZ MfE)							
Arsenic	%	97			80-120	Pass	
Cadmium	%	95			80-120	Pass	
Chromium	%	101			80-120	Pass	
Copper	%	106			80-120	Pass	
Lead	%	80			80-120	Pass	
Nickel	%	96			80-120	Pass	
Zinc	%	80			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023904	CP	%	97			75-125	Pass	
Cadmium	Z23-JI0023904	CP	%	94			75-125	Pass	
Chromium	Z23-JI0023904	CP	%	112			75-125	Pass	
Copper	Z23-JI0023904	CP	%	108			75-125	Pass	
Lead	Z23-JI0023904	CP	%	110			75-125	Pass	
Nickel	Z23-JI0023904	CP	%	94			75-125	Pass	
Zinc	Z23-JI0023904	CP	%	94			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023918	CP	%	112			75-125	Pass	
Cadmium	Z23-JI0023918	CP	%	109			75-125	Pass	
Nickel	Z23-JI0023918	CP	%	113			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023920	CP	%	117			75-125	Pass	
Cadmium	Z23-JI0023920	CP	%	113			75-125	Pass	
Nickel	Z23-JI0023920	CP	%	118			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023924	CP	%	117			75-125	Pass	
Cadmium	Z23-JI0023924	CP	%	115			75-125	Pass	
Chromium	Z23-JI0023924	CP	%	116			75-125	Pass	
Copper	Z23-JI0023924	CP	%	114			75-125	Pass	
Lead	Z23-JI0023924	CP	%	119			75-125	Pass	
Nickel	Z23-JI0023924	CP	%	114			75-125	Pass	
Zinc	Z23-JI0023924	CP	%	111			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023929	CP	%	117			75-125	Pass	
Cadmium	Z23-JI0023929	CP	%	117			75-125	Pass	
Nickel	Z23-JI0023929	CP	%	113			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023903	CP	mg/kg	8.1	5.8	32	30%	Fail	Q02
Cadmium	Z23-JI0023903	CP	mg/kg	0.07	0.07	6.4	30%	Pass	
Chromium	Z23-JI0023903	CP	mg/kg	25	22	15	30%	Pass	
Copper	Z23-JI0023903	CP	mg/kg	19	15	25	30%	Pass	
Lead	Z23-JI0023903	CP	mg/kg	27	22	22	30%	Pass	
Nickel	Z23-JI0023903	CP	mg/kg	18	16	13	30%	Pass	
Zinc	Z23-JI0023903	CP	mg/kg	96	84	14	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023908	CP	%	32	34	5.6	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023913	CP	mg/kg	6.9	6.7	3.4	30%	Pass	
Cadmium	Z23-JI0023913	CP	mg/kg	0.18	0.17	3.9	30%	Pass	
Chromium	Z23-JI0023913	CP	mg/kg	19	19	<1	30%	Pass	
Copper	Z23-JI0023913	CP	mg/kg	17	17	1.6	30%	Pass	
Lead	Z23-JI0023913	CP	mg/kg	160	170	3.7	30%	Pass	
Nickel	Z23-JI0023913	CP	mg/kg	14	14	1.1	30%	Pass	
Zinc	Z23-JI0023913	CP	mg/kg	160	160	3.3	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023919	CP	mg/kg	8.1	9.1	11	30%	Pass	
Cadmium	Z23-JI0023919	CP	mg/kg	0.06	0.07	15	30%	Pass	
Chromium	Z23-JI0023919	CP	mg/kg	26	28	7.6	30%	Pass	
Copper	Z23-JI0023919	CP	mg/kg	19	20	7.6	30%	Pass	
Lead	Z23-JI0023919	CP	mg/kg	25	29	15	30%	Pass	
Nickel	Z23-JI0023919	CP	mg/kg	19	21	8.0	30%	Pass	
Zinc	Z23-JI0023919	CP	mg/kg	90	100	11	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023919	CP	%	19	19	1.0	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023921	CP	mg/kg	5.2	5.5	5.8	30%	Pass	
Cadmium	Z23-JI0023921	CP	mg/kg	0.05	0.06	11	30%	Pass	
Chromium	Z23-JI0023921	CP	mg/kg	24	27	13	30%	Pass	
Copper	Z23-JI0023921	CP	mg/kg	15	17	11	30%	Pass	
Lead	Z23-JI0023921	CP	mg/kg	19	21	8.6	30%	Pass	
Nickel	Z23-JI0023921	CP	mg/kg	18	20	11	30%	Pass	
Zinc	Z23-JI0023921	CP	mg/kg	79	84	6.2	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023921	CP	%	20	20	<1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023928	CP	mg/kg	4.1	3.9	4.0	30%	Pass	
Cadmium	Z23-JI0023928	CP	mg/kg	0.06	0.06	5.9	30%	Pass	
Chromium	Z23-JI0023928	CP	mg/kg	23	22	3.9	30%	Pass	
Copper	Z23-JI0023928	CP	mg/kg	14	12	13	30%	Pass	
Lead	Z23-JI0023928	CP	mg/kg	17	14	19	30%	Pass	
Nickel	Z23-JI0023928	CP	mg/kg	16	16	1.8	30%	Pass	
Zinc	Z23-JI0023928	CP	mg/kg	70	67	4.5	30%	Pass	

Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-Jl0023934	CP	%	19	19	2.9	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Katyana Gausel	Analytical Services Manager
Raymond Siu	Senior Analyst-Metal
Sophie Bush	Senior Analyst-Asbestos

Raymond Siu
Senior Instrument Chemist (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention:	Colter Carson
Report	1007300-AID
Project Name	7 CHURCH STREET ASHBURTON
Project ID	1018898.2000
Received Date	Jul 13, 2023
Date Reported	Aug 11, 2023

Methodology:

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

Project Name 7 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Date Sampled Jul 12, 2023
Report 1007300-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
7 HA1 0.1	23-Jl0023937	Jul 12, 2023	Approximate Sample 264g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HA2 0.1	23-Jl0023939	Jul 12, 2023	Approximate Sample 158g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HA3 0.1	23-Jl0023941	Jul 12, 2023	Approximate Sample 175g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HA4 0.1	23-Jl0023943	Jul 12, 2023	Approximate Sample 138g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HA5 0.1	23-Jl0023945	Jul 12, 2023	Approximate Sample 153g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HA6 0.1	23-Jl0023947	Jul 12, 2023	Approximate Sample 339g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HALO A	23-Jl0023949	Jul 12, 2023	Approximate Sample 347g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HALO B	23-Jl0023950	Jul 12, 2023	Approximate Sample 277g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
7 HALO C	23-Jl0023951	Jul 12, 2023	Approximate Sample 283g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
7 HALO D	23-Jl0023952	Jul 12, 2023	Approximate Sample 135g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Jul 13, 2023	Indefinite

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 7 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 7 CHURCH STREET
Report #: 1007300
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	7 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023937		X							X	X
2	7 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023938									X	X
3	7 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023939		X							X	X
4	7 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023940									X	X
5	7 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023941		X							X	X
6	7 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023942									X	X
7	7 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023943		X							X	X
8	7 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023944									X	X
9	7 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023945		X							X	X
10	7 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023946									X	X
11	7 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023947		X							X	X

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
12	7 HA6 0.3	Jul 12, 2023		Soil	Z23-Jl0023948									X	X
13	7 HALO A	Jul 12, 2023		Soil	Z23-Jl0023949		X								
14	7 HALO B	Jul 12, 2023		Soil	Z23-Jl0023950		X								
15	7 HALO C	Jul 12, 2023		Soil	Z23-Jl0023951		X								
16	7 HALO D	Jul 12, 2023		Soil	Z23-Jl0023952		X								
17	COMPOSITE OF 7 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0023953									X	X
18	7 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0023954	X		X	X			X	X	X	
19	7 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0023955	X		X	X			X	X	X	
20	7 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0023956					X					
21	7 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0023957	X		X	X		X	X	X	X	
22	7 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0023958	X		X	X		X	X	X	X	
23	7 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0023959			X						X	

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 7 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 7 CHURCH STREET
Report #: 1007300
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
24	7 HA3 0.5	Jul 12, 2023		Soil	Z23-JI0023960									X	X
25	7 HA3 0.7	Jul 12, 2023		Soil	Z23-JI0023961									X	X
26	7 HA3 1.0	Jul 12, 2023		Soil	Z23-JI0023962			X						X	
27	7 HA4 0.5	Jul 12, 2023		Soil	Z23-JI0023963									X	X
28	7 HA4 0.7	Jul 12, 2023		Soil	Z23-JI0023964									X	X
29	7 HA4 1.0	Jul 12, 2023		Soil	Z23-JI0023965					X					
30	7 HA5 0.5	Jul 12, 2023		Soil	Z23-JI0023966	X		X	X		X	X	X	X	
31	7 HA5 0.7	Jul 12, 2023		Soil	Z23-JI0023967	X		X	X		X	X	X	X	
32	7 HA5 1.0	Jul 12, 2023		Soil	Z23-JI0023968					X					
33	7 HA6 0.5	Jul 12, 2023		Soil	Z23-JI0023969									X	X
34	7 HA6 0.7	Jul 12, 2023		Soil	Z23-JI0023970									X	X
35	7 HA6 1.0	Jul 12, 2023		Soil	Z23-JI0023971			X						X	
Test Counts						6	10	9	6	3	4	6	6	28	19

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

Units

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

Calculations

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

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

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

Terms

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

Comments

Sample Integrity

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

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

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

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention: **Colter Carson**

Report **1007300-S**
Project name 7 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Received Date Jul 13, 2023

Client Sample ID			**7 HA1 0.1**	**7 HA1 0.3**	**7 HA2 0.1**	**7 HA2 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023937**	**Z23-JI0023938**	**Z23-JI0023939**	**Z23-JI0023940**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	7.1	6.0	9.4	5.6
Cadmium	0.01	mg/kg	0.14	0.06	0.17	0.08
Chromium	0.1	mg/kg	23	25	25	23
Copper	0.1	mg/kg	16	16	19	15
Lead	0.1	mg/kg	65	21	84	24
Nickel	0.1	mg/kg	17	19	19	17
Zinc	5	mg/kg	110	86	120	84
Sample Properties						
% Moisture	1	%	19	18	24	19

Client Sample ID			**7 HA3 0.1**	**7 HA3 0.3**	**7 HA4 0.1**	**7 HA4 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023941**	**Z23-JI0023942**	**Z23-JI0023943**	**Z23-JI0023944**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	8.9	5.9	13	11
Cadmium	0.01	mg/kg	0.27	0.14	0.26	0.23
Chromium	0.1	mg/kg	22	22	25	26
Copper	0.1	mg/kg	21	16	27	21
Lead	0.1	mg/kg	180	57	350	200
Nickel	0.1	mg/kg	15	17	16	15
Zinc	5	mg/kg	180	110	230	180
Sample Properties						
% Moisture	1	%	26	21	16	33

Client Sample ID			7 HA5 0.1	7 HA5 0.3	7 HA6 0.1	7 HA6 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023945	Z23-JI0023946	Z23-JI0023947	Z23-JI0023948
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	6.1	5.2	5.0	5.5
Cadmium	0.01	mg/kg	0.33	0.09	0.15	0.25
Chromium	0.1	mg/kg	23	22	22	23
Copper	0.1	mg/kg	25	15	17	20
Lead	0.1	mg/kg	93	25	28	58
Nickel	0.1	mg/kg	15	17	17	16
Zinc	5	mg/kg	210	96	100	140
Sample Properties						
% Moisture	1	%	27	21	21	27

Client Sample ID			COMPOSITE OF 7 HALO A-D	7 HA1 0.5	7 HA1 0.7	7 HA2 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023953	Z23-JI0023954	Z23-JI0023955	Z23-JI0023957
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	8.0	-	-	-
Cadmium	0.01	mg/kg	0.35	-	-	-
Chromium	0.1	mg/kg	25	-	-	-
Copper	0.1	mg/kg	81	-	-	-
Lead	0.1	mg/kg	300	-	-	-
Nickel	0.1	mg/kg	15	-	-	-
Zinc	5	mg/kg	230	-	-	-
Sample Properties						
% Moisture	1	%	22	18	17	19
Heavy Metals						
Chromium	0.1	mg/kg	-	21	20	24
Copper	0.1	mg/kg	-	14	16	18
Nickel	0.1	mg/kg	-	16	15	18
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	5.1	5.6	5.9
Zinc	5	mg/kg	-	71	61	78
Lead	0.1	mg/kg	-	-	-	22

Client Sample ID			7 HA2 0.7	7 HA2 1.0	7 HA3 0.5	7 HA3 0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023958	Z23-JI0023959	Z23-JI0023960	Z23-JI0023961
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	5.6	5.7
Cadmium	0.01	mg/kg	-	-	0.06	0.07
Chromium	0.1	mg/kg	-	-	24	24
Copper	0.1	mg/kg	-	-	15	15
Lead	0.1	mg/kg	-	-	21	25

Client Sample ID			7 HA2 0.7	7 HA2 1.0	7 HA3 0.5	7 HA3 0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023958	Z23-JI0023959	Z23-JI0023960	Z23-JI0023961
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Nickel	0.1	mg/kg	-	-	18	17
Zinc	5	mg/kg	-	-	77	90
Sample Properties						
% Moisture	1	%	19	20	18	18
Heavy Metals						
Chromium	0.1	mg/kg	23	26	-	-
Copper	0.1	mg/kg	16	-	-	-
Nickel	0.1	mg/kg	17	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	5.6	-	-	-
Zinc	5	mg/kg	71	-	-	-
Lead	0.1	mg/kg	19	-	-	-

Client Sample ID			7 HA3 1.0	7 HA4 0.5	7 HA4 0.7	7 HA5 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023962	Z23-JI0023963	Z23-JI0023964	Z23-JI0023966
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	6.8	4.1	-
Cadmium	0.01	mg/kg	-	0.18	0.07	-
Chromium	0.1	mg/kg	-	25	20	-
Copper	0.1	mg/kg	-	22	13	-
Lead	0.1	mg/kg	-	66	13	-
Nickel	0.1	mg/kg	-	18	15	-
Zinc	5	mg/kg	-	200	87	-
Sample Properties						
% Moisture	1	%	14	21	8.1	16
Heavy Metals						
Chromium	0.1	mg/kg	21	-	-	22
Copper	0.1	mg/kg	-	-	-	14
Nickel	0.1	mg/kg	-	-	-	16
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	-	4.7
Zinc	5	mg/kg	-	-	-	64
Lead	0.1	mg/kg	-	-	-	15

Client Sample ID			7 HA5 0.7	7 HA6 0.5	7 HA6 0.7	7 HA6 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023967	Z23-JI0023969	Z23-JI0023970	Z23-JI0023971
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	5.0	5.4	-
Cadmium	0.01	mg/kg	-	0.08	0.06	-
Chromium	0.1	mg/kg	-	22	24	-
Copper	0.1	mg/kg	-	15	16	-
Lead	0.1	mg/kg	-	22	21	-
Nickel	0.1	mg/kg	-	17	17	-
Zinc	5	mg/kg	-	83	78	-
Sample Properties						
% Moisture	1	%	12	19	18	18
Heavy Metals						
Chromium	0.1	mg/kg	20	-	-	25
Copper	0.1	mg/kg	13	-	-	-
Nickel	0.1	mg/kg	15	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	4.1	-	-	-
Zinc	5	mg/kg	59	-	-	-
Lead	0.1	mg/kg	14	-	-	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M7 (NZ MfE)	Auckland	Jul 20, 2023	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Heavy Metals	Auckland	Aug 04, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 (NZ MfE)	Auckland	Jul 20, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 7 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 7 CHURCH STREET
Report #: 1007300
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Jul 21, 2023
Priority: 5 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	7 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023937		X							X	X
2	7 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023938									X	X
3	7 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023939		X							X	X
4	7 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023940									X	X
5	7 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023941		X							X	X
6	7 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023942									X	X
7	7 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023943		X							X	X
8	7 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023944									X	X
9	7 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023945		X							X	X
10	7 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023946									X	X
11	7 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023947		X							X	X
12	7 HA6 0.3	Jul 12, 2023		Soil	Z23-Jl0023948									X	X

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NATA# 2377 Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 7 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 7 CHURCH STREET
Report #: 1007300
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Jul 21, 2023
Priority: 5 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
13	7 HALO A	Jul 12, 2023		Soil	Z23-Jl0023949		X								
14	7 HALO B	Jul 12, 2023		Soil	Z23-Jl0023950		X								
15	7 HALO C	Jul 12, 2023		Soil	Z23-Jl0023951		X								
16	7 HALO D	Jul 12, 2023		Soil	Z23-Jl0023952		X								
17	COMPOSITE OF 7 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0023953									X	X
18	7 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0023954	X		X	X			X	X	X	
19	7 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0023955	X		X	X			X	X	X	
20	7 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0023956					X					
21	7 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0023957	X		X	X		X	X	X	X	
22	7 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0023958	X		X	X		X	X	X	X	
23	7 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0023959					X					
24	7 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0023960									X	X

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Project Name: 7 CHURCH STREET ASHBURTON
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Order No.: 6181830 7 CHURCH STREET
Report #: 1007300
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
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Contact Name: Colter Carson

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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
25	7 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0023961									X	X
26	7 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0023962					X					
27	7 HA4 0.5	Jul 12, 2023		Soil	Z23-Jl0023963									X	X
28	7 HA4 0.7	Jul 12, 2023		Soil	Z23-Jl0023964									X	X
29	7 HA4 1.0	Jul 12, 2023		Soil	Z23-Jl0023965					X					
30	7 HA5 0.5	Jul 12, 2023		Soil	Z23-Jl0023966	X		X	X		X	X	X	X	
31	7 HA5 0.7	Jul 12, 2023		Soil	Z23-Jl0023967	X		X	X		X	X	X	X	
32	7 HA5 1.0	Jul 12, 2023		Soil	Z23-Jl0023968					X					
33	7 HA6 0.5	Jul 12, 2023		Soil	Z23-Jl0023969									X	X
34	7 HA6 0.7	Jul 12, 2023		Soil	Z23-Jl0023970									X	X
35	7 HA6 1.0	Jul 12, 2023		Soil	Z23-Jl0023971					X					
Test Counts						6	10	6	6	6	4	6	6	25	19

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M7 (NZ MfE)							
Arsenic	%	102			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	99			80-120	Pass	
Lead	%	100			80-120	Pass	
Nickel	%	99			80-120	Pass	
Zinc	%	104			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023938	CP	%	113			75-125	Pass	
Cadmium	Z23-JI0023938	CP	%	113			75-125	Pass	
Chromium	Z23-JI0023938	CP	%	118			75-125	Pass	
Copper	Z23-JI0023938	CP	%	114			75-125	Pass	
Lead	Z23-JI0023938	CP	%	113			75-125	Pass	
Nickel	Z23-JI0023938	CP	%	107			75-125	Pass	
Zinc	Z23-JI0023938	CP	%	108			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023948	CP	%	108			75-125	Pass	
Cadmium	Z23-JI0023948	CP	%	108			75-125	Pass	
Chromium	Z23-JI0023948	CP	%	112			75-125	Pass	
Copper	Z23-JI0023948	CP	%	105			75-125	Pass	
Lead	Z23-JI0023948	CP	%	107			75-125	Pass	
Nickel	Z23-JI0023948	CP	%	102			75-125	Pass	
Zinc	Z23-JI0023948	CP	%	109			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023959	CP	%	110			75-125	Pass	
Cadmium	Z23-JI0023959	CP	%	104			75-125	Pass	
Chromium	Z23-JI0023959	CP	%	110			75-125	Pass	
Copper	Z23-JI0023959	CP	%	107			75-125	Pass	
Lead	Z23-JI0023959	CP	%	113			75-125	Pass	
Nickel	Z23-JI0023959	CP	%	108			75-125	Pass	
Zinc	Z23-JI0023959	CP	%	105			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023961	CP	%	113			75-125	Pass	
Cadmium	Z23-JI0023961	CP	%	109			75-125	Pass	
Copper	Z23-JI0023961	CP	%	118			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	Z23-JI0023961	CP	%	120			75-125	Pass	
Nickel	Z23-JI0023961	CP	%	108			75-125	Pass	
Zinc	Z23-JI0023961	CP	%	118			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023937	CP	mg/kg	7.1	6.4	10	30%	Pass	
Cadmium	Z23-JI0023937	CP	mg/kg	0.14	0.12	12	30%	Pass	
Chromium	Z23-JI0023937	CP	mg/kg	23	22	6.6	30%	Pass	
Copper	Z23-JI0023937	CP	mg/kg	16	15	6.9	30%	Pass	
Lead	Z23-JI0023937	CP	mg/kg	65	50	26	30%	Pass	
Nickel	Z23-JI0023937	CP	mg/kg	17	16	4.9	30%	Pass	
Zinc	Z23-JI0023937	CP	mg/kg	110	97	14	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023940	CP	%	19	19	1.1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023947	CP	mg/kg	5.0	5.0	<1	30%	Pass	
Cadmium	Z23-JI0023947	CP	mg/kg	0.15	0.15	4.2	30%	Pass	
Chromium	Z23-JI0023947	CP	mg/kg	22	22	<1	30%	Pass	
Copper	Z23-JI0023947	CP	mg/kg	17	17	<1	30%	Pass	
Lead	Z23-JI0023947	CP	mg/kg	28	31	11	30%	Pass	
Nickel	Z23-JI0023947	CP	mg/kg	17	17	1.2	30%	Pass	
Zinc	Z23-JI0023947	CP	mg/kg	100	110	5.0	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023959	CP	%	20	20	1.5	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023960	CP	mg/kg	5.6	6.0	6.8	30%	Pass	
Cadmium	Z23-JI0023960	CP	mg/kg	0.06	0.08	27	30%	Pass	
Chromium	Z23-JI0023960	CP	mg/kg	24	26	8.0	30%	Pass	
Copper	Z23-JI0023960	CP	mg/kg	15	16	1.2	30%	Pass	
Lead	Z23-JI0023960	CP	mg/kg	21	30	37	30%	Fail	Q02
Nickel	Z23-JI0023960	CP	mg/kg	18	19	8.1	30%	Pass	
Zinc	Z23-JI0023960	CP	mg/kg	77	100	27	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023967	CP	%	12	13	9.7	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Katyana Gausel	Analytical Services Manager
Raymond Siu	Senior Analyst-Metal
Sophie Bush	Senior Analyst-Asbestos

Raymond Siu
Senior Instrument Chemist (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

eurofins | Environment Testing

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention:	Colter Carson
Report	1007301-AID
Project Name	9 CHURCH STREET ASHBURTON
Project ID	1018898.2000
Received Date	Jul 13, 2023
Date Reported	Aug 11, 2023

Methodology:

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

Project Name 9 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Date Sampled Jul 12, 2023
Report 1007301-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
9 HA1 0.1	23-Jl0023972	Jul 12, 2023	Approximate Sample 583g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HA2 0.1	23-Jl0023974	Jul 12, 2023	Approximate Sample 396g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HA3 0.1	23-Jl0023976	Jul 12, 2023	Approximate Sample 439g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HA4 0.1	23-Jl0023978	Jul 12, 2023	Approximate Sample 577g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HA5 0.1	23-Jl0023980	Jul 12, 2023	Approximate Sample 328g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HA6 0.1	23-Jl0023982	Jul 12, 2023	Approximate Sample 681g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HALO A	23-Jl0023984	Jul 12, 2023	Approximate Sample 376g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HALO B	23-Jl0023985	Jul 12, 2023	Approximate Sample 299g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
9 HALO C	23-Jl0023986	Jul 12, 2023	Approximate Sample 590g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
9 HALO D	23-Jl0023987	Jul 12, 2023	Approximate Sample 442g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Jul 13, 2023	Indefinite

eurofins

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email: EnviroSales@eurofins.com

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

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

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 9 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 9 CHURCH STREET
Report #: 1007301
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	9 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023972		X							X	X
2	9 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023973									X	X
3	9 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023974		X							X	X
4	9 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023975									X	X
5	9 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023976		X							X	X
6	9 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023977									X	X
7	9 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023978		X							X	X
8	9 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023979									X	X
9	9 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023980		X							X	X
10	9 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023981									X	X
11	9 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023982		X							X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
12	9 HA6 0.3	Jul 12, 2023		Soil	Z23-JI0023983									X	X
13	9 HALO A	Jul 12, 2023		Soil	Z23-JI0023984		X								
14	9 HALO B	Jul 12, 2023		Soil	Z23-JI0023985		X								
15	9 HALO C	Jul 12, 2023		Soil	Z23-JI0023986		X								
16	9 HALO D	Jul 12, 2023		Soil	Z23-JI0023987		X								
17	COMPOSITE OF 9 HALO A-D	Jul 12, 2023		Soil	Z23-JI0023988									X	X
18	9 HA1 0.5	Jul 12, 2023		Soil	Z23-JI0023989									X	X
19	9 HA1 0.7	Jul 12, 2023		Soil	Z23-JI0023990									X	X
20	9 HA1 1.0	Jul 12, 2023		Soil	Z23-JI0023991					X					
21	9 HA2 0.5	Jul 12, 2023		Soil	Z23-JI0023992	X		X	X		X	X	X	X	
22	9 HA2 0.7	Jul 12, 2023		Soil	Z23-JI0023993	X		X	X		X	X	X	X	
23	9 HA2 1.0	Jul 12, 2023		Soil	Z23-JI0023994					X					

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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
24	9 HA3 0.5	Jul 12, 2023		Soil	Z23-JI0023995									X	X
25	9 HA3 0.7	Jul 12, 2023		Soil	Z23-JI0023996									X	X
26	9 HA3 1.0	Jul 12, 2023		Soil	Z23-JI0023997			X	X					X	
27	9 HA4 0.5	Jul 12, 2023		Soil	Z23-JI0023998									X	X
28	9 HA4 0.7	Jul 12, 2023		Soil	Z23-JI0023999									X	X
29	9 HA4 1.0	Jul 12, 2023		Soil	Z23-JI0024000			X	X		X		X	X	
30	9 HA5 0.5	Jul 12, 2023		Soil	Z23-JI0024001	X		X	X		X	X	X	X	
31	9 HA5 0.7	Jul 12, 2023		Soil	Z23-JI0024002	X		X	X		X	X	X	X	
32	9 HA5 1.0	Jul 12, 2023		Soil	Z23-JI0024003					X					
33	9 HA6 0.5	Jul 12, 2023		Soil	Z23-JI0024004	X		X	X		X	X	X	X	
34	9 HA6 0.7	Jul 12, 2023		Soil	Z23-JI0024005	X		X	X		X	X	X	X	
35	9 HA6 1.0	Jul 12, 2023		Soil	Z23-JI0024006	X		X	X		X	X	X	X	
Test Counts						7	10	9	9	3	8	7	8	28	19

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

Units

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

Calculations

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

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

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

Terms

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

Comments

Sample Integrity

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

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

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

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention: **Colter Carson**

Report **1007301-S**
Project name 9 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Received Date Jul 13, 2023

Client Sample ID			**9 HA1 0.1**	**9 HA1 0.3**	**9 HA2 0.1**	**9 HA2 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023972**	**Z23-JI0023973**	**Z23-JI0023974**	**Z23-JI0023975**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	3.2	9.7	7.6	5.0
Cadmium	0.01	mg/kg	0.03	0.17	0.25	0.10
Chromium	0.1	mg/kg	20	29	21	20
Copper	0.1	mg/kg	9.3	34	43	16
Lead	0.1	mg/kg	12	51	75	29
Nickel	0.1	mg/kg	13	22	15	15
Zinc	5	mg/kg	49	130	150	88
Sample Properties						
% Moisture	1	%	4.6	21	18	18

Client Sample ID			**9 HA3 0.1**	**9 HA3 0.3**	**9 HA4 0.1**	**9 HA4 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0023976**	**Z23-JI0023977**	**Z23-JI0023978**	**Z23-JI0023979**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	9.6	7.1	5.5	19
Cadmium	0.01	mg/kg	0.35	0.31	0.19	0.36
Chromium	0.1	mg/kg	23	23	20	30
Copper	0.1	mg/kg	50	78	15	55
Lead	0.1	mg/kg	92	81	32	140
Nickel	0.1	mg/kg	16	17	12	19
Zinc	5	mg/kg	160	160	91	230
Sample Properties						
% Moisture	1	%	25	18	23	24

Client Sample ID			9 HA5 0.1	9 HA5 0.3	9 HA6 0.1	9 HA6 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023980	Z23-JI0023981	Z23-JI0023982	Z23-JI0023983
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	24	7.6	14	5.3
Cadmium	0.01	mg/kg	0.44	0.09	0.28	0.06
Chromium	0.1	mg/kg	33	22	22	20
Copper	0.1	mg/kg	130	16	29	13
Lead	0.1	mg/kg	190	24	88	17
Nickel	0.1	mg/kg	26	17	16	16
Zinc	5	mg/kg	260	120	700	75
Sample Properties						
% Moisture	1	%	33	16	22	17

Client Sample ID			COMPOSITE OF 9 HALO A-D	9 HA1 0.5	9 HA1 0.7	9 HA2 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023988	Z23-JI0023989	Z23-JI0023990	Z23-JI0023992
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	13	5.9	5.2	-
Cadmium	0.01	mg/kg	0.40	0.10	0.06	-
Chromium	0.1	mg/kg	25	22	21	-
Copper	0.1	mg/kg	61	20	15	-
Lead	0.1	mg/kg	140	39	17	-
Nickel	0.1	mg/kg	16	16	16	-
Zinc	5	mg/kg	180	88	69	-
Sample Properties						
% Moisture	1	%	21	20	15	18
Heavy Metals						
Chromium	0.1	mg/kg	-	-	-	21
Copper	0.1	mg/kg	-	-	-	14
Nickel	0.1	mg/kg	-	-	-	16
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	-	4.4
Lead	0.1	mg/kg	-	-	-	18
Zinc	5	mg/kg	-	-	-	72

Client Sample ID			9 HA2 0.7	9 HA3 0.5	9 HA3 0.7	9 HA3 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023993	Z23-JI0023995	Z23-JI0023996	Z23-JI0023997
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	6.2	6.2	-
Cadmium	0.01	mg/kg	-	0.08	0.06	-
Chromium	0.1	mg/kg	-	24	25	-
Copper	0.1	mg/kg	-	23	21	-
Lead	0.1	mg/kg	-	20	21	-

Client Sample ID			9 HA2 0.7	9 HA3 0.5	9 HA3 0.7	9 HA3 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023993	Z23-JI0023995	Z23-JI0023996	Z23-JI0023997
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Nickel	0.1	mg/kg	-	18	18	-
Zinc	5	mg/kg	-	110	92	-
Sample Properties						
% Moisture	1	%	18	17	19	17
Heavy Metals						
Chromium	0.1	mg/kg	23	-	-	20
Copper	0.1	mg/kg	15	-	-	14
Nickel	0.1	mg/kg	17	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	4.8	-	-	-
Lead	0.1	mg/kg	18	-	-	-
Zinc	5	mg/kg	67	-	-	-

Client Sample ID			9 HA4 0.5	9 HA4 0.7	9 HA4 1.0	9 HA5 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0023998	Z23-JI0023999	Z23-JI0024000	Z23-JI0024001
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	10	9.7	-	-
Cadmium	0.01	mg/kg	0.12	0.16	-	-
Chromium	0.1	mg/kg	27	23	-	-
Copper	0.1	mg/kg	28	28	-	-
Lead	0.1	mg/kg	38	84	-	-
Nickel	0.1	mg/kg	19	15	-	-
Zinc	5	mg/kg	120	110	-	-
Sample Properties						
% Moisture	1	%	22	20	17	17
Heavy Metals						
Chromium	0.1	mg/kg	-	-	19	21
Copper	0.1	mg/kg	-	-	14	17
Nickel	0.1	mg/kg	-	-	-	16
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	-	7.1
Lead	0.1	mg/kg	-	-	15	28
Zinc	5	mg/kg	-	-	56	120

Client Sample ID			9 HA5 0.7	9 HA6 0.5	9 HA6 0.7	9 HA6 1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0024002**	**Z23-JI0024004**	**Z23-JI0024005**	**Z23-JI0024006**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	14	14	11
Heavy Metals						
Chromium	0.1	mg/kg	20	18	17	19
Copper	0.1	mg/kg	14	11	11	9.9
Nickel	0.1	mg/kg	14	14	13	14
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	4.4	3.9	18	34
Lead	0.1	mg/kg	17	11	16	11
Zinc	5	mg/kg	69	58	79	49

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M7 (NZ MfE)	Auckland	Jul 21, 2023	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Heavy Metals	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 (NZ MfE)	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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NATA# 2377 Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 9 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 9 CHURCH STREET
Report #: 1007301
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 4, 2023
Priority: 15 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	9 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0023972		X							X	X
2	9 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0023973									X	X
3	9 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0023974		X							X	X
4	9 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0023975									X	X
5	9 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0023976		X							X	X
6	9 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0023977									X	X
7	9 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0023978		X							X	X
8	9 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0023979									X	X
9	9 HA5 0.1	Jul 12, 2023		Soil	Z23-Jl0023980		X							X	X
10	9 HA5 0.3	Jul 12, 2023		Soil	Z23-Jl0023981									X	X
11	9 HA6 0.1	Jul 12, 2023		Soil	Z23-Jl0023982		X							X	X
12	9 HA6 0.3	Jul 12, 2023		Soil	Z23-Jl0023983									X	X

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Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
13	9 HALO A	Jul 12, 2023		Soil	Z23-Jl0023984		X								
14	9 HALO B	Jul 12, 2023		Soil	Z23-Jl0023985		X								
15	9 HALO C	Jul 12, 2023		Soil	Z23-Jl0023986		X								
16	9 HALO D	Jul 12, 2023		Soil	Z23-Jl0023987		X								
17	COMPOSITE OF 9 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0023988									X	X
18	9 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0023989									X	X
19	9 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0023990									X	X
20	9 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0023991					X					
21	9 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0023992	X		X	X		X	X	X	X	
22	9 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0023993	X		X	X		X	X	X	X	
23	9 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0023994					X					
24	9 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0023995									X	X

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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
External Laboratory															
25	9 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0023996									X	X
26	9 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0023997			X	X					X	
27	9 HA4 0.5	Jul 12, 2023		Soil	Z23-Jl0023998									X	X
28	9 HA4 0.7	Jul 12, 2023		Soil	Z23-Jl0023999									X	X
29	9 HA4 1.0	Jul 12, 2023		Soil	Z23-Jl0024000			X	X		X		X	X	
30	9 HA5 0.5	Jul 12, 2023		Soil	Z23-Jl0024001	X		X	X		X	X	X	X	
31	9 HA5 0.7	Jul 12, 2023		Soil	Z23-Jl0024002	X		X	X		X	X	X	X	
32	9 HA5 1.0	Jul 12, 2023		Soil	Z23-Jl0024003					X					
33	9 HA6 0.5	Jul 12, 2023		Soil	Z23-Jl0024004	X		X	X		X	X	X	X	
34	9 HA6 0.7	Jul 12, 2023		Soil	Z23-Jl0024005	X		X	X		X	X	X	X	
35	9 HA6 1.0	Jul 12, 2023		Soil	Z23-Jl0024006	X		X	X		X	X	X	X	
Test Counts						7	10	9	9	3	8	7	8	28	19

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M7 (NZ MfE)							
Arsenic	%	95			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	91			80-120	Pass	
Copper	%	94			80-120	Pass	
Lead	%	93			80-120	Pass	
Nickel	%	93			80-120	Pass	
Zinc	%	97			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Chromium	%	90			80-120	Pass	
Copper	%	91			80-120	Pass	
Nickel	%	90			80-120	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	96			80-120	Pass	
Lead	%	92			80-120	Pass	
Zinc	%	81			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Copper	Z23-JI0023948	NCP	%	105			75-125	Pass	
Lead	Z23-JI0023948	NCP	%	107			75-125	Pass	
Zinc	Z23-JI0023948	NCP	%	109			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023980	CP	%	84			75-125	Pass	
Cadmium	Z23-JI0023980	CP	%	88			75-125	Pass	
Chromium	Z23-JI0023980	CP	%	84			75-125	Pass	
Nickel	Z23-JI0023980	CP	%	82			75-125	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0023993	CP	%	112			75-125	Pass	
Cadmium	Z23-JI0023993	CP	%	108			75-125	Pass	
Chromium	Z23-JI0023993	CP	%	115			75-125	Pass	
Copper	Z23-JI0023993	CP	%	114			75-125	Pass	
Lead	Z23-JI0023993	CP	%	113			75-125	Pass	
Nickel	Z23-JI0023993	CP	%	102			75-125	Pass	
Zinc	Z23-JI0023993	CP	%	104			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023973	CP	%	21	21	<1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023979	CP	mg/kg	19	16	20	30%	Pass	
Cadmium	Z23-JI0023979	CP	mg/kg	0.36	0.30	18	30%	Pass	
Chromium	Z23-JI0023979	CP	mg/kg	30	26	14	30%	Pass	
Copper	Z23-JI0023979	CP	mg/kg	55	46	18	30%	Pass	
Lead	Z23-JI0023979	CP	mg/kg	140	96	37	30%	Fail	Q02
Nickel	Z23-JI0023979	CP	mg/kg	19	17	10	30%	Pass	
Zinc	Z23-JI0023979	CP	mg/kg	230	180	29	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023983	CP	%	17	17	<1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023992	CP	mg/kg	4.4	4.3	2.6	30%	Pass	
Cadmium	Z23-JI0023992	CP	mg/kg	0.09	0.08	8.8	30%	Pass	
Chromium	Z23-JI0023992	CP	mg/kg	21	20	2.5	30%	Pass	
Copper	Z23-JI0023992	CP	mg/kg	14	13	4.9	30%	Pass	
Lead	Z23-JI0023992	CP	mg/kg	18	17	3.7	30%	Pass	
Nickel	Z23-JI0023992	CP	mg/kg	16	16	2.1	30%	Pass	
Zinc	Z23-JI0023992	CP	mg/kg	72	68	5.4	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0023992	CP	%	18	18	2.4	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024005	CP	mg/kg	18	17	4.4	30%	Pass	
Cadmium	Z23-JI0024005	CP	mg/kg	0.10	0.09	13	30%	Pass	
Chromium	Z23-JI0024005	CP	mg/kg	17	22	24	30%	Pass	
Copper	Z23-JI0024005	CP	mg/kg	11	14	20	30%	Pass	
Lead	Z23-JI0024005	CP	mg/kg	16	19	20	30%	Pass	
Nickel	Z23-JI0024005	CP	mg/kg	13	16	23	30%	Pass	
Zinc	Z23-JI0024005	CP	mg/kg	79	97	19	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Katyana Gausel	Analytical Services Manager
Raymond Siu	Senior Analyst-Metal
Sophie Bush	Senior Analyst-Asbestos

Raymond Siu
Senior Instrument Chemist (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

eurofins | Environment Testing

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention:	Colter Carson
Report	1007302-AID
Project Name	11 CHURCH STREET ASHBURTON
Project ID	1018898.2000
Received Date	Jul 13, 2023
Date Reported	Aug 11, 2023

Methodology:

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

Project Name 11 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Date Sampled Jul 12, 2023
Report 1007302-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
11 HA1 0.1	23-Jl0024007	Jul 12, 2023	Approximate Sample 143g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HA2 0.1	23-Jl0024009	Jul 12, 2023	Approximate Sample 247g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HA3 0.1	23-Jl0024011	Jul 12, 2023	Approximate Sample 136g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HA4 0.1	23-Jl0024013	Jul 12, 2023	Approximate Sample 176g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HALO A	23-Jl0024015	Jul 12, 2023	Approximate Sample 175g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HALO B	23-Jl0024016	Jul 12, 2023	Approximate Sample 306g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HALO C	23-Jl0024017	Jul 12, 2023	Approximate Sample 216g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
11 HALO D	23-Jl0024018	Jul 12, 2023	Approximate Sample 217g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Jul 13, 2023	Indefinite

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Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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NATA# 2377
Site# 2370

Company Name:	Kainga Ora – Homes and Communities - SI	**Order No.:**	6181830 11 CHURCH STREET	**Received:**	Jul 13, 2023 8:00 AM
Address:	107 Carlton Gore Road Newmarket, Auckland NZ 1023	**Report #:**	1007302	**Due:**	Aug 11, 2023
		Phone:	(021) 537 696	**Priority:**	20 Day
		Fax:		**Contact Name:**	Colter Carson
Project Name:	11 CHURCH STREET ASHBURTON				
Project ID:	1018898.2000				

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	11 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0024007		X							X	X
2	11 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0024008									X	X
3	11 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0024009		X							X	X
4	11 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0024010									X	X
5	11 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0024011		X							X	X
6	11 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0024012									X	X
7	11 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0024013		X							X	X
8	11 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0024014									X	X
9	11 HALO A	Jul 12, 2023		Soil	Z23-Jl0024015		X								
10	11 HALO B	Jul 12, 2023		Soil	Z23-Jl0024016		X								
11	11 HALO C	Jul 12, 2023		Soil	Z23-Jl0024017		X								

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 11 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 11 CHURCH STREET
Report #: 1007302
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
12	11 HALO D	Jul 12, 2023		Soil	Z23-Jl0024018		X								
13	COMPOSITE OF 11 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0024019									X	X
14	11 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0024020	X		X	X		X	X	X	X	
15	11 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0024021	X		X	X		X	X	X	X	
16	11 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0024022			X						X	
17	11 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0024023	X		X	X		X	X	X	X	
18	11 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0024024	X		X	X		X	X	X	X	
19	11 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0024025			X						X	
20	11 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0024026									X	X
21	11 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0024027									X	X
22	11 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0024028					X					
23	11 HA4 0.5	Jul 12, 2023		Soil	Z23-Jl0024029									X	X

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Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
24	11 HA4 0.7	Jul 12, 2023		Soil	Z23-Jl0024030									X	X
25	11 HA4 1.0	Jul 12, 2023		Soil	Z23-Jl0024031			X						X	
Test Counts						4	8	7	4	1	4	4	4	20	13

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

Units

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

Calculations

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

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

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

Terms

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

Comments

Sample Integrity

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

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

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

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention: **Colter Carson**

Report **1007302-S**
Project name 11 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Received Date Jul 13, 2023

Client Sample ID			**11 HA1 0.1**	**11 HA1 0.3**	**11 HA2 0.1**	**11 HA2 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0024007**	**Z23-JI0024008**	**Z23-JI0024009**	**Z23-JI0024010**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	6.8	6.3	7.4	8.3
Cadmium	0.01	mg/kg	0.14	0.12	0.10	0.13
Chromium	0.1	mg/kg	26	26	25	26
Copper	0.1	mg/kg	18	17	14	24
Lead	0.1	mg/kg	36	30	29	42
Nickel	0.1	mg/kg	19	19	13	20
Zinc	5	mg/kg	100	96	84	110
Sample Properties						
% Moisture	1	%	32	24	14	20

Client Sample ID			**11 HA3 0.1**	**11 HA3 0.3**	**11 HA4 0.1**	**11 HA4 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0024011**	**Z23-JI0024012**	**Z23-JI0024013**	**Z23-JI0024014**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	8.2	8.3	10	14
Cadmium	0.01	mg/kg	0.25	0.22	0.34	0.34
Chromium	0.1	mg/kg	23	28	24	26
Copper	0.1	mg/kg	26	27	33	38
Lead	0.1	mg/kg	81	150	80	86
Nickel	0.1	mg/kg	14	19	15	17
Zinc	5	mg/kg	210	200	190	190
Sample Properties						
% Moisture	1	%	18	23	31	24

Client Sample ID			COMPOSITE OF 11 HALO A-D	11 HA1 0.5	11 HA1 0.7	11 HA1 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0024019	Z23-JI0024020	Z23-JI0024021	Z23-JI0024022
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	9.8	-	-	-
Cadmium	0.01	mg/kg	0.28	-	-	-
Chromium	0.1	mg/kg	25	-	-	-
Copper	0.1	mg/kg	43	-	-	-
Lead	0.1	mg/kg	120	-	-	-
Nickel	0.1	mg/kg	16	-	-	-
Zinc	5	mg/kg	220	-	-	-
Sample Properties						
% Moisture	1	%	19	25	22	20
Heavy Metals						
Chromium	0.1	mg/kg	-	20	25	24
Copper	0.1	mg/kg	-	13	16	-
Nickel	0.1	mg/kg	-	15	18	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	-	4.9	5.9	-
Lead	0.1	mg/kg	-	20	24	-
Zinc	5	mg/kg	-	70	84	-

Client Sample ID			11 HA2 0.5	11 HA2 0.7	11 HA2 1.0	11 HA3 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0024023	Z23-JI0024024	Z23-JI0024025	Z23-JI0024026
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	-	-	5.3
Cadmium	0.01	mg/kg	-	-	-	0.10
Chromium	0.1	mg/kg	-	-	-	25
Copper	0.1	mg/kg	-	-	-	21
Lead	0.1	mg/kg	-	-	-	95
Nickel	0.1	mg/kg	-	-	-	16
Zinc	5	mg/kg	-	-	-	130
Sample Properties						
% Moisture	1	%	19	21	17	18
Heavy Metals						
Chromium	0.1	mg/kg	32	24	22	-
Copper	0.1	mg/kg	26	19	-	-
Nickel	0.1	mg/kg	22	17	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	9.5	6.4	-	-
Lead	0.1	mg/kg	44	44	-	-
Zinc	5	mg/kg	120	99	-	-

Client Sample ID			11 HA3 0.7	11 HA4 0.5	11 HA4 0.7	11 HA4 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0024027	Z23-JI0024029	Z23-JI0024030	Z23-JI0024031
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	4.1	7.8	8.7	-
Cadmium	0.01	mg/kg	0.08	0.09	0.14	-
Chromium	0.1	mg/kg	21	23	25	-
Copper	0.1	mg/kg	14	19	24	-
Lead	0.1	mg/kg	37	25	42	-
Nickel	0.1	mg/kg	14	17	19	-
Zinc	5	mg/kg	84	88	110	-
Sample Properties						
% Moisture	1	%	17	19	18	18
Heavy Metals						
Chromium	0.1	mg/kg	-	-	-	22

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M7 (NZ MfE)	Auckland	Jul 21, 2023	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Heavy Metals	Auckland	Aug 04, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 (NZ MfE)	Auckland	Jul 21, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 11 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 11 CHURCH STREET
Report #: 1007302
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Arsenic	Asbestos - AS4964	Chromium	Copper	HOLD	Lead	Nickel	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	11 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0024007		X							X	X
2	11 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0024008									X	X
3	11 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0024009		X							X	X
4	11 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0024010									X	X
5	11 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0024011		X							X	X
6	11 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0024012									X	X
7	11 HA4 0.1	Jul 12, 2023		Soil	Z23-Jl0024013		X							X	X
8	11 HA4 0.3	Jul 12, 2023		Soil	Z23-Jl0024014									X	X
9	11 HALO A	Jul 12, 2023		Soil	Z23-Jl0024015		X								
10	11 HALO B	Jul 12, 2023		Soil	Z23-Jl0024016		X								
11	11 HALO C	Jul 12, 2023		Soil	Z23-Jl0024017		X								

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Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
12	11 HALO D	Jul 12, 2023		Soil	Z23-Jl0024018		X								
13	COMPOSITE OF 11 HALO A-D	Jul 12, 2023		Soil	Z23-Jl0024019									X	X
14	11 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0024020	X		X	X		X	X	X	X	
15	11 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0024021	X		X	X		X	X	X	X	
16	11 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0024022			X						X	
17	11 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0024023	X		X	X		X	X	X	X	
18	11 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0024024	X		X	X		X	X	X	X	
19	11 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0024025			X						X	
20	11 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0024026									X	X
21	11 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0024027									X	X
22	11 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0024028					X					
23	11 HA4 0.5	Jul 12, 2023		Soil	Z23-Jl0024029									X	X

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Auckland Laboratory - IANZ# 1327						X		X	X		X	X	X	X	X
Christchurch Laboratory - IANZ# 1290							X			X					
Tauranga Laboratory - IANZ# 1402															
24	11 HA4 0.7	Jul 12, 2023		Soil	Z23-Jl0024030									X	X
25	11 HA4 1.0	Jul 12, 2023		Soil	Z23-Jl0024031			X						X	
Test Counts						4	8	7	4	1	4	4	4	20	13

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M7 (NZ MfE)							
Arsenic	%	103			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	107			80-120	Pass	
Copper	%	106			80-120	Pass	
Lead	%	103			80-120	Pass	
Nickel	%	102			80-120	Pass	
Zinc	%	108			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Chromium	%	105			80-120	Pass	
Copper	%	106			80-120	Pass	
Nickel	%	104			80-120	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	108			80-120	Pass	
Lead	%	110			80-120	Pass	
Zinc	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0024008	CP	%	111			75-125	Pass	
Cadmium	Z23-JI0024008	CP	%	112			75-125	Pass	
Chromium	Z23-JI0024008	CP	%	114			75-125	Pass	
Copper	Z23-JI0024008	CP	%	111			75-125	Pass	
Lead	Z23-JI0024008	CP	%	110			75-125	Pass	
Nickel	Z23-JI0024008	CP	%	105			75-125	Pass	
Zinc	Z23-JI0024008	CP	%	97			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0024023	CP	%	101			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	Z23-JI0024023	CP	%	101			75-125	Pass	
Chromium	Z23-JI0024023	CP	%	104			75-125	Pass	
Copper	Z23-JI0024023	CP	%	101			75-125	Pass	
Lead	Z23-JI0024023	CP	%	93			75-125	Pass	
Nickel	Z23-JI0024023	CP	%	92			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0024025	CP	%	98			75-125	Pass	
Cadmium	Z23-JI0024025	CP	%	91			75-125	Pass	
Chromium	Z23-JI0024025	CP	%	97			75-125	Pass	
Copper	Z23-JI0024025	CP	%	94			75-125	Pass	
Lead	Z23-JI0024025	CP	%	92			75-125	Pass	
Nickel	Z23-JI0024025	CP	%	94			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0023979	NCP	mg/kg	19	16	20	30%	Pass	
Cadmium	Z23-JI0023979	NCP	mg/kg	0.36	0.30	18	30%	Pass	
Chromium	Z23-JI0023979	NCP	mg/kg	30	26	14	30%	Pass	
Copper	Z23-JI0023979	NCP	mg/kg	55	46	18	30%	Pass	
Lead	Z23-JI0023979	NCP	mg/kg	140	96	37	30%	Fail	Q02
Nickel	Z23-JI0023979	NCP	mg/kg	19	17	10	30%	Pass	
Zinc	Z23-JI0023979	NCP	mg/kg	230	180	29	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0024007	CP	%	32	32	<1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024021	CP	mg/kg	5.9	5.9	<1	30%	Pass	
Cadmium	Z23-JI0024021	CP	mg/kg	0.08	0.07	6.5	30%	Pass	
Chromium	Z23-JI0024021	CP	mg/kg	25	24	2.4	30%	Pass	
Copper	Z23-JI0024021	CP	mg/kg	16	17	1.4	30%	Pass	
Lead	Z23-JI0024021	CP	mg/kg	24	23	4.2	30%	Pass	
Nickel	Z23-JI0024021	CP	mg/kg	18	18	2.6	30%	Pass	
Zinc	Z23-JI0024021	CP	mg/kg	84	81	2.7	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0024021	CP	%	22	22	2.7	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024022	CP	mg/kg	5.2	5.4	4.7	30%	Pass	
Cadmium	Z23-JI0024022	CP	mg/kg	0.04	0.05	10.0	30%	Pass	
Chromium	Z23-JI0024022	CP	mg/kg	24	25	3.0	30%	Pass	
Copper	Z23-JI0024022	CP	mg/kg	16	16	3.5	30%	Pass	
Lead	Z23-JI0024022	CP	mg/kg	18	20	9.6	30%	Pass	
Nickel	Z23-JI0024022	CP	mg/kg	17	17	2.6	30%	Pass	
Zinc	Z23-JI0024022	CP	mg/kg	67	71	5.6	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Katyana Gausel	Analytical Services Manager
Raymond Siu	Senior Analyst-Metal
Sophie Bush	Senior Analyst-Asbestos

Raymond Siu
Senior Instrument Chemist (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention:	Colter Carson
Report	1007303-AID
Project Name	13 CHURCH STREET ASHBURTON
Project ID	1018898.2000
Received Date	Jul 13, 2023
Date Reported	Aug 11, 2023

Methodology:

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

Project Name 13 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Date Sampled Jul 12, 2023
Report 1007303-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
13 HA1 0.1	23-Jl0024032	Jul 12, 2023	Approximate Sample 206g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
13 HA2 0.1	23-Jl0024034	Jul 12, 2023	Approximate Sample 175g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
13 HA3 0.1	23-Jl0024036	Jul 12, 2023	Approximate Sample 176g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Jul 13, 2023	Indefinite

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Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Company Name: Kainga Ora – Homes and Communities - SI
Address: 107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Project Name: 13 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 13 CHURCH STREET
Report #: 1007303
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Aug 11, 2023
Priority: 20 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Asbestos - AS4964	Chromium	HOLD	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327							X		X	X	X
Christchurch Laboratory - IANZ# 1290						X		X			
Tauranga Laboratory - IANZ# 1402											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	13 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0024032	X				X	X
2	13 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0024033					X	X
3	13 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0024034	X				X	X
4	13 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0024035					X	X
5	13 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0024036	X				X	X
6	13 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0024037					X	X
7	13 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0024038					X	X
8	13 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0024039					X	X
9	13 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0024040		X			X	
10	13 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0024041					X	X
11	13 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0024042					X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Asbestos - AS4964	Chromium	HOLD	Zinc	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327							X		X	X	X
Christchurch Laboratory - IANZ# 1290						X		X			
Tauranga Laboratory - IANZ# 1402											
12	13 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0024043		X		X	X	
13	13 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0024044					X	X
14	13 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0024045					X	X
15	13 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0024046			X			
Test Counts						3	2	1	1	14	12

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

Units

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

Calculations

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

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

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

Terms

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

Comments

Sample Integrity

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

Asbestos Counter/Identifier:

Kate Stuart	Senior Analyst-Asbestos

Authorised by:

Sophie Bush	Senior Analyst-Asbestos

Sophie Bush
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

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

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Kainga Ora – Homes and Communities
107 Carlton Gore Road
Newmarket, Auckland
NZ 1023

Attention: **Colter Carson**

Report **1007303-S**
Project name 13 CHURCH STREET ASHBURTON
Project ID 1018898.2000
Received Date Jul 13, 2023

Client Sample ID			**13 HA1 0.1**	**13 HA1 0.3**	**13 HA2 0.1**	**13 HA2 0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0024032**	**Z23-JI0024033**	**Z23-JI0024034**	**Z23-JI0024035**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	17	14	17	10
Cadmium	0.01	mg/kg	0.27	0.15	0.34	0.25
Chromium	0.1	mg/kg	27	26	30	26
Copper	0.1	mg/kg	35	73	49	28
Lead	0.1	mg/kg	62	52	230	83
Nickel	0.1	mg/kg	17	19	17	18
Zinc	5	mg/kg	150	110	250	180
Sample Properties						
% Moisture	1	%	30	22	30	24

Client Sample ID			**13 HA3 0.1**	**13 HA3 0.3**	**13 HA1 0.5**	**13 HA1 0.7**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**Z23-JI0024036**	**Z23-JI0024037**	**Z23-JI0024038**	**Z23-JI0024039**
Date Sampled			**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**	**Jul 12, 2023**
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	8.7	6.1	8.9	5.7
Cadmium	0.01	mg/kg	0.46	0.23	0.13	0.06
Chromium	0.1	mg/kg	26	23	26	24
Copper	0.1	mg/kg	35	24	22	16
Lead	0.1	mg/kg	84	44	36	19
Nickel	0.1	mg/kg	17	17	18	18
Zinc	5	mg/kg	240	140	100	77
Sample Properties						
% Moisture	1	%	33	22	22	20

Client Sample ID			13 HA1 1.0	13 HA2 0.5	13 HA2 0.7	13 HA2 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			Z23-JI0024040	Z23-JI0024041	Z23-JI0024042	Z23-JI0024043
Date Sampled			Jul 12, 2023	Jul 12, 2023	Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Metals M7 (NZ MfE)						
Arsenic	0.1	mg/kg	-	5.5	6.4	-
Cadmium	0.01	mg/kg	-	0.07	0.09	-
Chromium	0.1	mg/kg	-	21	25	-
Copper	0.1	mg/kg	-	15	18	-
Lead	0.1	mg/kg	-	21	27	-
Nickel	0.1	mg/kg	-	16	18	-
Zinc	5	mg/kg	-	90	100	-
Sample Properties						
% Moisture	1	%	20	21	21	12
Heavy Metals						
Chromium	0.1	mg/kg	24	-	-	23
Metals M8 (NZ MfE)						
Zinc	5	mg/kg	-	-	-	78

Client Sample ID			13 HA3 0.5	13 HA3 0.7
Sample Matrix			Soil	Soil
Eurofins Sample No.			Z23-JI0024044	Z23-JI0024045
Date Sampled			Jul 12, 2023	Jul 12, 2023
Test/Reference	LOR	Unit		
Metals M7 (NZ MfE)				
Arsenic	0.1	mg/kg	5.4	4.3
Cadmium	0.01	mg/kg	0.14	0.09
Chromium	0.1	mg/kg	23	19
Copper	0.1	mg/kg	20	14
Lead	0.1	mg/kg	33	19
Nickel	0.1	mg/kg	16	14
Zinc	5	mg/kg	110	73
Sample Properties				
% Moisture	1	%	19	18

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M7 (NZ MfE)	Auckland	Jul 21, 2023	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Heavy Metals	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 (NZ MfE)	Auckland	Aug 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Project ID: 1018898.2000

Order No.: 6181830 13 CHURCH STREET
Report #: 1007303
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Jul 18, 2023
Priority: 2 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327								X	X
Christchurch Laboratory - IANZ# 1290						X	X		
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	13 HA1 0.1	Jul 12, 2023		Soil	Z23-Jl0024032	X		X	X
2	13 HA1 0.3	Jul 12, 2023		Soil	Z23-Jl0024033			X	X
3	13 HA2 0.1	Jul 12, 2023		Soil	Z23-Jl0024034	X		X	X
4	13 HA2 0.3	Jul 12, 2023		Soil	Z23-Jl0024035			X	X
5	13 HA3 0.1	Jul 12, 2023		Soil	Z23-Jl0024036	X		X	X
6	13 HA3 0.3	Jul 12, 2023		Soil	Z23-Jl0024037			X	X
7	13 HA1 0.5	Jul 12, 2023		Soil	Z23-Jl0024038		X		
8	13 HA1 0.7	Jul 12, 2023		Soil	Z23-Jl0024039		X		
9	13 HA1 1.0	Jul 12, 2023		Soil	Z23-Jl0024040		X		
10	13 HA2 0.5	Jul 12, 2023		Soil	Z23-Jl0024041		X		
11	13 HA2 0.7	Jul 12, 2023		Soil	Z23-Jl0024042		X		
12	13 HA2 1.0	Jul 12, 2023		Soil	Z23-Jl0024043		X		

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Project Name: 13 CHURCH STREET ASHBURTON
Project ID: 1018898.2000

Order No.: 6181830 13 CHURCH STREET
Report #: 1007303
Phone: (021) 537 696
Fax:

Received: Jul 13, 2023 8:00 AM
Due: Jul 18, 2023
Priority: 2 Day
Contact Name: Colter Carson

Eurofins Analytical Services Manager : Katyana Gausel

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Metals M7 (NZ MfE)
Auckland Laboratory - IANZ# 1327								X	X
Christchurch Laboratory - IANZ# 1290						X	X		
External Laboratory									
13	13 HA3 0.5	Jul 12, 2023		Soil	Z23-Jl0024044		X		
14	13 HA3 0.7	Jul 12, 2023		Soil	Z23-Jl0024045		X		
15	13 HA3 1.0	Jul 12, 2023		Soil	Z23-Jl0024046		X		
Test Counts						3	9	6	6

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M7 (NZ MfE)							
Arsenic	%	103			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	107			80-120	Pass	
Copper	%	106			80-120	Pass	
Lead	%	103			80-120	Pass	
Nickel	%	102			80-120	Pass	
Zinc	%	108			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0024008	NCP	%	111			75-125	Pass	
Cadmium	Z23-JI0024008	NCP	%	112			75-125	Pass	
Chromium	Z23-JI0024008	NCP	%	114			75-125	Pass	
Copper	Z23-JI0024008	NCP	%	111			75-125	Pass	
Lead	Z23-JI0024008	NCP	%	110			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Nickel	Z23-JI0024034	CP	%	120			75-125	Pass	
Zinc	Z23-JI0024034	CP	%	89			75-125	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Arsenic	Z23-JI0024044	CP	%	119			75-125	Pass	
Cadmium	Z23-JI0024044	CP	%	115			75-125	Pass	
Nickel	Z23-JI0024044	CP	%	113			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024033	CP	mg/kg	14	14	1.1	30%	Pass	
Cadmium	Z23-JI0024033	CP	mg/kg	0.15	0.17	15	30%	Pass	
Chromium	Z23-JI0024033	CP	mg/kg	26	27	3.5	30%	Pass	
Copper	Z23-JI0024033	CP	mg/kg	73	40	58	30%	Fail	Q02
Lead	Z23-JI0024033	CP	mg/kg	52	49	6.5	30%	Pass	
Nickel	Z23-JI0024033	CP	mg/kg	19	20	2.1	30%	Pass	
Zinc	Z23-JI0024033	CP	mg/kg	110	120	8.8	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0024033	CP	%	22	23	1.7	30%	Pass	

Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024042	CP	mg/kg	6.4	5.9	8.5	30%	Pass	
Cadmium	Z23-JI0024042	CP	mg/kg	0.09	0.08	10	30%	Pass	
Chromium	Z23-JI0024042	CP	mg/kg	25	23	7.6	30%	Pass	
Copper	Z23-JI0024042	CP	mg/kg	18	16	8.5	30%	Pass	
Lead	Z23-JI0024042	CP	mg/kg	27	24	9.6	30%	Pass	
Nickel	Z23-JI0024042	CP	mg/kg	18	17	8.2	30%	Pass	
Zinc	Z23-JI0024042	CP	mg/kg	100	95	7.7	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	Z23-JI0024042	CP	%	21	21	2.8	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	Z23-JI0024043	CP	mg/kg	5.6	5.6	<1	30%	Pass	
Cadmium	Z23-JI0024043	CP	mg/kg	0.07	0.06	6.4	30%	Pass	
Chromium	Z23-JI0024043	CP	mg/kg	23	23	<1	30%	Pass	
Copper	Z23-JI0024043	CP	mg/kg	16	16	<1	30%	Pass	
Lead	Z23-JI0024043	CP	mg/kg	22	22	2.4	30%	Pass	
Nickel	Z23-JI0024043	CP	mg/kg	17	17	1.4	30%	Pass	
Zinc	Z23-JI0024043	CP	mg/kg	78	78	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Katyana Gausel	Analytical Services Manager
Raymond Siu	Senior Analyst-Metal
Sophie Bush	Senior Analyst-Asbestos

Raymond Siu
Senior Instrument Chemist (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

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