

Supplementary Detailed Site Investigation (DSI)

86, 108 & 122 Arataki Road, Havelock North

ct: Woods

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STATEMENT

This Detailed Site Investigation has been prepared in accordance with the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011*. It has been reviewed and authorised by a suitably qualified and experienced practitioner (SQEP); and reported on in accordance with the current edition of the Ministry for the Environment's Contaminated Land Management Guidelines No.1 *Reporting on Contaminated Sites in New Zealand*.

SQEP CERTIFICATION

I, Carl O'Brien, of SQN Consulting Ltd ('SQN GeoSciences') certify that I meet the qualifications of a suitably qualified and experienced practitioner (SQEP) in contaminated land investigations, remediation, and management as outlined in Section 2.1.1 of the MfE's (2012) *Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*. Evidence of qualifications and experience can be provided upon request.

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EXECUTIVE SUMMARY

Woods engaged SQN GeoSciences (SQN) to conduct a Supplementary Detailed Site Investigation (DSI) of the properties located at 86, 108 & 122 Arataki Road, Havelock North ('the site'), to support a fast-track resource consent application for a proposed residential development comprising change in land use, subdivision and preparatory earthworks. This DSI is prepared to supplement the investigation and assessments made within the following former investigations:

- Geosciences Ltd (GSL, 2018), *Environmental Due Diligence (DD)*, 108, 122 & 166 Arataki Road, Havelock North, Ref: Rep-1232/DD/Sep18,
- GSL (2019), *Environmental Due Diligence (DD)*, 86 & 96 Arataki Road, Havelock North, Rep-H0044/DD/Mar19, and
- GSL (2021), *Detailed Site Investigation (DSI)*, 86, 102, and 122 Arataki Road, Havelock North, Hastings, Rep-H0162/DSI/Sep21.

Findings from the desktop reviews and site inspections completed to date (inclusive of this Supplementary DSI), to identify actual or potentially contaminating activities listed on the Ministry for the Environment's (MfE) Hazardous Activities and Industries List (HAIL), revealed the following activities may have occurred onsite:

- Historic horticultural activities (HAIL item A.10),
- Burning of building materials and/or refuse (HAIL item I),
- Deterioration and/or improper demolition of historic structures (HAIL item I/E.1), and
- Stockpiling of potentially contaminated material of unknown origin (HAIL item G.3).

The intrusive investigation findings from the aforementioned investigations completed to date (inclusive of this Supplementary DSI) determined that the following HAIL activities are more likely than not to have occurred onsite:

- **Burning of building materials and/or refuse (HAIL item I):**
 - Surface soil beneath a burn pile within the eastern portion of 122 Arataki Road (containing partially combusted building materials and/or refuse) contained heavy metals above the human health and environmental protection criteria.
- **Deterioration and/or improper demolition of historic structures (HAIL item I/E.1):**
 - Lead and/or asbestos contamination at concentrations exceeding the adopted human health and/or environmental protection criteria was identified in shallow soil around the curtilage of multiple site structures within the 86 and 108 Arataki Road properties. Additionally, asbestos containing materials (ACM) in the form of fibre cement debris was identified around Dwelling 5 at 108 Arataki Road.
 - One bulk ACM sample from the curtilage of Shed 6 additionally tested positive for asbestos. However, as only one fragment was identified, which was collected for analysis, and no asbestos was detected in the underlying soil, asbestos is not considered to remain within this area.

Additionally, all other samples contained at least one analyte above the expected background values and/or laboratory reporting limit.

The extent of contamination across these 6 areas is likely confined to shallow soils (to inferred depths of 0.15 - 0.5 mbgl), with a combined volume of approximately **245.5 m³** requiring remediation.

Based on the above:

- Remediation of the estimated extent of contamination in association with the proposed subdivision and development trigger Restricted Discretionary Activity status, under Regulation 10 of the NES.
- Due to the remedial extents, localised profile of contamination, and low contaminant mobility, discharge of contaminants to surrounding properties and/or groundwater is unlikely and will therefore comply with Permitted Activity criteria of Rules 47 – 49 of the Hawke’s Bay RRMP.
- The remedial extent is likely to require disposal at an appropriately licensed landfill facility, and it is likely TCLP analysis on several heavy metals will be required for acceptance;
- Portions of the site have been subject to low-level contamination and will likely require disposal to an appropriately licensed managed fill facility; however, acceptance of any material is at the discretion of the nominated receiving facility;
- To meet the requirements of Regulation 10 under the NES, a Remedial Action Plan (ref: *J250030-RAP-Mar25*) has been issued alongside this Supplementary DSI to outline the necessary practises and procedures to be in place during remedial and general earthworks.

1 INTRODUCTION

SQN GeoSciences (SQN) has prepared the following report for Woods in accordance with the SQN proposal, ref: Q240889/2, dated 12 February 2025.

This report has been prepared in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG) No. 1 *Guidelines for Reporting on Contaminated Sites in New Zealand* and No. 5 *Site Investigation and Analysis of Soils* (MfE 2021a & 2021b).

This DSI has been prepared as Supplementary Report to expand on the work completed by Geosciences Ltd in 2021 for 86, 108 and a portion of 122 Arataki Road (GSL, 2021, Appendix A). Specifically, this DSI:

- Assesses activities that have occurred post 2021 across the properties at 86, 108 and the southern portion of 122 Arataki Road;
- Includes Assessment of the Areas of 86, 108 & 122 Arataki Road that were not included the GSL 2021 DSI; and
- Collates all applicable information in an updated form for the current resource consent application.

2 PROPERTY DETAILS

TABLE 1 PROPERTY DETAILS

Address	Legal Description	Area (Ha)	Zoning
122 Arataki Road, Havelock North (Areas 1 & 2)	LOT 2 DP 540945	5.234	Plains Production
108 Arataki Road, Havelock North (Area 3)	SEC 10 S BLK IV TE MATA SD	2.939	
86 Arataki Road, Havelock North (Area 4)	LOT 2 DP 546439	2.984	
Total Investigation Area		11.157 Ha	

The above properties at the above identifiers, hereafter collectively referred to as ‘the site’, is located outside of the urban outskirts, approximately 2.3 km northeast of Havelock North town centre (Figure 1). West of the site the wider land use is predominantly urban residential, while land to the east is predominantly rural residential and production land.

For ease of reference, the site has been divided into Areas 1-4, as shown in Figure 2.

2.1 SITE CONTEXT

Geosciences Ltd (GSL) completed a Detailed Site Inspection (DSI, ref: *Rep-H0162/DSI/Sep21*) of a portion of 122 Arataki Road (Area 2), as well as 108 (Area 3) and 86 Arataki Road (Area 4), dated 29 September 2021. GSL’s DSI (2021) included the desktop review and intrusive investigation findings of two previously completed Due Diligence investigations (DD), both completed by GSL, dated 20th of

September 2018 and 21st March 2019 (refs: *Rep-1232/DD/Sep18*, and *Rep-H0044/DD/Mar19*, respectively). The desktop review within the DSI identified:

- Most of the site was historically the location of an orchard and broadacre crop from prior to 1949, until the 1970s, and mushroom farming between the 1960s – 1990s, with potential for bulk persistent pesticide and/or agrichemical storage on site (HAIL A.10) during this time. However, subsequent soil sampling and analysis did not identify contaminants above the adopted human health or environmental criteria.
- Several dwellings and structures were constructed prior to the 1970s, with potential for HAIL Item I to have occurred onsite from deterioration of building materials.
 - o The intrusive investigations identified 1m halo of lead contamination around three buildings (including Dwelling 2 and Shed 3 in this report), with concentrations exceeding the human health protection criteria.
 - o Approximately 201.5 m³ of impacted soils would require remediation and/or management.

This DSI concluded that the NES would apply, with works characterised as a Restricted Discretionary Activity, while the contaminated land rules of the HBRC RRMP would not apply to the site.

Review of the findings of the GSL investigations note:

- The background and Eco-SGV criteria have since been revised. Under the current guideline values, additional sample locations exceeded the expected background concentrations and environmental protection criteria for the site. Figures 3a-3c of this report show updated analytical results under the current applicable guideline values.
- One composite sample from the 2018 investigation and three discrete samples from the 2020 investigation identified arsenic concentrations marginally elevated above the application human health and environmental protection criteria. However, statistical analysis completed by GSL (2020) indicates that these results are not indicative of the soil from this portion, and do not pose a risk to human health or the environment. It was concluded that remediation or management of these soils was not required.

An excerpt of this DSI is attached as Appendix B.

3 CURRENT OBJECTIVES AND PROJECT DESIGN

Given the scope of the original DSI (Section 2.1), the primary objective of this investigation is to provide supplementary information required to reflect the current development proposal. That is, assess whether any actual or potentially contaminating activities may have occurred:

- Within the northern portion of 122 Arataki Road (Area 1) which was excluded from the scope of the previous DSI, and
- Across 86, 108 and 122 Arataki Road (Areas 2-4) since completion of the original DSI (GSL, 2021).

This DSI report shall therefore be read in conjunction with the original DSI (ref: Rep-H0162/DSI/Sep21).

A secondary objective is to classify the soil to assist with the offsite disposal of unsuitable or surplus soils.

To achieve the objectives, SQN has undertaken a supplementary DSI comprising:

- An historical appraisal of the areas not previously assessed and for post 2021 activities via a desktop review of¹:
 - Available historical aerial photographs.
 - Current and historic certificates of titles.
 - Documents from council-held property files.
- A site visit and walkover of the site.
- Development of a preliminary conceptual site model (CSM).
- An intrusive site investigation via collection and analysis of representative soil samples, based on the preliminary CSM, to determine the soil quality and any associated risk to human health and / or the environment arising from any actual or potential soil contamination on site.
- A risk and regulatory assessments for the site, based on the findings of the investigation, and in the context of the NES and RRMP as the applicable regulations for the site.
- Preparation of this DSI report in accordance with CLMG No. 1 (MfE, 2021a) detailing the findings of this investigation, including recommendations and relevant consenting requirements under the NES and RRMP.

4 PROPOSED ACTIVITY

This DSI has been prepared to support a fast-track resource consent application submission to allow for a large-scale mixed residential development. The proposed development will include a change in landuse from plains production to residential, subdivision across the site for proposed residential lots, and earthworks for establishment of building platforms, roads and installation of underground services.

A copy of the proposed scheme plan is attached in Appendix A.

5 STANDARDS AND REGULATIONS

As a result of the proposed change in land use, subdivision and soil disturbance outlined above, it will be necessary to address the requirements of the following applicable standards and regulations for the site.

5.1 NATIONAL ENVIRONMENTAL STANDARD (NES)

The New Zealand *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NES) ensures that land affected by contaminants in soil is appropriately identified and assessed when soil disturbance and/or land development activities take place and, if necessary, remediated or the contaminants contained to make the land safe for human use.

Under the NES, land is considered actually or potentially contaminated if an activity or industry on the MfE Hazardous Activities and Industries List (HAIL) has been, is, or is more likely than not to have been, undertaken on the land. Consequently, a change in landuse, subdivision, or soil disturbance activity on HAIL land requires a detailed site investigation (DSI) of the piece of land to determine if there is any risk to human health as a result of the former activities.

¹ Limited to post 2020 documents for portions of the site covered by the existing DSI (GSL, 2021).

The NES defines five standard landuse scenarios for which soil contaminant standards (SCS) have been derived; the most applicable scenario for the proposed development is residential, described as “standard residential lot, for single dwelling sites with gardens, including home-grown produce consumption (10%)”.

5.2 HAWKE’S BAY REGIONAL RESOURCE MANAGEMENT PLAN (HBRC RRMP)

Section 30(1)(ca) and (f) of the Resource Management Act provides the HBRC with a statutory duty to investigate land for the purposes of identifying and monitoring contaminated land and for the control of discharges of contaminants into or onto land or water and discharges of water into water.

Chapter 6.6.7 of the HBRC Regional Resource Management Plan (RRMP, 2021) deals with the actual or potential release of contaminants to land and water, during investigation, use, or remediation of contaminated land, pursuant to Section 15 of the RMA, unless a rule specifically states otherwise.

5.3 OPERATIVE HASTINGS DISTRICT PLAN (OHDP)

On the 27th of June 2024, the Hastings District Plan became fully operational. Sections 29.1 and 30.1 of the OHDP requires territorial authorities to enact and enforce the requirements of the NES for purposes of assessing soil contaminant values, provide controls and ensure that land affected by contaminants in soil is appropriately identified, assessed and, if required, remediated prior to development.

6 SUPPLEMENTARY ASSESSMENT - SITE HISTORY

A desktop study of publicly available files and photographs was undertaken to determine the history of the areas not previously assessed, and for activities between 2021 and 2025, with respect to any current or historic potentially contaminating land uses.

Relevant site features identified in the following sections are shown on Figure 4, with extant features denoted by numbers and former features denoted by letters (bracketed in text below).

6.1 RECORDS OF TITLE

SQN has reviewed copies of the current and historical records of title for the site, including any instruments on the title which detail relevant property information (e.g. current ownership, registered interests, easements, covenants, lease restrictions and transmissions), to determine if pre-existing consent notices or other restrictions / notifications which may be relevant to historic uses or potential soil contamination are held against the property.

No notes of interest pertaining to actual or potential contamination were recorded on the titles.

Copies of these documents are attached in Appendix C.

6.2 HISTORIC AERIAL PHOTOGRAPHS

Historical imagery sourced from LINZ and Google Earth (2020 – 2024) were reviewed for the entirety of the site, with an additional review of imagery from Retrolens (1950 - 1996) and LINZ (2015 - 2017) for the northern portion of the 122 Arataki Road property (Area 1). Key findings are summarised below, and relevant historical aerials are included as Appendix D.

Area 1 (Northern portion of 122 Arataki Road, not within the scope of the previous DSI):

- 1950 - 1969** Area 1 is utilised for horticultural activity (orcharding). No built structures exist onsite. Surrounding properties are predominantly of rural production or residential intent.
- 1977 - 2011** Horticultural activity has ceased across Area 1, and an accessway is established along the northern boundary. Area 1 remains as vacant pasture throughout this period, with some landscaping present in the western half from 2011.
- 2015** A large shed (Shed 1) is established in the centre of Area 1, and a tyre stockpile (Stockpile A) is noted along the northern boundary.
- 2017 - 2024** A large stockpile of metal construction materials is noted in the north-eastern corner and a potential burn pile (Burn Pile B) has also been established within the eastern portion of Area 1. A large stockpile has been established along the eastern boundary of Area 1. A potential vegetable garden has been established west of the shed.

Areas 2-4 (86, 108 and remainder of 122 Arataki Road):

- 2021 - 2023** Ploughing and cropping recommences from 2021 across Area 2 (remainder of 122 Arataki Road) until most recent available imagery. A stockpile of material is established midway down Area 3 (108 Arataki Road) along the eastern boundary. No other significant changes are noted.

Summary

Based on the above, the following pertinent information is noted:

- Area 1 was utilised for horticultural activity since prior to 1950 and until at least 1969 and is noted to have a burn pile (Burn Pile 1) onsite between 2017 and 2023. A large stockpile of potentially imported soil, and a tyre stockpile were identified onsite.
- Area 2 has been subject to additional cropping onsite in 2021.
- A stockpile of potential building materials or refuse has been placed within Area 3, visible between 2015 to 2023.

6.3 PROPERTY FILES

SQN accessed property files held by Heretaunga Hastings District Council for review of historic potentially contaminating activities within the northern portion of 122 Arataki Road not addressed within the previously completed DSI (GSL 2021). Additionally, a review files for 86, 108 and 122 Arataki Road was also undertaken to ensure no additional potentially contaminating activities had occurred at these properties since the completion of the former DSI.

No potentially contaminating activities were identified for the northern portion of 122 Arataki Road, or for the remainder of the site since the former DSI.

6.4 FORMER INVESTIGATIONS

6.4.1 GEOTECHNICAL REPORT – INITIA GEOTECHNICAL SPECIALISTS (FEBRUARY 2022).

Initia Geotechnical Specialists conducted a Geotechnical Report (Ref: 1190 Rev A) in February 2022 to support previous resource consent application for residential subdivision. The investigation determined:

- No fill material or evidence of potential contamination (such as odours, staining, or anthropogenic refuse) was identified.
- Dark brown silt topsoil, with sand and some rootlets, was encountered between 0 – 0.2/0.4 mbgl.
- Underlying material was a sandy gravel (fine to coarse), with minor silt, between 0.2/0.4 – 1.2/2.9 mbgl.
- This material was underlain by a sandy silt and gravelly silt with some lenses of clayey silt.
- Groundwater was not encountered during this investigation, however, is estimated to be at 5 mbgl along the northern site boundary, and likely deeper along the southern site boundary.

A copy of the report is available upon request.

7 SITE INSPECTION

SQN undertook a visual inspection of the site on the 26th and 27th of February 2025. The site layout was consistent most recent aerial imagery from Google Earth (2025), with the following key features observed:

122 Arataki Road (Areas 1 & 2):

- The inside of the large shed (Shed 1) onsite was inaccessible at the time of inspection; however, no evidence of any leaks/spills, staining or odours were noted within the curtilage of the building.
- Several small stockpiles of materials including tyres (Stockpile A), wood, steel pipes and soil (Stockpile C) were identified within the north-eastern portion of the site.
- The soil stockpile (Stockpile C), with an estimated volume of 99 m³, appears consistent with surrounding topsoil, with intermixed aggregate and occasional pieces of wood and brick noted. No other evidence of anthropogenic waste, asbestos, odours or staining were noted.
- Burn Pile B was noted within the western portion of Area 1.
- The western portion of the site is a landscaped ornamental garden which appears to be associated with the neighbouring residential dwelling at 160 Arataki Road.
- Inactive horticultural activity was noted across the balance of the site.

108 Arataki Road (Area 3):

- A small, localised area of minor deterioration to the building materials along the west aspect of Dwelling 4 was noted but otherwise appeared in good condition.
- Dwelling 5, in the south-western corner of the property has undergone partial uncontrolled demolition, with several fibre cement fragments identified as potential asbestos-containing materials (ACM) across the soil surface north and east of the dwelling, and on top of the deck.
- No other changes have occurred to the site since the previous DSI, as per visual inspection, and interviews with occupant of Dwelling 2, and the property owner (Section 7.1).

86 Arataki Road (Area 4):

- A small painted corrugated iron shed (Shed 6) was noted to be in a state of minor deterioration, and a suspected ACM fragment was identified (collected as sample BM3).
- Burn Piles E and F are noted east of Dwelling 7 and Shed 8.
- A small shed (Shed 9) with mild paint deterioration is noted northeast of Shed 8.
- Stockpiles of branches and tree cuttings, as well as collections of household refuse are noted north of Shed 9.
- Dwelling 7 and Shed 8 appear consistent with most recent aerial imagery.

No other visual or olfactory evidence of significant actual or potential contamination was identified during the site inspection.

Site photographs are attached as Appendix E, and relevant site features are shown in Figure 4.

7.1 OCCUPANT / OWNER INTERVIEWS

Interviews for historic site uses at 122 and 108 Arataki Road were not possible at the time of the site inspection; however, brief interviews were conducted with long-term occupants and/or the property owners of 86 Arataki Road which determined:

- A formerly existing shed on the site, within proximity to Shed 6, which potentially contained ACM, burned down.
- The shipping container within Area 4 is used for storage of household furniture.
- Two burn piles (Burn Piles E and F) were established east of Dwelling 7 and Shed 8 since the original DSI (GSL, 2021).
- No other changes have occurred to the site since 2020.

8 PRELIMINARY CONCEPTUAL SITE MODEL FOR POTENTIAL CONTAMINATION – DSI ADDENDUM

Based on the findings of the desktop review and site inspection, SQN has developed the following preliminary conceptual site model (CSM) for potential contamination on the site (Table 2). N.B. this excludes items/activities assessed under the previous DSI (GSL, 2021).

TABLE 2 PRELIMINARY CONCEPTUAL SITE MODEL

Land Use / Activity	HAIL Item	Contaminants of Concern	Comment/ Description	Expected Distribution	Investigation Requirements
Historic horticultural activity	HAIL A.10	Heavy metals & OCPs	Horticultural activities (orcharding and cropping) were identified across Area 1, which may have been occurring since at least 1950.	Due to expected consistent pesticide application across cropping activities, contamination (if present) would be relatively evenly distributed in areas of historic horticultural activity and confined to surficial (<75 mm) of soil.	Systematic composite sampling of surface soils where historic horticulture has been identified.
Deterioration and improper demolition of building materials	HAIL I	Lead & asbestos	One or more current/former structures on these were constructed prior to 1970, and therefore, may contain ACM and/or lead-based paint. The improper demolition or degradation of these materials over time can result in hotspot contamination of surficial soils surrounding the building.	Due to low mobility of heavy metals and asbestos, contamination (if present) would be confined to surficial (<75 mm) of soil in the vicinity of the building. Contaminant concentrations are expected to be negatively correlated with distance from the structures (vertically and laterally).	Targeted sampling of surface soils for hotspot contamination.
Burn piles / burned building materials	HAIL I	Heavy metals, OCPs, PAHs, asbestos	Three burn piles were identified during the site inspection, and interviews with one of the property owners had identified that a former Shed previously located nearby Shed 6, had may have burned down. The partial or complete combustion of materials can result in the uncontrolled release of hazardous substances.	Due to limited mobility of these contaminants in soil, the likely distribution would be highest concentrations confined to soils underlying, and within in close proximity to the burn piles / former shed.	Targeted sampling of surface soils for hotspot contamination.

9 ADDENDUM SOIL SAMPLING AND ANALYSIS

Based on the preliminary CSM and investigation requirements noted above, SQN personnel collected a total of 12 samples from across the historic orcharding area, which were composited at the lab into three composite samples (CompA – CompC). Seven discrete soil samples (SS7-SS9, SS11-SS13) were collected from across the site. Two representative asbestos bulk material samples (BM1-BM4) were collected the areas where ACM debris was identified on the soil surface, at the same locations as the corresponding soil samples.

Soil sample locations are shown in Figure 5, and the sample analytical schedule is summarised in Table 3.

TABLE 3 SOIL SAMPLING AND ANALYTICAL SCHEDULE

Area	Location	Soil Sample No.	Depth	Analytes
Area 1	Burn Pile B	SS7	0-75mm	M7, PAH
Area 4	Burn Piles E & F	SS12, SS13		
Area 1	Stockpile C	SP1		M7, PAH, OCP
	Historic orchards / cropping	CompA, CompB, CompC		Heavy metals / OCPs
Area 3	Western aspect of Dwelling 4	BM4		Asbestos ID
	Yard of Dwelling 5	SS8, BM1		Asbestos SQ. asbestos ID
	Curtilage of Dwelling 5	SS9, BM2		Lead, asbestos SQ, asbestos ID
Area 4	Curtilage of Shed 6 / Former shed	SS11, BM3		M7, PAH, asbestos SQ, asbestos ID

Notes:

1. M7 = Arsenic, cadmium, chromium, copper, lead, nickel, zinc.
2. Asbestos SQ = Semi Quantitative analysis
3. Asbestos ID = Presence / Absence analysis only.

9.1 QUALITY ASSURANCE AND QUALITY CONTROL

9.1.1 SAMPLE COLLECTION

Surface soil samples were collected from the uppermost 0-75 mm of topsoil using a stainless-steel foot corer or hand trowel. Samples were placed directly into laboratory supplied sample containers labelled with the date, sample identification number, sample depth, and initials of the sampler.

Soil sampling equipment was decontaminated in between samples using a soft soap solution in accordance with SQN internal quality control procedures. Soil sampling was conducted in accordance with the CLMG No. 5 *Site Investigation and Analysis of Soils*.

SQN field staff are appropriately qualified, suitably trained and experienced in undertaking contaminated land assessments. Personnel are cognisant of the requirements for sample handling and storage, and equipment decontamination procedures alongside completion of field assessments, notes and record keeping and documentation.

9.1.2 SAMPLE HANDLING AND ANALYSIS

The laboratory supplied sample containers were placed in a chilly bin with ice packs and a chain of custody document (COC) indicating the analyses to be performed, as summarised in Table 3, and were dispatched to Hill Labs in Auckland (asbestos) and Hamilton (other analytes) for analysis.

During this assessment, appropriate sample handling and storage protocols were followed to ensure sample integrity was maintained during sampling and transport while laboratory analysis has been undertaken at a laboratory accredited by International Accreditation New Zealand (IANZ) for the analyses conducted.

9.2 EVALUATION CRITERIA

In accordance with CLMG No. 2 *Hierarchy and Application in New Zealand of Environmental Guideline Values* (Revised 2011), the criteria summarised in Table 4 below have been adopted for the site.

TABLE 4 ADOPTED GUIDELINE VALUES

Assessment Category	Reference Document
Human Health	- NES (2011), Soil Contaminant Standards (SCS) for residential land use. - MfE (2011), <i>Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand</i>, Tier 1 criteria for TPH – Table 4.10 (silty clay, surface (<1 m) contamination). - BRANZ (2017), <i>New Zealand Guidelines for Assessing and Managing Asbestos in Soil</i> (NZGAMAS), Table 5 (residential land use). - Australian National Environment Protection Council (2013). <i>National Environment Protection (Assessment of Site Contamination) Measure, 1999</i>, as amended and in force on 22 May 2013 – Table 1A (1) (nickel and zinc).
Environmental Protection	- Landcare Research (2023) - <i>An Implementation Framework for Ecological Soil Guideline Values</i> (July 2023). Envirolink Tools Grant: C09X2206 - Table 4 (95% protection) (Eco-SGVs). - AUP(OP) (2016), Chapter E30, permitted activity soil acceptance criteria. - MfE (2011), <i>Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand</i> – Table 4.20 (silty clay, depth of contamination <1 m, groundwater 4 m).
Natural Background Concentrations	Landcare Research (2014), <i>Hawke's Bay Region: Background Soil Concentrations for Managing Soil Quality</i> . Envirolink Advice Grant 1443-HBRC194 – Table 1 (95 th Percentile).

10 ANALYTICAL RESULTS – DSI ADDENDUM

A comparison of the analytical results with the relevant guideline criteria are provided in Table 5 to Table 7 below, and Figure 5. Copies of the laboratory chain of custody document (COC) and analytical transcripts are attached in Appendix F, while a discussion of the results is provided below. Results from the original DSI (Section 2.1) should be considered alongside the following results and are included within Appendix A.

TABLE 5 ANALYTICAL RESULTS – HEAVY METALS¹

Sample ID	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
SS7	560	0.38	<u>290</u>	<u>980</u>	105	10	<u>460</u>
SS9					139		
SS11	31	0.45	33	108	42	8	<u>470</u>
SS12	6	0.30	14	25	74	6	178
SS13	10	0.29	15	27	90	6	168
SP1	7	0.22	13	45	68	6	198
CompA	4			27	36		107
CompB	6			29	24		71
CompC	8			28	26		54
Human Health ²	20	3	>10,000	>10,000	210	400 ³	8,000 ³
Environmental Protection ⁴	20	5	200	110	290	105 ⁵	200
Background ⁶	7.0	0.67	22.7	27.7	24.2	16.9	99.8

Notes:

1. All metal concentrations measured in mg/kg, unless otherwise specified
2. NES SCS.
3. NEP(ASC)M (Ni & Zn only)
4. Landcare Research (Eco-SGVs, 2023).
5. AUP (OP), Chapter E30 (nickel only).
6. Landcare Research (2014).
7. Values in **RED** exceed the Human Health criteria, values UNDERLINED BLUE exceed the Environmental Protection criteria, Values in **BOLD** exceed the background ranges.
8. NA = Not applicable / NL = No Limit / ND= not detected.

TABLE 6 ANALYTICAL RESULTS – ASBESTOS

Sample ID	Type	ACM ¹	FA/AF ¹
SS8	<i>Chrysotile</i>	<0.001	<0.001
SS9	<i>Chrysotile</i>	0.018	<0.001
SS11	ND	ND	ND
BM1	<i>Amosite, Chrysotile</i>		
BM2	ND		
BM3	<i>Amosite, Chrysotile</i>		
BM4	ND		
Human Health ²	N/A	<0.01	<0.001
Background ³	ND	ND	ND

Notes:

1. Measured in % w/w.
2. BRANZ (2017), NZGAMAS.
3. Asbestos is not naturally occurring in this region and thus any detection is above expected background concentrations.
4. Values in **RED** exceed the Human Health criteria, Values in **BOLD** exceed the background ranges.
5. ACM = Asbestos Containing Material, FA/AF = Fibrous asbestos and asbestos fines / NA = Not applicable / ND= not detected.

TABLE 7 ANALYTICAL RESULTS – ORGANIC COMPOUNDS¹

Sample ID	B[a]P TEQ ²	Naphthalene	Pyrene	Total ΣDDT ³
SS7	<0.029	<0.06	<0.012	
SS11	0.071	<0.06	0.067	
SS12	<0.026	<0.06	<0.011	
SS13	<0.028	<0.06	0.012	
SP1	<0.025	<0.05	0.011	<0.06
CompA				<0.07
CompB				<0.07
CompC				<0.07
Human Health	10 ⁴	69 ⁵	1,600 ⁵	70 ⁴
Environmental Protection ⁶	NA	NA	NA	12.0 ⁷
Background ⁸	ND	ND	ND	ND

Notes:

1. Measured in mg/kg.
2. B[a]P TEQ = Benzo[a]pyrene Toxic Equivalency Quotient.
3. Total ΣDDT includes the sum of DDT, DDD and DDE isomers.
4. NES SCS.
5. MfE (2011), Table 4.10.
6. MfE (2011), Table 4.20.
7. AUP (OP), Chapter E30 (total ΣDDT only).
8. Not naturally occurring, thus, any detection is above background.
9. Values in **RED** exceed the Human Health criteria, values UNDERLINED BLUE exceed the Environmental Protection criteria, Values in **BOLD** exceed the background ranges.
10. NA = Not applicable / NL = No Limit / ND= not detected.

10.1 ANALYTICAL RESULTS SUMMARY – DSI ADDENDUM

Soil sampling completed to assess the HAIL activities identified in the preliminary CSM requiring further characterisation has revealed:

Area 1:

- ***Burning of building materials and/or refuse:***
 - The burn pile located in Area 1 (SS7) contains arsenic in exceedance of the applicable human health criteria for the proposed residential land use, and commercial/industrial land use.
 - Arsenic, chromium, copper and zinc were also detected above the applicable environmental protection criteria.
 - No organic compounds were detected above laboratory limits.
- ***Stockpiling of soil (potentially imported):***
 - The stockpiles within Area 1 (SP1) contain copper, lead, zinc and pyrene above expected background levels, but not exceeding applicable human health or environmental protection criteria.
 - No other analytes were detected above expected background concentrations or laboratory reporting limits.
- ***Historic horticultural activity:***
 - All three composites covering the footprint of historic horticultural contained at least one heavy metal above the expected background for the underlying geology at the site, but below the adopted human health and environmental protection criteria.
 - None of the three composites contained OCPs above the laboratory detection limits.

Area 3:

- ***Deterioration and improper demolition of building materials:***
 - A bulk fragment (BM4) of potential ACM collected from the western aspect of Dwelling 4, which showed visual evidence of minor deterioration, tested negative for asbestos.
 - One bulk fragment collected from the eastern yard of Dwelling 5 (BM1) tested positive for asbestos. Soils underlying this fragment (SS8) contained chrysotile fibres, however, not in exceedance of the human health criteria or laboratory reporting limits.
 - Soil from the curtilage of the deck along northern aspect of Dwelling 5 (SS9) contained ACM above the applicable human health criteria, as well as lead above expected background concentrations.
 - A second fragment (BM2) collected from the deck south of SS9 tested negative for asbestos.

Area 4:

- ***Deterioration / potential burning of building materials:***
 - Soil from the northern curtilage of Shed 6 (SS11) contained arsenic above the applicable human health criteria, as well as zinc above the environmental protection criteria.

- o A bulk potentially asbestos-containing fragment (BM3) also located at SS11, tested positive for asbestos, however, soil from underneath the fragment (SS11) did not contain asbestos. It is noted that only one fragment of ACM was identified, which was collected for analysis.
- **Burning of building materials and/or refuse:**
 - o No analytes were detected above the applicable human health and/or environmental protection criteria.
 - o Soil underlying two burn piles located along the southern boundary of Area 4 / the site (SS12 & SS13), contained lead and zinc above the expected background concentrations, with SS12 additionally detecting arsenic and pyrene above expected background concentrations/laboratory reporting limits.

11 ESTIMATED EXTENT OF CONTAMINATION

Estimated extents of contamination are summarised in below and shown in Figures 6a and 6b based on the analytical results, visual observations and nature of the contamination identified and in lieu of further sampling and analysis.

TABLE 8 SUMMARY OF ESTIMATED EXTENTS OF CONTAMINATION

Site Area	Location / Feature	Area (m ²)	Depth (mbgl)	Volume (m ³)	Contaminants
Area 1	Burn Pile B	30	0.3	9	As, Cr, Cu, Zn
Area 3	Dwelling 2	150	0.3	45	Lead
	Shed 3 ¹	65	0.3	19.5	Lead
	Dwelling 5	145	0.15	21.75	Asbestos
Area 4	Shed 6	35	0.15	5.25	Arsenic & Zinc
	Dwelling 7 and Shed 8	290	0.5	145	Lead
Totals		715	-	245.5	-

Notes

1. Packing Shed in DSI (GSL, 2021).
2. As = Arsenic, Cr = Chromium, Cu = Copper, Zn = Zinc, Asbestos = ACM and free fibres in soil.

Regarding the extent of asbestos in the vicinity of the former shed / Shed 6 (Area 4), only one fragment of ACM was identified during the inspection, which was subsequently collected for analysis. As asbestos was not detected within the representative soil sample from this location, no further fragments or obvious source were identified, it is considered unlikely that asbestos contamination remains in this area.

However, due to the presence of building materials and grass cover limiting a thorough inspection of the soil surface, care should be taken in this area. Following removal of all structures, and as part of vegetation clearance, a thorough inspection should be completed.

12 SOIL CONTAMINATION RISK ASSESSMENT & UPDATED CONCEPTUAL SITE MODEL

For actual or potential soil contamination to pose a risk to current or end land users, and/or the receiving environment, a source-pathway-receptor relationship pathway must exist. Following the completion of visual inspection of the site, intrusive investigation, and assessment of analytical results received, the CSM and risk associated with soil contamination has been revised, as detailed in Table 9 and Table 10. These tables outline the source-receptor pathways and their associated potential risks where controls are not in place.

TABLE 9 **UPDATED CONCEPTUAL SITE MODEL – ONSITE RECEPTORS**

Final Receptor	Source / Contaminants	Predominant Pathway(s)	Complete (Y/N)	Risk
Site Workers	Heavy metals	Soil contact / dust inhalation / ingestion	Yes – arsenic is present above the NES SCS for commercial / industrial site workers (burn pile) with potential for exposure in absence of appropriate controls to mitigate the pathways of exposure.	Moderate – areas of contamination are highly localised, however exposure via dust inhalation and soil contact are possible, resulting in moderate to severe consequences.
	Asbestos	Dust inhalation	Yes – asbestos is present above the soil guideline value for the proposed land use, but below industrial site workers with potential for exposure in absence of appropriate controls to mitigate the pathways of exposure.	Low – exposure via dust inhalation is possible, but unlikely during soil disturbance given the identification of one fragment. However, exposure results in delayed moderate to severe consequences. In dry and windy conditions, risk is higher for inhalation of asbestos without appropriate controls in place.
	OCPs / PAHs	Soil contact / dust inhalation / ingestion	No – not present above the NES SCS for commercial / industrial site workers.	NA
Ecological Receptors	Heavy metals	Soil contact	Yes – heavy metals are present within two locations (SS8 and SS11) above the applicable environmental protection criteria.	Low – due to low mobilisation of contaminants and groundwater estimated at 5 mbgl, and localised extents of contamination present, impacted ecological receptors are confined to surficial soils, and unlikely to impact receptors below the most superficial 150 mm of topsoil.
	OCPs / PAHs	Soil contact	No – not present above the applicable environmental protection criteria.	NA

Note:

1. Risk calculated using a 5x5 risk matrix (likelihood of an effect occurring vs the severity of the consequence), with risk ratings of very low to critical, or not applicable (N/A) where no contaminant source is present. Risk matrix derived from <https://www.sitesafe.org.nz/guides--resources/practical-safety-advice/risk-control/>.

TABLE 10 **UPDATED CONCEPTUAL SITE MODEL – OFF-SITE RECEPTORS**

Final Receptor	Source / Contaminants	Predominant Pathway(s)	Complete (Y/N)	Risk
Neighbouring residential occupants	Heavy metals, asbestos, PAHs & OCPs	Dust inhalation	Yes – dust generation in windy / dry conditions could cause dust mobilisation to neighbouring sites.	Low – Dust mobilisation towards neighbouring sites could occur at levels that present a low risk to nearby occupants, where no controls are in place. However, prevailing wind directions are westerly, taking dust away from residential areas and a change in topography shelters western boundary.
Ecological Receptors	Heavy metals, PAHs & OCPs	Soil contact through incorrect disposal, entrainment in surface water	Yes – heavy metals are present above the applicable environmental protection criteria.	Negligible to moderate - given the low mobility of heavy metals, and highly localised extents of contamination, migration of heavy metals to groundwater or offsite is considered unlikely. However, in cases of incorrect disposal ecological receptors could be at moderate risk.

Note:

1. Risk calculated using a 5x5 risk matrix (likelihood of an effect occurring vs the severity of the consequence), with risk ratings of very low to critical, or not applicable (N/A) where no contaminant source is present. Risk matrix derived from <https://www.sitesafe.org.nz/guides--resources/practical-safety-advice/risk-control/>.

13 UPDATED STATUTORY ASSESSMENT

The following consenting requirements are expected based on the findings of this investigation:

- NES – Restricted Discretionary Activity (Reg. 10).
- Hawke’s Bay Regional Council RRMP – Permitted activity (Rules 47-49).

These requirements are discussed in further detail in turn below.

13.1 THE NATIONAL ENVIRONMENTAL STANDARD (NES)

This DSI & previous assessment by GSL has confirmed HAIL Activities (namely Items I & E1) have occurred and resulted in impacts to soil that present a potential risk to human health if not addressed. These 6 discrete portions of the site meet the definition of land covered under Regulation 5(7) of the NES.

As the proposed activity will result in disturbance of soil containing contaminant concentrations above the applicable standard defined under Regulation 7, consent is required as a Restricted Discretionary Activity subject to the requirements of Regulation 10.

To meet the requirements of Regulation 10, SQN have prepared a Remediation Action Plan (Ref: J250030-RAP-Mar25) detailing the remedial requirements and associated site management controls required to make the land fit for use.

13.2 HAWKE’S BAY REGIONAL RESOURCE MANAGEMENT PLAN (RRMP)

Exceedances of the Eco-SGVs were reported in localised locations at the site. However, potential discharges resulting from the contamination identified is considered to comply with the permitted activity criteria of rules 47-49 of the HBRMP as:

- The contaminants exceeding the Eco-SGVs have a low mobility.
- The contamination is confined to surficial soil surrounded by sufficient grass cover in two highly localised areas.

Direct discharges to groundwater, and to surrounding properties or nearby surface bodies are therefore unlikely.

Furthermore, the RAP prepared by SQN outlines the management controls that will be implemented during soil disturbance activities to prevent potential environmental discharges.

13.3 OPERATIVE HASTINGS DISTRICT PLAN (OHDP)

Section 31(1)(b)(iia) of the Resource Management Act (RMA) 1991 requires territorial authorities to prevent or mitigate any adverse effects of the development, subdivision, or use of contaminated land. The OHDP achieves this by deferring to the NES in accordance with Regulation 4 of the NES and as such, no additional consent is required while the requirements of the NES are met.

It is noted that the original DSI references the former Partially Operative Hasting District Plan (POHDP) which, since the original DSI, has been superseded by the OHDP. However, the POHDOP also defers the assessment of contamination to the national level by means of the NES (2011) instrument.

13.4 OFF-SITE DISPOSAL

Acceptance of soil removed from site by a receiving facility will be at the facility’s discretion, subject to their site-specific consent requirements. However, based on the findings of this supplementary

DSI, topsoil material within the estimated contaminated areas (Figures 6a & 6b) will require disposal at a suitably licenced landfill facility.

It should be noted that due to the concentrations of contaminants identified, Toxicity Characteristic Leaching Procedure (TCLP) will most likely need to be undertaken prior to acceptance at the request of the receiving facility.

14 REFERENCES

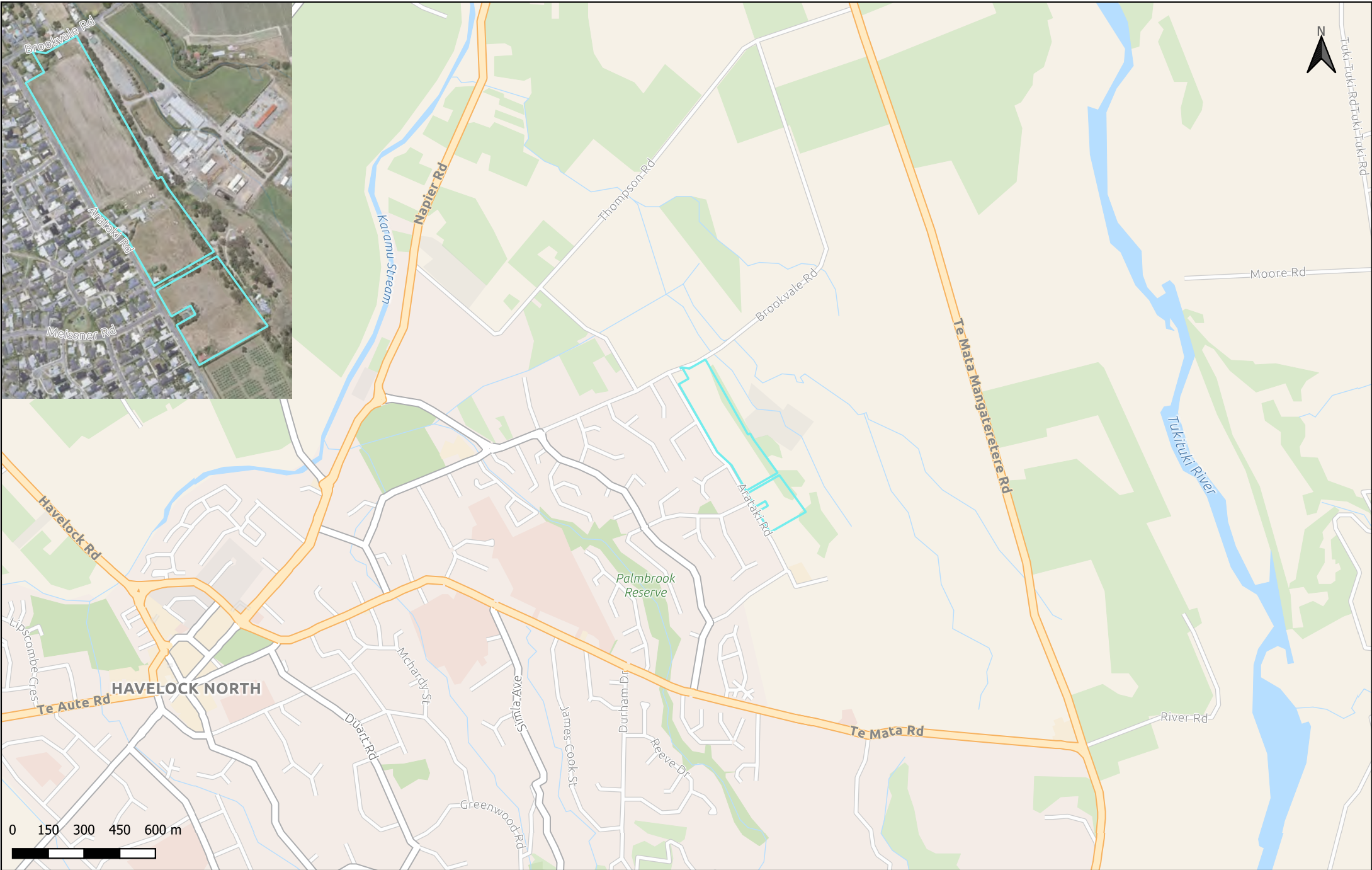
1. Auckland Council (2013) – *Auckland Unitary Plan (Operative in Part)*, Auckland, New Zealand.
2. Auckland Council (2011) – *Auckland Council GEOMaps*.
<http://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>
3. BRANZ (2017), *New Zealand Guidelines for Assessing and Managing Asbestos in Soil* (NZGAMAS).
4. GNS Science (2020) – *Geological Map of New Zealand Online Database (1:250K)*.
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5. Landcare Research (2014) – *Hawke's Bay Region: Background Soil Concentrations for Managing Soil Quality*. Report No. RM 14-03, HBRC plan no. 4611. Envirolink Advice Grant: 1443-HBRC194.
5. Ministry for the Environment (2021a) — *Contaminated Land Management Guidelines No.1: Reporting on contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.
6. Ministry for the Environment (2011a) — *Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values*. Ministry for the Environment, Wellington, New Zealand.
7. Ministry for the Environment (2021b) — *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*. Ministry for the Environment, Wellington, New Zealand.
8. Ministry for the Environment (2011b) – *Hazardous Activities and Industries List (HAIL)*, Ministry for the Environment, Wellington, New Zealand, October.
9. Ministry for the Environment (2011c) – *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.
10. Ministry for the Environment (2011d) – *Methodology for Deriving Standards for contaminants in Soil to Protect Human Health*. Ministry for the Environment, Wellington, New Zealand.
11. Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011.
12. SiteSafe, *Guides & Resources, Practical Safety Advice, Risk Control*,
<https://www.sitesafe.org.nz/guides--resources/practical-safety-advice/risk-control/>.

15 LIMITATIONS

The conclusions and all information in this Report are given strictly in accordance with and subject to the following limitations and recommendations:

1. The assessment undertaken to form this conclusion is limited to the scope of work agreed between SQN and the client, or the client's agent as outlined in this Report. This report has been prepared for the sole benefit of the client and neither the whole nor any part of this report may be used or relied upon by any other party except for Regional and Territorial authorities in their duties under the Resource Management Act 1991.
2. The investigations carried out for the purposes of the report have been undertaken, and the report has been prepared, in accordance with normal prudent practice and by reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria in existence at the date of this report.
3. This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by SQN for use of any part of this report in any other context.
4. This Report was prepared on the dates and times as referenced in the report and is based on the conditions encountered on the site and information reviewed during the time of preparation. SQN accepts no responsibility for any changes in site conditions or in the information reviewed that have occurred after this period of time.
5. Where this report indicates that information has been provided to SQN by third parties, SQN has made no independent verification of this information except as expressly stated in the report. SQN assumes no liability for any inaccuracies in or omissions to that information.
6. Given the limited Scope of Works, SQN has only assessed the potential for contamination resulting from past and current known uses of the site.
7. Environmental studies identify actual sub-surface conditions only at those points where samples are taken and when they are taken. Actual conditions between sampling locations or differ from those inferred. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated and SQN does not guarantee that contamination does not exist at the site.
8. Except as otherwise specifically stated in this report, SQN makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials ("ACM") on the site. If fill has been imported on to the site at any time, or if any buildings constructed prior to 1 January 2000 have been demolished on the site or materials from such buildings disposed of on the site, the site may contain asbestos or ACM.
9. No investigations have been undertaken into any off-site conditions, or whether any adjoining sites may have been impacted by contamination or other conditions originating from this site. The conclusion set out above is based solely on the information and findings contained in this report.
10. Except as specifically stated above, SQN makes no warranty, statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use, development or re-development of the site.
11. The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.
12. Use, development or re-development of the site for any purpose may require planning and other approvals and, in some cases, environmental regulatory authority and accredited site auditor approvals. SQN offers no opinion as to whether the current use has any or all approvals required, is operating in accordance with any approvals, the likelihood of obtaining any approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environmental works.
13. SQN makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site. The on-going use of the site and/or use of the site for any different purpose may require the owner/user to manage and/or remediate site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.
14. Except as required by law or for the purposes of Regional & Territorial Authorities discharging their duties under the Resource Management Act 1991, no third party may use, or rely on, this report unless otherwise agreed by SQN in writing. Where such agreement is provided, SQN will provide a letter of reliance to the agreed third party in the form required by SQN.
15. To the extent permitted by law, SQN expressly disclaims and excludes liability for any loss, damage, cost or expenses suffered by any third party relating to or resulting from the use of, or reliance on, any information contained in this Report. SQN does not admit that any action, liability or claim may exist or be available to any third party.
16. Except as specifically stated in this section regarding Regional and Territorial Authorities, SQN does not authorise the use of this report by any other third party.

FIGURES



SQN GeoSciences Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	SITE LOCATION		DRAWN GC	APPROVED CD	JOB No. J250030	DATE 2025-03-12
	86, 108 & 122 Arataki Road, Havelock North		NOTES		SCALE 1:20,000 (A4) Inset 1:10,494 (A4)	REV 0

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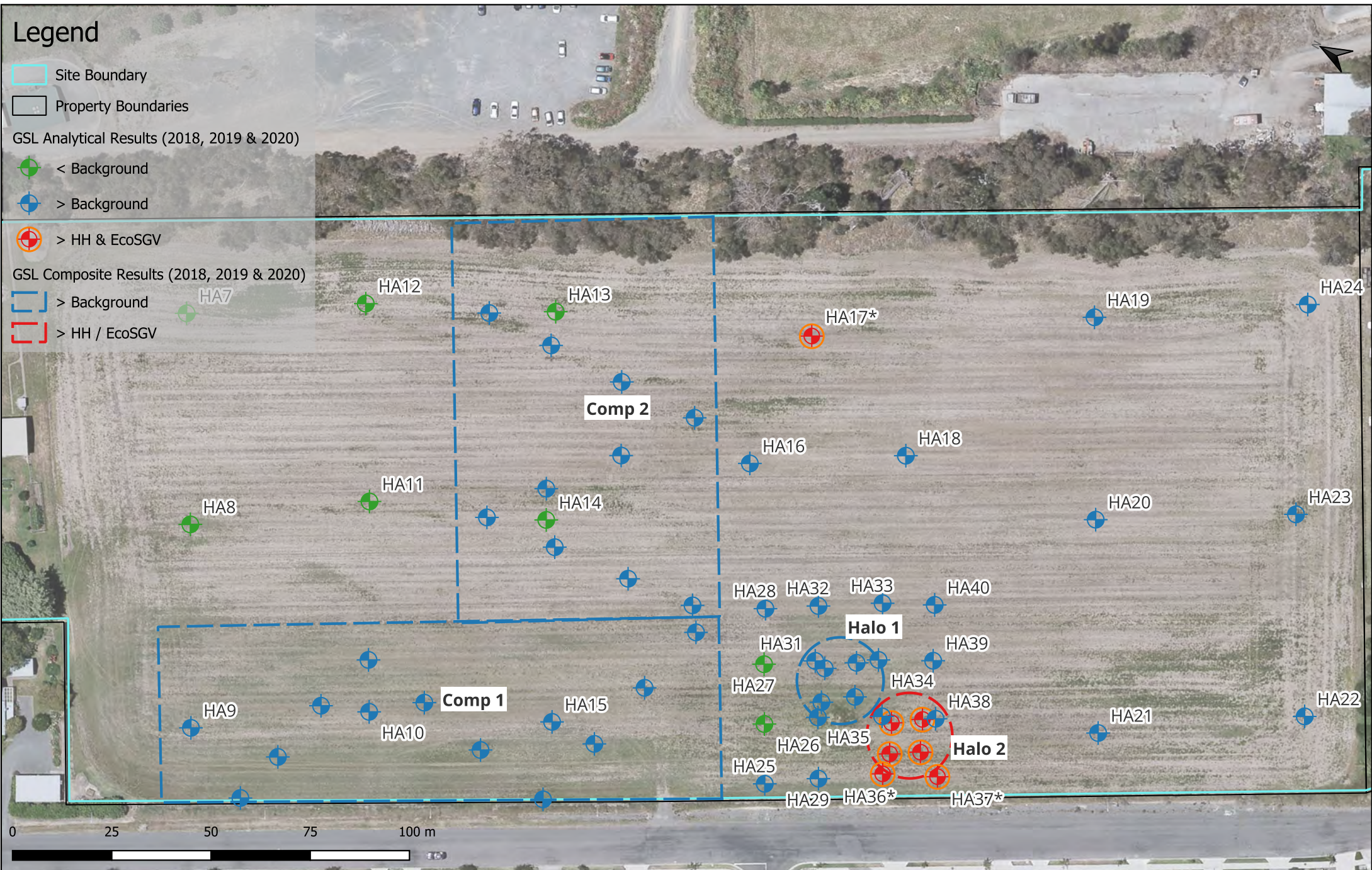
Legend

Site Boundary

Areas

SQN GeoSciences Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	OVERALL SITE PLAN	DRAWN GC	APPROVED CD	JOB No. J250030	DATE 2025-03-12
	86, 108 & 122 Arataki Road, Havelock North	NOTES	SCALE 1:4500 (A4)		
		DWG No. Figure 2			

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SQN GeoSciences	Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	122 ARATAKI ROAD - GSL ANALYTICAL RESULTS		DRAWN LC	APPROVED COB	JOB No. J250030	DATE 2025-03-14
		86, 108 & 122 Arataki Road, Hastings		NOTES *95% UCL results indicate that marginal exceedances are spurious and in the context of the broader area these concentrations do not pose a risk to human health / environment. HH = Human Health		SCALE 1:1200 (A4)	REV 0

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 Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	108 ARATAKI ROAD - GSL ANALYTICAL RESULTS	DRAWN LC NOTES HH = Human Health	APPROVED COB	JOB No. J250030 SCALE 1:930 (A4) DWG No. Figure 3b	DATE 2025-03-14 REV 0
	86, 108 & 122 Arataki Road, Hastings				

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Legend

Site Boundary

Property Boundaries

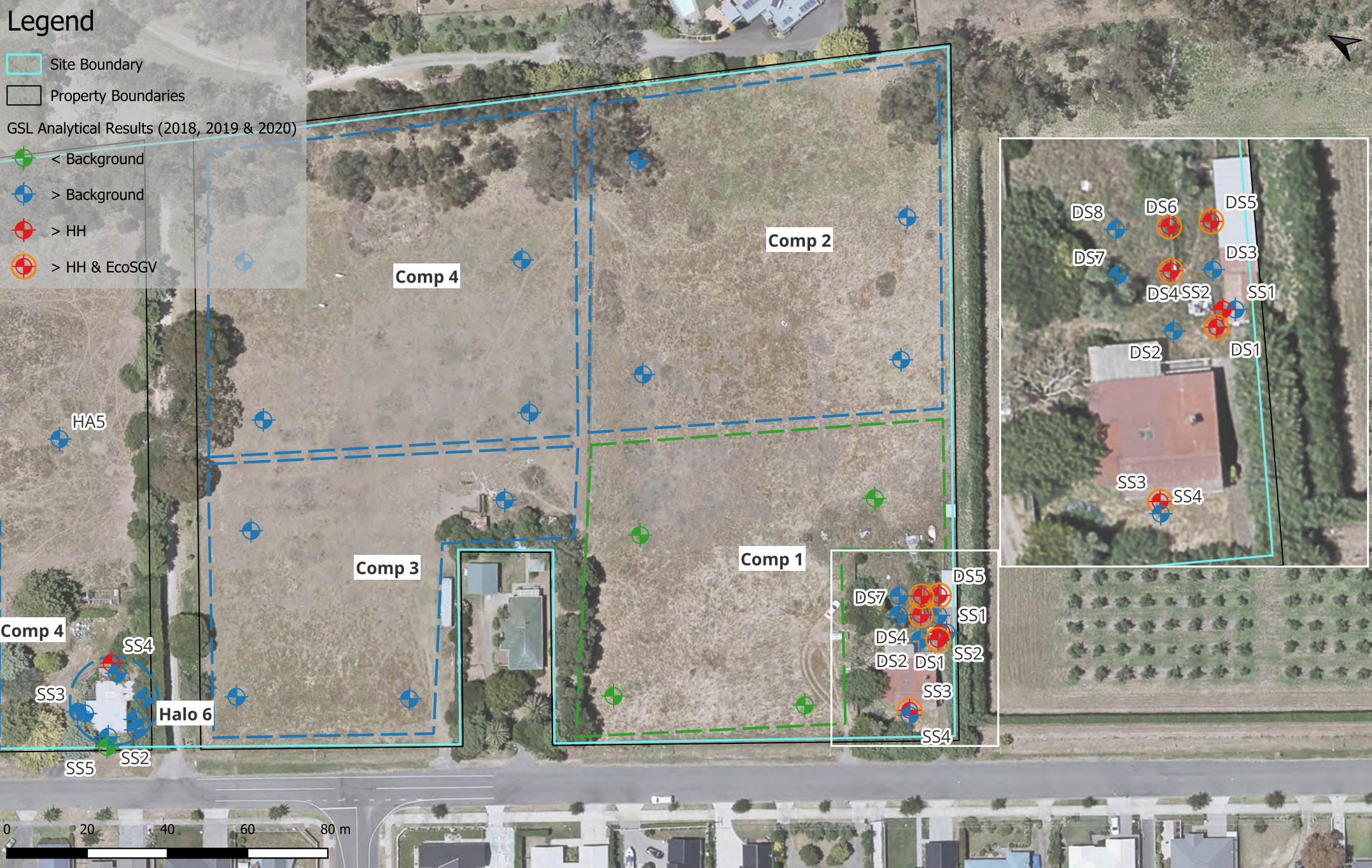
GSL Analytical Results (2018, 2019 & 2020)

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> Background

> HH

> HH & EcoSGV



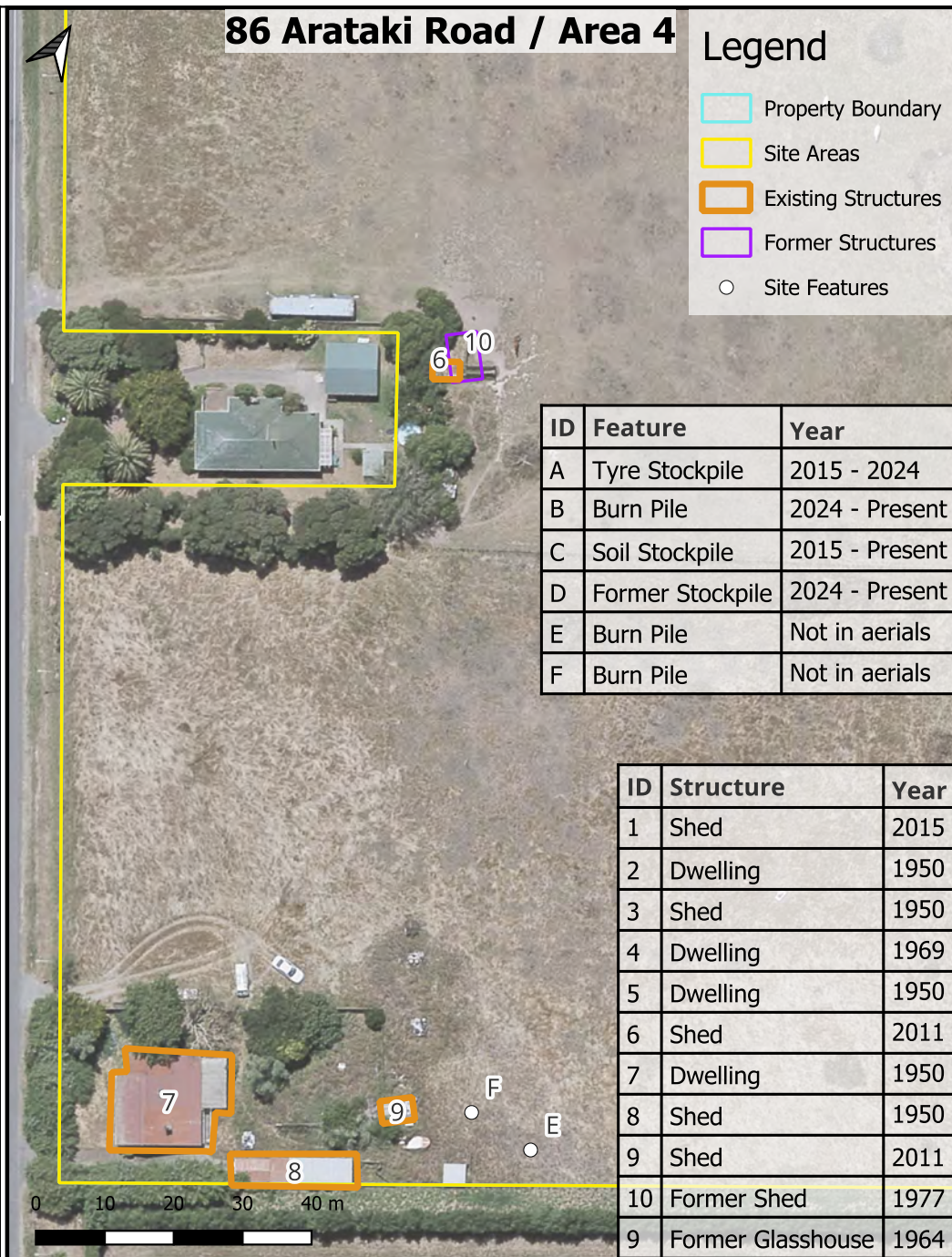
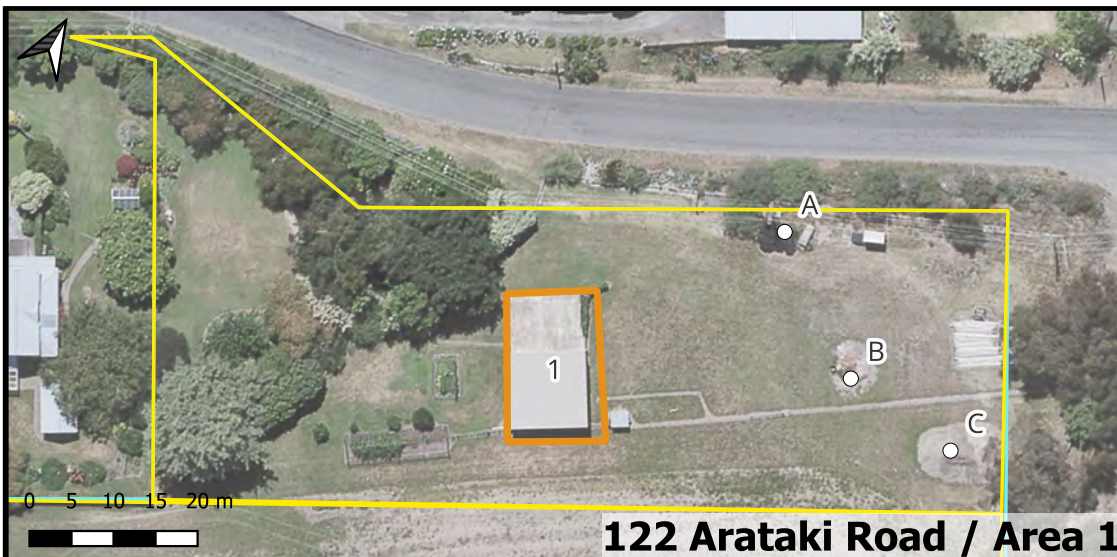
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Tel: 0800 333 287

**86 ARATAKI ROAD -
GSL ANALYTICAL RESULTS**
86, 108 & 122 Arataki Road, Hastings

DRAWN LC APPROVED COB
NOTES
HH = Human Health

JOB No. J250030 DATE 2025-03-14
SCALE 1:1200 (A4)
DWG No. Figure 3c REV 0

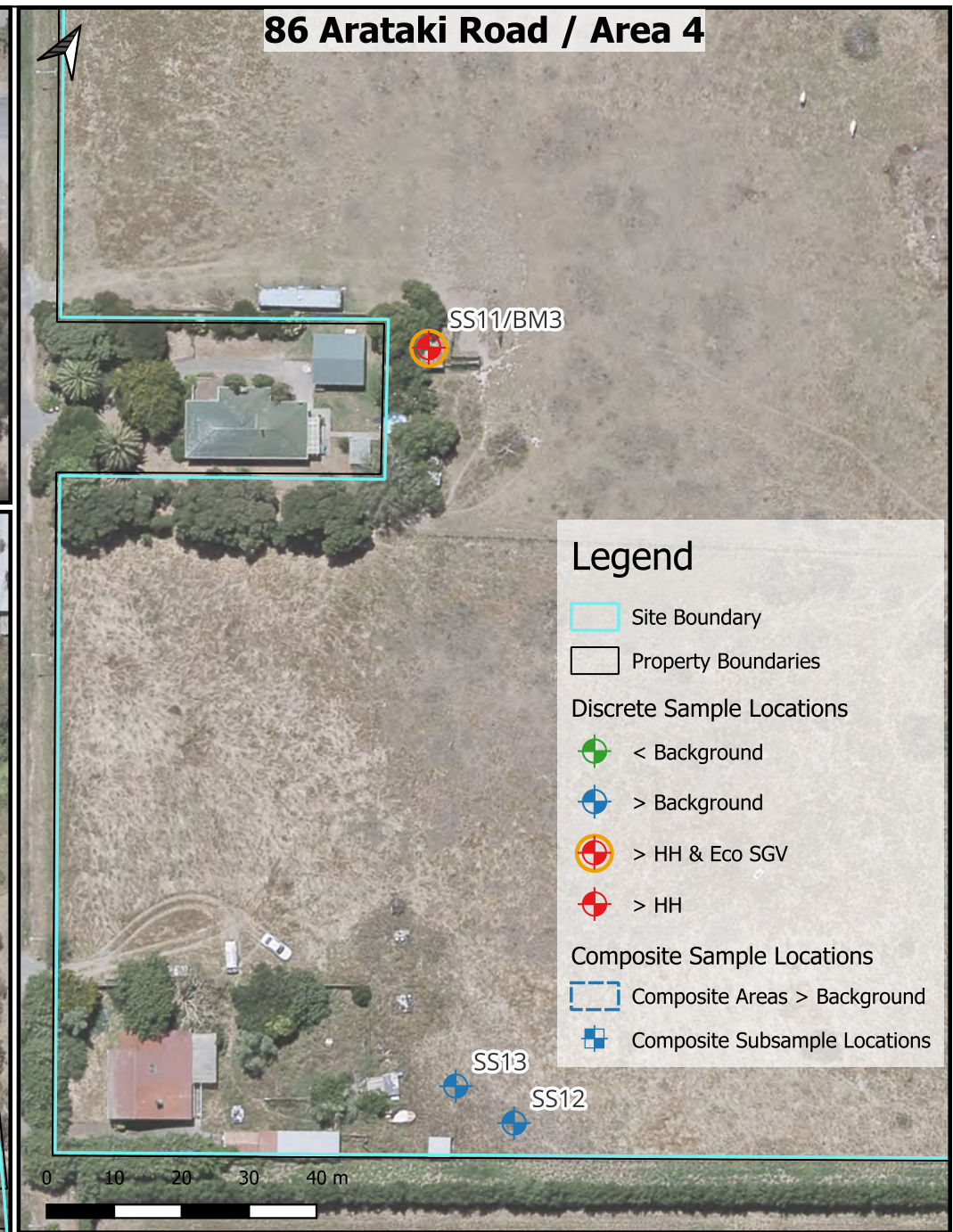
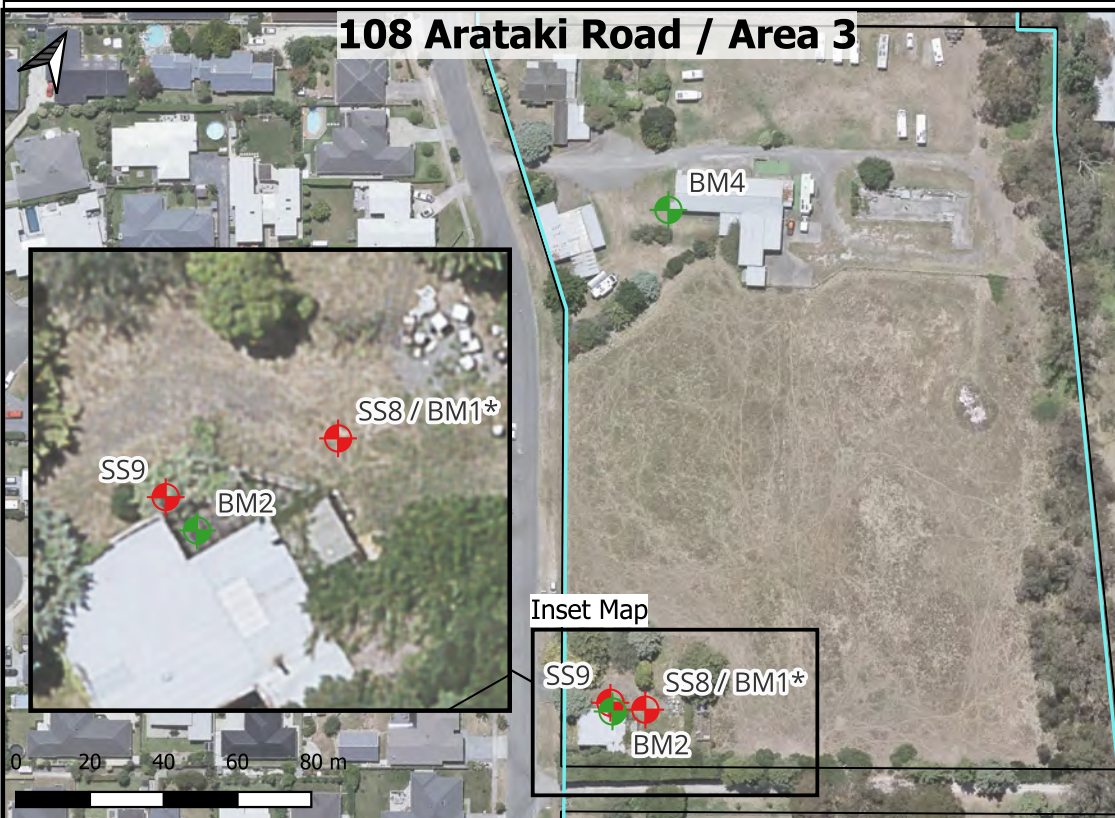
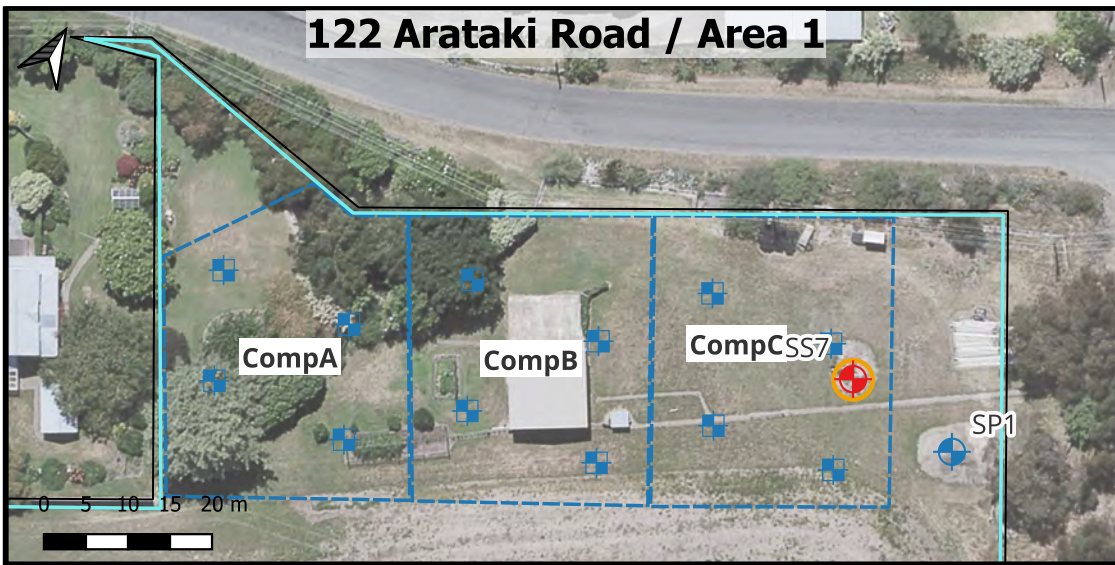


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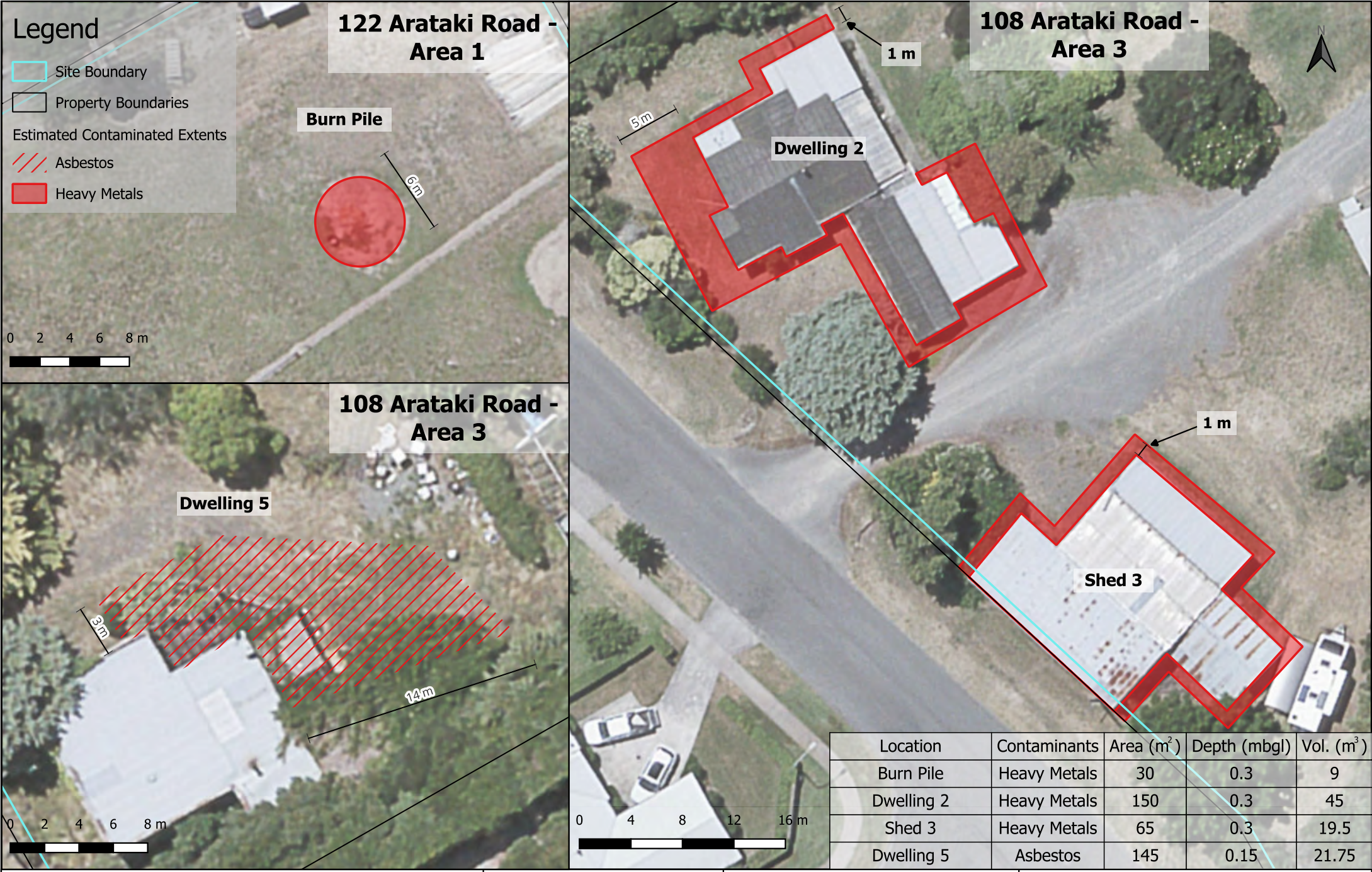
- Property Boundary
- Site Areas
- Existing Structures
- Former Structures
- Site Features

ID	Feature	Year
A	Tyre Stockpile	2015 - 2024
B	Burn Pile	2024 - Present
C	Soil Stockpile	2015 - Present
D	Former Stockpile	2024 - Present
E	Burn Pile	Not in aerials
F	Burn Pile	Not in aerials

ID	Structure	Year
1	Shed	2015
2	Dwelling	1950
3	Shed	1950
4	Dwelling	1969
5	Dwelling	1950
6	Shed	2011
7	Dwelling	1950
8	Shed	1950
9	Shed	2011
10	Former Shed	1977
9	Former Glasshouse	1964



Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	SOIL SAMPLE LOCATIONS & ANALYTICAL RESULTS 86, 108 & 122 Arataki Road, Havelock North	DRAWN GC APPROVED CD NOTES HH = Human Health *Asbestos detected in bulk material, below detection limit within underlying soil.	J250030 2025-03-17 1:900 (A4) Figure 5 0
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Location	Contaminants	Area (m ²)	Depth (mbgl)	Vol. (m ³)
Burn Pile	Heavy Metals	30	0.3	9
Dwelling 2	Heavy Metals	150	0.3	45
Shed 3	Heavy Metals	65	0.3	19.5
Dwelling 5	Asbestos	145	0.15	21.75

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Location	Contaminants	Area (m ²)	Depth (mbgl)	Vol. (m ³)
Shed 6	Heavy Metals	35	0.15	5.25
Dwelling 7 & Shed 8	Heavy Metals	290	0.5	145

 Building 1, 1 William Pickering Drive, Rosedale, Auckland, 0632 PO Box 45053, Waterloo, Lower Hutt, 5042 Tel: 0800 333 287	ESTIMATED EXTENT OF CONTAMINATION		DRAWN LC APPROVED COB		JOB No. J250030	DATE 2025-03-17
	86, 108 & 122 Arataki Road, Hastings		NOTES All extents are estimates only. Proposed validation sample locations are indicative and dependent on final remedial extents.		SCALE 1:450 (A4)	REV 0

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APPENDIX A DETAILED SITE INVESTIGATION (GSL, 2021)

DETAILED SITE INVESTIGATION (DSI)

86, 102, AND 122 ARATAKI ROAD

HAVELOCK NORTH, HASTINGS



REFERENCE NUMBER: REP-H0162/DSI/SEP21

PREPARED FOR: CDL LAND NEW ZEALAND LTD

DATE ISSUED: 29 SEPTEMBER 2021



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TABLE 2: 2018 ANALYTICAL RESULTS¹

	Arsenic	Copper	Lead	ΣDDT
Comp 1	7.16	35.4	22.6	ND
Comp 2	13.4	42.5	44	ND
Comp 3	15.1	48.1	87.2	ND
Comp 4	11.7	73.2	33.6	0.75
Halo 1	-	-	65.6	-
Halo 2	20.1	240	119	0.28
Halo 4	-	-	352	-
Halo 5	11.4	93.1	352	0.19
Halo 6	-	-	193	-
NES ²	20	>10,000	210	70
Eco-SGV ³	60	120	900	4.8
Background ⁴	9.97	48.14	25.83	-

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – residential landuse with 10% homegrown produce
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
4. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
5. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges.
6. NA = Not applicable / NL = No Limit / ND= not detected

TABLE 3: 2019 ANALYTICAL RESULTS¹

	Arsenic	Copper	Lead	ΣDDT
Comp 1	2.92	21.9	14.1	ND
Comp 2	3.71	21.5	17.1	0.02
Comp 3	3.68	65.8	15.0	ND
Comp 4	3.59	36.2	14.7	ND
SS1	-	-	123	-
SS2	-	-	255	-
SS3	-	-	844	-
SS4	-	-	93.0	-
NES ²	20	>10,000	210	70
Eco-SGV ³	60	120	900	4.8
Background ⁴	9.97	48.14	25.83	-

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – residential landuse with 10% homegrown produce
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
4. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
5. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges.
6. NA = Not applicable / NL = No Limit / ND= not detected

7 SITE INSPECTION & INFRASTRUCTURE

GSL staff undertook a visual inspection of the site on 13 August 2021, at which time all external areas of the site were made accessible, however this investigation did not include an assessment of the internal aspects of any structures onsite.

Access to all properties was via gravel driveways accessed from Arataki Road. The dwelling at 86 Arataki Road was occupied, with the yard being overgrown and used to keep chickens and ducks, with miscellaneous end of life household materials stored that are not suitable for kerbside rubbish collection. The dwelling and shed were maintained in good structural condition however paint was peeling from side access door and some weatherboards on the shed. The wider area of this lot was maintained under pasture grass.

The southernmost dwelling at 108 Arataki Road was unoccupied, and while the exterior of the dwelling appeared structurally sound, the house curtilage and yard were unkempt with overgrown grass and residual household materials left by previous occupants scattered around portions of the yard. The northernmost dwelling was still occupied, with both the dwelling and yard maintained in good condition. The dwelling comprised of a mixture of weatherboards which were likely the original cladding, and fibre cement panels. The septic tank servicing this dwelling was evident

south-west of the dwelling, while an abandoned in-ground swimming pool was situated east of the dwelling.

South of the northernmost dwelling was the oldest packing shed onsite, with the haybarn extension still present. This building generally comprised of timber construction and was well maintained, an inspection of the interior of the building was not possible as it was locked, however there were no indications of current or former dangerous good storage evident within the vicinity of this structure. East of this structure was the most recent packing/mushroom growing shed, which was also in a well-maintained condition, as with the other packing shed, it was not possible to inspect the inside of this structure.

East of the packing/mushroom growing shed was the residual concrete platform of the historic glasshouse structure. The footprint of the glasshouse was maintained under concrete elevated above ground level, with a small square of exposed foil in the western extent. North of this structure and the packing/mushroom shed was several caravans and campervans parked for storage, with some of which were occupied. No evidence of vehicle maintenance associated with the storage of these vehicles was noted during the inspection.

The balance of 108 and 122 Arataki Road was maintained under pasture for grazing, with an organic burn area located in the paddock south-east of the former glasshouse concrete platform. The septic tank location of the historic dwelling at 122 Arataki Road was demarcated by four poles in the ground, which surrounded the concrete structure of the septic tank. There was no evidence of other historic structures within the pasture area onsite. During the walkover of this area, GSL staff had a brief discussion with one of the former land owners who was collecting soil samples for nutrient analysis in advance of planting a pea crop within the 122 Arataki Road pasture area. He confirmed the site history as discussed in Section 6.4.1, and when asked about the

During the visual inspection, no evidence of gross contamination such as odorous material, staining or stressed vegetation, was noted within any portion of the site.

Hand auger boreholes advanced across the site noted that the topsoil depth is typically 200mm, overlying grey silty sand, with a fine gravel layer encountered at a depth of approximately 500mm, particularly within the 122 Arataki Road lot. There was some variability noted within the topsoil depths, with 500mm recorded in one location.

Site photographs are attached as Appendix D.

8 PRELIMINARY CONCEPTUAL SITE MODEL FOR POTENTIAL SOIL CONTAMINATION

The desktop study revealed that the site has been the location of mixed pastoral and horticultural activities for its discernible past. While horticultural activity is not listed as a HAIL Item, the bulk storage or use of persistent pesticides associated with historic horticultural activities is recorded on the HAIL under Item A.10. Given the time period where horticultural activity was occurring and the analytical results obtained during the 2018 and 2019 due diligence investigations, GSL considers that historic use of pesticides, particularly organochlorines (DDT etc.), has likely occurred within portions of the site. The use of such pesticides would traditionally be through the direct sprayed application to the paddocks and fields. While the evidence reviewed for 86 Arataki Road has not conclusively identified the presence of horticultural activity within this piece of land, the wider area of the Heretaunga Plains is a well-known horticultural hub and has a strong history of horticultural

landuse, thus historical horticultural activities cannot be entirely ruled out based on the available site history.

In addition to the orchard and broadacre crop areas of the site, there are also two structures where persistent pesticide contamination needs to be considered, being the historic glasshouse and the historic agrichemical storage shed. While persistent pesticides may have been utilised within the historic glasshouse, it is unlikely that underlying soil has been exposed to potential soil contaminants due to the presence of the concrete platform upon which it was constructed. Little is known about the historic agrichemical store aside from its general location, as such it is possible that agrichemicals could have been released to the soil profile in this location during storage and handling.

The age and nature of many of the dwellings and structures present on site also lend themselves to an era when lead based paints were commonly used, from which the degradation or maintenance could have resulted in demonstrable impacts to soil. Any impacts from lead based paint would be confined to a 'halo area' surrounding those structures where lead based paint was utilised and would primarily be confined to the surficial topsoil layers.

The locations of potential soil contaminating activities are shown in Figure 2.

8.1 ONSITE SPATIAL ASSESSMENT

The potential soil contaminating activities identified by this investigation are associated with four distinct land uses, each of which have differing contaminant distribution characteristics that require individual consideration as part of any intrusive investigation.

8.1.1 UNIFORM BULK PERSISTENT PESTICIDE APPLICATION AREA

During historic orchard and broadacre crop activities, the application of persistent pesticides would have likely be undertaken in a uniform manner directly to the crop being cultivated. Any soil contamination resulting from this process would likely be concentrated uniformly to the soil surface, with contaminant concentrations dissipating with depth.

However, following cessation of orchard activity, this area has been subject to multiple broadacre cropping events and conversion to pasture. General practice as part of these activities results in the 'turning over' of the soil through tillage and/or harrowing, mixing the topsoil profile to depths of between 150mm and 300mm, however in this instance it is likely limited to the noted topsoil layer onsite.

As result of this activity, any soil contaminants present within this area are now likely to be uniformly distributed within the topsoil layer onsite.

8.1.2 AGRICHEMICAL STORAGE

While only anecdotal evidence of agrichemical storage has been noted by this investigation, it is likely that storage occurred on site within one of the identified structures. Any storage of agrichemicals may have resulted in the accidental release of these to the soil profile through spill events during handling, storage, or mixing. Assuming these spill events were not contained to an impervious surface, these events would result soil contamination hotspots within and adjacent to any spill event, likely coinciding with the storage shed location.

Typically, hot spot contamination would be concentrated to the soil surface where the spill event happened, dissipating with distance and depth. GSL notes that in this instance, the identified storage shed location has been subject to an extended period of broadacre crop and pasture cultivation, which has likely mixed and spread any contamination hotspot locations across a larger area. During this process, it is possible that any potential hotspots have been diluted to an extent that they are indistinguishable from the wider soil quality.

8.1.3 GLASSHOUSE

While agrichemical application to glasshouse crops would have been uniform and direct to crop similar to the orchard activity, the presence of the concrete platform would have likely prevented any potential contaminant exposure to the underlying soil as spray application would be direct to the growing media. Consequently, potential agrichemical soil contamination associated with glasshouse activity is considered negligible.

It is noted that the footprint of the glasshouse is within the footprint of historic orchard activity, however the construction of the glasshouse likely required the removal of topsoil and associated potential soil contamination in this location. If there is residual topsoil under the glasshouse platform, it is likely of a quality similar to that described in Section 8.1.1 above, with a similar contaminant distribution.

The glasshouse is also of an age where potential lead-based paint soil contamination requires consideration, which is discussed in Section 8.1.4 below.

8.1.4 PRE-1970s STRUCTURES

Soil samples from the due diligence investigations indicate that some, or all, of the pre-1970s structures onsite have likely used lead-based paint during building construction or maintenance, which has subsequently been released into the adjacent soil profile. Soil contamination associated with lead based paint use is typically concentrated to a halo around a structure footprint between 1m and 3m, with concentrations dissipating with distance and depth from the structure.

No asbestos containing materials were noted to be in a broken or degraded condition onsite, and as such any potential risk from such contaminants is considered low to negligible.

9 INTRUSIVE INVESTIGATION

Based on the conceptual site model outlined above, GSL undertook an intrusive investigation of the site to determine the presence and extent of soil contamination onsite. The intent of the intrusive investigation was to determine whether historical activities have resulted in adverse impacts to soil quality on site, and to supplement and support the analytical results obtained during the 2018 and 2019 due diligence investigations.

9.1 SOIL SAMPLING

To assess the potential soil contamination identified by the conceptual site model above and in light of the analytical results obtained during former due diligence assessment, GSL personnel developed a combined grid-based and judgemental soil sampling strategy comprising of 68 discrete soil sample locations. These locations were distributed as follows:

TABLE 5: BUILDING FOOTPRINT ANALYTICAL RESULTS¹

	Lead		Lead
SS1 (0–75mm)	74	DS6 0-75mm	354
SS2 (0-75mm)	98	DS7 0-75mm	129
SS3 (0-75mm)	46	DS8 0-75mm	146
SS4 (0-75mm)	270	DS9 0-75mm	82
SS5 (0-75mm)	23	DS11 0-75mm	170
DS1 0-75mm	620	DS13 0-75mm	710
DS1 300mm	250	DS13 300mm	15.7
DS1 500mm	15.6	DS14 0-75mm	54.4
DS2 0-75mm	140	DS15 0-75mm	23
DS2 300mm	21	DS16 0-75mm	200
DS3 0-75mm	210	DS18 0-75mm	80
DS3 300mm	150	DS20 0-75mm	74
DS4 0-75mm	380	DS22 0-75mm	62
DS4 300mm	287	DS23 0-75mm	52
DS5 0-75mm	554		
NES ²	210	NES ²	210
Eco-SGV ³	900	Eco-SGV ³	900
Background ⁴	25.83	Background ⁴	25.83

Notes:

7. All concentrations measured in mg/kg.
8. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – residential landuse with 10% homegrown produce
9. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
10. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
11. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges.
12. NA = Not applicable / NL = No Limit / ND= not detected

TABLE 6: ORCHARD/BROADACRE ANALYTICAL RESULTS¹

	Arsenic	Copper	Lead	ΣDDX	Dieldrin	Lindane	Endosulfan
HA1 0-75mm	6.3	-	17	0.10	0.03	<0.01	<0.01
HA2 0-75mm	7.6	-	23	0.21	<0.01	<0.01	<0.01
HA3 0-75mm	9.0	-	28	4.7	<0.01	0.01	<0.01
HA4 0-75mm	6.9	-	14	1.1	<0.01	<0.01	0.02
HA5 0-75mm	5.2	-	15	0.96	0.03	<0.01	0.01
HA6 0-75mm	6.8	-	20	1.6	0.01	<0.01	<0.01
HA7 0-75mm	6.3	-	21	-	-	-	-
HA8 0-75mm	3.1	-	16	-	-	-	-
HA9 0-75mm	7.2	-	23	-	-	-	-
HA10 0-75mm	6.7	-	20	0.01	<0.01	<0.01	<0.01
HA11 0-75mm	3.7	-	16	-	-	-	-
HA12 0-75mm	6.8	-	22	-	-	-	-
HA13 0-75mm	7.0	-	23	-	-	-	-
HA14 0-75mm	4.1	-	15	<0.01	<0.01	<0.01	<0.01
HA15 0-75mm	8.8	-	25	-	-	-	-
HA16 0-75mm	7.8	-	28	<0.01	<0.01	<0.01	<0.01
HA17 0-75mm	21	-	64	-	-	-	-
HA18 0-75mm	8.5	-	35	-	-	-	-
HA19 0-75mm	17	-	52	<0.01	0.01	<0.01	<0.01
HA20 0-75mm	9.2	-	30	-	-	-	-
HA21 0-75mm	14	-	71	<0.01	<0.01	0.01	<0.01
HA22 0-75mm	18	-	56	-	-	-	-
HA23 0-75mm	14	-	45	-	-	-	-
HA24 0-75mm	13	-	39	-	-	-	-
HA25 0-75mm	14	-	-	-	-	-	-
HA26 0-75mm	5.9	-	-	-	-	-	-
HA27 0-75mm	5.8	-	-	-	-	-	-
HA28 0-75mm	15	-	-	-	-	-	-
HA29 0-75mm	19	-	-	-	-	-	-
HA30 0-75mm	17	-	-	-	-	-	-
HA31 0-75mm	20	-	-	-	-	-	-
HA32 0-75mm	19	-	-	-	-	-	-
HA33 0-75mm	8.6	-	-	-	-	-	-
HA34 0-75mm	13	-	-	-	-	-	-
HA35 0-75mm	12	-	-	-	-	-	-
HA36 0-75mm	21	-	-	-	-	-	-
HA37 0-75mm	21	-	-	-	-	-	-
HA38 0-75mm	12	-	-	-	-	-	-
HA39 0-75mm	12	-	-	-	-	-	-
HA40 0-75mm	11	-	-	-	-	-	-
NES ²	20	>10,000	210	70	2.6	140 ⁶	4 ⁵
Eco-SGV ³	60	120	900	4.8	4 ⁵	1.2 ⁵	4 ⁵
Background ⁴	9.97	48.14	25.83	-	-	-	

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – residential landuse with 10% homegrown produce
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
4. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
5. Soil Remediation Circular (2009) – Human Health and Ecological Receptors Residential Intervention Value.
6. MfE (2006) - Identifying, Investigating and Managing Risks Associated with Former Sheep-dip Sites – Residential Value
7. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges. NA = Not applicable / NL = No Limit / ND= not detected

10.3 95% UCL

The 95% Upper Confidence Limit (95% UCL) is used where a statistically designed sampling regime is employed in order to be representative of the actual environmental conditions on site. As GSL utilised a systematic, grid-based soil sampling regime across the area of uniform bulk persistent pesticide application, a 95% UCL statistical assessment is considered appropriate for this area of the site.

Statistical analysis of the analytical results confirms a normal distribution of contaminants in the surface soil horizons. Consequently, the use of the 95% UCL is justified as the method calculates the mean concentration plus or minus the confidence limit, in this case indicating that there is only a 5% probability that concentrations will exceed the calculated arithmetic mean concentration described below.

GSL has calculated two 95% UCL average concentrations for the area of uniform bulk persistent pesticide application encompassed by the footprint of 122 Arataki Road which are summarised in Table 7 below. The first UCL comprises the majority of the 122 Arataki Road which has been subject to historic orchard/broadacre crop and encompasses samples HA7 to HA24, while the second area is the historic location of an agrichemical storage shed which was sampled at a greater density compared to the balance of the lot and encompasses samples HA25 to HA40.

The 95% UCL indicates with 95% confidence that topsoil across both these areas would comply with the NES residential 10% produce SCS. Copies of the 95% UCL calculations are included in Appendix F.

TABLE 7. 95% UPPER CONFIDENCE LIMIT¹

	Arsenic
95% UCL (Orchard/Broadacre Crop Area)	11.92
95% UCL (Storage Shed)	16.34
Residential 10% Produce²	20
Eco-SGV³	60

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – Residential landuse with 10% homegrown produce consumption soil contaminant standard.
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);

11 SOIL CONTAMINATION RISK ASSESSMENT

For actual or potential soil contamination to pose a risk to current or end land users, and/or the receiving environment, a source-pathway-receptor relationship pathway must exist. Following the completion of an intrusive investigation of the site and assessment of analytical results received, GSL has undertaken a risk assessment in light of the associated exposure pathways, and end receptors. The risk assessment is split into an assessment of each of the current land use activities onsite, each of which is discussed in turn below.

11.1 BUILDING FOOTPRINTS

Three halo composite soil samples and two discrete soil samples from the 2018 and 2019 due diligence investigations returned lead concentrations and one arsenic concentration, in excess of the NES residential 10% SCS. Considering these results, the intrusive investigation targeted the footprints of the structures where the exceeds were recorded, which are discussed in turn below.

11.1.1 108 ARATAKI ROAD NORTHERN DWELLING

The 2018 due diligence investigation halo composite sample of this dwelling returned a lead concentration of 352mg/kg. Subsequent delineation soil sampling completed by this investigation has identified that lead exceedances are limited to within the 1m halo of the dwelling footprint along the northern, eastern and southern dwelling extents, while lead contamination extends to 5m west of the dwelling.

The lead concentrations returned within this location exceed the NES residential 10% SCS, and as such would be considered to pose a potential risk to end residential land users as part of any development. During development earthworks, localised remedial works will be required to ensure that this soil is isolated for reuse in a recreational area or removed from site, ensuring any risks are removed or mitigated.

Site observations indicate that the area of impacted soil is predominantly maintained under lawn or ornamental gardens, with limited existing land user interactions or soil disturbance and no homegrown vegetable consumption. Consequently, while this soil has been characterised as posing a potential risk to end residential land users, it is considered that any potential soil contaminant exposure risks to existing residential land users are low, and can be suitably managed by maintaining existing land use activities which limit soil interaction and disturbance within the 1m footprint of the dwelling.

11.1.2 108 ARATAKI ROAD SOUTHERN DWELLING

Soil Sample SS4 returned a lead concentration of 270mg/kg, which exceeds the NES residential 10% SCs, while the remaining discrete soil samples and due diligence composite soil sample returned lead concentrations which were compliant with the SCS.

Based on the compliant results obtained from soil surrounding this dwelling, the SS4 lead concentration is considered to be anomalous, and of low risk to end land users. However, due to the proximity of this sample to the structure onsite, future demolition works to removed the dwelling onsite will result in the removal of soil from this location as part of post-demolition tidying, further mitigating any potential risks to end land users.

11.1.3 108 ARATAKI PACKING SHED

As with the dwelling above, the 2018 halo composite sample returned a lead concentration of 352mg/kg within 1m footprint of this dwelling, which is in excess of the NES residential 10% SCS, and would be considered to pose a risk to residential end land users as part of the proposed development.

Delineation soil sampling completed by this investigation has confirmed that the non-complaint lead concentrations were limited to the immediate building footprint only. During development

earthworks, localised remedial works will be required to ensure that this soil is isolated for reuse in a recreational area or removed from site, ensuring any risks are removed or mitigated.

As the lead soil concentrations returned comply with the NES commercial/industrial SCS, this soil is not considered a risk to existing land users in this portions of the site.

11.1.4 86 ARATAKI ROAD DWELLING AND SHED

2019 soil sampling has identified that lead soil contamination associated with the residential dwelling at 86 Arataki Road is limited to a 1m halo around the dwelling footprint. Delineation soil sampling has identified that maintenance of the shed in the rear yard has impacted the southern half of the rear yard with lead concentrations in excess of the NES residential 10% SCS to a depth of 500mm. Soil within these areas is considered to pose a potential risk to end residential land users as part of the proposed development of the site, and will required remedial works as part of any development to ensure that this soil is isolated for reuse in a recreational area or removed from site, ensuring any risks are removed or mitigated.

Site observations indicate that the area of impacted soil is predominantly maintained under overgrown lawn and used for storage, with limited existing land user interactions or soil disturbance. No evidence of any vegetable gardens or homegrown produce for consumption was identified. Consequently, while this soil has been characterised as posing a potential risk to end residential land users, it is considered that any potential soil contaminant exposure risks to existing residential land users are low, and can be suitably managed by maintaining existing land use activities which limit soil interaction and disturbance in these areas.

11.1.5 122 ARATAKI ROAD HISTORIC STRUCTURE FOOTPRINTS

Halo composite samples from the historic structure footprints situated within 122 Arataki Road returned an arsenic concentration marginally in excess of the NES residential 10% produce SCS, and a copper concentration double the adopted environmental criteria. Grid-based delineation soil sampling within this portion of the site, using arsenic as the indicator for contamination, returned two arsenic concentrations which were marginally in excess of the NES residential 10% produce SCS. Subsequent 95% UCL calculations of this area indicates that when this portion of the site is considered as a whole, soil quality in this area is highly unlikely to pose a risk to residential end land users.

As this area is utilised for pasture grazing and crop cultivation, any potential soil contamination risks to existing land users are considered negligible.

11.1.6 REMAINING SITE STRUCTURES

Soil samples from the structure footprints have generally returned elevated lead concentrations, however these are compliant with the NES residential 10% produce SCS, and therefore are not considered to pose a risk to end land users as part of any future site development, or to existing land users.

11.2 HISTORIC ORCHARD/BROADACRE CROP AREAS

GSL has collected 24 discrete soil sample and seven composite soil samples from the portions of the site which have been subject to agrichemical application during historic orchard and broadacre crop cultivation. The findings for each lot are summarised in the sections below.

11.2.1 86 ARATAKI ROAD

GSL collected four composite soil samples, comprising of four sub-samples each collected from the 0-150mm soil profile, as part of 2019 due diligence investigations. These samples were collected in accordance with the iteration of CLMG No.5 in place at the time, while the collection of these samples are in general accordance with the current CLMG No.5 iteration. Consequently, the analytical results obtained in 2019 are considered sufficient for assessment of the potential soil contamination risk in this location.

The 2019 analytical results all returned analyte concentrations which were consistent with the NES residential 10% produce SCS, and as such there are no risks to potential residential end land users. However due to the detection of elevated heavy metals and detectable organic compounds in some samples, this soil will be subject to controls as part of any development earthworks to ensure the risks from any potentially mobilised soil contaminants are managed during this process.

11.2.2 108 ARATAKI ROAD

During the 2018 due diligence investigation, a composite soil sample comprising of 10 sub-samples collected from the 0-150mm, was collected which identified elevated arsenic, copper, and lead concentrations along with detectable organic compound concentrations. While this was accepted practice at the time of investigation, this sample approach is no longer considered appropriate under the current CLMG No.5 iteration and was therefore subject to additional assessment within this DSI. GSL notes that analytical results from the 2018 due diligence assessment indicated that soil within historic orchard/broadacre crop location was highly likely to comply with the NES residential produce 10% SCS. This was confirmed by additional supplementary infill assessment during this investigation where the collection of six discrete soil samples across this area from the 0-75mm soil profile in accordance with the current CLMG No.5 iteration returned analytical results confirming the composite analytical results. That is elevated heavy metal concentrations above the expected naturally occurring background and detectable organic compound concentrations were identified, all which complied with the NES residential 10% produce SCS.

Consequently, soil within this area is considered to comply with the NES residential 10% produce SCS, and as such there are no risks to potential residential end land users. However due to the detection of elevated heavy metals and detectable organic compounds in some samples, this soil will be subject to controls as part of any development earthworks to ensure the risks from any potentially mobilised soil contaminants are managed during this process.

As this area is utilised for pasture grazing and crop cultivation, any potential soil contamination risks to existing land users are considered negligible.

11.2.3 122 ARATAKI ROAD

During the 2018 due diligence investigation, three composite soil samples were collected in the same manner as 108 Arataki Road above, with one soil sample returning an elevated copper concentration and one sample returning trace organic compound concentrations, indicating that soil within historic orchard/broadacre crop location was likely to comply with the NES residential produce 10% SCS.

To confirm these observations, GSL collected fifteen discrete soil samples from the 0-75mm soil profile in accordance with the current CLMG No.5 iteration. One soil sample returned an arsenic concentration marginally in excess of the NES residential 10% produce SCS, with all other soil samples returning analyte concentrations compliant with the SCS. Subsequent 95% UCL calculations (refer Section 10.3 above) of this area indicates that when this portion of the site is considered as a whole, soil quality in this area is highly unlikely to pose any risk to residential end land users as part of any development.

The 2018 elevated copper concentration is double the adopted environmental criteria, however based on the analytical results from the balance of this area, this concentration is considered spurious and highly unlikely to pose an environmental discharge risk.

As this area is utilised for pasture grazing and crop cultivation, any potential soil contamination risks to existing land users are considered negligible.

12 ESTIMATED EXTENT OF IMPACTED SOILS

Intrusive investigation across the 11.1567 Ha piece of land has revealed elevated concentrations above the expected naturally occurring background range of heavy metals and organic compounds within topsoil across the site, but largely compliant with the applicable NES SCS and adopted environmental criteria for the proposed end land use. As outlined in the sections above, localised remedial works will be necessary to ensure that discrete portions of the soil onsite are isolated and reused in less sensitive portions of the development (i.e. road or recreational reserves), or removed offsite to an appropriate receiving site. Based on the results of this investigation, the areas of impacted soil and estimated associated volumes are:

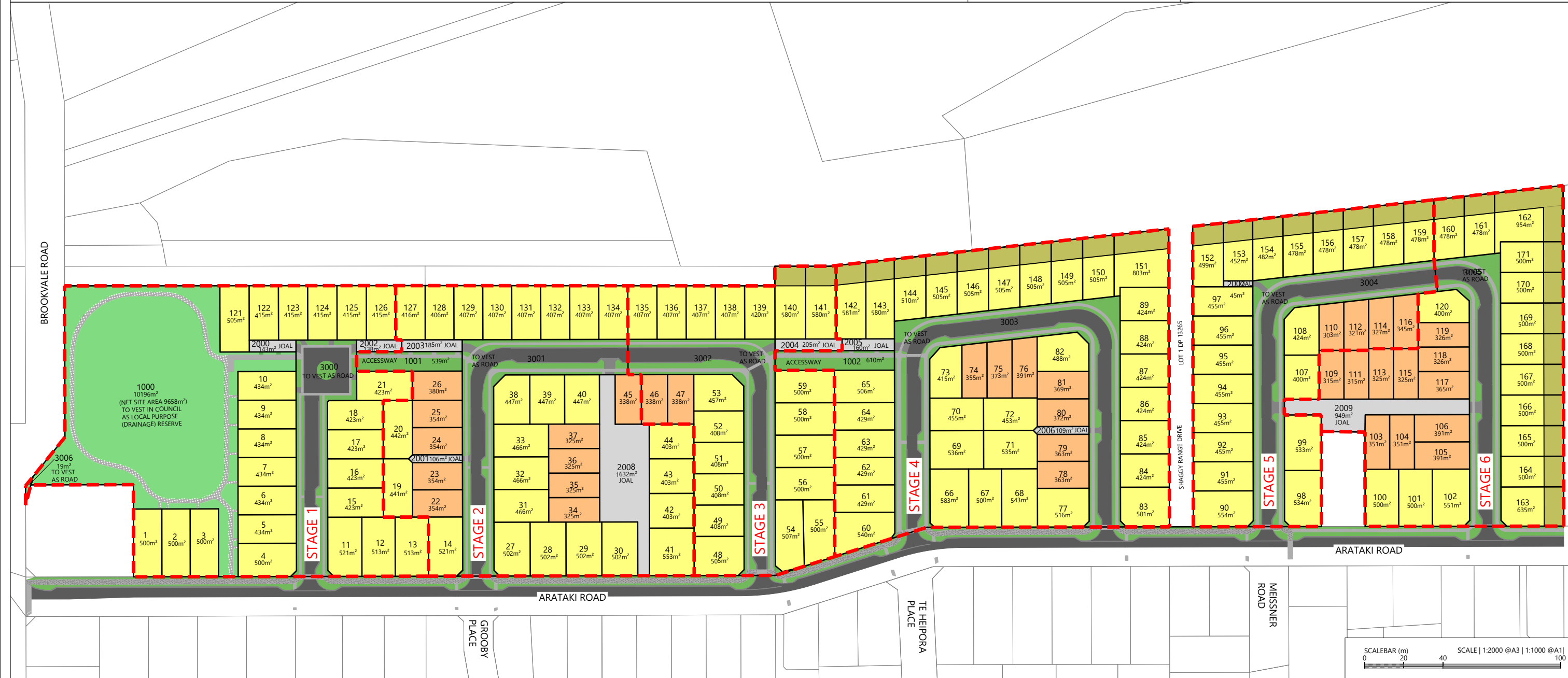
- **108 Arataki Road Northern Dwelling** – 33m² halo around dwelling plus 70m² west of the dwelling, totalling 103m² impacted to 300mm, approximately 31m³;
- **108 Arataki Road Packing Shed** – 32m² halo around packing shed impacted to 500mm, approximately 16m³;
- **86 Arataki Road Dwelling** – 34m² halo around dwelling impacted to 500mm, approximately 17m³;
- **86 Arataki Road Shed** – 275m² impacted to 500mm, approximately 137.5m³.

Based on the above volumes and areas, approximately 201.5m³ of impacted soil will require remediation and/or management. Using a conversion rate of 1.5 to reflect the silty sand nature of soils, this equates to some 302 tonnes of impacted soils.

APPENDIX B PROPOSED SCHEME PLAN

ARATAKI DEVELOPMENT STANDALONE LOTS	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	TOTAL
	24	35	21	40	24	27	171

LEGEND	
STAGE BOUNDARIES	---
BOUNDARIES	---
ROAD CARRIAGEWAY	---
PEDESTRIAN PATHS	---
INFORMAL PEDESTRIAN PATHS	---
SHARED PATHS	---
JOINT OWNED ACCESS LOTS (JOAL)	---
LOT TYPE 1	---
LOT TYPE 2	---
PROPOSED DRAINAGE RESERVE	---
COVENANT AREA OVER LOT TYPE 1	---



REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

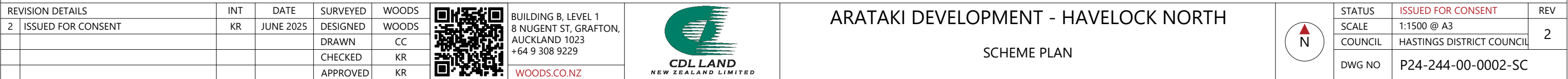
BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229
WOODS.CO.NZ

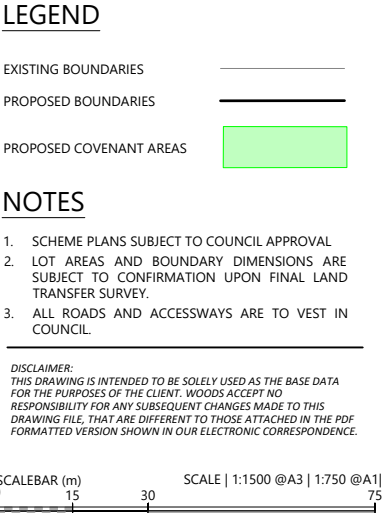
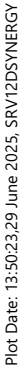


ARATAKI DEVELOPMENT - HAVELOCK NORTH

DEVELOPMENT CONTROL PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:2000 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-0100-GE	





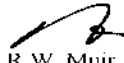
REVISION DETAILS		INT	DATE	SURVEYED	WOODS		BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229		ARATAKI DEVELOPMENT - HAVELOCK NORTH		STATUS	ISSUED FOR CONSENT	REV	
2	ISSUED FOR CONSENT	KR	JUNE 2025	DESIGNED	WOODS							SCALE	1:1500 @ A3	2
				DRAWN	CC							COUNCIL	HASTINGS DISTRICT COUNCIL	
				CHECKED	KR							DWG NO	P24-244-00-0003-SC	
				APPROVED	KR									
							WOODS.CO.NZ							

APPENDIX C RECORDS OF TITLE



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy



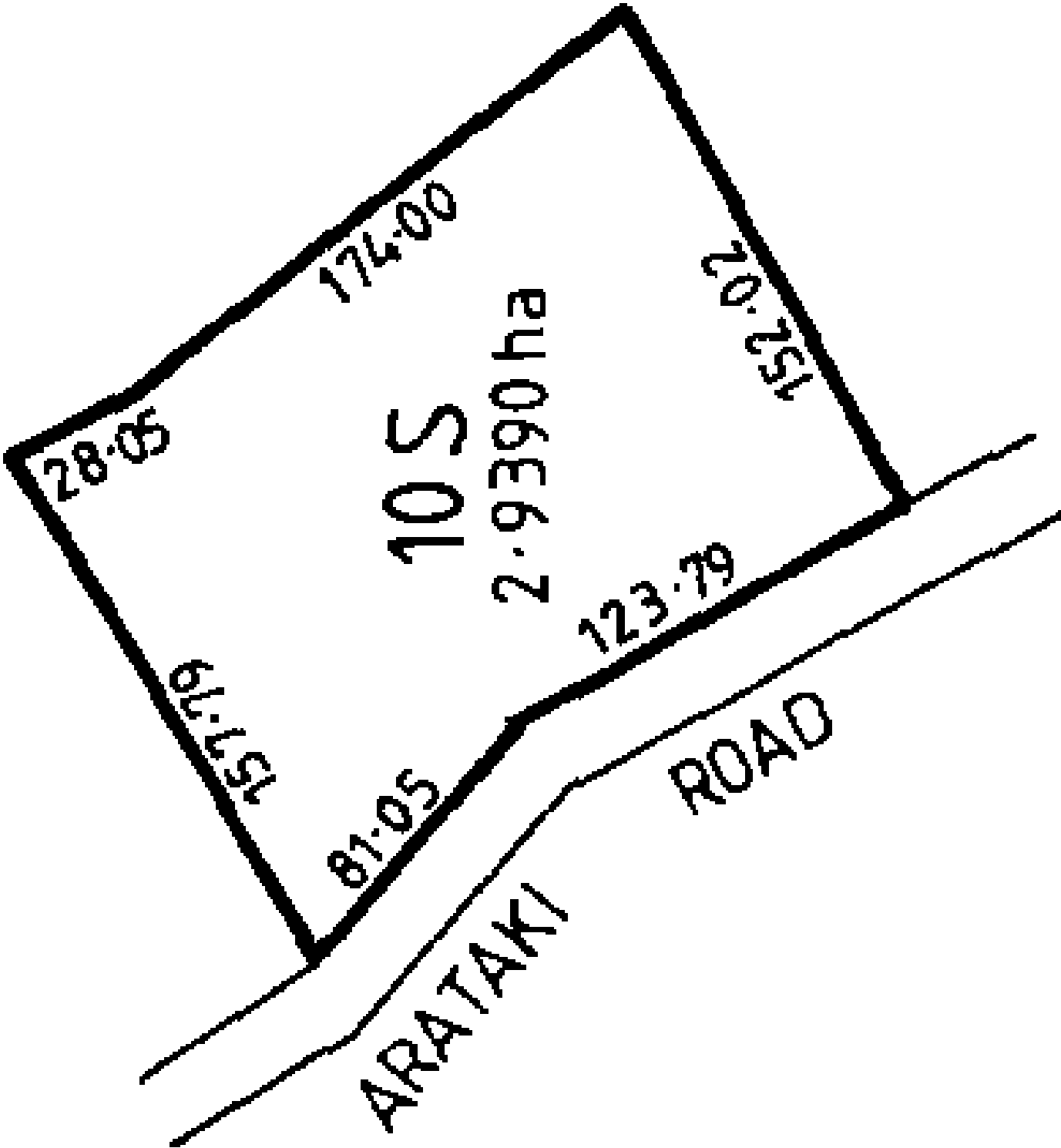

R.W. Muir
Registrar-General
of Land

Identifier **HBM2/265**
Land Registration District **Hawkes Bay**
Date Issued 26 August 1988

Prior References
HB201/90

Estate Fee Simple
Area 2.9390 hectares more or less
Legal Description Section 10S Survey Office Plan 1781
Registered Owners
CDL Land New Zealand Limited

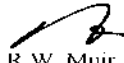
Interests
Subject to Section 59 Land Act 1948





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R.W. Muir
Registrar-General
of Land

Identifier 930676
Land Registration District Hawkes Bay
Date Issued 19 August 2020

Prior References

HBG3/230 HBG3/231

Estate Fee Simple
Area 2.9838 hectares more or less
Legal Description Lot 2 Deposited Plan 546439
Registered Owners
CDL Land New Zealand Limited

Interests

Subject to Section 206 Land Act 1924

11791202.5 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 19.8.2020 at 12:13 pm

Subject to a right to drain sewage over part marked B and rights to convey electricity and telecommunications over part marked A, all on DP 546439 created by Easement Instrument 11791202.6 - 19.8.2020 at 12:13 pm

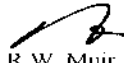
The easements created by Easement Instrument 11791202.6 are subject to Section 243 (a) Resource Management Act 1991





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R.W. Muir
Registrar-General
of Land

Identifier **908215**
Land Registration District **Hawkes Bay**
Date Issued 29 October 2019

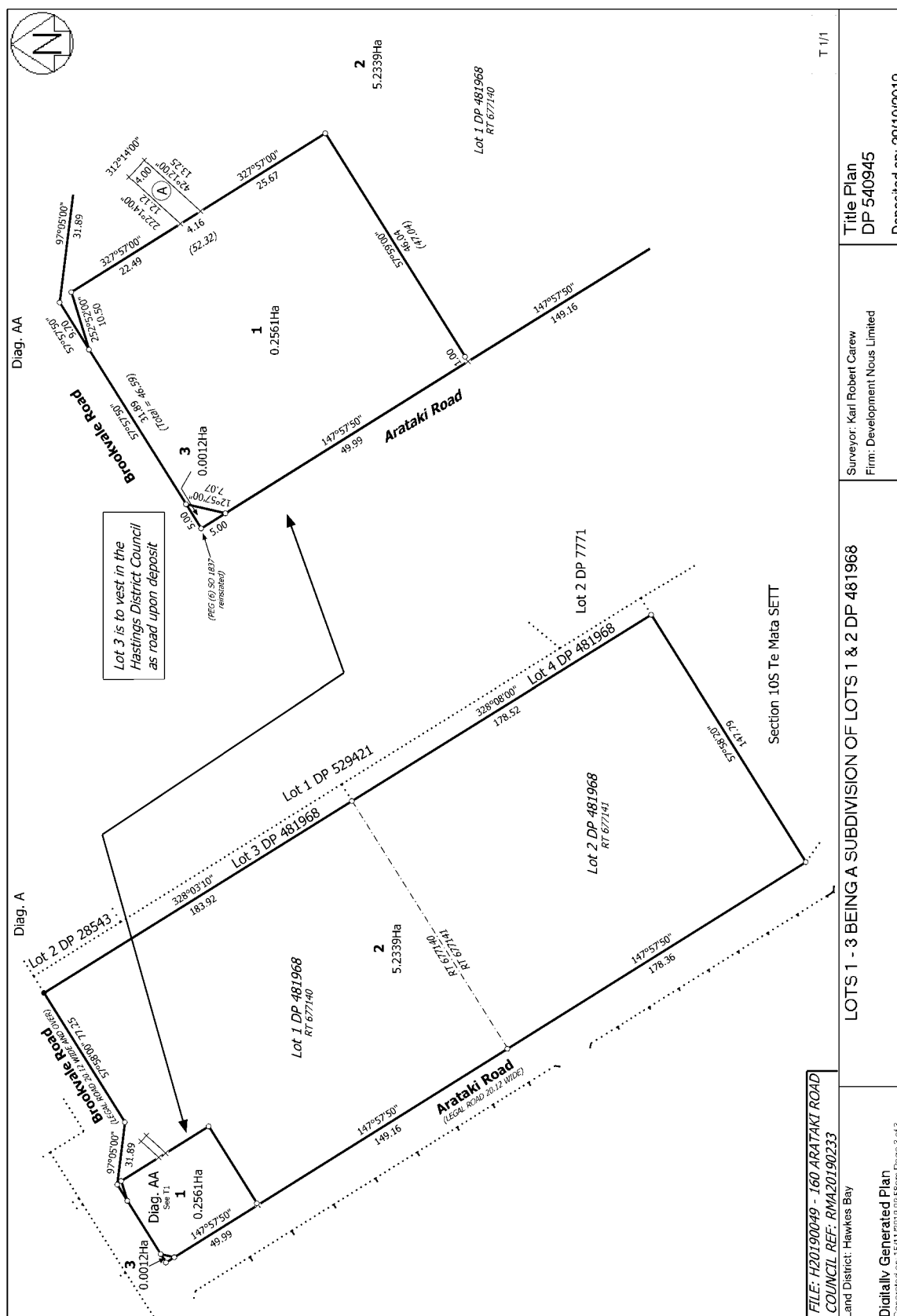
Prior References

677140 677141

Estate Fee Simple
Area 5.2339 hectares more or less
Legal Description Lot 2 Deposited Plan 540945
Registered Owners
CDL Land New Zealand Limited

Interests

Subject to Section 8 Mining Act 1971
Subject to Section 168A Coal Mines Act 1925
Land Covenant in Easement Instrument 9218697.5 - 1.11.2012 at 5:00 pm (Affects part formerly Lot 2 DP 481968)
Land Covenant in Easement Instrument 9218697.6 - 1.11.2012 at 5:00 pm (Affects part formerly Lot 1 DP 481968)
9871274.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981 by Hastings District Council -
20.10.2014 at 10:47 am (Affects part formerly Lot 1 DP 481968)
Fencing Covenant in Transfer 11544178.2 - 29.10.2019 at 3:48 pm (Affects part formerly Lot 1 DP 481968)
11544178.5 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 29.10.2019 at 3:48 pm
Subject to a right to drain sewage over part marked A on DP 540945 created by Easement Instrument 11544178.6 -
29.10.2019 at 3:48 pm
The easements created by Easement Instrument 11544178.6 are subject to Section 243 (a) Resource Management Act 1991



APPENDIX D HISTORICAL AERIAL PHOTOGRAPHS





N 5752 M/18

0 80 160 240 320 m

1980

Aerial photograph courtesy of Retrolens

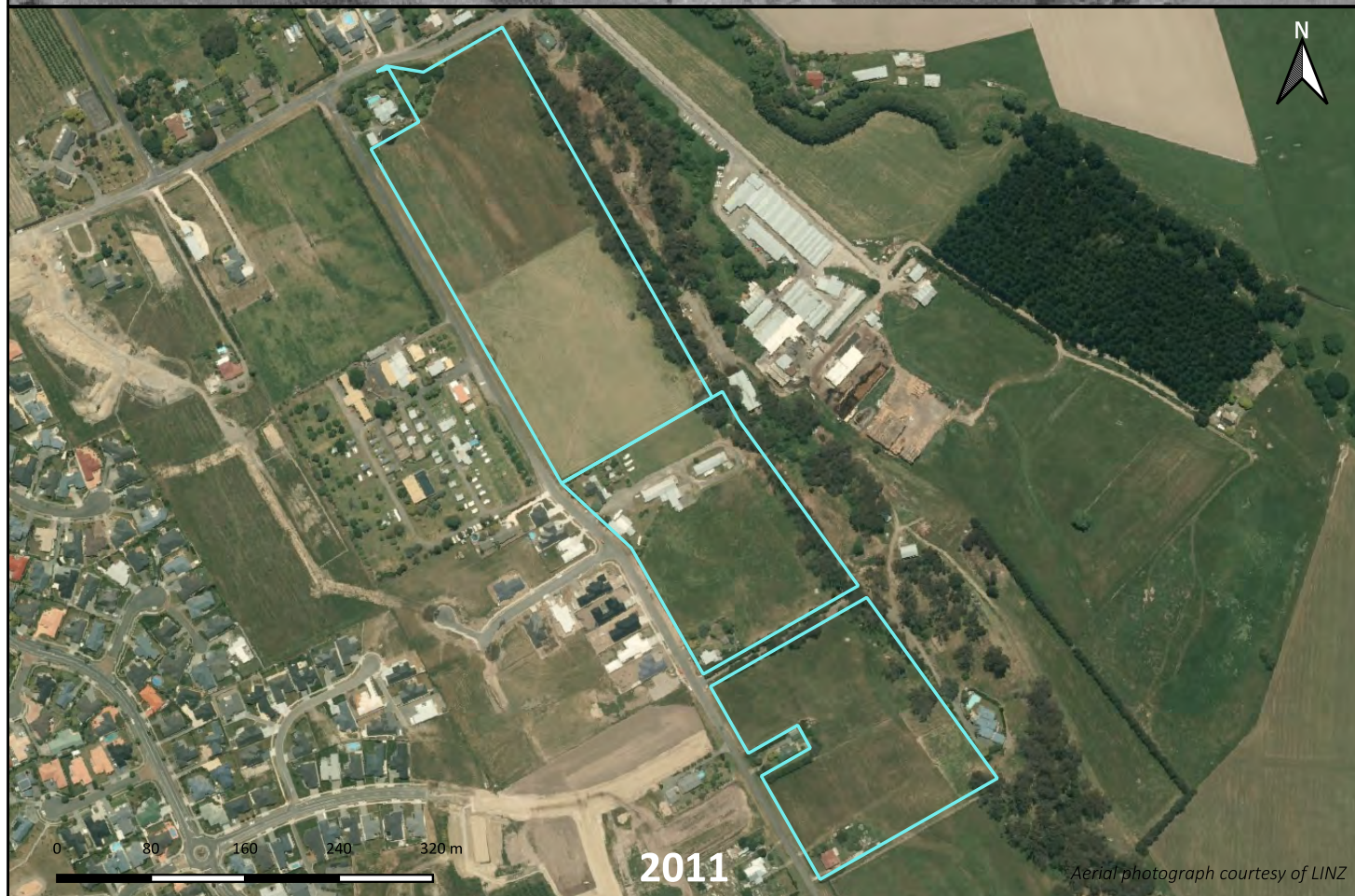


0 80 160 240 320 m

1988

Aerial photograph courtesy of Retrolens















SQN GeoSciences 1 William Pickering Dr, Rosedale, 0632 Tel: 0800 333 287	Historic Aerial Photographs	Reference: J250030 Date: 2025/03/12
	122 Arataki Road, Havelock North	Drawn: GC Approved: CD



APPENDIX E SITE PHOTOGRAPHS



PLATE 1: Several small stockpiles of consistent material (Stockpile 1) in the western portion of Area 1



PLATE 2: Western portion of Area 1 with Burn Pile 1 in the foreground and Stockpile 1 in the background.



PLATE 3: Area 1, looking from the eastern end towards Shed 1, with historic horticultural area in the foreground, and stockpiled materials visible on the right.



PLATE 4: Inactive horticultural activity across Area 2.



PLATE 5: Dwelling 5 with fragments of suspected ACM within the yard in the foreground.



PLATE 6: Northern aspect of Dwelling 5.



PLATE 7: North-eastern aspect of Shed 6.



PLATE 8: West of Shed 8 and Dwelling 7, where Burn Piles are location. Burn Pile F visible in the lower right-hand side.

APPENDIX F LABORATORY TRANSCRIPTS

Certificate of Analysis

Page 1 of 4

Client:	SQN Consulting Limited T/A SQN GeoSciences	Lab No:	3796382	SPv1
Contact:	Grace Catterall	Date Received:	04-Mar-2025	
	C/- SQN Consulting Limited T/A SQN GeoSciences	Date Reported:	10-Mar-2025	
	PO Box 45053	Quote No:	127056	
	Waterloo	Order No:	J250030	
	Lower Hutt 5042	Client Reference:	122 Arataki Road, Havelock North	
		Submitted By:	Grace Catterall	

Sample Type: Soil

Sample Name:		SS7 26-Feb-2025	SS9 26-Feb-2025	SS11 26-Feb-2025	SS12 26-Feb-2025	SS13 26-Feb-2025
Lab Number:		3796382.13	3796382.14	3796382.15	3796382.16	3796382.17
Individual Tests						
Dry Matter	g/100g as rcvd	81	-	90	93	89
Total Recoverable Lead	mg/kg dry wt	-	139	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	560	-	31	6	10
Total Recoverable Cadmium	mg/kg dry wt	0.38	-	0.45	0.30	0.29
Total Recoverable Chromium	mg/kg dry wt	290	-	33	14	15
Total Recoverable Copper	mg/kg dry wt	980	-	108	25	27
Total Recoverable Lead	mg/kg dry wt	105	-	42	74	90
Total Recoverable Nickel	mg/kg dry wt	10	-	8	6	6
Total Recoverable Zinc	mg/kg dry wt	460	-	470	178	168
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	0.5	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.015	-	< 0.011	< 0.011	< 0.015
2-Methylnaphthalene	mg/kg dry wt	< 0.018	-	< 0.011	< 0.011	< 0.017
Acenaphthylene	mg/kg dry wt	< 0.012	-	0.017	< 0.011	< 0.012
Acenaphthene	mg/kg dry wt	< 0.012	-	< 0.011	< 0.011	< 0.012
Anthracene	mg/kg dry wt	< 0.012	-	< 0.011	< 0.011	< 0.012
Benzo[a]anthracene	mg/kg dry wt	< 0.012	-	0.037	< 0.011	< 0.012
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.012	-	0.045	< 0.011	< 0.012
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.029	-	0.071	< 0.026	< 0.028
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.029	-	0.071	< 0.026	< 0.028
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.012	-	0.061	< 0.011	< 0.012
Benzo[e]pyrene	mg/kg dry wt	< 0.012	-	0.029	< 0.011	< 0.012
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.012	-	0.037	< 0.011	< 0.012
Benzo[k]fluoranthene	mg/kg dry wt	< 0.012	-	0.024	< 0.011	< 0.012
Chrysene	mg/kg dry wt	< 0.012	-	0.036	< 0.011	< 0.012
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.012	-	< 0.011	< 0.011	< 0.012
Fluoranthene	mg/kg dry wt	< 0.012	-	0.069	< 0.011	0.014
Fluorene	mg/kg dry wt	< 0.012	-	< 0.011	< 0.011	< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.012	-	0.039	< 0.011	< 0.012
Naphthalene	mg/kg dry wt	< 0.06	-	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt	< 0.012	-	< 0.011	< 0.011	< 0.012
Phenanthrene	mg/kg dry wt	0.029	-	0.020	0.022	0.020
Pyrene	mg/kg dry wt	< 0.012	-	0.067	< 0.011	0.012



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

Sample Type: Soil					
Sample Name:		SP1 26-Feb-2025	Composite of CompA_1, CompA_2, CompA_3 & CompA_4	Composite of CompB_1, CompB_2, CompB_3 & CompB_4	Composite of CompC_1, CompC_2, CompC_3 & CompC_4
Lab Number:		3796382.18	3796382.19	3796382.20	3796382.21
Individual Tests					
Dry Matter	g/100g as rcvd	98	84	94	96
4 Metal suite (As, Cu, Pb, Zn)					
Total Recoverable Arsenic	mg/kg dry wt	-	4	6	8
Total Recoverable Copper	mg/kg dry wt	-	27	29	28
Total Recoverable Lead	mg/kg dry wt	-	36	24	26
Total Recoverable Zinc	mg/kg dry wt	-	107	71	54
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	7	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.22	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	-	-	-
Total Recoverable Copper	mg/kg dry wt	45	-	-	-
Total Recoverable Lead	mg/kg dry wt	68	-	-	-
Total Recoverable Nickel	mg/kg dry wt	6	-	-	-
Total Recoverable Zinc	mg/kg dry wt	198	-	-	-
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
alpha-BHC	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
beta-BHC	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
delta-BHC	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Total DDT Isomers	mg/kg dry wt	< 0.06	< 0.07	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endosulfan I	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endosulfan II	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endrin	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Endrin ketone	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Heptachlor	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Methoxychlor	mg/kg dry wt	< 0.010	< 0.012	< 0.011	< 0.011
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.015	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.010	-	-	-
Acenaphthene	mg/kg dry wt	< 0.010	-	-	-
Anthracene	mg/kg dry wt	< 0.010	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.010	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.010	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.025	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.025	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.010	-	-	-

Sample Type: Soil					
Sample Name:		SP1 26-Feb-2025	Composite of CompA_1, CompA_2, CompA_3 & CompA_4	Composite of CompB_1, CompB_2, CompB_3 & CompB_4	Composite of CompC_1, CompC_2, CompC_3 & CompC_4
Lab Number:		3796382.18	3796382.19	3796382.20	3796382.21
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Benzo[e]pyrene	mg/kg dry wt	< 0.010	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.010	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.010	-	-	-
Chrysene	mg/kg dry wt	< 0.010	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.010	-	-	-
Fluoranthene	mg/kg dry wt	0.012	-	-	-
Fluorene	mg/kg dry wt	< 0.010	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.010	-	-	-
Naphthalene	mg/kg dry wt	< 0.05	-	-	-
Perylene	mg/kg dry wt	< 0.010	-	-	-
Phenanthrene	mg/kg dry wt	< 0.010	-	-	-
Pyrene	mg/kg dry wt	0.011	-	-	-

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	13-21
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	14
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	13, 15-18
4 Metal suite (As, Cu, Pb, Zn)	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.4 - 4 mg/kg dry wt	19-21
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	13, 15-18
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	18-21
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	13, 15-18
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	13, 15-21
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	14
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-12
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	14
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	13, 15-18

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	13, 15-18

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

Testing was completed between 05-Mar-2025 and 10-Mar-2025. For completion dates of individual analyses please contact the laboratory.

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

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



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 2

Client:	SQN Consulting Limited T/A SQN GeoSciences	Lab No:	3796481	A2Pv1
Contact:	Grace Catterall	Date Received:	04-Mar-2025	
	C/- SQN Consulting Limited T/A SQN GeoSciences	Date Reported:	05-Mar-2025	
	PO Box 45053	Quote No:	127056	
	Waterloo	Order No:	J250030	
	Lower Hutt 5042	Client Reference:	122 Arataki Road, Napier	
		Submitted By:	Grace Catterall	

Sample Type: Soil				
Sample Name:		SS8 26-Feb-2025	SS9 26-Feb-2025	SS11 26-Feb-2025
Lab Number:		3796481.1	3796481.2	3796481.3
Asbestos Presence / Absence		Chrysotile (White Asbestos) detected.	Chrysotile (White Asbestos) detected.	Asbestos NOT detected.
Description of Asbestos Form		ACM debris	Mastic, ACM debris	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	0.018	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
As Received Weight	g	696.8	531.0	461.7
Dry Weight	g	669.6	445.7	418.8
Moisture*	%	4	16	9
Sample Fraction >10mm*	g dry wt	15.7	65.9	15.6
Sample Fraction <10mm to >2mm*	g dry wt	370.5	133.9	260.3
Sample Fraction <2mm*	g dry wt	282.6	245.0	142.4
<2mm Subsample Weight*	g dry wt	52.6	52.6	53.3
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	0.08177	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	0.00107	< 0.00001	< 0.00001

Glossary of Terms

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

Please refer to the **BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.**
<https://www.branz.co.nz/asbestos>

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-3
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-3
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-3
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-3
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-3
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-3
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3

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

Testing was completed on 05-Mar-2025. For completion dates of individual analyses please contact the laboratory.

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

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

Mahaleel (May) Alfante BSc, PGDipSci
Laboratory Technician - Asbestos



ASBESTOS BULK ANALYSIS REPORT

AS 4964 (2004) – Method for the
Qualitative Identification of Asbestos
in Bulk Samples and In-House Method 1

122 Arataki Road, Hovelock North

CLIENT NAME

SQN Consulting Ltd
PO Box 45053
Waterloo
Lower Hutt
5042

Attn: Grace Catterall

REPORT NO.

L-05969v1

DATE ISSUED

04 March 2025



Report No.: L-05969v1
Sampling Date: 27 February 2025
Date Received: 03 March 2025
Date Analysed: 03 March 2025
Number of Samples: 4
Analysed By: Laura Liu
Authorised By: Laura Liu
Sampled By: Grace Catterall
Client Reference: 122 Arataki Road / J250030
Location/Description: 122 Arataki Road

RESULTS:

The following samples were examined using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques.

The following results apply to the samples as received.

LAB NO.	SAMPLE NO.	SAMPLE DESCRIPTION/ SAMPLE TYPE	SAMPLE SIZE (g)	RESULT
22845	S001	BM1 / fibre cement	57.1	Amosite (brown) and Chrysotile (white) asbestos detected
22846	S002	BM2 / fibre cement	76.0	Asbestos NOT detected, Organic fibres detected
22847	S003	BM3 / fibre cement	86.5	Amosite (brown) and Chrysotile (white) asbestos detected
22848	S004	BM4 / fibre cement	55.6	Asbestos NOT detected, Organic fibres detected

KEY TECHNICAL PERSONNEL

NAME: Laura Liu



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

NOTE:

1. This report must not be altered or reproduced except in full.
2. This report relates specifically to the sample(s) tested that were drawn and/or provided by the client or their nominated third party to AEC Laboratories.

APPENDIX G SQEP CERTIFICATION

Curriculum Vitae

Name: Carl O'Brien
Company: SQN Consulting Ltd
Position: Senior Environmental Scientist

Contact: (M) 027 420 5193
(E) Carl@SQN.co.nz

Tertiary Qualifications:

- Post Graduate Diploma in Science (Environmental Management) (Distinction), University of Auckland, 2013
- Bachelor Of Science (Biology), University of Auckland, 2008

Suitably Qualified and Experienced Practitioner Status:

I have more than 16 years' experience in environmental impact assessments, contaminated land management and assessment, Assessment of Environmental Effects, Adaptive Management Plans, Environmental Regulatory Assessments, and Environmental Policy Assessment. My qualifications and experience meet the requirements of a '*Suitably Qualified and Experienced Practitioner*' as detailed in the User's Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (MfE 2012). This is sufficient for preparation and certification of reports.

Employment Record:

- SQN Consulting Ltd, Senior Environmental Scientist (August 2024 – Current);
- AgFirst Consultants HB Ltd, Senior Environmental / Horticultural Consultant (July 2023 – Current);
- Geosciences Ltd, General Manager / Director (2018 – 2023);
- Geosciences Ltd, Senior Environmental Consultant (2015 – 2018);
- Mitchell Partnerships Ltd, Environmental Consultant (2008 – 2015).

Summary of Key Projects

Kāinga Ora Housing Corporation – Social Housing Stock Re-Development Programme: Preparation of PSI, DSI and feasibility assessments for the redevelopment or significant swathes of KOHC (formerly Housing New Zealand Corporation) properties in Whangarei, Auckland, Rotorua, Gisborne, Napier, Hastings, Taupo, Wellington, and Palmerston North. Works have included site management plans and remediation strategies to address a range of HAIL activities encompassed within the KOHC stock as well as technical caucusing to develop an internal KOHC policy on site assessment.

Ambury Properties Ltd – SleepyHead Estate: Preparation of a PSI and DSI for the Stage 1 Earthworks extent for the construction and development of a new Sleepyhead factory. This was followed by preparation and presentation of expert evidence for Hearing 19 on the

Proposed Waikato District Plan for rezoning of land at Ohinewai to establish the Sleepyhead Estate, a mixed commercial, industrial and residential precinct.

CDL Land New Zealand Ltd – Brookfield Estate Stage 2: Preparation of a DSI, RAP and SVR for Brookfield's Estate Stage 2, Havelock North, Hastings to address residual persistent pesticide contamination from historic orchard activities. This included development of an encapsulation regime for impacted soils, delineation of soils of different qualities, and stratified disposal of excess soil from the development, followed by site validation reporting.

Neil Group – Various: Preparation of PSI's and DSIs for Neil Group residential development in Auckland and Bay of Plenty including determination of Remediation Action Plans, Site Management Plans, and Site Validation Reports where required.

Millennium Group Ltd – Sandy Lane Residential Development: Contaminated Land Advisor for the implementation of a revised Remediation Action Plan to address former landfill activities. Works included on call services for environmental advice, accidental discovery of a significant volume of refuse during earthworks, liaison with WorkSafe NZ and Licensed Asbestos Removalists and undertaking a staged validation approach over the site to minimize disruptions during earthworks. Following completion of works, the project required production of expert evidence and technical witness caucusing for High Court claims of loss by the Client against the previous consultancies;

NZ Storage Holdings Ltd - Otahuhu Power Station Redevelopment: Resource consent works to obtain relevant permissions for staged investigation and redevelopment of the former Otahuhu A and Otahuhu B power stations and associated infrastructure (switchyards, transformer bays, DG Stores etc). Detailed investigation of underlying soil quality across the parcel is ongoing.

ERGO Consulting Ltd – Vector Substation Upgrades: Preliminary and detailed investigation of existing substations throughout Auckland and Northern Waikato for the purpose of undertaking upgrade works.

Southern Gateway Consortium Limited – Puhinui Road, Prices Road and State Highway 20 Master Plan: Engaged by the consortium to undertake staged contamination investigations (PSI and DSI's) across an initial 27.6 ha footprint for the expansion of road network linkages and bridges with supplementary detailed investigation of green fields properties in Wiri. Future provision for assessment of the remaining ~150 ha of masterplan footprint was set out in the site management plan prepared.

The Mill Industrial Park Ltd – The Mill Industrial Park Subdivision and Development: Initially commenced engagement to facilitate Environment Court mediation following Auckland Council abatement notices with respect to actual and potential contamination. Following mediation, contaminated land investigations commenced and works expanded into development of remedial action plans and site management plans for the containment of impacted soil within an engineered structure on site. Works also expanded to include detailed site investigation of areas of the Industrial Park to provide recommendations and controls for completing boundary adjustment subdivisions across the site alongside Contaminated Land Advisor role during earthworks;

Northland Waste Ltd – Transfer Station Redevelopment: Preliminary and detailed site investigations of current waste transfer stations for redevelopment including preparation of Environmental Management Plans, design of stormwater and trade waste discharge monitoring regimes.

Ridge Road Quarry Ltd – Managed Fill & Quarry Expansion: Preparation of an Assessment of Environmental Effects of Leachate Discharge from the application to expand the Ridge Road

Quarry Managed Fill to encompass up to 10 million cubic metres of fill over a life of quarry application. The scope of works included provisions for monitoring discharges from sediment retention ponds, management mechanisms for deposition of asbestos containing materials and generation of a site-specific set of waste acceptance criteria.

Pro Floors Ltd – Clean & Managed Fill AEE's and CLA Advice: Preparation of assessments of environmental effects for numerous managed fill locations across the Auckland Region including site specific risk assessments and development of acceptance criteria. In addition, ongoing contaminated land advice has been provided for accidental discovery of contamination, compliance with resource consent conditions and preparation of site closure reports at completion of filling activities.

Dirtworks Ltd – Preparation of Managed Fill AEE's and CLA advice: Preparation of assessments of environmental (discharge) effects for numerous managed fill locations across the Auckland Region including site specific risk assessments and development of waste acceptance criteria. In addition, ongoing contaminated land advice has been provided for accidental discovery of contamination, compliance with resource consent conditions and preparation of site closure reports at completion of filling activities.

P & I Pascoe Ltd – Clean & Managed Fill AEE's and CLA Advice: Preparation of assessments of environmental effects for numerous managed fill locations across the Auckland Region including site specific risk assessments and development of waste acceptance criteria. In addition, ongoing contaminated land advice has been provided for accidental discovery of contamination, compliance with resource consent conditions and preparation of site closure reports at completion of filling activities.