Waipapa Taumata Rau Student Centre and Library Project – Contamination Site Management Plan (CSMP)

Title: Waipapa Taumata Rau Student Centre and Library Project – Contamination Site Management Plan				
Ref: 1103046-RPT-CON-202				
Date	**Issue No**	**Description**	**Prepared by:**	**Approved by SQEP:**
October 2026	1	Draft CSMP for client review	T. Mather	N. O'Rourke
October 2026	2.0	Draft CSMP to support consent application.	T. Mather	N. O'Rourke
October 2026	2.1	For FTTA Substantive Application	T. Mather	N. O'Rourke

1 Introduction

Tonkin & Taylor Ltd (T+T) has been engaged by the University of Auckland (UoA) to prepare this CSMP. The CSMP has been prepared to manage potential effects of ground contamination during earthworks for the UoA Student Centre and Library on the corner of Princes Street and Alfred Street, Auckland Central. The work area is shown in Figure 1 overleaf and is herein referred to as 'the site'.

The persons preparing this CSMP are suitably qualified and experienced practitioners (SQEP) as required by the National Environmental Standards for managing and assessing contaminants in soil (NESCS)[1] and as defined in the NESCS Users' Guide[2].

2 Background and proposed earthworks

We understand that UoA are proposing to redevelop the site. The design proposal[3] indicates that the existing Student Union complex buildings on site will be demolished (B311 and B312). The site will then be redeveloped with a 19,568 sqm building comprising eight levels including two basement levels (Basement and Lower Ground) and six above-ground levels (Ground and Levels 1 to 5), with rooftop plant level.. The proposed basement floor level extends to RL 36.11, which is up to approximately 9.5 m below the existing ground surface.

3 Contamination conditions and basis for procedures

The site history, as documented by the T+T Preliminary Site Investigation (PSI)[4], identified potentially contaminating activities on the site, being:

- Structures and buildings on site constructed prior to 2000 which are likely to contain asbestos containing material (ACM) and lead.
- Potential filling from construction activities during site development containing ACM, PAHs and heavy metals.
- Historical releases of hydrocarbons from underground storage of fuel for boilers. Historical plans indicate an underground storage tank (UST) was located between B311 and B312, which has possibly been drained and filled with slurry, however no decommissioning reports have been provided.
- Historical releases of hydrocarbons from historical and current transformers at the western side of Building 312.

In August and September 2026, T+T completed preliminary sampling of site soils concurrently with the geotechnical investigation. The contamination investigation involved observations and soil sample collection from six boreholes (BH01 – BH06). A summary of the findings of this investigation is presented below:

- Concrete and fine-coarse gravel hardfill is present at the surface across the site and is predominantly underlain by a relatively thin layer of fill (up to 0.9 m depth), then residual soils of the Auckland Volcanic Field (AVF) and East Coast Bays Formation (ECBF). ECBF rock was encountered at depths between 5.1 and 10.3 m.
- Results of soil sampling from the six locations across the site showed:
  - Trace asbestos in soil (< 0.001% w/w fibrous asbestos [FA] and asbestos fines [AF])) was detected in surficial fill material (0.0 to 0.4 m bgl) at BH01 near the western site boundary.
  - There were no exceedances of relevant human health criteria under the NESCS.
  - There was one exceedance of Auckland Unitary Plan (AUP) permitted activity (PA) criteria for lead at BH06 near the central portion of site (0.0 to 0.4 m bgl). The fill material in this area of the site was notably different (fibrous peat with minor gravel and brick fragments).
  - PAHs were detected in near surface fill soils near the central portion of site (BH01 and BH06) above background ranges but below human health and AUP PA criteria.
- Perched groundwater was encountered in the AVF at BH03, below the impacted soil. Regional groundwater is present at depths below approximately 6.5 m bgl in the underlying ECBF residual soils and rock.
- Further sampling is recommended beneath the building post-demolition, and potentially in the vicinity of BH01 and BH06 where trace asbestos and lead exceeding the AUP PA criteria were detected, to better understand soil disposal requirements. This post-demolition "pre-work" testing is set out in Section 5 of this CSMP.

The soil sampling locations are shown below in Figure 2. The soil results table is presented in Table 1.

4 Roles and responsibilities

Role	Responsibility
UoA and / or their appointed project manager.	Responsible for ensuring compliance with resource consent conditions including the requirements of the CSMP and ensuring a SQEP is retained during the works.
Main Contractor (Contractor).	Responsible for implementation of CSMP during earthworks, including monitoring compliance of all sub-contractors with the requirements for the CSMP. The Main Contractor is responsible for ensuring the site and works complies with resource consents, environmental management systems and requirements of Site Management Plans not just related to contaminated land.
Any subcontractor(s) undertaking soil disturbance work.	Responsible for undertaking works applicable to their profession in accordance with the requirements of this CSMP.
Contaminated Land Specialist (SQEP).	Responsible for provision of ground contamination advice during the works and completion reporting. The SQEP shall also complete any additional soil and / or water sampling as required. The SQEP must meet the requirements of a SQEP as per the NESCS Users' Guide. The SQEP meets with the general requirements of a "competent person" under the Health and Safety at Work (Asbestos) Regulations.
WorkSafe New Zealand.	Responsible for enforcing health and safety including the Asbestos Regulations.
Auckland Council.	Responsible for protection of human health and the environment, the monitoring and compliance of consent conditions under their respective rules and / or plans.

5 Pre-work testing

T+T propose undertaking additional sampling to confirm soil disposal requirements post-demolition of the existing buildings. The following process is proposed to assess ground contamination conditions (if any) beneath the buildings and update this CSMP (if necessary):

- The SQEP should liaise with the Contractor (or demolition subcontractor) to review asbestos survey information and the removal processes implemented (if required) during demolition.
- The SQEP will undertake additional sampling for asbestos (NZ semi-quantitative method), metals and PAHs, in general accordance with the locations presented in Figure 3. The proposed sampling will increase the sampling density from 6 to 14 locations for the site.
- The target depth for the investigations will be into natural soil. Samples will be collected of fill and natural soils.
- We understand that soil in the vicinity of BH06 is proposed to be removed from site. Given the lead concentrations in surficial fill exceeding environmental (AUP PA) criteria, it is suggested that the SQEP should conduct an inspection of the area post-demolition and liaise with the Contractor regarding their preferred disposal options. On that basis, the SQEP can confirm if additional pre-work sampling is needed in the vicinity of BH06 (minimum of four locations) to inform disposal.
- If necessary, based on the results of the above, the SQEP should revise this CSMP. Any revisions to this CSMP should be provided to Council prior to bulk earthworks commencing.

6 UST removal procedures

The site history review identified that underground storage tanks (USTs) were previously installed at the site. USTs within the footprint of the basement excavation, will be removed from site and therefore will not pose a potential on-going risk of environmental discharge. The Contractor shall remove the USTs using the following procedures:

<u>The Contractor shall:</u>

- Notify Council of the discovery as soon as practicable, as a minimum before removal of the UST begins.
- Ensure that the removal works are undertaken in accordance with this CSMP and the relevant guidelines, regulations and Council requirements, including but not limited to:
  - Code of Practice for the Design, Installation and Operation of Underground Petroleum Storage Systems. The Occupational Safety and Health Service, Department of Labour, Wellington, 1992.
  - Hazardous Substances and New Organisms Act; and
  - MfE Contaminated Land Management Guidelines, in particular the current edition of *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand.*
- Liaise with the SQEP so that inspection and validation testing of the works is completed.

<u>The provisions of the contaminated site management plan are mandatory for all persons (employees, contractor and sub-contractors) who will be involved in undertaking ground disturbance works on the site.</u>

The SQEP shall:

- Observe the removal of the tank including taking photographs and looking for evidence of breaches in the system.
- Collect soil samples from appropriate locations beneath the infrastructure including, fill points, filling or dispensing lines and beneath storage tanks/areas in accordance with the MfE Contaminated Land Management Guidelines.
- Schedule the soil samples for laboratory analyses for contaminants of concern relevant to the UST, such as TPH, BTEX and/or PAHs.
- Review the laboratory results against the assessment criteria and provide preliminary conclusions as to the status of remaining soils at the site and the need for any further excavation (if any); and

Collate the necessary information, in accordance with the MfE Contaminated Land Management Guidelines, for inclusion in the Site Validation Report.

7 Site management procedures

The **table overleaf** provides the controls and procedures to manage the ground contamination risk during the proposed development.

8 Applicability

This report has been prepared for the benefit of Waipapa Taumata Rau, University of Auckland with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

This CSMP provides a framework for managing contamination hazards on site by identifying potential hazards and suggesting mitigation measures relevant to site conditions and works proposed at the time of writing. This CSMP provides information and recommendations to augment this process but is not intended to relieve the person conducting a business or undertaking (PCBU), previously referred to as the controller of the place of work) of either their responsibility for the health and safety of their workers, contractors and the public, or their responsibility for protection of the environment.

Any persons undertaking ground disturbance works on the site must develop a site-specific risk assessment (such as a job safety analysis (JSA), or similar) to complement this CSMP and to address other health and safety requirements that may be applicable to their particular works. The site-specific risk assessment must also be modified to address any specific health, safety or environmental issues that may arise during the works.

From time to time, statutory requirements, site ownership or occupation, operating procedures or site conditions may vary requiring that this plan be amended or updated. The plan has been prepared on the basis of information available at the date of preparation.

The nature and continuity of soil conditions away from sample locations are inferred and it must be appreciated that actual conditions could vary from the assumed model. We understand and agree that our client will submit this report as part of an application under the Fast-track Approvals Act 2024 and that an Expert Panel as the consenting authority will use this report for the purposes of assessing that application.

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The provisions of the contaminated site management plan are mandatory for all persons (employees, contractor and sub-contractors) who will be involved in undertaking ground disturbance works on the site.

UoA Student Centre and Library Project – Controls and procedures

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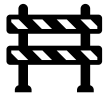
Key Contamination Risks

 **Soil Risk**	• Trace asbestos was detected in surficial fill (from approximately 0.0-0.4 m bgl) at BH01 near the western portion of site. • There were no exceedances of human health criteria for heavy metals or PAHs. • The lead concentration in surficial soils near BH06 (from approximately 0.0-0.4 m bgl) at the central portion of the site exceeded adopted environmental criteria. • If gross contamination is encountered, key exposure pathways are likely to be via inhalation, skin contact or ingestion. Further health and safety controls might be required to be implemented to protect human health e.g. site workers, nearby residents or commercial workers. If gross contamination is discovered, the contingency measures outlined below must be followed.	 **Groundwater**	• Based on the PSI and preliminary soil sampling results, there are no specific contamination-related requirements for dewatering of groundwater.

Health and Safety Procedures

 **Induction and training**	• **<u>All site personnel</u>** shall be required to undergo a CSMP briefing by a SQEP before commencing work. • Specific training must be given on identifying unexpected contamination, asbestos control procedures controls and procedures to minimise discharges of contaminants to the environment and minimum requirements for Personal Protective Equipment (PPE) and its use. The purpose of the induction and training is to ensure that personnel are competent to undertake the requirements of this CSMP.
 **PPE**	• Standard PPE (full length clothing) is expected to be sufficient to manage contamination from soil disturbance. • If unexpected contamination is identified or suspected, the SQEP shall be contacted for advice on further required protective equipment.
 **Decontamination**	As part of good environmental practice, to avoid tracking soil outside of the works area the following controls should be implemented: • Bootwash with fresh water to clean boots of soil and / or debris. • Hand wash for workers to clean hands regularly at breaks and at the end of the day.

 **Asbestos Control Procedures**	**Trace asbestos contamination controls** shall be implemented in addition to the controls detailed in this table. • See **Table 2** below for trace asbestos control requirements. • Trace asbestos controls shall be overseen by a Competent Person. • If suspected asbestos fragments are encountered, the accidental discovery procedures described in the Contingency Measures section below shall be implemented and a SQEP contacted for further advice.
Additional Site Investigations and Sampling Procedures	
 **Investigations**	• The investigations completed to date have been undertaken to support resource consent. • Structures remain on the site that were built prior to January 2000, which may contain asbestos. Asbestos demolition surveys are required prior to the removal or demolition of any of these structures. • The pre-works testing process is set out in Section 5.
Site Management Procedures	
 **Site Establishment**	• **Trace asbestos controls** shall be implemented in accordance with **Table 2** below. • Establish standard earthworks controls for dust, erosion, sediment, and stormwater. • Prior to works commencing the site shall be appropriately fenced to prevent access by the public. • A site hazard board shall summarise the on-site works and state that risks are present from soil contamination. It shall also include notification procedures and health and safety actions for unexpected discovery of contaminated soil, if encountered. • Contamination associated hazards to be addressed in the contractor's health and safety plan. • Arrange disposal permits for excavated soil to be disposed to an appropriate waste disposal facility. • UoA or their nominated contractor shall engage a SQEP to supervise the works and shall contact the SQEP if unexpected contamination is encountered. • A PPE store shall hold the necessary PPE for use of staff and a decontamination unit, and wheel wash shall be established.
 **Spoil Disposal procedures**	• We understand that on-site reuse of site-won material is not currently proposed as part of the redevelopment. From a contamination perspective, fill material (soil to approximately 0.9 m below ground level) could be retained onsite as concentrations are below adopted human health criteria. If contamination remains onsite, Council is likely to require a long-term management plan, and geotechnical suitability would need be confirmed. • Any spoil requiring offsite disposal shall be disposed to a facility consented to take that material. Permits and acceptance must be received from the disposal operator before transporting material. • Potential disposal options for each material type based on investigations to date are listed below, subject to acceptance from disposal facility operators: – Shallow fill soils (to 0.4 m bgl) in the vicinity of BH01 will need to be disposed of to a managed fill facility that can accept trace levels of asbestos (< 0.001% for FA and AF). – Shallow fill soils in the vicinity of BH06 exceed typical managed fill criteria for lead. These soils would likely need to be disposed of to a landfill facility licensed to accept contaminated soil. – Shallow soils represented by other investigated locations may be able to be accepted as clean fill. – Underlying natural strata is expected to be accepted as clean fill.

	Further sampling as outlined in Section 5 is recommended post-demolition to better understand soil disposal requirements and re-use recommendations. Results will need to be provided to the facility operator(s) and acceptance will be subject to approval by the facility operator(s).
 **Spoil excavation, transport and management**	**<u>GENERAL SITE CONTROLS:</u>** • All soil being disposed offsite shall be transported in covered trucks. • Wheels of trucks transporting soil offsite shall be free of debris prior to leaving site, and there shall be no tracking of material onto roads or footpaths. • The disposal documentation / weighbridge dockets for each load shall be collected and provided to the SQEP one month after completion of works. • Significant stockpiling of excavated soils is not anticipated. Where required, stockpiles shall only be placed in an area where runoff can be controlled, clear of any flooding or ponding areas and at an adequate distance away from receptors. Alternatively appropriate sediment and erosion controls shall be constructed around the stockpiles (cut off drains, silt fences and silt socks). • The maximum height of any stockpile is likely to be 3 m, subject to confirmation by a geotechnical engineer. • The stockpiles will be covered with geotextile or mulched if not in use for more than 3 days to prevent rainfall induced erosion and dust. • Any stockpile that is inactive for longer than 1 week shall be stabilised (i.e. mulched).
 **Dust Control and Air Monitoring**	• To be implemented in accordance with standard earthworks practices. • Dust will be managed by maintaining damp conditions using water sprays in areas of ground disturbance / excavation. Dust controls shall comply with the applicable Council guidelines, regulations and other applicable legislation. • Consider stopping work if wind conditions are too high and dust cannot be mitigated.
 **Imported Material and material reuse Procedures**	All soils imported to site must be either: • Hardfill sourced direct from a consented quarry. • Crushed concrete sourced from a commercial recycler who can provide suitable testing information to shows that the materials are free of asbestos. • Be soil that has been adequately investigated in accordance with MfE Contamination Land Management Guidelines No.5 – Site Investigation and Analysis of Soils (Revised 2021)[7] by a SQEP to meet the 'clean fill' definition. For heavy metals, clean fill criteria are defined by the published background concentrations for Auckland volcanic. For organic contaminants, clean fill criteria is defined by the WasteMINZ 2023 Technical Guidelines for Disposal to Land. Revision 3.1. Table H-2. *Class 5 Clean fill waste acceptance criteria*. **In all cases the testing information shall be provided to the SQEP for approval prior to the materials being imported to site.**
 **Erosion and Sediment Control and Water Management**	**<u>Erosion and Sediment Control:</u>** • These effects will be managed by ensuring that no debris or spoil generated by the works is allowed to be discharged to the stormwater system. • Erosion and sediment control shall be installed prior to soil disturbance works and managed in accordance with the Council's guidelines (i.e. GD05) and other applicable legislation, including where necessary the use of silt fences and runoff diversion bunds (as appropriate) and filter cloths / mats installed over stormwater cesspits. Soil must be reinstated to an erosion-resistant state within one month of completion of the soil disturbance works. **<u>Stormwater (Ponding Water):</u>** • Clean water shall be diverted away from ground disturbance / excavation areas. Wherever possible water generated or encountered in areas of ground disturbance / excavation will be retained onsite to soak away. • Accumulated water, which does not soak away, shall be contained for: – Soakage to ground through a soakage area onsite. The location and suitability of soakage will need to be considered by Contractor; or

- If soakage cannot be maintained and off-site discharge is required, discharge to trade waste/sewer under permit or through a trade waste contractor will be required. Pre-discharge treatment and testing may be required to confirm compliance with relevant discharge limits; or
- Discharge to the stormwater system. If this is required, the water shall be initially treated to remove sediment/solids. Validation of the discharge would be undertaken to establish it can meet the stormwater discharge limits prior to discharge.

- If visual evidence of contamination (e.g. sheen and / or odorous) is encountered, then the water shall not be allowed to be disposed to stormwater. The water shall be allowed to infiltrate into the ground or be pumped out to a sewer subject to securing any necessary permits.

Discharge of dewatering water

- Perched groundwater was encountered during site investigations. Groundwater encountered during excavations will be managed with the above stormwater procedures.

Contingency Measures

Unexpected Discoveries / Uncontrolled Discharges:

If unexpected contamination (such as fill, unusually coloured, odorous, or suspected asbestos containing material) is identified during earthworks on any part of the site, or uncontrolled discharges occur then the Contractor shall ensure the following (where appropriate):

- All works shall cease within 10 m of the suspected contamination.
- The Contractor shall contact the SQEP for advice as soon as the area is made safe. Where required, the SQEP shall visually inspect the material and provide additional advice regarding its safe handling.
- Works shall not recommence until the SQEP has given approval.
- Discharge of any ponded water or dewatering water to stormwater shall stop until approval to recommence discharge is obtained from the SQEP and the regulatory authority.
- No soil shall be taken offsite from the impacted area until the SQEP has given approval. All details of the discharge (volume, type, location), contamination encountered, and procedures taken to remedy the situation are to be recorded and included with the Site Validation Report to be submitted to Auckland Council at the completion of works.
- All details of the discharge (volume, type, location), contamination encountered and procedures taken to remedy the situation are to be recorded and included with the Site Validation Report to be submitted to Auckland Council at the completion of works.

Complaints procedures:

A written record of all complaints received shall be maintained. The Contractor's site supervisor shall initiate an investigation and notify Auckland Council as soon as practicable on receipt of a complaint, including providing details of any corrective actions taken. Appropriate feedback will be provided to the complainant, such as the response made and any corrective actions taken, in response to the complaint.

Notification requirements:

UoA or the client appointed representative shall be notified immediately in the event that any contingency measures are required to be implemented. Auckland Council (regulatory) shall be notified in writing as soon as practicable in the event of receiving any complaints.

Works Completion Reporting

- Verification observations shall be conducted by the SQEP. The verification programme recommendations includes observation of the ground works to monitor compliance with the CSMP, and to document the final site condition including sampling results and locations of retained material.
- Validation sampling will be carried out from appropriate locations beneath the infrastructure of the decommissioned UST including, fill points, filling or dispensing lines and beneath storage tanks/areas, with soil samples tested for contaminants of concern relevant to the UST, such as TPH, BTEX and/or PAHs.
- Validation sampling shall be undertaken by the SQEP, in general accordance with requirements of the MfE Contaminated Land Management Guideline No. 5[5].

- A site validation report shall be prepared by the SQEP on completion of the earthworks and upon receipt of all necessary documentation.

Information required from the contractor, to be provided the SQEP within one month of works completion:

- Copies of weigh bridge summaries and disposal volumes for the disposal to clean fill, managed fill and / or consented landfill.
- Documentation confirming the source, and where necessary testing, of any imported material during works.
- Discharge details for dewatering water from the site works areas including volumes, locations, duration, observations, sediment removal undertaken and any performance monitoring.
- Results of soil, surface or groundwater water quality testing completed during the works.
- Records of visits from contaminated land related council representatives.
- Details of any complaints in relation to contamination.
- Details of any contaminated land related health & safety incidents and how they were resolved.
- Details of unexpected discoveries and the contingency action undertaken.

References

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

2 Ministry for the Environment, 2012. Users' Guide - National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

3 Warren and Mahoney Architects, October 2026. Waipapa Taumata Rau, The University of Auckland Student Centre and Library 100% FTAA Substantive Application Rev B, Architectural & Landscape Design Report. Prepared for Waipapa Taumata Rau, The University of Auckland

4 T+T, University of Auckland Waipapa Taumata Rau, Student Centre and Library – Contaminated Land Preliminary Site Investigation. October 2026. T+T reference: 1103046-RPT-CON-201 v2.1

5 Ministry for the Environment, revised 2021. Contaminated Land Management Guideline No. 5. Site Investigation and analysis of soils.

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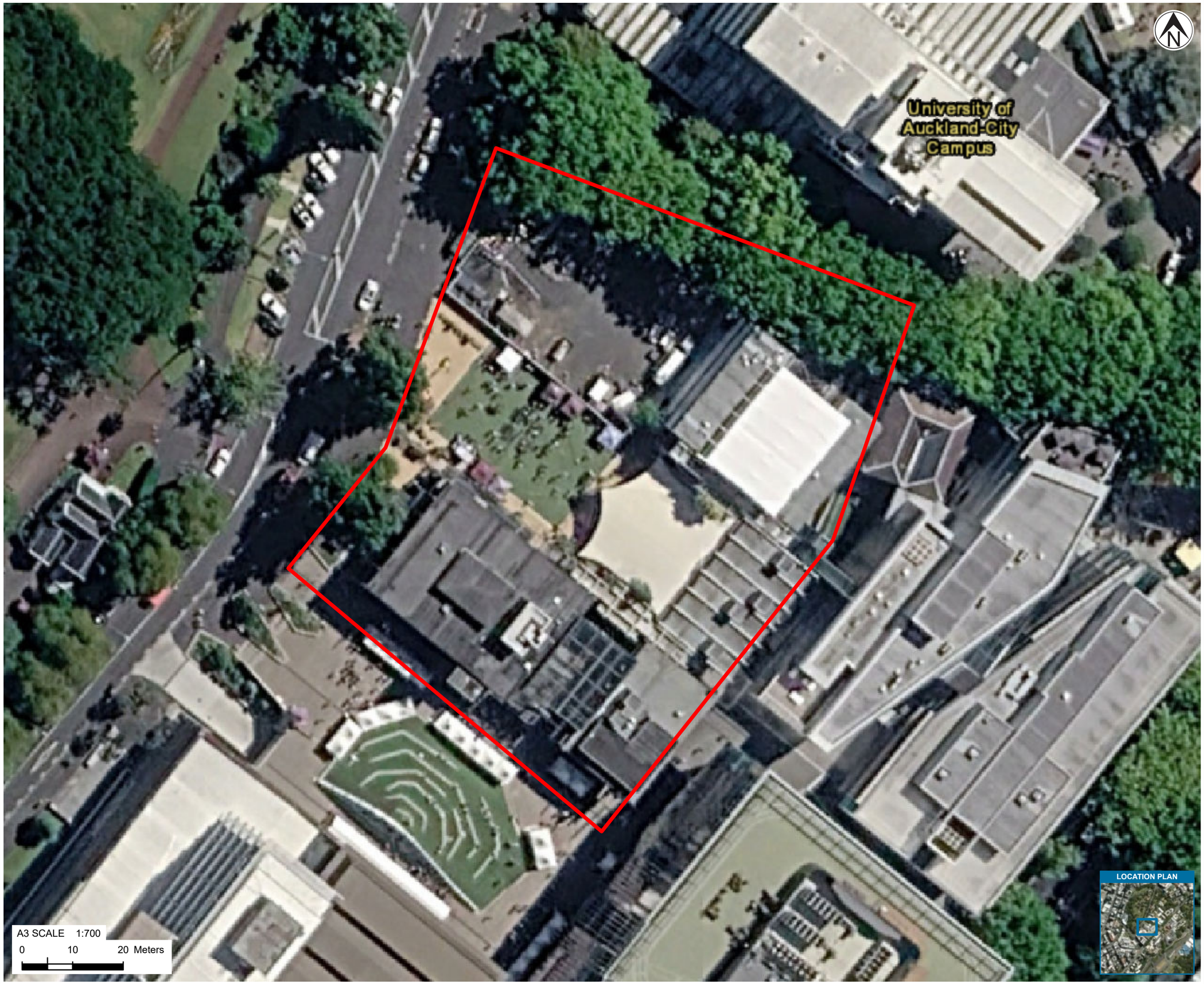

LEGEND

Site Boundary

CRS: WGS 1984 Web Mercator Auxiliary Sphere
Credits: Auckland Council, LINZ, NIWA, T+T, Auckland Council, NIWA, Vantor, LINZ, Stats NZ, Esri, HERE, Garmin

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APPROVED DATE

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UOA LIBRARY AND STUDENT HUB PROJECT

Site Location Plan

PROJECT No.	1103046	
FIG No.	FIGURE 1.	
SCALE (A3)	1:700	REV 0

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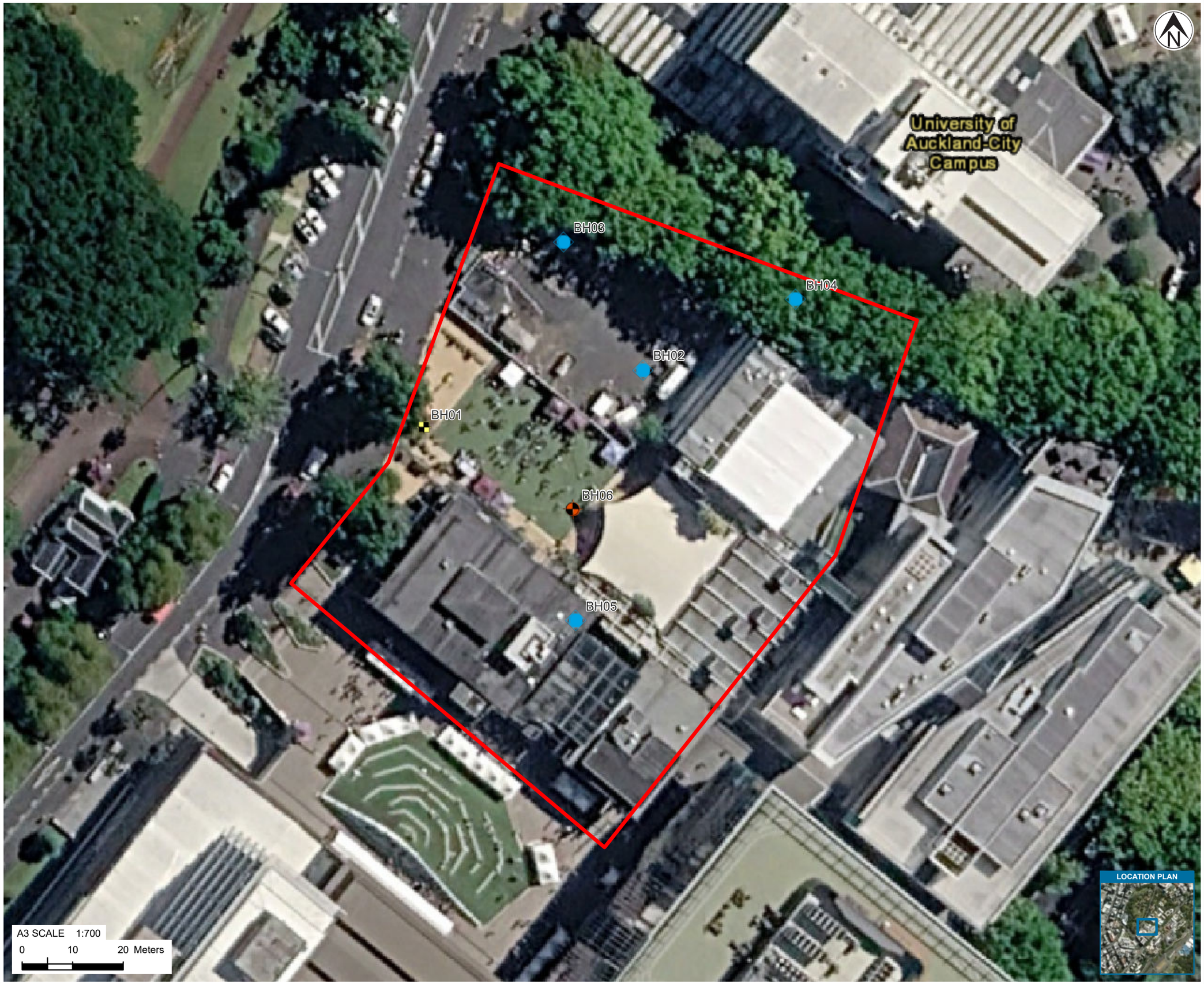

LEGEND

Investigations or Sampling

- Results below background concentrations
- Trace asbestos detected in soil
- Results exceed AUP PA
- Site Boundary

CRS: WGS 1984 Web Mercator Auxiliary Sphere
Credits: Auckland Council, LINZ, NIWA, T+T, Auckland Council, NIWA, Vantor, LINZ, Stats NZ, Esri, HERE, Garmin

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Borehole Sampling Locations

PROJECT No.	1103046		
FIG No.	FIGURE 2.		
SCALE (A3)	1:700	REV	0

Table 1: Analytical soil results - University of Auckland Waipapa Taumata Rau, Libarary and Student Hub

Sample ID	Commercial/ industrial outdoor worker human health guideline values[1]	Auckland Unitary Plan Permitted Activity Criteria[4]	Auckland Background Concentrations (volcanic range)[3]	BH01			BH02			DUP_01	BH03	BH04	BH05		BH06		
Lab number				4287036.27	4287036.28	4287036.3	4287036.2	4287036.4	4287036.9	4287036.12	4287036.13	4310559.1	4287036.2	4287036.21	4287036.33	4287036.34	4287036.37
Depth (m)				0.0-0.4	0.6-0.9	2.0-2.3	0.5-0.6	1.2-1.3	2.9-3.0	0.5-0.6	1-1.5	0.2-0.6	0.6-1.0	1.2-1.5	0.0-0.4	0.8-1.2	4.1-4.5
Strata				SILT, some gravel	SILT, some clay	Sandy gravelly SILT	Sandy SILT	Sandy GRAVEL	Silty GRAVEL, some sand	Sandy SILT	SILT, some clay	SILT some sand	SILT	Silty gravelly SAND	PEAT (fibrous)	Clayey SILT	SILT
Date				4/09/2026	4/09/2026	4/09/2026	12/08/2026	12/08/2026	12/08/2026	12/08/2026	12/08/2026	10/09/2026	31/08/2026	31/08/2026	3/09/2026	3/09/2026	3/09/2026
Asbestos in Soil[5]																	
Asbestos Type	-	NA	< LoR	Chrysotile (White Asbestos) detected	Asbestos NOT detected	-	Asbestos NOT detected	-	-	-	-	Asbestos NOT detected	Asbestos NOT detected	-	Asbestos NOT detected	-	-
Asbestos as AF/FA as % of Total Sample	0.05%	NA	< LoR	< 0.001	< 0.001	-	< 0.001	-	-	-	-	< 0.001	< 0.001	-	< 0.001	-	-
Asbestos in ACM as % of Total Sample	0.001%	NA	< LoR	< 0.001	< 0.001	-	< 0.001	-	-	-	-	< 0.001	< 0.001	-	< 0.001	-	-
Heavy metals																	
Arsenic	70	100	12	4	3	< 2	< 2	< 2	7	< 2	< 2	< 2	< 2	< 2	7	2	< 2
Cadmium	1,300	7.5	0.65	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.29	< 0.10	< 0.10
Chromium	6,300	400	125	55	90	42	32	39	73	31	81	72	87	43	46	84	18
Copper	NL	325	90	25	36	35	28	29	49	28	22	38	39	37	161	33	11
Lead	3,300	250	65	88	16.8	8.9	6.1	7.3	24	6.1	8.7	11.6	11	7.3	550	18.2	7.4
Nickel	6000 [2]	320[3]	320	28	21	54	33	57	112	31	16	65	22	43	96	21	16
Zinc	400,000 [2]	1160[3]	1160	93	26	61	88	83	79	89	23	41	28	64	330	23	30
Polycyclic Aromatic Hydrocarbons																	
1-Methylnaphthalene	0.77[6]	-	<LoR	< 0.015	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	< 0.013	-	-
2-Methylnaphthalene	3,000[6]	-	<LoR	< 0.015	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	< 0.013	-	-
Acenaphthene	45,000[6]	-	<LoR	0.03	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.121	-	-
Acenaphthylene	-	-	<LoR	< 0.015	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.015	-	-
Anthracene	230,000[6]	-	<LoR	0.03	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.23	-	-
BaP equivalent	35	20	2	0.17	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	1.03	-	-
Benzo (a) anthracene	refer BAPeq	refer BAPeq	<LoR	0.20	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	1.27	-	-
Benzo (a) pyrene (BAP)	refer BAPeq	refer BAPeq	<LoR	0.30	< 0.039	-	< 0.036	< 0.039	-	< 0.036	< 0.015	-	< 0.042	< 0.037	1.83	-	-
Benzo (a) pyrene Toxic Equivalence (TEF)	-	-	<LoR	0.30	< 0.039	-	< 0.036	< 0.039	-	< 0.036	< 0.036	-	< 0.041	< 0.037	1.81	-	-
Benzo (b) fluoranthene + Benzo (j) fluoranthene	refer BAPeq	refer BAPeq	<LoR	0.23	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.036	-	< 0.017	< 0.015	1.41	-	-
Benzo (e) pyrene	73[6]	-	<LoR	0.11	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.68	-	-
Benzo (g,h,i) perylene	-	-	<LoR	0.15	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.85	-	-
Benzo (k) fluoranthene	refer BAPeq	refer BAPeq	<LoR	0.10	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.53	-	-
Chrysene	refer BAPeq	refer BAPeq	<LoR	0.18	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	1.03	-	-
Dibenzo (a,h) anthracene	refer BAPeq	refer BAPeq	<LoR	0.03	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.148	-	-
Fluoranthene	refer BAPeq	refer BAPeq	<LoR	0.41	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	2.6	-	-
Fluorene	30,000[6]	-	<LoR	< 0.015	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.066	-	-
Indeno (1,2,3-c,d) pyrene	refer BAPeq	refer BAPeq	<LoR	0.14	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	0.85	-	-
Naphthalene	230[7]	NL[8]	<LoR	< 0.08	< 0.08	-	< 0.08	< 0.08	-	< 0.08	< 0.015	-	< 0.09	< 0.08	< 0.07	-	-
Perylene	67[6]	-	<LoR	0.06	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.08	-	< 0.017	< 0.015	0.33	-	-
Phenanthrene	-	-	<LoR	0.17	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	1.2	-	-
Pyrene	23,000[6]	NL[8]	<LoR	0.38	< 0.016	-	< 0.015	< 0.016	-	< 0.015	< 0.015	-	< 0.017	< 0.015	2.8	-	-
Total of Reported PAHs in Soil				2.40	< 0.4	-	< 0.4	< 0.4	-	< 0.4	< 0.4	-	< 0.5	< 0.4	15.2	-	-

Notes:

'-' indicates not analysed or no relevant acceptance criteria

NL' indicates contaminant is non-limiting (>10,000)

All results are reported in mg/kg

250	Bold values indicates concentration exceeds upper limit of expected background concentrations
250	Greyed cell indicates concentration exceeds Auckland Unitary Plan Permitted Activity Criteria

1 - Mfe Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.

2 - Guideline values for Nickel and Zinc from NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure 1999.

3 - Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: volcanic soils

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

5 - Criteria from BRANZ soil guideline value for asbestos based on Commercial and Industrial land use.

6 -USEPA Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.

8 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Soil acceptance criteria for protection of groundwater quality.

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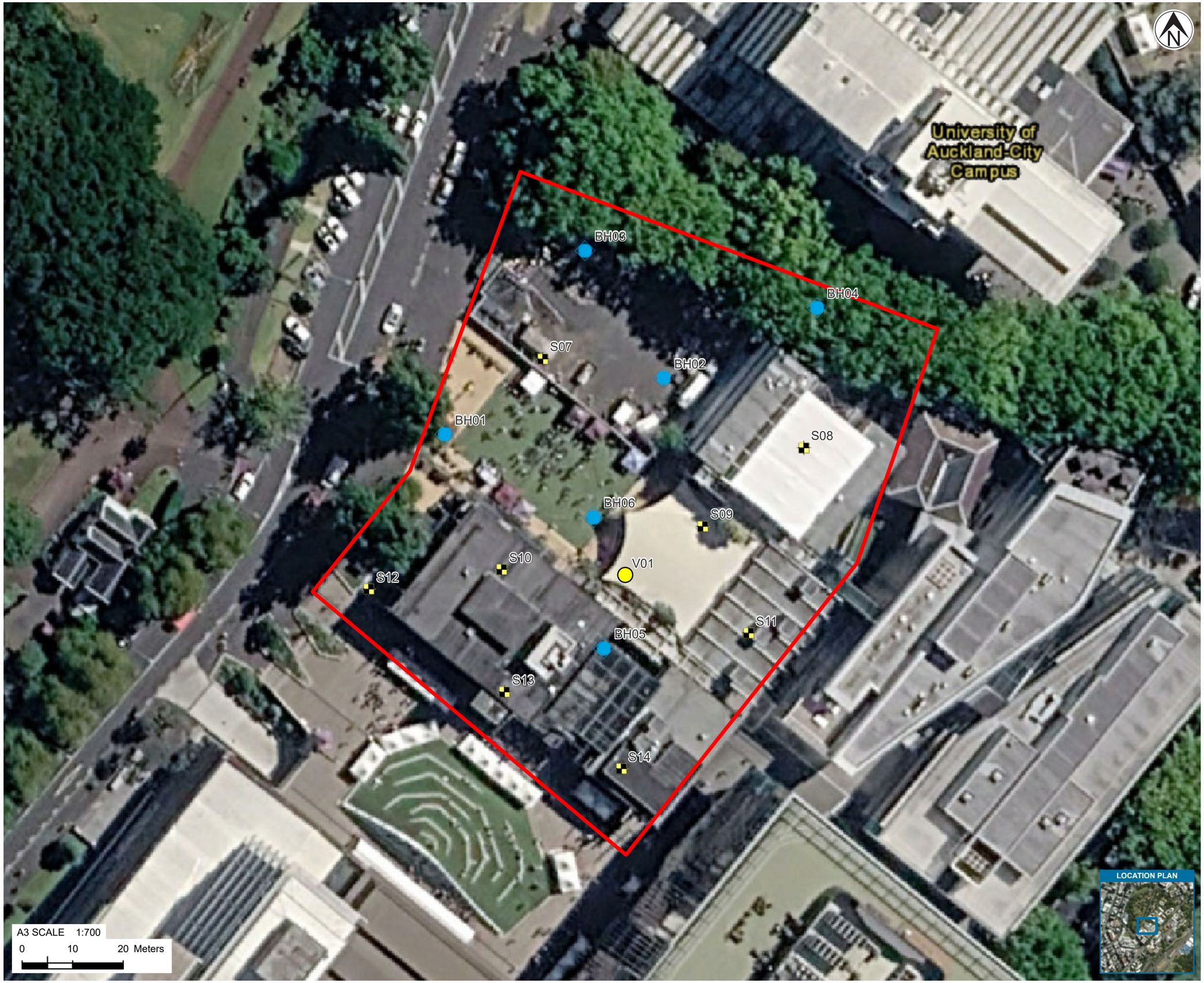

LEGEND

Investigations or Sampling

- Preliminary sampling locations
- Proposed pre-work sampling locations
- Indicative UST validation sampling location
- Site Boundary

CRS: WGS 1984 Web Mercator Auxiliary Sphere
Credits: Auckland Council, LINZ, NIWA, T+T, Auckland Council, NIWA, Vantor, LINZ, Stats NZ, Esri, HERE, Garmin

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LOCATION PLAN

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UOA LIBRARY AND STUDENT HUB PROJECT

PROPOSED PRE-WORK SAMPLING PLAN

PROJECT No.	1103046
FIG No.	FIGURE 3.
SCALE (A3)	1:700 REV 0

Table 2: Asbestos in Soil earthwork controls

Scenario	Trace asbestos contamination
	< 0.01 f/ml in air ≤ 0.001% w/w AF+FA in soil < 0.01% w/w ACM
Additional documentation/ notification requirements	No additional notification required.
Oversight by a licensed removalist	Not required.
Personal protective equipment	No asbestos-specific PPE as concentrations is unlikely to exceed trace levels in air.
Respiratory protective equipment	No asbestos-specific requirements as concentrations are unlikely to exceed trace levels in air.
Dust/asbestos fibre suppression	Water spray via localised points.
Air monitoring	Air monitoring not required.
Cleaning facilities	Foot wash and used PPE collection area.
Vehicle (truck) protection	Truck lining/soil wrapping depends on the receiving landfill. All trucks should be covered.
Truck/excavator air conditioning	Standard air conditioning.
Vehicle washing facilities	Visual assessment by a competent person* or contaminated land SQEP following brush and or wash down.

*A competent person must meet the requirements of regulation 41(3) of the Asbestos Regulations.