DETAILED SITE INVESTIGATION (DSI)

69 TRIG ROAD 149-151 & 155-157 BRIGHAM CREEK ROAD,

WHENUAPAI, AUCKLAND

Reference Number: REP-1475/DSI/JUN20(REV1)

PREPARED FOR: NEIL CONSTRUCTION LIMITED

12 JUNE 2020

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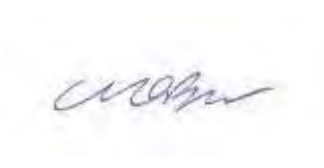
Statement

This 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 managed 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.*

Report prepared on behalf of GSL by:	Report reviewed and authorised on behalf of GSL by:
	
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Thank you for the opportunity to carry out this investigation. Should you have any queries regarding this report please do not hesitate to contact us on 09 475 0222.

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EXECUTIVE SUMMARY

Neil Construction Ltd propose to develop the piece of land encompassed by 69 Trig Road, 149-151 and 155-157 Brigham Creek Road, Whenuapai through the demolition of the existing residential structures and infrastructure, subdivision of the titles creating some 60 new lots. Landuse will comprise a mixture of commercial and residential landuses and the proposed development will include cut to fill earthworks across the full extent of the site on the order of 48,200 m^3 to achieve the desired site profile. As a previous environmental due diligence investigation conducted by Geosciences Ltd (GSL) identified potentially contaminating landuses on site including importation of up to 14,000 m^3 of unverified fill material onto the southeast portion of 69 Trig Road (HAIL Item I), the potential for the bulk storage and use of persistent pesticides in farm sheds across the site (HAIL Item A.10), and the presence of domestic wastewater septic tanks and effluent disposal infrastructure associated with the residential activities on site (HAIL Item G.5). In accordance with the recommendations of that investigation, and as required by a request for further information made by Auckland Council, GSL were engaged to undertake a detailed site investigation (DSI) on the piece of land in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG), the *National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health* (NES) and Chapter E.30 of *the Auckland Unitary Plan (Operative in Part)* (AUP(OP)).

The investigation included a review of the previous environmental investigation and a review of a geotechnical investigation of the site which confirm the location, extents, and composition of the unverified fill materials. Based on the findings of the geotechnical report and the GSL's previous investigation, a conceptual site model for potential contamination was developed identifying the fill and storage sheds as the primary sources of potential contamination on the site. The conceptual model also noted that most efficient methodology for assessing the potential impacts from domestic wastewater disposal is to remove the systems and conduct validation sampling in order to confirm that no residual contamination is present.

Based on the conceptual model, GSL undertook an intrusive investigation through the collection of 29 soil samples from 12 test pits excavated through the unverified fill, the collection of 11 discrete surface soil samples on a judgemental basis around the storage sheds on site, and the collection of a further 3 composite soil samples from cropped areas in order to further confirm the findings of the previous investigation in those former cropped areas.

Based on the conceptual model and observations made during test pitting, soil samples from the fill were analysed for a broad range of contaminants of concern including heavy metals, polycyclic aromatic hydrocarbons, organochlorine pesticides, and asbestos containing materials. Surface soil samples from around storage sheds were analysed for arsenic, copper lead, and OCPs, or for lead only. Analysis of the soil samples revealed:

- No soil sample returned a concentration of any contaminant of concern in excess of the NES residential soil contaminant standard or the AUP(OP) permitted activity soil acceptance standards;
- soil samples from within the unverified fill returned detectable concentrations of OCPs and PAHs well within the applicable human health and environmental acceptance criteria;

- one soil sample from within the fill returned detectable asbestos fibres below the BRANZ Tier 1 human health threshold for AF/FA for all site users;
- discrete soil samples from potential hotspots returned one concentration of arsenic marginally above the expected background range; and
- one composite soil samples returned a trace detection of ∑DDT

As no soil sample returned concentrations of any contaminant of concern in excess of the applicable NES and AUP(OP) landuse standards, GSL concludes that the proposed change in landuse, subdivision, and development are highly unlikely to result in any risk to human health or the environment.

Due to the detection of contaminants of concern in excess of the expected naturally occurring background concentration ranges within the emplaced fill and storage sheds on 69 Trig Road, the proposed change in landuse, subdivision, and development will be required to address the Regulations of the NES. As this investigation has concluded that the proposed change in landuse, subdivision and development is highly unlikely to result in a risk to human or environmental health, the subdivision and change in landuse can be considered a Permitted Activity under Regulation 8(4) of the NES. Development earthworks will likely require Resource Consent as a Controlled Activity under Regulation 9 of the NES.

A site management plan (SMP) has been provided alongside this DSI which documents the controls to be in place for the protection of human and environmental health as a result of the potential mobilisation of contaminants in soil during soil disturbance works. The SMP also includes the provision for the controlled decommissioning and removal of the onsite septic tanks and effluent disposal systems.

1 INTRODUCTION

Geosciences Ltd (GSL) has prepared the following report for Neil Construction Ltd in accordance with the GSL proposal, Ref: Pro-2062/Apr20, dated 24 April 2020.

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"* (References 1 and 2).

2 PROPERTY DETAILS

Table 1: Property Details

Location	Legal Description	Size	Zoning
69 Trig Road	Lot 3 DP 101583 and ½ Lot 5 DP101583	57,170 m^2 & 4,485 m^2	Future Urban Zone
149-151 Brigham Creek Road	Lot 4 DP 101583	61,270 m^2	Future Urban Zone
155-157 Brigham Creek Road	Lot 2 DP 334953	36,244 m^2	Future Urban Zone
Total Area		15.92 Ha	

The properties at the addresses above, hereafter referred to collectively as 'the site' are located in the predominantly rural Whenuapai area of West Auckland, approximately 13 km to the northwest of the Auckland CBD. The site is predominantly vacant rural land with a residential dwelling in the approximate centre of the site and two smaller residential dwellings on the northwest portion of the site. The surrounding area is predominantly rural residential and rural production land, to the immediate north of the site is the New Zealand Defence Force Whenuapi Airbase.

3 PROPOSED CHANGE IN LANDUSE, SUBDIVISION AND DEVELOPMENT

It is understood that Neil Construction Ltd intend to develop the site through the demolition of the existing site infrastructure, undertake bulk site wide earthworks and subdivide the titles creating up to 60 new lots with mixed use residential and commercial / industrial landuses proposed. Preliminary plans indicate a split of 36 proposed residential lots and 24 commercial lots alongside associated access lots and infrastructure.

Earthworks plans provided to GSL show bulk developmental earthworks proposed across the site including some 48,200 m^3 of cut to fill operations including a cut of up to 2 m through the central portion of the site and fill of up to 3.0 m in the northern portion of the site and up to 5.0 m in the southeast portion. A copy of the proposed scheme plans and earthworks drawings are included as Appendix A.

3.1 LANDUSE CONSENT - LUC60350837

Following application for landuse consent ref: LUC60350837, Auckland Council issued a request for further information under Section 92 of the Resource Management Act noting the following with respect to soil contamination matters:

"Contamination Specialist

A copy of the application has been forwarded to Councils Contamination Specialist who has requested the following additional information

-The Environmental due diligence investigation supplied to consider the potential for soil contamination concludes that a range of potentially contaminating activities have occurred at the site which have not been investigated. As such, consents under the NES:CS and Chapter E,30 of the AUP(OP) may be required as part of the application. Please review section 7 of the Environmental due diligence investigation and, in accordance with its recommendations, submit a soil contamination Detailed Site Investigation Report (DSI), prepared by a Suitably Qualified and Experienced soil contamination Practitioner (SQEP) in accordance with the Contaminated Land Management Guidelines Nos. 1&5 (Ministry for the Environment, revised 2011) for the identified areas subject to historical filling, storage sheds and effluent disposal

-Based on the results of the DSI, please submit a revised Environmental Management Plan or separate Contaminated Soils Management Plan that details the proposed management measures to be undertaken to minimise the identified risks to human health and the environment associated with soil contamination throughout the proposed development works and render the site's soils suitable for the proposed residential activities.

-Based on the results of the DSI, please review and revise the reasons for consent with respect to the NES:CS and AUP(OP) Chapter E.30"

4 STANDARDS AND REGULATIONS

As a result of the proposed change in landuse, subdivision and development outlined above, and in order to address the request for information by Auckland Council detailed in the above section, it will be necessary to address the requirements of the following applicable standards and regulations for the site.

4.1 NATIONAL ENVIRONMENTAL STANDARD (NES)

The *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health* (NES) (MfE, 2012), which came into effect on 1 January 2012, 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 to be 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 subdivision or development on HAIL land requires a detailed site investigation (DSI) of the piece of land to determine if there is a risk to human health as a result of the former activities.

The NES defines five standard landuse scenarios for which soil contaminant standards have been derived. While both commercial and residential landuses are proposed, the most sensitive landuse scenario which is applicable to the proposed change in landuse, subdivision and development at this site is defined by the NES as: *Residential: Standard residential lot for single dwelling with gardens, including home grown produce consumption (10%).*

4.2 AUCKLAND UNITARY PLAN (OPERATIVE IN PART) (AUP(OP))

Section 30(1)(f) of the RMA provides the Auckland Council 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.

The Auckland Unitary Plan (Operative in Part) (AUP(OP)), which was formally notified on 30 September 2013, is a combined regional policy statement, regional coastal plan, regional plan and district plan. Auckland Council notified an operative in part version of the plan on 15 November 2016 (Reference 4).

Chapter E.30 of the AUP(OP) deals specifically with contaminated land and maintains that Council is required to manage both the use of land containing elevated levels of contaminants and the discharge of contaminants from land containing elevated levels of contaminants. As no appeals have been lodged on Chapter E.30, the provisions of that section can be considered operative under Section 87 of the Resource Management Act 1991. For all purposes of this investigation, the relevant provisions of the AUP(OP) relating to soil contamination have legal jurisdiction and those provision have been considered where they may have an impact on the proposed development

5 DSI OBJECTIVES

The objectives of this investigation were to assess:

- the soil quality and any associated risk to human health and the environment as a result of potential contamination in soil on the site as a result of former HAIL activities;
- the resulting status of the activity under the NES;
- what, if any, contaminated land rules of the AUP(OP) apply to the proposed subdivision and development; and
- any further work that may be required under the NES, or the AUP(OP) as a result of the soil quality on site.

6 SCOPE OF WORKS

To achieve the objectives of the DSI, GSL has undertaken the following:

- a review of GSL's previous environmental due diligence investigation
- a review of previous environmental and geotechnical reports;
- the development of a conceptual site model for potential contamination on site based on the sites landuse history;

- the excavation of 12 test pits through the use of a mechanical excavator across an area of identified fill;
- the collection of representative soil samples from within the fill horizon;
- the collection of three composite soil samples from areas of former horticultural activity;
- the collection of seven discrete surface soil samples from potential hotspot areas surrounding former storage shed locations;
- the analysis of soil samples for the contaminants of concern identified in the conceptual site model of potential contamination and
- The preparation this report in accordance with contaminated land management guideline No.1 – "Reporting on contaminated sites in New Zealand" (Ministry for the Environment, 2011) detailing the findings of this investigation and the recommendations, if any, for further work.

7 PREVIOUS INVESTIGATIONS

7.1 GEOSCIENCES LTD - 2019 ENVIRONMENTAL DUE DILIGENCE INVESTIGATION (DDI)

GSL conducted an environmental due diligence investigation (DDI) of the site in March 2019, the findings of which are summarised in the GSL report, *LtR-1331/Mar19*. The investigation included a desktop study of the sites history through review of historic aerial images of the site available on the Retrolens website and Auckland Council GEOMaps website, a review of the certificates of title for the site, a review of the Auckland Council property file for each of the properties making up the site, and the collection of eight composite soil samples from across the full extent of the site in order to assess the potential for soil contamination as a result of historic horticultural activity.

The desktop review noted that the site appears to have been pasture for much of its history until being converted for horticultural use between 1980 and 1988, consistent with the historical certificates of title identifying 1984 as the year the site converted to horticultural landuse. Horticultural activity appeared short lived, having largely ceased in the northern portion of the site by 2000, at which time that portion of the site has been converted to rural residential landuse / pasture. Some smaller scale horticulture continues in the southern portion of the site up to the most recent aerial images. Additionally, filling activities have been undertaken across the southeast corner of 69 Trig Road, these appear to be related to the spreading of three large stockpiles of material noted in 2004-2009 images. The 2013 image shows trucks parked on the southwest corner of the fill area indicating that additional fill material has been imported to the site at that time.

It is clear from the historical images that the piece of land has been subject to horticultural landuse and as the bulk storage and use of persistent pesticides associated with historic horticulture is included on the MfE HAIL under Item A.10, the piece of land would be considered potentially contaminated. Filling operations are noted across a portion of 69 Trig Road, unverified filling is considered to be encompassed by Item I on the MfE HAIL where a risk to human or environmental health is present only.

Additionally, plans contained in the property files identified the approximate locations of septic tanks and associated effluent disposal fields for the dwellings on site. Auckland Council considers

that domestic wastewater treatment and disposal systems are encompassed by Item G.5 on the MfE HAIL.

As noted in Section 3.3 of the DDI, documents held on the property file for 69 Trig Road identified that the previous landowner had been prosecuted for the illegal importation of approximately 10,000 m^3 of fill over an area of approximately 11,500 m^2 which resulted in an *"undulating topography"*.

The following is an excerpt of Section 3.3 of GSL's previous investigation relating to the court proceedings:

> *"Court proceeding note that from 2001 the landowner arranged for Jayel Contracting Ltd to tip cleanfill onto the site. Testimony is held from the proceedings from Mr Noel Stuart Luxford, a Registered Civil Engineer and shareholder of Babbage Consultants, who states that at the request of Waitakere City Council he had "Reviewed some engineering aspects of a volume of earthworks placed at the above property in the first half of 2001." Mr Luxford stated that he had reviewed the contour plan for the site prior to the earthworks and undertook a site inspection in order to make an estimation of the volumes and areas of filling involved.*
>
> *During his site inspection he noted the presence of several stockpiles scattered around the site, he describes the stockpiles as up to 3 m in height with one stockpile of clay and silt material which was up to 4 m.*
>
> *Based on his review of information, Mr Luxford estimated that earthworks were undertaken over an area of approximately 11,306 m^2 with a total cut volume of 1,146 m^3 and a fill volume of 14,141 m^3, these volumes compare with Waitakere City Council's estimates. Based on those figures he estimates that approximately 13, 007 m^3 of fill was imported to site. He estimates that the maximum depth of fill may be as much as 5.5 m in highly localised to the area of the former gully, while the maximum depth outside of the gully would taper from zero to 3.5 m.*
>
> *Mr Luxford undertook a visual inspection of the stockpiled material and where possible the surface of the filled material and noted that there was only very minor inclusions of gravel, concrete and brick. With respect to contamination he states:*
>
> > *"On the Basis of my field observations of the fill quality transported to the site the only material that might provide potential contamination of the site is the inclusion of old bitumen. However, such material is generally considered to be inert if well aged and thus I do not believe there is any longterm risk from such material. Unless there is material hidden beneath the surface which is different from that visible on surface, then I do not consider there to be any contamination risk""*

The DDI noted the potential for a wide range of potential contaminants including heavy metals, polycyclic aromatic hydrocarbons (PAHs) and organochlorine pesticides (OCPs), concluding that a detailed site investigation of the site would be required in order to assess the nature of the fill material and any resultant risks to human health or the environment as a result of the disturbance of that material.

The potential for lead based paint to have been used on storage sheds on site was also noted, in particular on sheds adjacent to the main dwelling which were noted to be in poor condition with flaking and deteriorated external paints. The potential impacts to soil of lead based paint use can be encompassed under Item I on the MfE HAIL where a risk to human or environmental health is present only.

7.2 CMW GEOSCIENCES - 2020 GEOTECHNICAL INVESTIGATION

GSL were provided with a copy of the geotechnical investigation undertaken on site by CMW Geosciences in January 2020 for review to provide context for the underlying soil across the site and for indication on the extents of the unverified fill on the southeast portion of the site.

The investigation included the drilling of two machine boreholes up to 20 m depth, excavation of seven test pits by 20 tonne mechanical excavator to depths of up to 3.0 m in the unverified fill and the advancing of eleven hand auger boreholes across the site to depths of up to 5.0 m.

The investigation described the unverified fill as follows:

> *"Fill encountered in the south eastern corner of 69 Trig Road generally comprised grey, brown, orange and black, clays and clay/silt mixtures, with organic material, concrete, old drainage pipes, and plastic throughout. Testing throughout this material demonstrated peak shear strength of between 48kPa and 208kPa.*
>
> *A thin layer (0.1m) of buried topsoil was encountered at the base of the this fill in TP05-19 and TP07-19."*

The 69 Trig Road fill was recorded to depths of 2.6 m below surface with a thickness of up to 2.45 m at its maximum extent in test pits excavated as part of the investigation. The fill area is mapped at some 11,380 m^2.

Fill was also encountered on the northern portion of 155-157 Brigham Creek Road, however, as noted in GSL's DDI this fill was consented engineered fill emplaced as upgrade works to a culvert on that piece of the site. A small thin lens of fill was identified in the central portion of the site, however the description of the fill matches that of the underlying clay deposits, it is considered highly likely to be localised cut to fill undertaken as part of standard rural activities.

Groundwater levels were recorded during the investigation in hand auger boreholes in March 2019 and in November 2019. The March average depth across the site was 3.08 m below ground level (blg), however groundwater was not encountered in six of the 11 hand auger bores. The November average depth was 2.23 m bgl as measured in test pits and hand auger holes across the site. The groundwater level within the fill horizon on the southeast corner of the site ranged between 1.0 m and 2.8 m bgl.

8 CONCEPTUAL SITE MODEL FOR POTENTIAL CONTAMINATION

8.1 POTENTIAL SOURCES OF CONTAMINATION

The following potential sources of contamination were identified on the site:

- Unverified fill on southeast corner of 69 Trig Road (Item I);
    - *Contaminants of concern:* Heavy metals, polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCPs), asbestos containing material (ACM)
- Potential for bulk storage and use of persistent pesticides (Item A.10);
    - *Contaminants of concern:* Arsenic, copper, lead, and OCPs
- Potential impacts of lead based paint on storage sheds on site (Item I)

- *Contaminants of concern:* Lead only

- Onsite septic tanks and effluent disposal fields associated with the dwelling (Item G.5);
  - *Contaminants of concern:* heavy metals are used as indicators of potential impacts

8.2 EXPECTED SPATIAL DISTRIBUTION

The potential sources of contamination documented above can be expected to produce the following spatial distributions of the contaminants of concern as follows.

8.2.1 UNVERIFIED FILL

The handling and emplacement of unverified fill can be expected to result in a mixing effect of the soils emplaced, that being said if the fill was sourced from several sites then the fill horizon would be expected to have a relatively heterogenous composition, with the potential for pockets of unsuitable material throughout the fill.

8.2.2 BULK STORAGE AND USE OF PERSISTENT PESTICIDES

The use of persistent pesticides through the direct sprayed application to crops is generally expected to result in a uniform distribution of contaminants across the uppermost topsoil horizon, and would not be expected to result in the formation of hotspots.

The bulk storage of persistent pesticides can result in the formation of hotspots where spills or leaks are present and not adequately cleaned up at the time. Hotspots would be expected to be highly localised to area of storage or mixing and would not be expected to be laterally extensive while the highest risk horizon for potential impacts is the surficial topsoil.

8.2.3 LEAD BASED PAINT

Lead based paint can impact the soil directly surrounding structures with external painted surfaces. Paint flakes, chips or dust can infiltrate the surface soils where paints are in deteriorated condition, or at times of routine maintenance where insufficient ground protection is used. Lead concentrations can be elevated in the immediate curtilage of the structure and attenuate rapidly with distance from the source, in GSL professional experience background concentrations are generally found within 3-5 m of the source. Likewise, lead concentrations are generally elevated in surface soils only and attenuate to background concentrations rapidly with depth, impacts are generally restricted to the topsoil horizon.

8.2.4 DOMESTIC WASTEWATER TREATMENT

While the risk for soil contamination as a result of domestic wastewater treatment wastewater treatment systems is considered to be very low, any impacts from the disposal of waste to land within the effluent disposal field would be expected to be constrained to the area of the dripper lines within the disposal field itself, attenuating rapidly with distance and depth from the dripper lines.

8.3 INTRUSIVE INVESTIGATION REQUIREMENTS

Based on the conceptual model described above a systematic soil sampling regime is required in order to assess the unverified fill on 69 Trig Road, while judgemental sampling is appropriate to address any high risk areas for potential spills or mixing of persistent pesticides. Likewise, a judgemental soil sampling regime is appropriate for the assessment of the potential impacts of lead based paint surrounding storage sheds on site.

While the previous investigation assessed the majority of former cropped areas further composite soil sampling is considered appropriate on portions of the former horticultural land in order to provide a more robust assessment of the potential impacts of the direct sprayed application of persistent pesticides.

With respect to the investigation of wastewater treatment systems on site, given the exact location of the septic tanks and disposal lines are not well documented, the most practical approach to the assessment is the controlled removal of the systems followed by judgemental targeted soil sampling of the underlying soil in high risk areas as identified in Section 8.2.3 above. The process and controls required for the removal of the septic tanks and disposal fields are provided in the Site Management Plan (SMP) provided alongside this DSI. With respect to intrusive investigations undertaken as part of this DSI, the effluent treatment and disposal systems are not considered further in the following sections.

9 SOIL SAMPLING AND ANALYSIS

Based on the conceptual model developed in the above sections, GSL undertook intrusive investigation as documented in the following sections. Fieldwork was undertaken over the course of 6-7 May 2020, on both days of fieldwork the weather was fine and clear following a prolonged dry summer period. At the time of the inspection the site was found as documented during the DDI, the main residence had been recently vacated by the previous owners and tree removal works had commenced across the site with demolition works on the house scheduled to commence in the near future.

Site infrastructure is detailed in Figure 2 while test pit and soil sample locations are indicated in Figures 3 and 4.

9.1 UNVERIFIED FILL

In order to assess the fill, GSL undertook a test pit investigation through excavation of test pits on a systematic grid based pattern across the extent of unverified fill. Twelve test pit locations were laid out on three transects across the filled area on an approximate 25 m spacing, infill test pits were undertaken along the central east-west transect in order to intensify the sampling density through the centre of the fill and multiple soil samples were collected from each test pit resulting in the collection of 29 Discrete soil samples from within the emplaced fill.

In terms of sampling density, GSL note that the WasteMINZ *Technical Guidelines for Disposal to Land* recommend a sampling rate of one sample per 500 m^3 for the assessment of fill material while the MfE Contaminated Land Management Guideline No.5 *"Site Investigation and Analysis of Soils"* recommends the collection of soil samples from between 21 and 25 discrete locations on an

approximately 22 m spaced grid pattern for the detection of circular hotspots of 26 m^2 to 28 m^2 diameter with 95% certainty on a two dimensional plane only.

Based on the estimated volume of fill present (up to 14,000 m^3 estimated across some 11,380 m^2 varying in depth from shallow at the edges to >4m in the centre of the gully), 29 discrete soil samples were collected from various depths within the fill horizon. This assessment provides a rate of at least 1 soil sample per 500 m^3 as recommended in the WasteMINZ Guidelines and directly reflects the spatial distribution assessment envisaged within CLMG No.5.

Fill encountered in all test pits was predominantly silty clay material overlying am organic rich, peaty buried topsoil horizon inferred to be the historic ground / gully surface observed in historic aerial photographs. A strong organic odour was noted in the buried topsoil horizon where encountered alongside black staining and a sheen similar to hydrocarbon, in light of the analytical results documented below, and the context of the horizon encountered this is considered to be a result of anaerobic organic decaying matter, not hydrocarbon discharge.

Throughout the full extent of the fill foreign materials were identified including minor plastics / weed-mat / textiles, and building materials including timbers, brick and ceramic fragments, broken concrete, and minor fragments of fibre cement materials. Minor, isolated fragments of potentially ACM material was encountered in surficial horizons of the fill in test pits TP2 and TP4 while fragments of ACM pipe were identified in test pit TP11. Soil samples were collected from the highest risk horizons in test pits where building rubble was identified. While minor isolated fragments of ACM were identified in the fill, the risk of widespread ACM impacts are considered low given the test pit observations. The only area of concern for ACM contamination is surrounding test pit TP11 where broken fragments were more pervasive. Burnt material including timber, ash and organic material was noted at the base of the fill in test pits TP9, TP11 and TP12

Soil samples were collected from the excavator bucket from desired depths using a stainless steel hand trowel and were placed directly into laboratory provided glass sample jars, labelled with the date, sample identification number, sample depth, location, and initials of the sampler noted on the label; sample jars were then stored in a chilly bin to preserve the samples. Sampling equipment was decontaminated in between samples using a soft soap solution in accordance with GSL internal quality control procedures.

Additional soil samples were collected from each test pit where building rubble was identified, using the same methodology as above, and placed in a laboratory provided plastic asbestos sample container ensuring at least 500g of sample was collected to ensure the correct laboratory reporting limits.

Test pit locations are indicated on Figure 3.

9.2 Storage and Use of Persistent Pesticides / Lead Based Paints

In order to assess the potential for hotspots resulting from storage and mixing of persistent pesticides during the sites horticultural use a judgemental soil sampling regime was employed. Soil samples were collected from the surface 0-150 mm topsoil horizon in locations were high risk of potential leaks or spills were noted, such as storage areas, high traffic areas such as doorways or potential mixing / dispensing areas. Soil samples were collected from the uppermost 0-150 mm of topsoil using a stainless steel hand auger and were transferred directly to resealable plastic zipper

bags with the date, sample identification number, sample depth, location, and initials of the sampler noted in the bag.

In order to assess the potential impacts of the use of persistent pesticides, three composite soil samples were collected from three small discrete areas of more recent horticultural activities which were not assessed under the DDI soil sampling regime. Composite soil samples were composed of four discrete subsamples collected using a stainless steel hand auger and composited in the field.

Where the potential for lead paint was noted, soil samples targeted the immediate curtilage of structures, and were collected from the surface 0-150 mm of topsoil from within 2 m of the identified source. It is noted that as lead is a contaminant of concern related to historical horticulture there is some cross-over between the sample locations assessing lead paint and persistent pesticide storage.

Sampling equipment was decontaminated in between samples using a soft soap solution in accordance with GSL internal quality control procedures. Discrete soil sample locations and composite soil sample areas area indicated on Figure 4.

9.3 LABORATORY ANALYSIS AND QUALITY CONTROL

Sample bags and jars were placed in a chilly bin packed with ice with a chain of custody form (COC) indicating the analysis to be performed. Soil samples were dispatched to Eurofins Laboratories in Auckland for the analysis of the contaminants of concern as detailed in Section 8 above.

Eurofins Laboratories are accredited by International Accreditation New Zealand (IANZ) for the analysis undertaken.

While Eurofins are accredited by IANZ for the identification of asbestos, IANZ do not issue accreditation for the semi-quantitative analysis of asbestos in soil. As Eurofins are suitably qualified and experienced in asbestos analytical techniques, they are considered an appropriate facility to undertake semi-quantitative analysis of asbestos in soil.

9.4 ACCEPTANCE CRITERIA AND RELEVANT GUIDELINES

The NES mandates fourteen soil contaminant standards (SCS) for the protection of human health for organic compounds and inorganic elements for various landuse criteria. While the proposed plans indicate a mixture of commercial and residential landuse on site, the NES human health SCS criteria for a residential block with 10% produce (residential 10%) have been applied as the most conservative standard applicable to the proposed change in landuse, subdivision, and development.

The NES does not contain soil contaminant standards for asbestos, therefore analytical results are compared to the Tier 1 Risk Assessment Threshold for asbestos fines (AF) and friable asbestos (FA) set by the BRANZ *New Zealand Guidelines for Assessing and Managing Asbestos in Soil* (BRANZ Guidelines).

The AUP(OP) also set permitted activity environmental discharge and soil acceptance criteria for potentially contaminated land.

Results are also compared to the background concentration ranges of inorganic elements in soils in the Auckland Region for volcanic / non-volcanic soils.

10 ANALYTICAL RESULTS

A comparison of the analytical results with the relevant guideline criteria is provided in Tables 2-5 below. Copies of the laboratory chain of custody document (COC) and analytical transcripts are attached in Appendix D, while a discussion of the results is provided below.

10.1 HEAVY METALS

No soil sample returned a concentration of any heavy metals in excess of the NES residential 10% SCS or the AUP(OP) permitted activity soil acceptance criteria. Only soil sample SS4 returned a concentration of arsenic (13mg/kg) and TP10 (0.5m) returned a concentration of nickel (42 mg/kg) which marginally exceeded the expected naturally occurring background ranges for arsenic (12 mg/kg) and nickel (35 mg/kg) in non-volcanic soils in the Auckland Region.

10.2 ORGANOCHLORINE PESTICIDES (OCPS)

Trace detections of ∑DDT were recorded in soil samples TP1 (1.0m), TP2 (1.5m), TP2 (3.0m), TP3 (1.0m), TP7 (0.5m), and SS2 (0-150mm) while soil sample TP2 (1.5m) also returned a trace detection of dieldrin. All detected OCP concentrations fall orders of magnitude within the NES residential SCS and the AUP(OP) permitted activity soil acceptance criteria.

10.3 POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

Detections of PAHs were returned in soil samples from shallower depths (<2.0 m) in test pits TP1, TP2, TP3, TP4, TP7, TP8, TP9, TP10, and TP12. No soil sample returned a concentration with a BaP equivalent concentration in excess of the NES residential 10% SCS or the AUP(OP) permitted activity soil acceptance criteria.

10.4 ASBESTOS

One soil sample TP11 (0.5m) returned detectable asbestos fibres below BRANZ Tier 1 Risk Assessment Threshold. No other soil sample returned a detection of asbestos fibres.

Table 1: Test Pit Heavy Metal Analytical Results[1]

	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
TP1 (1.0m)	4.7	<0.4	14	14	27	12	52
TP1 (2.0m)	<2	<0.4	<5	<5	11	<5	9.2
TP2 (1.5m)	3.8	<0.4	17	15	34	14	50
TP2 (3.0m)	4.6	<0.4	22	16	21	9.2	43
TP2 (5.0m)	<2	<0.4	<5	<5	7.5	<5	7.1
TP3 (1.0m)	3	<0.4	22	14	14	25	56
TP3 (2.5m)	3.7	<0.4	14	9.5	11	12	21
TP3 (6.0m)	<2	<0.4	5.3	7.5	21	<5	15
TP4 (0.5m)	3.9	<0.4	16	14	11	18	34
TP4 (2.0m)	3	<0.4	12	7.5	8.6	9.9	16
TP4 (3.5m)	<2	<0.4	<5	<5	8.6	<5	6
TP5 (1.0m)	3.1	<0.4	10	13	11	11	26
TP5 (2.0m)	<2	<0.4	<5	<5	12	<5	8.9
TP5 (3.0m)	<2	<0.4	<5	<5	7.8	<5	6.4
TP6 (0.5m)	3.5	<0.4	13	12	8.4	12	24
TP7 (0.5m)	4.4	<0.4	14	17	16	12	31
TP8 (0.5m)	3.6	<0.4	13	13	15	12	20
TP8 (1.0m)	4.9	<0.4	15	34	47	18	56
TP8 (2.0m)	3	<0.4	<5	<5	5.5	<5	8.2
TP8 (2.2m)	4.6	<0.4	5.6	<5	12	<5	5.9
TP9 (0.5m)	5	<0.4	16	12	9.4	13	17
TP9 (1.5m)	7.5	<0.4	13	21	15	8.1	29
TP10 (0.5m)	3.2	<0.4	36	19	19	**42**	47
TP10 (1.2m)	3.5	<0.4	20	12	8.7	5.8	30
TP11 (0.5m)	3.3	<0.4	14	14	9.7	14	26
TP11 (1.0m)	3.5	<0.4	13	15	11	13	75
TP11 (1.5m)	3.5	<0.4	16	12	11	15	20
TP12 (0.5m)	3.1	<0.4	17	14	14	19	27
TP12 (1.5m)	3.9	<0.4	20	15	12	20	31
NES[2]	20	3	460	>10,000	210	NL	NL
AUP(OP)[3]	100	7.5	400	325	250	105	400
Background[4]	0.4-12	<0.1-0.65	2-55	1-45	<5-65	0.9-35	9-180

Notes follow Table 3 below.

Table 3: Test Pit Organic Compound Analytical Results

	∑DDT[5]	Dieldrin	BaP[6]
TP1 (1.0m)	**0.01**	<0.01	**0.12**
TP1 (2.0m)	ND	<0.01	ND
TP2 (1.5m)	**0.02**	**0.04**	**0.76**
TP2 (3.0m)	**0.01**	<0.01	ND
TP2 (5.0m)	ND	<0.01	ND
TP3 (1.0m)	**0.01**	<0.01	**0.07**
TP3 (2.5m)	ND	<0.01	ND
TP3 (6.0m)	ND	<0.01	ND
TP4 (0.5m)	ND	<0.01	**2.29**
TP4 (2.0m)	ND	<0.01	**0.07**
TP4 (3.5m)	ND	<0.01	ND
TP5 (1.0m)	ND	<0.01	ND
TP5 (2.0m)	ND	<0.01	ND
TP5 (3.0m)	ND	<0.01	ND
TP6 (0.5m)	ND	<0.01	ND
TP7 (0.5m)	**0.04**	<0.01	**1.06**
TP8 (0.5m)	ND	<0.01	**0.05**
TP8 (1.0m)	ND	**0.01**	0.10
TP8 (2.0m)	ND	<0.01	ND
TP8 (2.2m)	ND	<0.01	ND
TP9 (0.5m)	ND	<0.01	**3.05**
TP9 (1.5m)	ND	<0.01	**0.0004**
TP10 (0.5m)	ND	<0.01	**0.19**
TP10 (1.2m)	ND	<0.01	ND
TP11 (0.5m)	ND	<0.01	ND
TP11 (1.0m)	ND	<0.01	**0.005**
TP11 (1.5m)	ND	<0.01	ND
TP12 (0.5m)	ND	<0.01	**0.17**
TP12 (1.5m)	ND	<0.01	**0.24**
NES[2]	70	2.6	10
AUP(OP)[3]	12	2.7	20
Background[4]	ND	ND	ND

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 10% Produce (Reference 1).
3. Auckland Unitary Plan (Operative in Part) - Table E.30.6.1.4.2 Permitted activity soil acceptance criteria
4. Auckland Regional Council Technical Publication No.153 (2001) (Reference 7).
5. Total ΣDDT includes the sum of DDT, DDD and DDE isomers. (Reference 5)
6. For benzo(a)pyrene the equivalent BaP concentration is calculated as the sum of each of the detected concentrations of nine carcinogenic PAHs multiplied by their respective potency equivalency factors as per Table 40 of *The Methodology*.
7. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the AUP(OP), Values in **BOLD** exceed the Background Ranges.
8. NA = Not applicable / NL = No Limit / ND= not detected

Table 4: Asbestos Analytical Results

	Asbestos Detected	% Weight/ weight
TP1 (1.0m)	Not Detected	<0.001%
TP2 (1.5m)	Not Detected	<0.001%
TP3 (1.0m)	Not Detected	<0.001%
TP4 (0.5m)	Not Detected	<0.001%
TP5 (1.0m)	Not Detected	<0.001%
TP7 (0.5m)	Not Detected	<0.001%
TP8 (0.5m)	Not Detected	<0.001%
TP9 (0.5m)	Not Detected	<0.001%
TP9 (1.5m)	Not Detected	<0.001%
PT10 (0.5m)	Not Detected	<0.001%
TP11 (0.5m)	Chrysotile asbestos detected in fibre cement fragments and loose fibre bundles	<0.001%
TP11 (1.0m)	Not Detected	<0.001%
TP12 (0.5m)	Not Detected	<0.001%
BRANZ Guidelines	-	0.001% w/w

Notes:

1. BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil - Tier 1 Risk Assessment threshold for friable asbestos (FA) and asbestos fines (AF) for all site users
2. Concentrations measured in dry weight / weight percentage
3. values in BOLD exceed the Tier 1 Threshold.

Table 5: Surface Soil Sample Analytical Results[1]

	Arsenic	Copper	Lead	∑DDT[5]
SC1	<2	<5	<5	ND
SC2	7.4	23	19	ND
SC3	<2	8.6	7.6	ND
SS1	8.4	12	22	ND
SS2	6.8	12	21	**0.01**
SS3	7	11	19	ND
SS4	**13**	28	19	ND
SS5	<2	<5	9.4	ND
SS6	<2	15	6.5	ND
SS7	<2	7.1	5.7	ND
SS8	-	-	18	-
SS9	-	-	15	-
SS10	-	-	19	-
SS11	-	-	17	-
NES[2]	20	>10,000	210	70
AUP(OP)[3]	100	325	250	12
Background[4]	0.4-12	1-45	<5-65	ND

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 10% Produce (Reference 1).
3. Auckland Unitary Plan (Operative in Part) - Table E.30.6.1.4.2 Permitted activity soil acceptance criteria
4. Auckland Regional Council Technical Publication No.153 (2001) (Reference 7).
5. Total ΣDDT includes the sum of DDT, DDD and DDE isomers. (Reference 5)
6. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the AUP(OP), Values in **BOLD** exceed the Background Ranges.
7. NA = Not applicable / NL = No Limit / ND= not detected

11 CONCLUSIONS

Geosciences Ltd carried out a detailed site investigation (DSI) in accordance with the MfE Contaminated Land Management Guidelines on the piece of land encompassed by 151 and 155-157 Brigham Creek Road and 69 Trig Road, Whenuapai.

As a result of the former HAIL activities that have been historically, or are currently, undertaken at the site as identified in previous investigation, GSL developed a conceptual model of the potential for soil contamination that may have occurred, or be occurring, at the site.

The conceptual model identified that the site had been the location of horticultural activities, including the potential for the storage and use of persistent pesticides (HAIL Item A.10), and had been subject to the importation of up to 14,000 m^3 of unverified fill material, which can be encompassed by Item I on the MfE HAIL. Additionally, septic tanks and effluent disposal fields associated with residential landuse were identified (Item G.5).

Based on the conceptual model intrusive investigation included the systematic grid based test pit investigation into the identified area of unverified filling and judgemental targeted soil sampling around farm sheds and areas of potential use of persistent pesticides in order to augment the previous investigation into the sites historical horticultural landuse. The intrusive investigation included the collection of 29 discrete soil samples from various depths in 12 test pits excavated through the fill, the collection of 11 surface soil samples in order to assess potential hotspots identified in the conceptual model, and the collection of 3 composite soil samples from horticultural blocks.

Soil samples were analysed for the contaminants of concern identified in the conceptual model and analysis revealed that:

- No soil sample returned a concentration of any contaminant of concern in excess of the NES residential soil contaminant standard or the AUP(OP) permitted activity soil acceptance standards;
- soil samples from within the unverified fill returned detectable concentrations of OCPs and PAHs well within the applicable human health and environmental acceptance criteria;
- one soil sample from within the fill returned detectable asbestos fibres below the BRANZ Tier 1 human health threshold for AF/FA for all site users;
- discrete soil samples from potential hotspots returned one concentration of arsenic marginally above the expected background range; and
- one composite soil samples returned a trace detection of ∑DDT

As no soil sample returned a concentration of any contaminant of concern in excess of the NES residential 10% SCS or the AUP(OP) permitted activity soil acceptance standards, GSL concludes that the proposed change in landuse, subdivision and development is highly unlikely to result in any risk to human health or the environment.

GSL notes that the septic tanks and effluent disposal systems associated with the residential dwellings on site remain unassessed, the provisions for their removal and validation are addressed in the SMP accompanying this DSI.

11.1 THE NATIONAL ENVIRONMENTAL STANDARDS (NES)

With respect to the majority of the site, outside the areas of effluent disposal, detailed in Section 12 below, no soil samples returned concentrations of contaminants in excess of the applicable NES landuse standards, the detection of contaminants of concern above the expected naturally occurring background concentration ranges the Regulations of the NES will be applicable to the proposed change in landuse, subdivision and development.

While no soil sample returned a concentration of any contaminant of concern in excess of the most conservative applicable NES SCS, it is highly unlikely that the proposed change in landuse, subdivision and development will result in a risk to human health, as a result GSL concludes that the change in landuse and subdivision can be considered as a Permitted Activity under Regulation 8(4) of the NES.

Soil disturbance works including site wide earthworks and, if required, screening and offsite removal of unsuitable fill materials on 69 Trig Road will likely require Resource Consent as a Controlled Activity under Regulation 9 of the.

In order to address the requirements of Regulation 9 a site management plan (SMP) is required which will document the controls to be in place for the protection of human health and the environment as a result of the potential mobilisation of contaminants in soil during soil disturbance on site.

With respect to the onsite effluent disposal systems, due to the small scale of disturbance required to remove the systems, and the low risk to human health involved in the works, GSL considers that the decommissioning and removal of domestic wastewater treatment systems can readily fall within the remit of a Controlled Activity under Regulation 9 of the NES.

11.2 THE AUCKLAND UNITARY PLAN (OPERATIVE IN PART) (AUP(OP))

As no soil sample returned a concentration of any contaminant of concern in excess of the AUP(OP) permitted activity soil acceptance criteria, the piece of land does not meet the Auckland Council definition of contaminated land. As a result, the contaminated land rules of Chapter E.30 of the AUP(OP) will not be applicable to the proposed change in landuse, subdivision and development.

As the decommissioning of the septic tanks and effluent disposal fields are low risk activities and involve only small scale soil disturbance GSL considers that these works falls within the requirements of a permitted activity under Rule E.30.6.1.2 of the AUP(OP).

Rule E.30.6.1.2 allows for the disturbance and offsite disposal of actually or potentially contaminated soil as a permitted activity while the following provisions are met:

1. *"The volume of soil disturbed must not exceed:*
   a. *200 m^3 per site; or*
   b. *200 m^3 per project for sites or roads with multiple concurrent land disturbance projects, where the cumulative total volume of soil disturbance associated with each given project will be used when determining activity status; or*
   c. *an average depth and width of 1 m for linear trenching by network utilities in the road or rail corridor. For the purposes of this rule the rail corridor does not include land more than 10 m from the rail tracks.*
2. *Prior to the activity commencing:*

a. *the Council must be advised of the activity in writing if the volumes of soil disturbed on land containing elevated levels of contaminants exceeds 25 m^3, including details of the measures and controls to be implemented to minimise discharges of contaminants to the environment, and such controls are to be effective for duration of the activity and until the soil is reinstated to an erosion-resistant state; and*
b. *control on linear trenching must be implemented to manage discharges to the environment from trenches acting as migration pathways for contaminants;*

3. *Any discharge from land containing elevated levels of contaminants must not contain separate phase liquid contaminants including separate phase hydrocarbons.*
4. *The duration of the soil disturbance on a site must not exceed two months.*
5. *Any contaminated material removed from the site must be disposed of at a facility or site authorised to accept such materials."*

12 REFERENCES

1. Ministry for the Environment (2003) — *Contaminated Land Management Guidelines No.1: Reporting on contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.

2. Ministry for the Environment (2003) — *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*. Ministry for the Environment, Wellington, New Zealand.

3. Ministry for the Environment (2012) - Users Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Ministry for the Environment, Wellington, New Zealand.

4. Ministry for the Environment (2011) – *Methodology for Deriving Standards for contaminants in Soil to Protect Human Health.* Ministry for the Environment, Wellington, New Zealand.

5. Auckland Council (2013) –*Auckland Unitary Plan (Operative in Part)*, Auckland, New Zealand.

6. Auckland Regional Council (2001) – *Background Concentrations of Inorganic Elements in Soils from the Auckland region (TP153*) – Auckland.

7. Edbrooke, S.W (2001) — *Geology of the Auckland Urban Area,* Institute of Geological and Nuclear Sciences Geological Map 3, Lower Hutt, New Zealand.

8. Auckland Council (2011) - *Auckland Council GEOMAPS*. http://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

9. Ministry for the Environment (rev 2011) - *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand.* Ministry for the Environment, Wellington, New Zealand.

13 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 GSL 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 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 GSL 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. GSL 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 GSL by third parties, GSL has made no independent verification of this information except as expressly stated in the report. GSL assumes no liability for any inaccuracies in or omissions to that information.
6. Given the limited Scope of Works, GSL 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 GSL does not guarantee that contamination does not exist at the site.
8. Except as otherwise specifically stated in this report, GSL 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 1970 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, GSL 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. GSL 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. GSL 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, no third party may use, or rely on, this report unless otherwise agreed by GSL in writing. Where such agreement is provided, GSL will provide a letter of reliance to the agreed third party in the form required by GSL.
15. To the extent permitted by law, GSL 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. GSL 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, GSL does not authorise the use of this report by any third party.

FIGURES

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ENVIRONMENTAL
Level 1, 47 Clyde Road,
Browns Bay, 0630
Tel: (09) 475 0222

Figure 1 - Site Locality

69 Trig Road, 149-151 & 155-157 Brigham Creek Road, Whenuapai

Reference:	J1475
Date:	12/06/2020
Drawn:	DW
Approved:	COB

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Level 1, 47 Clyde Road,
Browns Bay, 0630
Tel: (09) 475 0222

Figure 2 - Site Infrastructure

69 Trig Road, 149-151 & 155-157 Bridgham Creek Road, Whenuapai

Reference:	J1475
Date:	12/06/2020
Drawn:	DW
Approved:	COB

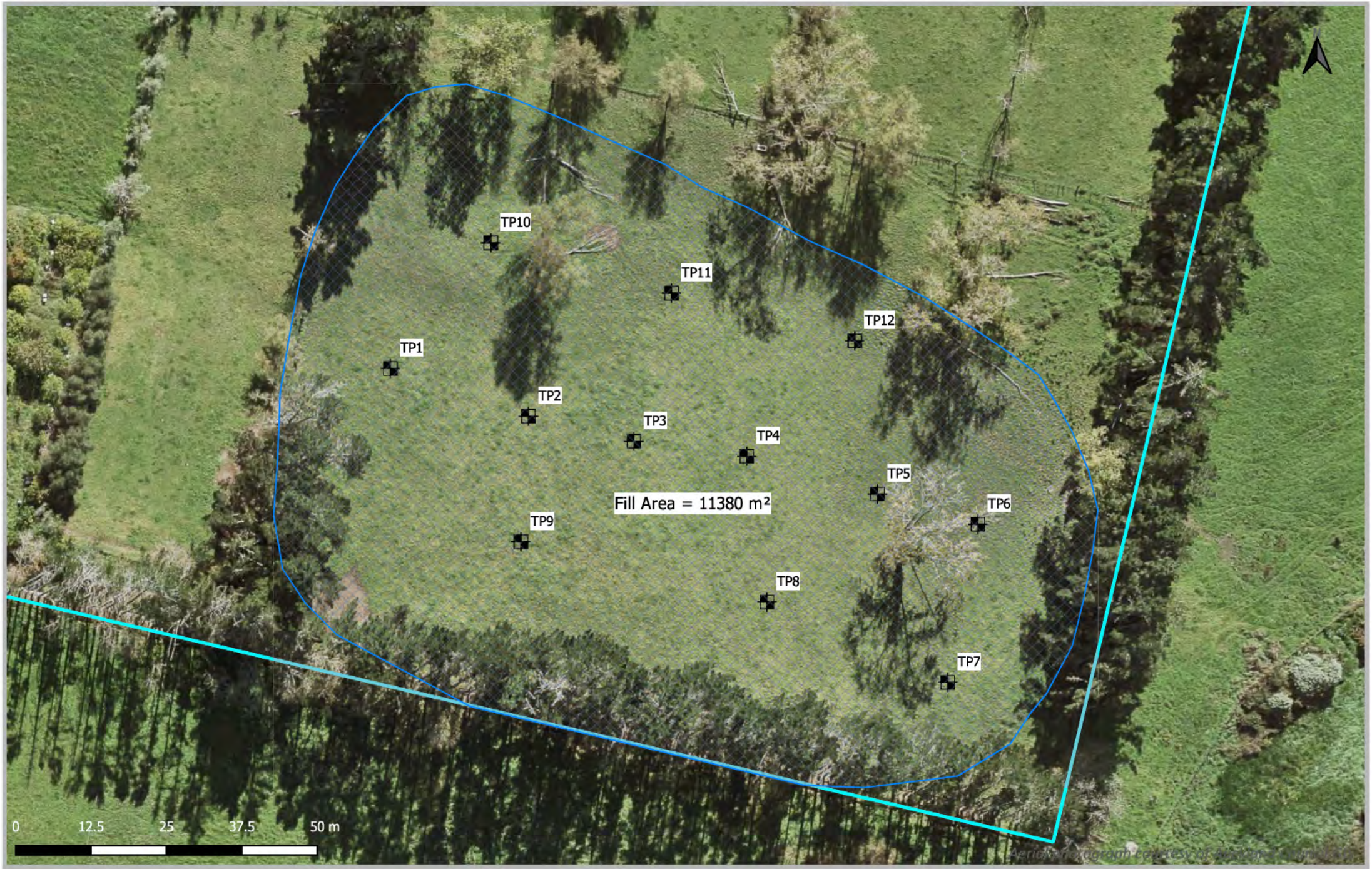

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Figure 3 - Test Pit Locations

69 Trig Road, 149-151 & 155-157 Bridgham Creek Road, Whenuapai

Reference:	J1475
Date:	12/06/2020
Drawn:	DW
Approved:	COB

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Figure 4 - Soil Sample Locations

69 Trig Road, 149-151 & 155-157 Bridgham Creek Road, Whenuapai

Reference:	J1475
Date:	12/06/2020
Drawn:	DW
Approved:	COB

APPENDIX A PROPOSED SCHEME PLAN

Schedule of Areas

Description	Area
RESIDENTIAL	
Lots 1-36	1.8413 ha
Roads	0.8170 ha
Recreation Reserve	0.2133 ha
Drainage Reserve	0.6725 ha
JOAL	0.0783 ha
	3.6224 ha
COMMERCIAL	
Lots 37-60	9.4315 ha
Roads	1.7992 ha
Drainage Reserve	0.6133 ha
	11.8440 ha
TOTAL	15.4664 ha

Rev	Description	By	Date

THE NEIL GROUP
NEIL CONSTRUCTION LIMITED
LAND DEVELOPERS
THE NEIL GROUP LIMITED
LEVEL 3, BUILDING B
8 NUGENT STREET
GRAFTON
PO BOX 8751, SYMONDS STREET
AUCKLAND, NEW ZEALAND
TELEPHONE: +64 9 815 8585
FACSIMILE: +64 9 815 8587
WEB: www.neilgroup.co.nz

Job Title
151,155–157 BRIGHAM CREEK RD
& 69 TRIG RD
WHENUAPAI

Drawing Title
POSSIBLE SUBDIVISION

	By	Date
Surveyed:		
Designed:		
Drawn:		
Approved:		

Scale
1:1500 @ A1
1:2150 @ A2
1:3000 @ A3

Job No.
Drawing No. BCR–SP–01 V9
Rev

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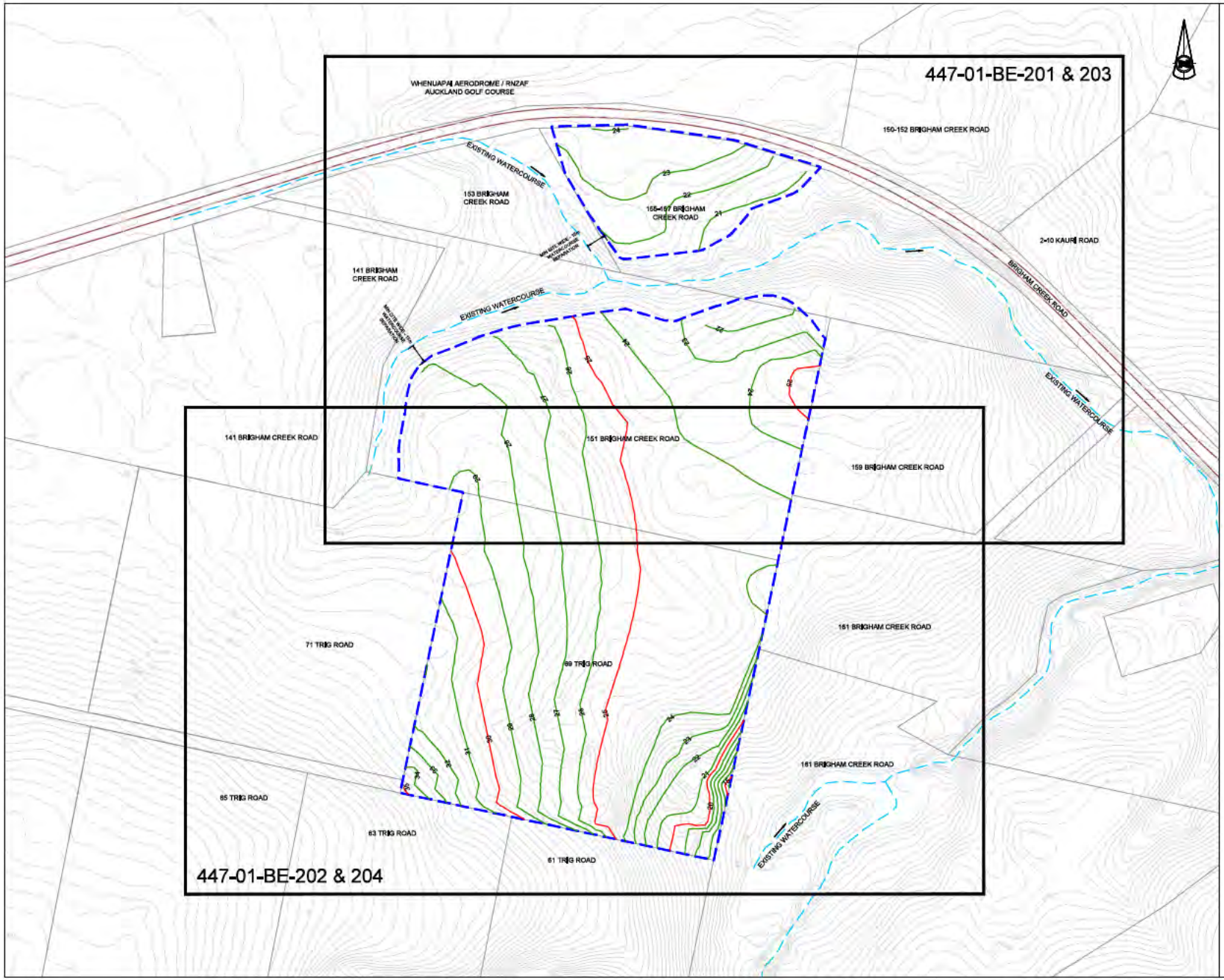

EARTHWORKS

STAGE / AREA (ha)	CUT (m3)	FILL (m3)	BALANCE (m3)
155-157 BRIGHAM CREEK RD			
1.29ha	2,100	2,100	-
SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.			
151 BRIGHAM CREEK AND 69 TRIG RD			
10.40ha	46,100	46,100	-
SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.			
TOTAL SITE EARTHWORKS AREA			
11.69ha	48,200	48,200	-
SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.			

NOTE:
1. ABOVE VOLUMES ARE RAW SURFACE TO SURFACE AND DO NOT REPRESENT TOPSOIL, UNSUITABLE, SHRINKAGE OR CIVIL SPOIL ADJUSTED VOLUMES.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS, SPECIFICATIONS AND REPORTS.
2. ALL WORKS AND MATERIALS TO COMPLY WITH THE RELEVANT COUNCIL ENGINEERING STANDARDS AND IN ACCORDANCE WITH THE BUILDING CODE.
3. THE CONTRACTOR IS TO LOCATE AND CONFIRM THE LOCATION OF ALL UTILITY SERVICES ON SITE, PRIOR TO ANY WORKS COMMENCING, INCLUDING PROTECTION OF THE SAME THROUGHOUT THE DURATION OF THE WORKS.
4. THE CONTRACTOR IS TO ENSURE THEY HAVE READ THE RESOURCE CONSENT, INCLUDING CONDITIONS, AND COMPLY FULLY.
5. THE CONTRACTOR IS TO ENSURE THE HAVE READ THE GOETECHNICAL INVESTIGATION REPORT.
6. REFER TO THE ABOVE REFERENCED G.I.R. FOR FULL DETAILS OF COUNTERFORT DRAINAGE, UNDERFILL DRAINAGE, SEEPAGE BARRIER KEYS & ALL OTHER GEOTECHNICAL REQUIREMENTS.
7. VOLUMES SHOULD NOT BE USED FOR CONTRACTOR COSTING.
8. EXISTING CONTOURS FROM SITE SURVEY AND COUNCIL GIS.

LEGEND

- PROPOSED CONTOUR MINOR (1m)
- PROPOSED CONTOUR MAJOR (5m)
- EXISTING CONTOURS (0.5m)
- PROPOSED CUT CONTOUR (1m)
- PROPOSED FILL CONTOUR (1m)
- PROPOSED ZERO CONTOUR
- EXTENT OF EARTHWORKS

Rev	Description	By	Date
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

THE NEIL GROUP
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LAND DEVELOPERS
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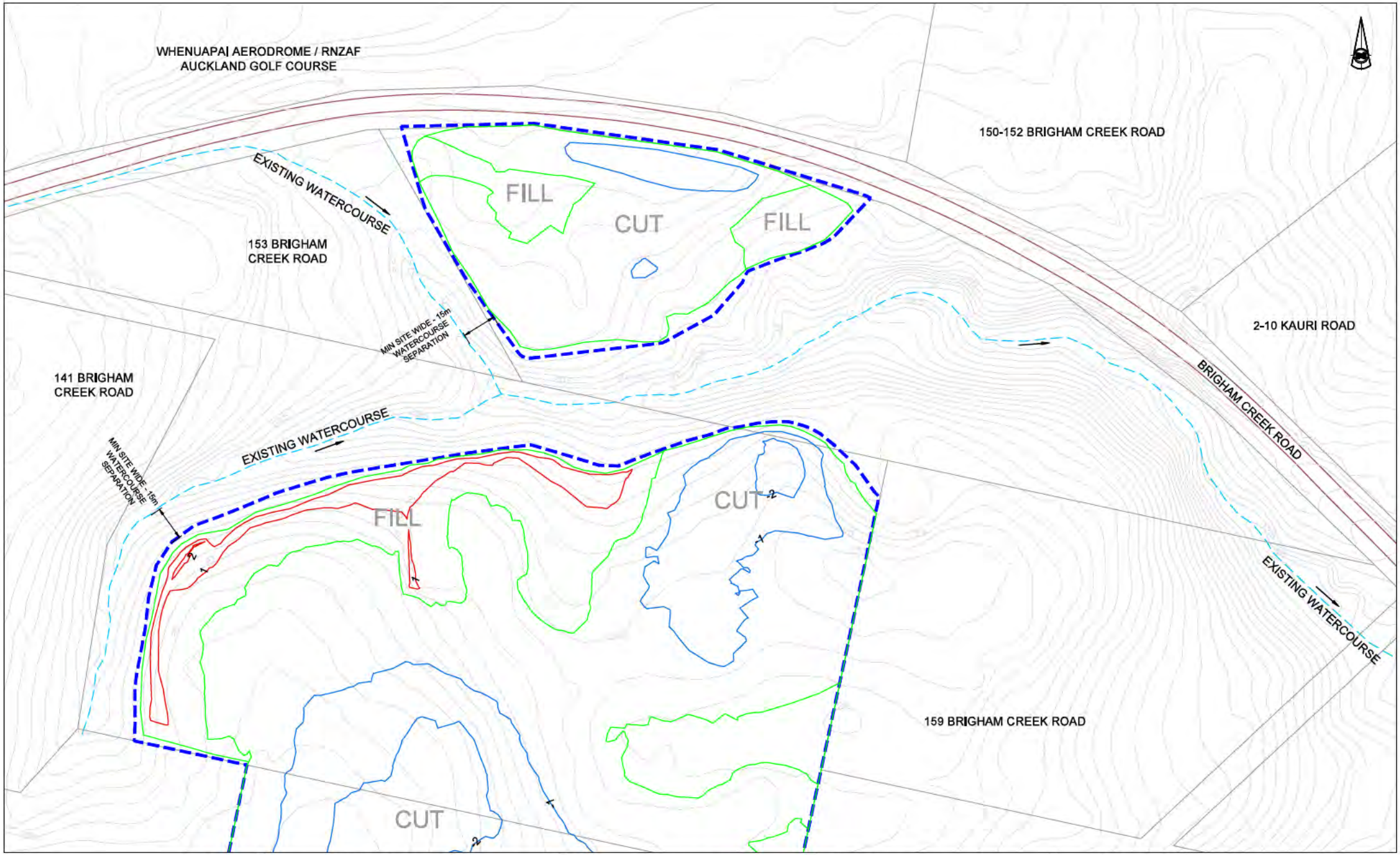
WEB www.theneilgroup.co.nz

Job Title
BRIGHAM CREEK & TRIG ROAD
WHENUAPAI

Drawing Title
BULK EARTHWORKS
FINISHED CONTOURS
LOCATION PLAN

	By	Date
Surveyed:	DS	
Designed:	CK	
Drawn:	CK	11/19
Approved:	CK	

Scale: 1:1500@A3
Job No.
Drawing No.: 447-01-BE-200
Rev: A
CAD FILE: F:_PROJECTS\BRIGHAM CREEK TRIGG\DWG\ENG\BULK EW\447-01-EW-200.dwg



Rev	Description	By	Date
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

THE NEIL GROUP

NEIL CONSTRUCTION LIMITED
LAND DEVELOPERS

THE NEIL GROUP LIMITED
LEVEL 3, BUILDING B
15 REGENT STREET
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Job Title
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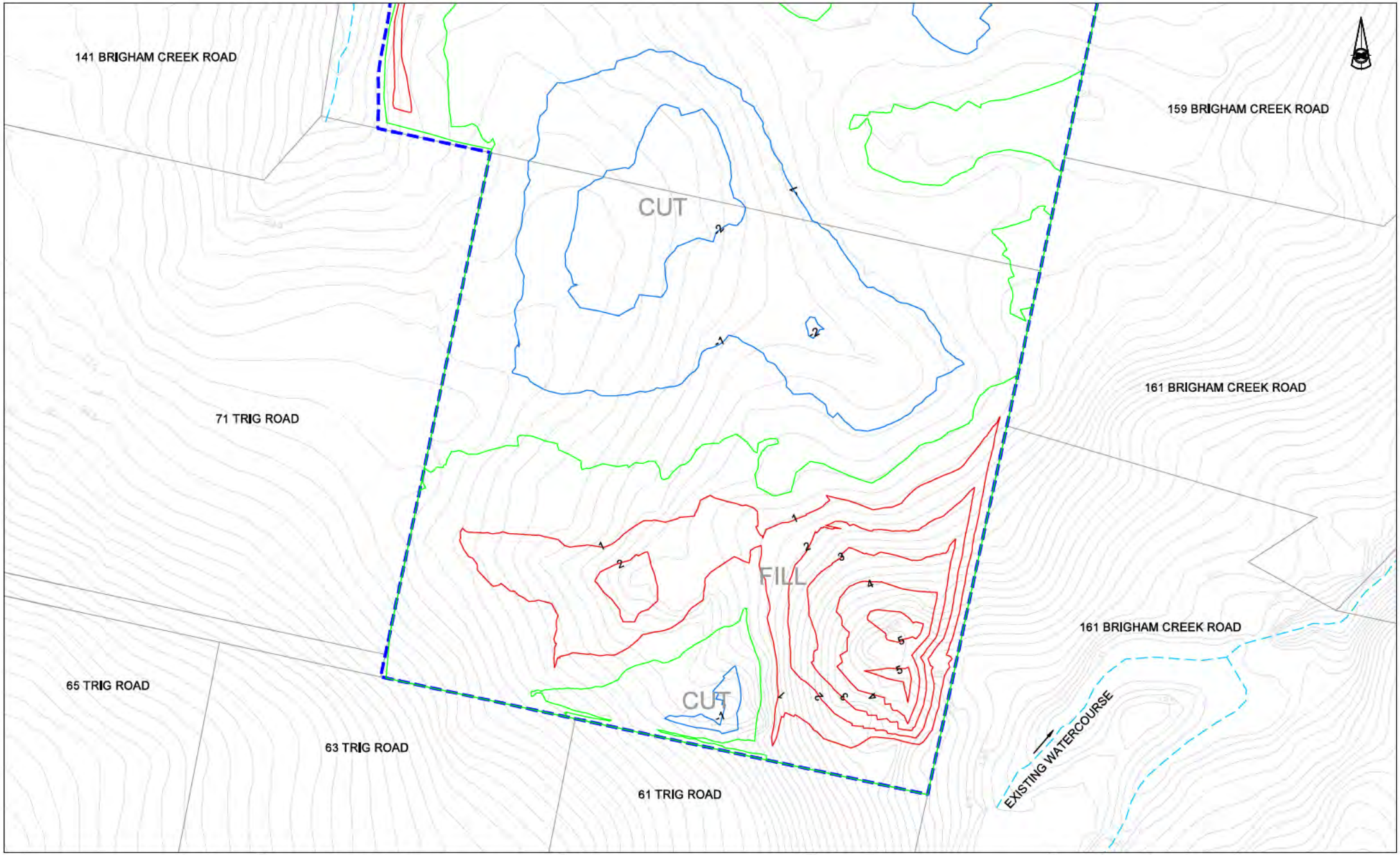
WHENUAPAI

Drawing Title
BULK EARTHWORKS
FINISHED CONTOURS
CUT FILL

	By	Date	Scale	Job No.
Surveyed:	DS		1:1500@A3	Drawing No. 447-01-BE-203 Rev A
Designed:	CK			
Drawn:	CK	11/19		
Approved:	CK			
CAD FILE	F:_PROJECTS\BRIGHAM CREEK TRIGG\DWG\ENG\BULK EW\447-01-EW-200.dwg			



Rev	Description	By	Date
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

THE NEIL GROUP

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Job Title
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WHENUAPAI

Drawing Title
BULK EARTHWORKS
FINISHED CONTOURS
CUT FILL

	By	Date
Surveyed:	DS	
Designed:	CK	
Drawn:	CK	11/19
Approved:	CK	
CAD FILE	F:_PROJECTS\BRIGHAM CREEK TRIGG\DWG\ENG\BULK EW\447-01-EW-200.dwg	

Scale: 1:1500@A3

Job No.

Drawing No.: 447-01-BE-204

Rev: A

APPENDIX B PREVIOUS INVESTIGATION

Table 1: Analytical Results[1]

	Arsenic	Copper	Lead
SC1	3.90	7.12	18.1
SC2	3.81	11.3	14.1
SC3	1.34	2.46	4.73
SC4	1.78	6.05	6.81
SC5	0.955	3.73	4.81
SC6	2.57	4.08	11.0
SC7	0.599	1.96	3.63
SC8	2.33	10.5	15.7
SS1	4.21	12.8	15.5
NES[2]	20	>10,000	210
AUP(OP)[3]	100	325	250
Background[4]	0.4-12	1-45	<5-65

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards for Assessing and Managing Contaminants in Soil for the Protection of Human Health - Residential landuse with 10% homegrown produce.
3. Auckland Unitary Plan (Operative in Part) - Table E.30.6.1.4.1 Permitted Activity Soil Acceptance Criteria
4. Auckland Regional Council Technical Publication No. 153
5. Values in BOLD exceed the NES criteria, values in BOLD exceed the AUP(OP) criteria, values in BOLD exceed the background ranges
6. NA = Not applicable / NL = No limit / ND = not detected

6.1 HEAVY METALS

All soil samples returned concentrations of heavy metals within the expected naturally occurring background concentration ranges for volcanic soils in the Auckland Region.

6.2 ORGANOCHLORINE PESTICIDES (OCPS)

All soil samples returned concentrations of OCPs below the laboratory limit of reporting.

7 POTENTIAL FOR CONTAMINATION

Based on the findings of the intrusive soil sampling GSL concludes that horticultural activity on the site is highly unlikely to have resulted in any distinct contamination issues that may result in a potential risk to human health or the environment.

Following the completion of this investigation, GSL has identified the following source of potential contamination on site:

- Unverified fill material;
- Potential hotspots around storage sheds
- Possible utilisation of Asbestos Containing Materials within the construction of the house; and
- Presence of a septic tank and effluent disposal system associated with the residential house.

An assessment of the likely extents and issues associated with each of these items is discussed in turn below based on GSL' experience in similar situations. In addition, GSL has provided an assessment of the general condition of the site as it pertains to risk.

7.1 UNVERIFIED FILL MATERIAL

Due to time constraints relating to site access and the due diligence period GSL conducted the site inspection prior to receipt of the property file, as such the presence and extent of unverified fill on site was not known at the time of the inspection and visual inspection of this area did not show any clear evidence of fill as it has been well contoured into the surrounding landuse. Therefore, the fill horizon was not explicitly sampled as part of the limited soil sampling regime undertaken.

GSL notes that based the above testimony provided represents a visual inspection of the surface of a considerable volume of soil only. No soil sampling or consideration was given beyond visual and olfactory considerations and as such, GSL considers that the potential for soil contamination within the fill has not adequately been assessed under current industry best practice.

The potential for heavy metals, polycyclic aromatic hydrocarbons, and organochlorine pesticides (OCPs) alongside asbestos containing materials to be present in the fill. While consent was granted for the spreading of the stockpiled material and re-contouring of the filed area in 2012, there is no record of and soil sampling or analysis of that material. A copy of the plans for the spreading of fill from this 2012 activity were included on the property file and are appended alongside the remaining property file items.

In addition, and while composite soil sample SC8 was collected from the topsoil horizon in the filled area, the composite soil sample was analysed for horticultural contaminants of concern only and was restricted to the surface 0 – 150 mm. Estimates in the property file suggest that between 13,005 m^3 and 15,000 m^3 of fill may be present and spread over an area of approximately 11,306 m^2 in the southeast corner of 69 Trig Road. Unverified fill is encompassed under Item I of the MfE HAIL.

Any future change in landuse, subdivision and development in the filled area will require an appropriately detailed site investigation to appropriately assess residual soil quality. As noted above the source sites for the imported material was not documented or known, as such a wide range of potential contaminants should be considered in any investigation of the fill, GSL recommends that the

fill area should be subject to a detailed site investigation undertaken in accordance with the MfE Contaminated Land Management Guidelines, which should include the excavation of test pits across the full extent of the fill and the collection of representative soil samples from a minimum of 20 locations in order to provide a suitably conservative risk assessment of the quality of the fill. GSL notes the DSI should include analysis of soil samples for contaminants of concern as follows: heavy metals, polycyclic aromatic hydrocarbons (PAH), OCPs and asbestos.

7.2 POTENTIAL HOTSPOTS AROUND STORAGE SHEDS

GSL notes that potential for hotspots in and around the storage sheds on 69 Trig Road exist. One soil sample was collected in what was considered a 'worst case scenario' during the site inspection, however this is not considered a comprehensive coverage of the full extent of the sheds themselves. Further sampling will be required in this area to meet the threshold for a detailed site investigation prior to any future development of the site should the sale and purchase be agreed upon.

7.3 ASBESTOS CONTAINING MATERIALS IN BUILDINGS

ACM has been widely used in an array of building materials for an extensive period of New Zealand's building materials history. While its use was widely concluded by 1990, New Zealand legislation notes that its use cannot be ruled out on buildings constructed prior to 1 January 2000. As a result, the presence of asbestos within the dwellings cannot be ruled out.

With regards to ACM, the potential for soil contamination is only present if ACM is in deteriorated or broken condition. No broken or degraded ACM was identified during the site inspection suggesting that if ACM is present within the building, it is most likely in good condition and doesn't represent a significant risk of soil contamination.

ACM is only likely to impact soil immediately adjacent to the dwelling and as such are not considered to present any significant potential for gross soil contamination across the site as a whole.

With respect to the demolition of any building constructed prior to 1999 the *Health and Safety at Work (Asbestos) Regulations 2016, demands* a fully intrusive pre-demolition hazardous building materials survey to be undertaken before demolition works can commence. The survey must be conducted by a suitably WorkSafe NZ licensed asbestos assessor, and will identify the location and extent of any hazardous building materials, specifically ACM. Should ACM be identified in the survey then asbestos removal works will be required prior to the demolition of the dwelling, the removal must be completed by an appropriately licensed asbestos removal contractor and under the controls of an asbestos removal control plan (to be provided by the appointed contractor. The hazardous building materials survey will form the basis of any asbestos removal control plan.

7.4 EFFLUENT DISPOSAL INFRASTRUCTURE

Domestic effluent disposal infrastructure is considered to be encompassed under Items G.5 and G.6 of the MfE HAIL as waste disposal to land. Should the existing long drop, septic tanks and disposal fields require decommissioning and removal as part of the proposed future development, works in these areas will need to address the requirement of the NES and Auckland Unitary Plan (Operative In Part) with respect to contamination regulations.

Effluent disposal fields are likely to result in small scale impacts limited to the topsoil horizon where the effluent liquor is dispersed. In GSL's experience, impacts are unlikely to extend beyond the boundaries of the disposal field and generally do not exceed 400 mm in depth, meaning that a small localised area will likely require remedial earthworks during decommissioning. Impacts are considered unlikely to be pervasive across a large area, Auckland Council pump out reports note the location of the septic tanks, however do not show the location of the related disposal fields. Drainage plans in the property file indicate locations of the disposal fields however no as built plans were contained and the exact extent of disposal fields is not known.

7.5 GENERAL SITE CONDITION

As set out in the site inspection section above, GSL notes that numerous locations on site contain end of life farm equipment and other miscellaneous discarded items (whiteware, plastics, timbers etc) including at least 4 shipping containers. GSL notes that the total volume of these materials would be considered significant and should they not be removed from site by the current landowners, would represent a liability to Neil Construction Ltd during site preparation as they will require disposal.

GSL recommends that any sale and purchase agreement should include a provision that vendor is responsible for the clearance of all refuse, building materials and machinery currently on the site.

8 RISK ASSESSMENT

With respect to the piece of land assessed, GSL notes that the importation of at least 13,005 m^3 of unverified fill onto the property at 69 Trig Road represents a moderate to high risk for Neil Construction Ltd. The considerable volume of fill does not have any associated laboratory transcripts and the stockpiles were only subject to visual surficial inspections. Given the fill may extent to 5m below relative ground level, considerable further assessment will be required in this area to determine its applicability for future landuse.

While potentially contaminating activities have been identified in the remaining properties located at GSL assesses the risks associated with actual and potential contamination on the piece of land located at 149-151 and 155-157 Brigham Creek Road to be low. That is, localised discrete areas of the site are more likely than not to have been impacted by both current and historical activities, however, GSL does not consider these impacts to be pervasive, rather, that localised investigation and remediation will be required as part of any proposed change in landuse, subdivision or development.

9 OWNERS LIABILITY

Responsibilities for any contamination present on site will transfer to the new site owner following the completion of the vacant possession transaction. New Zealand legislation is based on a '*caveat emptor*' principle, meaning buyer beware. Following the completion of the sale and purchase agreement, the new owner will be required to satisfy any requirements of the NES, and the Auckland Unitary Plan (Operative in Part) in respect of soil contamination on site

10 CONCLUSIONS

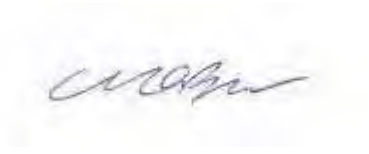
GSL has undertaken an environmental due diligence investigation, in general accordance with the MfE Contaminated Land Management Guidelines, of the properties located at 149-151 and 155-157 Brigham Creek Road and 69 Trig Road, Whenuapai.

This investigation has identified potential sources of contamination on site, that overall would be considered to represent a moderate risk to Neil Construction Ltd, particularly the importation of unverified fill in the southern portion of 69 Trig Road. With respect to the findings of this investigation, the following actually and potentially contaminating activities have been identified:

- Potentially asbestos containing building materials utilised in the residential dwelling and garage on site.
- Onsite domestic waste water treatment systems (septic tanks and effluent disposal fields) relating to the dwellings, additionally a long drop toilet was identified during the site inspection in the southwest corner of 69 Trig Road.
- Unverified filling has been undertaken on the southeast corner of the site, within 69 Trig Road. While the material was visually assessed by an expert witness in court hearings as being consistent with cleanfill material, the source sites for the material is not known. GSL considers that the fill represents a potential source of contamination, should any future development of the site involve the disturbance of the fill then further investigation in this area will be required as described in Section 7.1 above.

While limited soil sampling undertaken as part of this investigation has indicated that former horticultural activities are highly unlikely to have resulted in contamination of the topsoil on site, considerable further investigation will be required to provide sufficient certainty for future residential development.

Thank you for the opportunity to carry out this investigation. Should you have any queries regarding this report please do not hesitate to contact us on 09 475 0222.

Report prepared on behalf of GSL by:	Report reviewed on behalf of GSL by:
	
David Wilkinson Environmental Scientist Geosciences Ltd	Carl O'Brien General Manager Geosciences Ltd

APPENDIX C GEOTECHNICAL INVESTIGATION

Courtesy CMW Geotechnical

BOREHOLE LOG - HA01-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 18/03/2019
Borehole Location: Refer to site plan

CMW Geosciences

1:25 Sheet 1 of 1

Logged by: JMJ | Position: E.1745248.4m N.5925965.4m | Elevation: RL 26.00m | Hole Diameter: 50mm
Checked by: TG | Survey Source: Measured onsite | Datum: NZTM | Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm) 5 10 15	Structure & Other Observations
		0.4	Peak = UTP	26.0	0		OL: TOPSOIL	D to M	H		HA		
		0.8	Peak = UTP	25.8			CL: Gravelly CLAY: brown and orange. Low plasticity. (Fill)						
		1.2	Peak = 204+kPa		1		... at 0.90m, with trace topsoil.						
		1.6	Peak = UTP	24.6			GC: GRAVEL with some clay: black and grey. (Fill)	M	MD				
							Borehole terminated at 1.6 m						
					2								
					3								
					4								
					5								

Termination reason: Unable to Penetrate Further

Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - HA02-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 18/03/2019
Borehole Location: Refer to site plan

CMW Geosciences

1:25 Sheet 1 of 1

Logged by: RD | Position: E.1745291.5m N.5925975.4m | Elevation: RL 18.00m | Hole Diameter: 50mm
Checked by: TG | Survey Source: Measured onsite | Datum: NZTM | Angle from horizontal: 90°

Depth	Type & Results	RL (m)	Depth (m)	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
		18.0		OL: TOPSOIL						
0.4	Peak = 217+kPa	17.7		CL: CLAY with some silt: dark brown, grey mottled orange. Low plasticity. (Fill)	M	H				
0.8	Peak = 124kPa Residual = 53kPa		1			VSt				
1.2	Peak = 56kPa Residual = 35kPa	16.8		CH: CLAY: grey streaked blackish brown. High plasticity. (Puketoka Formation)	M to W	St				
				... from 1.20m to 1.40m, organic stained with loose sand inclusions.						
1.6	Peak = 46kPa Residual = 28kPa			*... at 1.50m, with trace fine sand.*	W					
		16.1								
2.0	Peak = 28kPa Residual = 15kPa		2	OH: CLAY: blackish grey. High plasticity. With fibrous, decomposing wood inclusions. (Puketoka Formation)						
		15.9		CH: CLAY: grey streaked blackish brown. High plasticity. (Puketoka Formation)		F				
2.4	Peak = 40kPa Residual = 28kPa				W to S			HA		
2.8	Peak = 62kPa Residual = 15kPa									
			3			St				
3.2	Peak = UTP	14.8		SM: Sandy SILT with minor clay: grey. Low plasticity. Sand is fine grained. (Waitemata Group)	S	VSt				
3.6	Peak = 124kPa Residual = 54kPa	14.3		CH: CLAY with minor fine sand: grey. High plasticity. (Waitemata Group)						
4.0	Peak = 96kPa Residual = 59kPa		4			St				
4.4	Peak = 186kPa Residual = 65kPa				W to S					
4.8	Peak = 112kPa Residual = 50kPa					VSt				
			5	Borehole terminated at 5.0 m						

Termination reason: Target Depth Reached

Remarks: Groundwater encountered at 2.9m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - MH01-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Borehole Location: Refer to site plan Logged by: TK Checked by: TG Scale: 1:50 Sheet 1 of 2

Position: 1745319.0mE; 5925970.0mN Projection: NZTM Angle from horizontal: 90°
Elevation: 15.80m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Depth	Type & Results	RL (m)	Depth (m)	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	RQD	Drilling Method/ Support
		15.8		TOPSOIL: brown.	D to…				
		15.7		CH: Silty CLAY: with trace fine to medium sand; brown mottled light grey. High plasticity. (Uncontrolled Fill)			60		
0.5	Peak = 74kPa Residual = 36kPa				M	St	100		OB / PQ3
1.0	Peak = 110kPa Residual = 53kPa		1						
		14.6		CH: Silty CLAY: with trace fine to medium sand; light brownish grey mottled orange. High plasticity. (Puketoka Formation)		VSt	100		
1.5	Peak = 63kPa								
1.5	Residual = 20kPa SPT = (4,4,10) N* = 14						89		SPT
			2	… at 2.20m, trace organic fragments <20 mm	M to W		86		OB / PQ3
3.0	Peak = 74kPa								
3.0	Residual = 30kPa SPT = (4,7,10) N* = 17		3				100		SPT
				… at 3.70m, becoming bluish grey			95		OB / PQ3
			4	… at 4.00m, becoming brownish grey, minor fine to medium sand		St			
4.5	SPT = (3,3,3) N* = 6			… at 4.50m, becoming grey mottled orange.			100		SPT
5.0-5.5	Push Tube 1 U63		5				91		U63
							100		OB / PQ3
6.0	SPT = (3,3,3) N* = 6		6				100		SPT
			7	… at 7.10m, becoming brownish grey mottled dark grey, minor medium to coarse sand.	W		86		OB / PQ3
7.5	SPT = (5,7,10) N* = 17	8.3		ML: Sandy SILT: with minor clay; bluish grey. Low plasticity. Medium to coarse sand. (Waitemata Group)			100		SPT
			8			VSt	100		OB / PQ3
9.0	SPT = (7,13,17) N* = 30		9				100		SPT
			10				100		OB / PQ3

Termination Reason: Target Depth Reached
Shear Vane No: 1620 DCP No:

Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - MH01-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Borehole Location: Refer to site plan Logged by: TK Checked by: TG Scale: 1:50 Sheet 2 of 2
Position: 1745319.0mE; 5925970.0mN Projection: NZTM Angle from horizontal: 90°
Elevation: 15.80m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Weathering: RS CW HW MW SW UW	Recovery	RQD	Estimated Strength: EW VW W MS S VS ES	Defect Spacing (mm): <20 20-60 60-200 200-600 600-2000 >2000	Drilling Method/ Support	Structure & Other Observations
		10.5	SPT = (12,22,30) N* = 52	5.5	11		ML: Sandy SILT: bluish grey. Low plasticity. Medium to coarse sand. (Waitemata Group)		H		100				SPT	Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks
		12.0	SPT = (17,28,32/70mm) N* = 50+		12						100				OB / PQ3	
											100				SPT	
				3.1	13		Grey, SANDSTONE. Weathered to a silty SAND, grey, medium to coarse. (Waitemata Group)				93				OB / PQ3	
		13.5	SPT = (29,50/55mm) Nc = 50+	2.3	14		Grey, SANDSTONE. Weathered to a sandy SILT grey mottled dark grey, low plasticity. (Waitemata Group)				0				SPT	
					15						100				TT / HQ3	
		15.5	SPT = (50/90mm) Nc = 50+	0.3	16		Grey, SANDSTONE. Weathered to a silty SAND, grey, medium to coarse. (Waitemata Group)				0				S P T	
											93				TT / HQ3	
		17.0	SPT = (50/115mm) Nc = 50+		17						0				S P T	
					18						61				TT / HQ3	
		18.5	SPT = (50/90mm) Nc = 50+								0				S P T	
					19						100				TT / HQ3	
					20		Borehole terminated at 20.00 m									

Termination Reason: Target Depth Reached
Shear Vane No: 1620 DCP No:
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP01-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745206.0mE; 5925974.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.0m
Elevation:Elevation: 27.00m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			27.0			OL: TOPSOIL			5 10 15 20	Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks
			26.8			ML: Clayey SILT: brown, orange, grey and black. Low plasticity. Trace gravel, concrete and old drain pipe. (Uncontrolled Fill)				
	0.5	Peak = UTP								
	1.0	Peak = >200kPa Residual = 48kPa	26.0	1		CH: CLAY with some silt: light grey streaked orange. High plasticity. (Puketoka Formation)				
	1.5	Peak = 224+ kPa					M	VSt to H		
	2.0	Peak = 192kPa Residual = 112kPa		2						
	2.5	Peak = 163kPa Residual = 74kPa								
			24.4			MH: Clayey SILT: light grey mottled orange. High plasticity. (Puketoka Formation)				
	3.0	Peak = 144kPa Residual = 51kPa		3		Test pit terminated at 3.00 m				
				4						
				5						

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP02-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745227.0mE; 5926000.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.5m
Elevation:Elevation: 25.50m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			25.5			OL: TOPSOIL				
			25.3			CH: Silty CLAY with minor topsoil: brown streaked orange and grey. Rootlets. Trace organics. Very loosely compacted. (Uncontrolled Fill)				
	0.5	Peak = 48kPa Residual = 13kPa					M	F		
▼	1.0	Peak = 77kPa Residual = 29kPa		1		... at 1.00m, perched groundwater and trace organics				
	1.5	Peak = 51kPa Residual = 19kPa	24.0			CH: Organic stained Silty CLAY with some organics: dark grey streaked black. Highly plasticity. (Puketoka Formation)	M to W	St		
	2.0	Peak = 83kPa Residual = 29kPa		2		Test pit terminated at 2.00 m				2.0m: yellow nova coil at the base of test pit
				3						
				4						
				5						

Dynamic Cone Penetrometer (Blows/100mm): 5 10 15 20

Structure & Other Observations: Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks

Termination Reason: Terminated early due to nova coil encountered.
Shear Vane No: 2081 DCP No:
Remarks: Perched groundwater at 1.0m.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP03-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745219.0mE; 5926036.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.0m
Elevation:Elevation: 25.40m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			25.4			OL: TOPSOIL				
			25.2			CH: Silty CLAY with trace organics: orange, brown, grey and black. High plasticity. Trace pipe, trace concrete. Loosely compacted. (Uncontrolled Fill)				
						... at 0.30m, large block of concrete, 0.4m x 0.4m				
	0.5	Peak = 72kPa Residual = 29kPa						St		
	1.0	Peak = 80kPa Residual = 32kPa		1			M			
			24.2			CH: CLAY with minor silt: grey streaked orange. High plasticity. Trace rootlets and trace organics. (Puketoka Formation)				
	1.5	Peak = 128kPa Residual = 61kPa						VSt		
						... at 1.90m, moist to wet	M...			
	2.0	Peak = 131kPa Residual = 64kPa		2		Test pit terminated at 2.00 m				
				3						
				4						
				5						

Dynamic Cone Penetrometer (Blows/100mm): 5 10 15 20

Structure & Other Observations: Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: No groundwater encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP04-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745272.0mE; 5926032.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.0m
Elevation:Elevation: 23.00m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			23.0			OL: TOPSOIL			5 10 15 20	Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks
			22.8			ML: Clayey SILT with organics: dark brown. Low plasticity. (Puketoka Formation)				
			22.7			CH: Silty CLAY: grey mottled orange. High plasticity. Organic staining. (Puketoka Formation)				
	0.5	Peak = 147kPa Residual = 35kPa					M to W	VSt		
	1.0	Peak = 160kPa Residual = 83kPa		1						
▼	1.2	Peak = 176kPa Residual = 80kPa				Test pit terminated at 1.20 m				
				2						
				3						
				4						
				5						

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: Groundwater seepage observed at 1.2m.

TEST PIT LOG - TP05-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745271.0mE; 5925996.0mN Projection: NZTM Pit Dimensions: 3.5m by 2.0m
Elevation: Elevation: 21.40m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			21.4			OL: TOPSOIL				
			21.2			CH: Silty CLAY: orange, brown, grey and black. High plasticity. Trace pipe, concrete, gravel, cobbles, cloth and plastic. (Uncontrolled Fill)				
	0.5	Peak = 147kPa Residual = 35kPa					M			
	1.0	Peak = >200kPa Residual = 51kPa		1		... at 1.00m, well compacted				
						... at 1.20m, trace concrete		VSt		
	1.5	Peak = 157kPa Residual = 45kPa				... at 1.50m, moist to wet with trace organics				
			19.6			CH: CLAY with some silt: grey, black, orange and brown. High plasticity. (Uncontrolled Fill)				
	2.0	Peak = 125kPa Residual = 51kPa		2			M to W			
▼	2.5	Peak = 64kPa Residual = 42kPa								
			18.8			OL: Buried TOPSOIL				
			18.7			CH: Silty CLAY with organics: grey mottled orange. High plasticity. Organic staining throughout. (Puketoka Formation)		St to VSt		
	3.0	Peak = 131kPa Residual = 48kPa		3		Test pit terminated at 3.00 m				
				4						
				5						

Dynamic Cone Penetrometer (Blows/100mm): 5 10 15 20

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: Groundwater seepage observed at 2.6m in the topsoil.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP06-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745331.0mE; 5926017.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.0m
Elevation:Elevation: 20.00m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description (Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit))	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations (Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks)
			20.0			OL: TOPSOIL			5 10 15 20	
			19.8			ML: Clayey SILT: brown. Low plasticity. With large roots. (Puketoka Formation)				
			19.6			CH: Silty CLAY: grey mottled orange. High plasticity. (Puketoka Formation)				
	0.5	Peak = >200kPa Residual = 51kPa					M	VSt to St		
	1.0	Peak = 147kPa Residual = 48kPa	19.0	1		CH: CLAY with minor silt: grey mottled orange. High plasticity. (Puketoka Formation)				
	1.5	Peak = 83kPa Residual = 32kPa				Test pit terminated at 1.50 m				
				2						
				3						
				4						
				5						

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

TEST PIT LOG - TP07-19

Client: Neil Group Limited
Project: Trig & Brigham Creek Road
Site Location: Whenuapai
Project No.: AKL2019-0040
Date: 26/11/2019
Test Pit Location: Refer to site plan Logged by: JW Checked by: TG Scale: 1:25 Sheet 1 of 1

Position: 1745289.0mE; 5925956.0mN Projection: NZTM Pit Dimensions: 3.0m by 2.5m
Elevation:Elevation: 18.50m Datum: AUCKHT 1946 Survey Source: Hand Held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
			18.5			OL: TOPSOIL				
			18.4			CH: Silty CLAY: orange, brown, grey and black. High plasticity. Trace rootlets, trace gravel, trace concrete and loosely compacted. (Uncontrolled Fill)				
	0.5	Peak = 141kPa Residual = 19kPa					M	VSt		
	1.0	Peak = 192kPa Residual = 96kPa		1						
			17.4			OL: Buried TOPSOIL				
			17.3			CH: CLAY with some silt: grey streaked orange. High plasticity. Trace rootlets, trace limonite staining. Trace organic staining. (Puketoka Formation)				
	1.5	Peak = 147kPa Residual = 64kPa				Test pit terminated at 1.50 m				
				2						
				3						
				4						
				5						

Dynamic Cone Penetrometer (Blows/100mm): 5 10 15 20

Structure & Other Observations: Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks

Termination Reason: Target depth reached
Shear Vane No: 2081 DCP No:
Remarks: Groundwater no encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

APPENDIX D SITE PHOTOGRAPHS

PLATE 1: Fill area during test pit investigation

PLATE 2: surface of fill

PLATE 3: Upper horizon of fill

PLATE 4: excavated buried organic rich topsoil layer

PLATE 5: buried topsoil

PLATE 6: indicative cross section of fill

PLATE 7: shallow fill overlying natural Puketoka formation

PLATE 8: excavated fill and topsoil

PLATE 9: ACM pipe fragment from TP11

PLATE 10: storage shed on western boundary

PLATE 11: western boundary of 69 Trig Road

PLATE 12: storage shed and disused shadehouse

PLATE 13: Storage shed on 155 Brigham Creek Road

PLATE 14: vehicles and farm machinery stored on 69 Trig Road

APPENDIX E LABORATORY TRANSCRIPTS

CHAIN OF CUSTODY RECORD

☐ Eurofins | mgt Auckland Office

☐ Eurofins | mgt Wellington Office

☐ Eurofins | mgt Melbourne Lab

Company	Geosciences Ltd	Purchase Order	
Address	47 Clyde Road, Browns Bay Auckland 0630	Eurofins | mgt Quote №	
Contact Name	Brodie Rowsie	Project Manager	~~Carl O'Brien~~ Brodie Rowsie
Contact Phone №	272285556	Project №	~~Brigham Creek~~ 69 Trig Rd 69 Trig Road
Special Direction		Project Name	J1475
Relinquished by (Signature)	Krysten Walker	Electronic Results Format	pdf
(Time / Date)	__:__ __/__/__	Email for Results	s 9(2)(a)
		Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☑ 5 DAY (Std.) ☐ Other ( )

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M7-NZ	PAH	OCP	Semi quantative asbetos	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Method of Shipment	Sample Comments / DG Hazard Warning
1	TP1 1.0M	6/05/2020	Soil	X	X	X	X								☑ Courier (#)	
2	TP1 2.2M	6/05/2020	Soil	X	X	X			x					x	☐ Hand Delivered	
3	TP2 1.5M	6/05/2020	Soil	X	X	X	X							x	☐ Postal	
4	TP2 3.0M	6/05/2020	Soil	X	X	X			x					x		
5	TP2 5.0M	6/05/2020	Soil	X	X	X								x		
6	TP3 1.0M	6/05/2020	Soil	X	X	X	X							x		
7	TP3 2.5M	6/05/2020	Soil	X	X	X			x					x		
8	TP3 6.0M	6/05/2020	Soil	X	X	X								x		
9	TP4 0.5M	6/05/2020	Soil	X	X	X	X							x		
10	TP4 2.0M	6/05/2020	Soil	X	X	X			x					x		
11	TP4 3.5M	6/05/2020	Soil	X	X	X								x		
12														x		

Date/Time: 9/5/2020 5.00 PM

Chilled: Yes / No

Temp: 22.2

-0.2

Correction: 2.2

Final Temp:

Laboratory Use Only									
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	__:__	Signature		Temperature	
Received By	Karishma Patel	AUCK | WELL | MELB	Date	__/__/__	Time	__:__	Signature		Report №	718617

QS3106_R0 Modified by: T Lakeland Approved by: O Metumist Approved on: 14 May 2015

CHAIN OF CUSTODY RECORD

☐ Eurofins | mgt Auckland Office ☐ Eurofins | mgt Wellington Office ☐ Eurofins | mgt Melbourne Lab

Company	Geosciences Ltd
Address	47 Clyde Road, Browns Bay Auckland 0630
Contact Name	Brodie Rowsie
Contact Phone №	272235556
Special Direction	
Relinquished by	Krystan Walker
(Signature)	KWalker
(Time / Date)	__:__ __/__/__
Purchase Order	
Eurofins | mgt Quote №	
Project Manager	~~Carl O'Brien~~ Brodie Rowse
Project №	~~Brigham Creek~~ 69 Trig Rd
Project Name	J1475
Electronic Results Format	pdf
Email for Results	s 9(2)(a)
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply; ☑ 5 DAY (Std) ☐ Other ( )
Method of Shipment	☑ Courier (#) ☐ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M7-NZ	PAH	OCP	Semi quantitative asbestos	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	TP5 1.0M	6/05/2020	Soil	X	X	X	X		x					x	
2	TP5 2.0M	6/05/2020	Soil	X	X	X								x	
3	TP5 3.0M	6/05/2020	Soil	X	X	X								x	
4	TP6 0.5M	6/05/2020	Soil	X	X	X								x	
5	TP7 0.5M	6/05/2020	Soil	X	X	X	X		X					x	
6	TP8 0.5M	7/05/2020	Soil	X	X	X	X		X					x	
7	TP8 1.0M	7/05/2020	Soil	X	X	X	X		X					x	
8	TP8 2.0M	7/05/2020	Soil	X	X	X								x	
9	TP8 2.2M	7/05/2020	Soil	X	X	X								x	
10	TP9 0.5M	7/05/2020	Soil	X	X	X	X		X					x	
11	TP9 1.5M	7/05/2020	Soil	X	X	X	X		X					x	
12															

Laboratory Use Only								
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	__:__	Signature	Temperature
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	__:__	Signature	Report №

QS3106_R0 Modified by: T Lakeland Approved by: O Mehmet Approved on: 14May 2015

CHAIN OF CUSTODY RECORD

☐ Eurofins | mgt Auckland Office

☐ Eurofins | mgt Wellington Office

☐ Eurofins | mgt Melbourne Lab

Company	Geosciences Ltd	Purchase Order		Project Manager	Carl O'Brien
Address	47 Clyde Road, Browns Bay Auckland 0630	Eurofins | mgt Quote №		Project №	Brigham Creek
Contact Name	Brodie Rowsie				
Contact Phone №	272285556				
Special Direction					
Relinquished by (Signature)	Krysten Walker				
(Time / Date)	___:___	__/__/__			

Project Name	J1475
Electronic Results Format	pdf
Email for Results	s 9(2)(a)
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☑ 5 DAY (Std.) ☐ Other ( )

Analytes (Note: Where metals are required, please specify "Total" or "Filtered")	M7-NZ	PAH	OCP	Semi quantative asbetos	B22NZ	Containers: 1L Plastic	250mL Plastic	125ml Plastic (Bag)	200ml Amber Glass	40ml vial	125ml Amber Glass	Jar	Method of Shipment	Sample Comments / DG Hazard Warning
													☑ Courier (#) ☐ Hand Delivered ☐ Postal	
№ Client Sample ID / Date / Matrix														
1 TP10 0.5M 7/05/2020 Soil	X	X	X	X								X		
2 TP10 1.2M 7/05/2020 Soil	X	X	X											
3 TP11 0.5M 7/05/2020 Soil	X	X	X	X								X		
4 TP11 1.0M 7/05/2020 Soil	X	X	X	X								X		
5 TP11 1.5M 7/05/2020 Soil	X	X	X									X		
6 TP12 0.5M 7/05/2020 Soil	X	X	X	X								X		
7 TP12 1.5M 7/05/2020 Soil	X	X	X									X		
8 SC1 7/05/2020 Soil					X							X		
9 SC2 7/05/2020 Soil					X			X						
10 SC3 7/05/2020 Soil					X			X						
11 SS1 7/05/2020 Soil					X			X						
12 SS2 7/05/2020 Soil					X			X						

Date/Time:

Chilled: Yes / No

Temp:

Correction:

Final Temp:

Laboratory Use Only									
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	___:___	Signature		Temperature
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	___:___	Signature		Report №

CHAIN OF CUSTODY RECORD

☐ Eurofins | mgt Auckland Office — 35 O'Rorke Road Penrose, AUCKLAND 1061, New Zealand — P: 0800 856450 (free dial) — E: SoilCarrol@eurofins.co.nz; OruMetmat@eurofins.com.au

☐ Eurofins | mgt Wellington Office — 85 Pyn Road, Seaview, Lower Hutt, WELLINGTON 5011, New Zealand — P: 0800 856450 (free dial) — E: SoilCarrol@eurofins.co.nz; OruMetmat@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close, Oakleigh, VIC 3166, Australia — P: 0800 856 450 (free dial) — E: SoilCarrol@eurofins.com.au; OruMetmat@eurofins.com.au

Company	Geosciences Ltd	Purchase Order	
Address	47 Clyde Road, Browns Bay Auckland 0630	Eurofins | mgt Quote №	
Contact Name	Brodie Rowsie	Project Manager	Carl O'Brien
Contact Phone №	272285556	Project №	Brigham Creek
Special Direction		Project Name	J1475
Relinquished by (Signature)	Krysten Walker	Electronic Results Format	pdf
(Time / Date)	___:___ __/__/__	Email for Results	s 9(2)(a)
		Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* (* Surcharges apply) ☑ 5 DAY (Std.) ☐ Other ( )

Analysis (Note: Where metals are required, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M7-NZ	PAH	OCP	Semi quantative asbetos	B22NZ	Pb	Containers: 1L Plastic	250mL Plastic	125mL Plastic (bag)	250mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Method of Shipment	Sample Comments / DG Hazard Warning
1	SS3	7/05/2020	Soil					X				x					☑ Courier (#)	
2	SS4	7/05/2020	Soil					X				x					☐ Hand Delivered	
3	SS5	7/05/2020	Soil					X				x					☐ Postal	
4	SS6	7/05/2020	Soil					X				x						
5	SS7	7/05/2020	Soil					X				x						
6	SS8	7/05/2020	Soil						X			x						
7	SS9	7/05/2020	Soil						X			x						
8	SS10	7/05/2020	Soil						X			x						
9	SS11	7/05/2020	Soil						X			x						
10												x						
11																		
12																		

Laboratory Use Only									
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	___:___	Signature		Temperature	
Received By		AUCK | WELL | MELB	Date	__/__/__	Time	___:___	Signature		Report №	

QS3106_R0 Modified by: T Lakeland Approved by: O Metmat Approved on: 14 May 2015

Certificate of Analysis

eurofins | Environment Testing

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation, unless otherwise specified.
ACCREDITED LABORATORY Accreditation No. :1290

Geosciences Ltd
First Floor, 47 Clyde Road
Browns Bay
Auckland NZ 0630

Attention:	Brodie Rowse
Report	718517-AID
Project Name	59 TRIG ROAD
Project ID	J1475
Received Date	May 08, 2020
Date Reported	May 14, 2020

Methodology:

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

Project Name 59 TRIG ROAD
Project ID J1475
Date Sampled May 06, 2020 to May 07, 2020
Report 718517-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP1 1.0M	20-My13253	May 06, 2020	Approximate Sample 611g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP2 1.5M	20-My13254	May 06, 2020	Approximate Sample 689g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP3 1.0M	20-My13255	May 06, 2020	Approximate Sample 641g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP4 0.5M	20-My13256	May 06, 2020	Approximate Sample 595g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP5 1.0M	20-My13257	May 06, 2020	Approximate Sample 627g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP7 0.5M	20-My13258	May 06, 2020	Approximate Sample 612g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP8 0.5M	20-My13259	May 07, 2020	Approximate Sample 637g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP8 1.0M	20-My13260	May 07, 2020	Approximate Sample 736g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP9 0.5M	20-My13261	May 07, 2020	Approximate Sample 573g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP9 1.5	20-My13262	May 07, 2020	Approximate Sample 565g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP10 0.5M	20-My13263	May 07, 2020	Approximate Sample 553g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP11 0.5M	20-My13264	May 07, 2020	Approximate Sample 602g Sample consisted of: Fine grained soil and rocks.	AF: Chrysotile asbestos detected in fibre cement fragments and loose fibre bundles. Approximate raw weight of AF = 0.0079g Estimated asbestos content in AF = 0.0019g* Total estimated asbestos concentration in AF = 0.00031% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
TP11 1.0M	20-My13265	May 07, 2020	Approximate Sample 571g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP12 0.5M	20-My13266	May 07, 2020	Approximate Sample 609g Sample consisted of: Fine grained soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	May 14, 2020	Indefinite

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NATA # 1261
Site # 23736

Company Name: Geosciences Ltd
Address: First Floor, 47 Clyde Road
Browns Bay
Auckland NZ 0630

Project Name: 59 TRIG ROAD
Project ID: J1475

Order No.:
Report #: 718517
Phone: 0011 64 9 4760 454
Fax:

Received: May 8, 2020 5:00 PM
Due: May 13, 2020
Priority: 3 Day
Contact Name: Brodie Rowse

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						Asbestos - WA guidelines	Lead	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M7 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins | mgt Suite B22-NZ: OCP, Metals (As,Cu,Pb) (NZ MfE)
Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	TP1 1.0M	May 06, 2020		Soil	K20-My13253	X		X	X	X	X	
2	TP2 1.5M	May 06, 2020		Soil	K20-My13254	X		X	X	X	X	
3	TP3 1.0M	May 06, 2020		Soil	K20-My13255	X		X	X	X	X	
4	TP4 0.5M	May 06, 2020		Soil	K20-My13256	X		X	X	X	X	
5	TP5 1.0M	May 06, 2020		Soil	K20-My13257	X		X	X	X	X	
6	TP7 0.5M	May 06, 2020		Soil	K20-My13258	X		X	X	X	X	
7	TP8 0.5M	May 07, 2020		Soil	K20-My13259	X		X	X	X	X	
8	TP8 1.0M	May 07, 2020		Soil	K20-My13260	X		X	X	X	X	
9	TP9 0.5M	May 07, 2020		Soil	K20-My13261	X		X	X	X	X	
10	TP9 1.5	May 07, 2020		Soil	K20-My13262	X		X	X	X	X	
11	TP10 0.5M	May 07, 2020		Soil	K20-My13263	X		X	X	X	X	
12	TP11 0.5M	May 07, 2020		Soil	K20-My13264	X		X	X	X	X	

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Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
13	TP11 1.0M	May 07, 2020		Soil	K20-My13265	X		X	X	X	X	
14	TP12 0.5M	May 07, 2020		Soil	K20-My13266	X		X	X	X	X	
15	TP1 2.2M	May 06, 2020		Soil	K20-My13267			X	X	X	X	
16	TP2 3.0M	May 06, 2020		Soil	K20-My13268			X	X	X	X	
17	TP2 5.0M	May 06, 2020		Soil	K20-My13269			X	X	X	X	
18	TP3 2.5M	May 06, 2020		Soil	K20-My13270			X	X	X	X	
19	TP3 6.0M	May 06, 2020		Soil	K20-My13271			X	X	X	X	
20	TP4 2.0M	May 06, 2020		Soil	K20-My13272			X	X	X	X	
21	TP4 3.5	May 06, 2020		Soil	K20-My13273			X	X	X	X	
22	TP5 2.0M	May 06, 2020		Soil	K20-My13274			X	X	X	X	
23	TP5 3.0M	May 06, 2020		Soil	K20-My13275			X	X	X	X	
24	TP6 0.5M	May 06, 2020		Soil	K20-My13276			X	X	X	X	

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Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
25	TP8 2.0M	May 07, 2020		Soil	K20-My13277			X	X	X	X	
26	TP8 2.2M	May 07, 2020		Soil	K20-My13278			X	X	X	X	
27	TP10 1.2M	May 07, 2020		Soil	K20-My13279			X	X	X	X	
28	TP11 1.5M	May 07, 2020		Soil	K20-My13280			X	X	X	X	
29	TP12 1.5M	May 07, 2020		Soil	K20-My13281			X	X	X	X	
30	SC1	May 07, 2020		Soil	K20-My13282			X				X
31	SC2	May 07, 2020		Soil	K20-My13283			X				X
32	SC3	May 07, 2020		Soil	K20-My13284			X				X
33	SS1	May 07, 2020		Soil	K20-My13285			X				X
34	SS2	May 07, 2020		Soil	K20-My13286			X				X
35	SS3	May 07, 2020		Soil	K20-My13287			X				X
36	SS4	May 07, 2020		Soil	K20-My13288			X				X

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Sample Detail						Asbestos - WA guidelines	Lead	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M7 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins | mgt Suite B22-NZ: OCP, Metals (As,Cu,Pb) (NZ MfE)
Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
37	SS5	May 07, 2020		Soil	K20-My13289			X				X
38	SS6	May 07, 2020		Soil	K20-My13290			X				X
39	SS7	May 07, 2020		Soil	K20-My13291			X				X
40	SS8	May 07, 2020		Soil	K20-My13292		X	X				
41	SS10	May 07, 2020		Soil	K20-My13293		X	X				
42	SS11	May 07, 2020		Soil	K20-My13294		X	X				
43	SS9	May 07, 2020		Soil	K20-My13331		X	X				
Test Counts						14	4	43	29	29	29	10

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

% w/w weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Katyana Gausel	Senior Analyst-Asbestos (NZS) (Key Technical Personnel)

Authorised by:

Irene Suresh	Senior Analyst-Asbestos (NZS)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Geosciences Ltd
First Floor, 47 Clyde Road
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Auckland NZ 0630

Attention: **Brodie Rowse**

Report **718517-S**
Project name 59 TRIG ROAD
Project ID J1475
Received Date May 08, 2020

Client Sample ID			TP1 1.0M	TP2 1.5M	TP3 1.0M	TP4 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13253	K20-My13254	K20-My13255	K20-My13256
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	0.01	0.01	0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.01	0.02	0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	0.04	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	0.04	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	117	136	132	133
Tetrachloro-m-xylene (surr.)	1	%	68	79	75	80
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.15
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	0.04	0.04	0.70
Benz(a)anthracene	0.03	mg/kg	0.08	0.61	0.05	1.6
Benzo(a)pyrene	0.03	mg/kg	0.08	0.44	0.05	1.5

Client Sample ID			TP1 1.0M	TP2 1.5M	TP3 1.0M	TP4 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13253	K20-My13254	K20-My13255	K20-My13256
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	0.12	0.76	0.07	2.3
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.13	0.76	0.09	2.3
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.15	0.76	0.10	2.3
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	0.10	0.70	0.05	1.2
Benzo(g.h.i)perylene	0.03	mg/kg	0.06	0.27	0.04	0.85
Benzo(k)fluoranthene	0.03	mg/kg	0.08	0.47	0.04	1.2
Chrysene	0.03	mg/kg	0.10	0.38	0.06	1.4
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	0.10	< 0.03	0.26
Fluoranthene	0.03	mg/kg	0.11	0.95	0.10	4.4
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.12
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	0.07	0.32	0.04	0.72
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	0.18	0.04	2.4
Pyrene	0.03	mg/kg	0.14	0.92	0.10	4.5
p-Terphenyl-d14 (surr.)	1	%	92	88	73	79
2-Fluorobiphenyl (surr.)	1	%	66	75	64	73
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	4.7	3.8	3.0	3.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	17	22	16
Copper	5	mg/kg	14	15	14	14
Lead	5	mg/kg	27	34	14	11
Nickel	5	mg/kg	12	14	25	18
Zinc	5	mg/kg	52	50	56	34
% Moisture	1	%	17	21	17	19

Client Sample ID			TP5 1.0M	TP7 0.5M	TP8 0.5M	TP8 1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13257	K20-My13258	K20-My13259	K20-My13260
Date Sampled			May 06, 2020	May 06, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	0.03	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	0.04	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			TP5 1.0M	TP7 0.5M	TP8 0.5M	TP8 1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13257	K20-My13258	K20-My13259	K20-My13260
Date Sampled			May 06, 2020	May 06, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	INT	INT	INT	145
Tetrachloro-m-xylene (surr.)	1	%	76	79	73	71
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	0.04	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	0.14	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	0.54	< 0.03	0.07
Benzo(a)pyrene	0.03	mg/kg	< 0.03	0.70	0.04	0.07
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	1.1	0.05	0.10
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	1.1	0.07	0.11
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	1.1	0.08	0.13
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	0.51	< 0.03	0.07
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	0.46	< 0.03	0.05
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	0.56	0.04	0.05
Chrysene	0.03	mg/kg	< 0.03	0.59	0.05	0.09
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	0.14	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	1.4	0.07	0.13
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	0.43	< 0.03	0.05
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	0.39	< 0.03	0.06
Pyrene	0.03	mg/kg	< 0.03	1.5	0.07	0.13
p-Terphenyl-d14 (surr.)	1	%	73	82	83	80
2-Fluorobiphenyl (surr.)	1	%	58	68	77	67
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	3.1	4.4	3.6	4.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	14	13	15
Copper	5	mg/kg	13	17	13	34
Lead	5	mg/kg	11	16	15	47
Nickel	5	mg/kg	11	12	12	18
Zinc	5	mg/kg	26	31	20	56
% Moisture	1	%	21	21	18	18

Client Sample ID			TP9 0.5M	TP9 1.5	TP10 0.5M	TP11 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13261	K20-My13262	K20-My13263	K20-My13264
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	129	125	INT	INT
Tetrachloro-m-xylene (surr.)	1	%	89	70	73	65
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	0.06	< 0.03	0.04	< 0.03
Benz(a)anthracene	0.03	mg/kg	1.9	< 0.03	0.12	< 0.03
Benzo(a)pyrene	0.03	mg/kg	1.9	< 0.03	0.14	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	3.1	< 0.03	0.19	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	3.1	0.04	0.21	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	3.1	0.07	0.22	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	1.7	< 0.03	0.12	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	1.0	< 0.03	0.07	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	1.7	< 0.03	0.14	< 0.03
Chrysene	0.03	mg/kg	1.9	< 0.03	0.16	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	0.46	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	2.2	0.04	0.23	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	1.2	< 0.03	0.09	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	0.04	< 0.03	0.07	< 0.03
Pyrene	0.03	mg/kg	2.3	0.05	0.27	< 0.03

Client Sample ID			TP9 0.5M	TP9 1.5	TP10 0.5M	TP11 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13261	K20-My13262	K20-My13263	K20-My13264
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
p-Terphenyl-d14 (surr.)	1	%	68	73	73	68
2-Fluorobiphenyl (surr.)	1	%	68	61	57	67
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	5.0	7.5	3.2	3.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	13	36	14
Copper	5	mg/kg	12	23	19	14
Lead	5	mg/kg	9.4	15	19	9.7
Nickel	5	mg/kg	13	8.1	42	14
Zinc	5	mg/kg	17	29	47	26
% Moisture	1	%	22	19	19	18

Client Sample ID			TP11 1.0M	TP12 0.5M	TP1 2.2M	TP2 3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13265	K20-My13266	K20-My13267	K20-My13268
Date Sampled			May 07, 2020	May 07, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	INT	147	INT	147
Tetrachloro-m-xylene (surr.)	1	%	66	68	73	77

Client Sample ID			TP11 1.0M	TP12 0.5M	TP1 2.2M	TP2 3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13265	K20-My13266	K20-My13267	K20-My13268
Date Sampled			May 07, 2020	May 07, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	0.25	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	0.09	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	0.13	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	0.17	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.18	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.07	0.20	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	0.08	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	0.04	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	0.04	0.11	< 0.03	< 0.03
Chrysene	0.03	mg/kg	0.04	0.13	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	0.04	0.23	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	0.14	< 0.03	< 0.03
Pyrene	0.03	mg/kg	0.05	0.24	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	70	73	77	73
2-Fluorobiphenyl (surr.)	1	%	61	61	60	64
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	3.5	3.1	< 2	4.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	17	< 5	22
Copper	5	mg/kg	15	14	< 5	16
Lead	5	mg/kg	11	14	11	21
Nickel	5	mg/kg	13	19	< 5	9.2
Zinc	5	mg/kg	75	27	9.2	43
% Moisture	1	%	18	20	33	29

Client Sample ID			TP2 5.0M	TP3 2.5M	TP3 6.0M	TP4 2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13269	K20-My13270	K20-My13271	K20-My13272
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			TP2 5.0M	TP3 2.5M	TP3 6.0M	TP4 2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13269	K20-My13270	K20-My13271	K20-My13272
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	145	113	128	130
Tetrachloro-m-xylene (surr.)	1	%	72	74	76	78
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.07
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	0.04	0.09
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.08	0.10
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.06
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.08
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.10
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.11
p-Terphenyl-d14 (surr.)	1	%	68	74	79	75
2-Fluorobiphenyl (surr.)	1	%	57	57	62	68
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	< 2	3.7	< 2	3.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	14	5.3	12
Copper	5	mg/kg	< 5	9.5	7.5	7.5
Lead	5	mg/kg	7.5	11	23	8.6
Nickel	5	mg/kg	< 5	12	< 5	9.9
Zinc	5	mg/kg	7.1	21	15	16

Client Sample ID			TP2 5.0M	TP3 2.5M	TP3 6.0M	TP4 2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13269	K20-My13270	K20-My13271	K20-My13272
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
% Moisture	1	%	26	27	39	21

Client Sample ID			TP4 3.5	TP5 2.0M	TP5 3.0M	TP6 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13273	K20-My13274	K20-My13275	K20-My13276
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	125	128	135	149
Tetrachloro-m-xylene (surr.)	1	%	82	75	71	82
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03

Client Sample ID			TP4 3.5	TP5 2.0M	TP5 3.0M	TP6 0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13273	K20-My13274	K20-My13275	K20-My13276
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	75	77	68	72
2-Fluorobiphenyl (surr.)	1	%	50	60	53	58
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	< 2	< 2	< 2	3.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	13
Copper	5	mg/kg	< 5	< 5	< 5	12
Lead	5	mg/kg	8.6	12	7.8	8.4
Nickel	5	mg/kg	< 5	< 5	< 5	12
Zinc	5	mg/kg	6.0	8.9	6.4	24
% Moisture	1	%	28	32	21	21

Client Sample ID			TP8 2.0M	TP8 2.2M	TP10 1.2M	TP11 1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13277	K20-My13278	K20-My13279	K20-My13280
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			TP8 2.0M	TP8 2.2M	TP10 1.2M	TP11 1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13277	K20-My13278	K20-My13279	K20-My13280
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	132	INT	126	126
Tetrachloro-m-xylene (surr.)	1	%	75	77	72	78
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.08	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	70	71	69	73
2-Fluorobiphenyl (surr.)	1	%	66	51	52	60
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	3.0	4.6	3.5	3.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	5.6	20	16
Copper	5	mg/kg	< 5	< 5	12	12
Lead	5	mg/kg	5.5	12	8.7	11
Nickel	5	mg/kg	< 5	< 5	5.8	15
Zinc	5	mg/kg	8.2	5.9	30	20
% Moisture	1	%	23	37	19	24

Client Sample ID			TP12 1.5M	SC1	SC2	SC3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13281	K20-My13282	K20-My13283	K20-My13284
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
D butylchlorendate (surr.)	1	%	INT	140	146	139
Tetrachloro-m-xylene (surr.)	1	%	79	76	83	79
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	-	-	-
Acenaphthylene	0.03	mg/kg	< 0.03	-	-	-
Anthracene	0.03	mg/kg	< 0.03	-	-	-
Benz(a)anthracene	0.03	mg/kg	0.15	-	-	-
Benzo(a)pyrene	0.03	mg/kg	0.18	-	-	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	0.24	-	-	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.26	-	-	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.27	-	-	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	0.13	-	-	-
Benzo(g.h.i)perylene	0.03	mg/kg	0.09	-	-	-
Benzo(k)fluoranthene	0.03	mg/kg	0.18	-	-	-
Chrysene	0.03	mg/kg	0.19	-	-	-
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	-	-	-
Fluoranthene	0.03	mg/kg	0.33	-	-	-
Fluorene	0.03	mg/kg	< 0.03	-	-	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	0.09	-	-	-
Naphthalene	0.1	mg/kg	< 0.1	-	-	-
Phenanthrene	0.03	mg/kg	0.09	-	-	-
Pyrene	0.03	mg/kg	0.34	-	-	-

Client Sample ID			TP12 1.5M	SC1	SC2	SC3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13281	K20-My13282	K20-My13283	K20-My13284
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
p-Terphenyl-d14 (surr.)	1	%	83	-	-	-
2-Fluorobiphenyl (surr.)	1	%	77	-	-	-
Copper	5	mg/kg	-	< 5	23	8.6
Metals M8 (NZ MfE)						
Arsenic	2	mg/kg	-	< 2	7.4	< 2
Lead	5	mg/kg	-	< 5	19	7.6
Metals M7 (NZ MfE)						
Arsenic	2	mg/kg	3.9	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	20	-	-	-
Copper	5	mg/kg	15	-	-	-
Lead	5	mg/kg	12	-	-	-
Nickel	5	mg/kg	20	-	-	-
Zinc	5	mg/kg	31	-	-	-
% Moisture	1	%	20	28	30	24

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13285	K20-My13286	K20-My13287	K20-My13288
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	0.01	< 0.01	0.35
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13285	K20-My13286	K20-My13287	K20-My13288
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	137	150	138	INT
Tetrachloro-m-xylene (surr.)	1	%	78	77	84	80
Copper	5	mg/kg	12	12	11	28
Metals M8 (NZ MfE)						
Arsenic	2	mg/kg	8.4	6.8	7.0	13
Lead	5	mg/kg	22	21	19	19
% Moisture	1	%	15	21	24	80

Client Sample ID			SS5	SS6	SS7	SS8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13289	K20-My13290	K20-My13291	K20-My13292
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	0.02	-
Endosulfan sulphate	0.01	mg/kg	< 0.01	0.01	< 0.01	-
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endrin aldehyde	0.01	mg/kg	[G01] < 0.1	[G01] < 0.1	[G01] < 0.1	-
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
D butylchlorendate (surr.)	1	%	143	INT	150	-
Tetrachloro-m-xylene (surr.)	1	%	89	77	86	-

Client Sample ID			SS5	SS6	SS7	SS8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K20-My13289	K20-My13290	K20-My13291	K20-My13292
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit				
Copper	5	mg/kg	< 5	15	7.1	-
Metals M8 (NZ MfE)						
Arsenic	2	mg/kg	< 2	< 2	< 2	-
Lead	5	mg/kg	9.4	6.5	5.7	18
% Moisture	1	%	11	22	11	28

Client Sample ID			SS10	SS11	SS9
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			K20-My13293	K20-My13294	K20-My13331
Date Sampled			May 07, 2020	May 07, 2020	May 07, 2020
Test/Reference	LOR	Unit			
Metals M8 (NZ MfE)					
Lead	5	mg/kg	15	19	17
% Moisture	1	%	27	28	28

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	May 11, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Copper	Auckland	May 11, 2020	6 Months
- Method:			
Metals M8 (NZ MfE)	Auckland	May 12, 2020	6 Months
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M7 (NZ MfE)	Auckland	May 11, 2020	6 Months
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	May 11, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			
% Moisture	Auckland	May 11, 2020	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Site # 23736

Company Name: Geosciences Ltd
Address: First Floor, 47 Clyde Road
Browns Bay
Auckland NZ 0630

Project Name: 59 TRIG ROAD
Project ID: J1475

Order No.:
Report #: 718517
Phone: 0011 64 9 4760 454
Fax:

Received: May 8, 2020 5:00 PM
Due: May 15, 2020
Priority: 5 Day
Contact Name: Brodie Rowse

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						Asbestos - WA guidelines	Lead	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M7 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins | mgt Suite B22-NZ: OCP, Metals (As,Cu,Pb) (NZ MfE)
Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	TP1 1.0M	May 06, 2020		Soil	K20-My13253	X		X	X	X	X	
2	TP2 1.5M	May 06, 2020		Soil	K20-My13254	X		X	X	X	X	
3	TP3 1.0M	May 06, 2020		Soil	K20-My13255	X		X	X	X	X	
4	TP4 0.5M	May 06, 2020		Soil	K20-My13256	X		X	X	X	X	
5	TP5 1.0M	May 06, 2020		Soil	K20-My13257	X		X	X	X	X	
6	TP7 0.5M	May 06, 2020		Soil	K20-My13258	X		X	X	X	X	
7	TP8 0.5M	May 07, 2020		Soil	K20-My13259	X		X	X	X	X	
8	TP8 1.0M	May 07, 2020		Soil	K20-My13260	X		X	X	X	X	
9	TP9 0.5M	May 07, 2020		Soil	K20-My13261	X		X	X	X	X	
10	TP9 1.5	May 07, 2020		Soil	K20-My13262	X		X	X	X	X	
11	TP10 0.5M	May 07, 2020		Soil	K20-My13263	X		X	X	X	X	
12	TP11 0.5M	May 07, 2020		Soil	K20-My13264	X		X	X	X	X	

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Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
13	TP11 1.0M	May 07, 2020		Soil	K20-My13265	X		X	X	X	X	
14	TP12 0.5M	May 07, 2020		Soil	K20-My13266	X		X	X	X	X	
15	TP1 2.2M	May 06, 2020		Soil	K20-My13267			X	X	X	X	
16	TP2 3.0M	May 06, 2020		Soil	K20-My13268			X	X	X	X	
17	TP2 5.0M	May 06, 2020		Soil	K20-My13269			X	X	X	X	
18	TP3 2.5M	May 06, 2020		Soil	K20-My13270			X	X	X	X	
19	TP3 6.0M	May 06, 2020		Soil	K20-My13271			X	X	X	X	
20	TP4 2.0M	May 06, 2020		Soil	K20-My13272			X	X	X	X	
21	TP4 3.5	May 06, 2020		Soil	K20-My13273			X	X	X	X	
22	TP5 2.0M	May 06, 2020		Soil	K20-My13274			X	X	X	X	
23	TP5 3.0M	May 06, 2020		Soil	K20-My13275			X	X	X	X	
24	TP6 0.5M	May 06, 2020		Soil	K20-My13276			X	X	X	X	

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Sample Detail						Asbestos - WA guidelines	Lead	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M7 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)	Eurofins | mgt Suite B22-NZ: OCP, Metals (As,Cu,Pb) (NZ MfE)
Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
25	TP8 2.0M	May 07, 2020		Soil	K20-My13277			X	X	X	X	
26	TP8 2.2M	May 07, 2020		Soil	K20-My13278			X	X	X	X	
27	TP10 1.2M	May 07, 2020		Soil	K20-My13279			X	X	X	X	
28	TP11 1.5M	May 07, 2020		Soil	K20-My13280			X	X	X	X	
29	TP12 1.5M	May 07, 2020		Soil	K20-My13281			X	X	X	X	
30	SC1	May 07, 2020		Soil	K20-My13282			X				X
31	SC2	May 07, 2020		Soil	K20-My13283			X				X
32	SC3	May 07, 2020		Soil	K20-My13284			X				X
33	SS1	May 07, 2020		Soil	K20-My13285			X				X
34	SS2	May 07, 2020		Soil	K20-My13286			X				X
35	SS3	May 07, 2020		Soil	K20-My13287			X				X
36	SS4	May 07, 2020		Soil	K20-My13288			X				X

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Auckland Laboratory - IANZ# 1327							X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
37	SS5	May 07, 2020		Soil	K20-My13289			X				X
38	SS6	May 07, 2020		Soil	K20-My13290			X				X
39	SS7	May 07, 2020		Soil	K20-My13291			X				X
40	SS8	May 07, 2020		Soil	K20-My13292		X	X				
41	SS10	May 07, 2020		Soil	K20-My13293		X	X				
42	SS11	May 07, 2020		Soil	K20-My13294		X	X				
43	SS9	May 07, 2020		Soil	K20-My13331		X	X				
Test Counts						14	4	43	29	29	29	10

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

****NOTE** pH duplicates are reported as a range NOT as RPD

Units

mg/kg milligrams per kilogram
mg/L milligrams per litre
ug/L micrograms per litre
ppm Parts per million
ppb Parts per billion
% Percentage
org/100mL Organisms per 100 millilitres
NTU Nephelometric Turbidity Units
MPN/100mL Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5 3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6 2 FTSA, 8 2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-BHC	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-BHC	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-BHC	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-BHC (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
Method Blank							
Copper	mg/kg	< 5			5	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 2			2	Pass	
Lead	mg/kg	< 5			5	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Metals M7 (NZ MfE)							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	103			70-130	Pass	
2.4'-DDE	%	101			70-130	Pass	
2.4'-DDT	%	98			70-130	Pass	
4.4'-DDD	%	101			70-130	Pass	
4.4'-DDE	%	98			70-130	Pass	
4.4'-DDT	%	91			70-130	Pass	
a-BHC	%	99			70-130	Pass	
Aldrin	%	102			70-130	Pass	
b-BHC	%	85			70-130	Pass	
Chlordanes - Total	%	112			70-130	Pass	
cis-Chlordane	%	116			70-130	Pass	
d-BHC	%	96			70-130	Pass	
Dieldrin	%	104			70-130	Pass	
Endosulfan I	%	102			70-130	Pass	
Endosulfan II	%	84			70-130	Pass	
Endosulfan sulphate	%	103			70-130	Pass	
Endrin	%	101			70-130	Pass	
Endrin aldehyde	%	102			70-130	Pass	
Endrin ketone	%	94			70-130	Pass	
g-BHC (Lindane)	%	109			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	113			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	88			70-130	Pass	
trans-Chlordane	%	108			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	%	85			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	101			70-130	Pass	
Fluoranthene	%	95			70-130	Pass	
Fluorene	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	93			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	
Pyrene	%	94			70-130	Pass	
LCS - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	108			70-130	Pass	
LCS - % Recovery									
Metals M8 (NZ MfE)									
Arsenic			%	113			70-130	Pass	
Lead			%	114			70-130	Pass	
LCS - % Recovery									
Metals M7 (NZ MfE)									
Arsenic			%	105			70-130	Pass	
Cadmium			%	104			70-130	Pass	
Chromium			%	98			70-130	Pass	
Copper			%	97			70-130	Pass	
Lead			%	98			70-130	Pass	
Nickel			%	96			70-130	Pass	
Zinc			%	114			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
Endrin aldehyde	K20-My10766	NCP	%	72			70-130	Pass	
Spike - % Recovery									
				Result 1					
Copper	K20-My13261	CP	%	83			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K20-My13261	CP	%	88			70-130	Pass	
Lead	K20-My13261	CP	%	92			70-130	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Cadmium	K20-My13261	CP	%	99			70-130	Pass	
Chromium	K20-My13261	CP	%	86			70-130	Pass	
Nickel	K20-My13261	CP	%	81			70-130	Pass	
Zinc	K20-My13261	CP	%	90			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
4.4'-DDE	K20-My13262	CP	%	112			70-130	Pass	
a-BHC	K20-My13262	CP	%	104			70-130	Pass	
Aldrin	K20-My13262	CP	%	87			70-130	Pass	
b-BHC	K20-My13262	CP	%	87			70-130	Pass	
Chlordanes - Total	K20-My13262	CP	%	114			70-130	Pass	
cis-Chlordane	K20-My13262	CP	%	118			70-130	Pass	
d-BHC	K20-My13262	CP	%	104			70-130	Pass	
Dieldrin	K20-My13262	CP	%	112			70-130	Pass	
Endosulfan I	K20-My13262	CP	%	115			70-130	Pass	
Endosulfan II	K20-My13262	CP	%	116			70-130	Pass	
Endosulfan sulphate	K20-My13262	CP	%	113			70-130	Pass	
Endrin	K20-My13262	CP	%	110			70-130	Pass	
Endrin ketone	K20-My13262	CP	%	122			70-130	Pass	
g-BHC (Lindane)	K20-My13262	CP	%	117			70-130	Pass	
Heptachlor	K20-My13262	CP	%	91			70-130	Pass	
Heptachlor epoxide	K20-My13262	CP	%	119			70-130	Pass	
trans-Chlordane	K20-My13262	CP	%	110			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K20-My13262	CP	%	79			70-130	Pass	
Acenaphthylene	K20-My13262	CP	%	82			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	K20-My13262	CP	%	88			70-130	Pass	
Benz(a)anthracene	K20-My13262	CP	%	81			70-130	Pass	
Benzo(a)pyrene	K20-My13262	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	K20-My13262	CP	%	80			70-130	Pass	
Benzo(k)fluoranthene	K20-My13262	CP	%	99			70-130	Pass	
Chrysene	K20-My13262	CP	%	92			70-130	Pass	
Fluoranthene	K20-My13262	CP	%	88			70-130	Pass	
Fluorene	K20-My13262	CP	%	82			70-130	Pass	
Naphthalene	K20-My13262	CP	%	85			70-130	Pass	
Phenanthrene	K20-My13262	CP	%	74			70-130	Pass	
Pyrene	K20-My13262	CP	%	90			70-130	Pass	
Spike - % Recovery									
				Result 1					
Copper	K20-My13271	CP	%	83			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K20-My13271	CP	%	84			70-130	Pass	
Lead	K20-My13271	CP	%	91			70-130	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Cadmium	K20-My13271	CP	%	96			70-130	Pass	
Chromium	K20-My13271	CP	%	85			70-130	Pass	
Nickel	K20-My13271	CP	%	82			70-130	Pass	
Zinc	K20-My13271	CP	%	88			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
4.4'-DDD	K20-My13272	CP	%	119			70-130	Pass	
4.4'-DDE	K20-My13272	CP	%	100			70-130	Pass	
4.4'-DDT	K20-My13272	CP	%	78			70-130	Pass	
a-BHC	K20-My13272	CP	%	95			70-130	Pass	
Aldrin	K20-My13272	CP	%	101			70-130	Pass	
b-BHC	K20-My13272	CP	%	81			70-130	Pass	
Chlordanes - Total	K20-My13272	CP	%	100			70-130	Pass	
cis-Chlordane	K20-My13272	CP	%	105			70-130	Pass	
d-BHC	K20-My13272	CP	%	91			70-130	Pass	
Dieldrin	K20-My13272	CP	%	98			70-130	Pass	
Endosulfan I	K20-My13272	CP	%	103			70-130	Pass	
Endosulfan II	K20-My13272	CP	%	103			70-130	Pass	
Endosulfan sulphate	K20-My13272	CP	%	99			70-130	Pass	
Endrin	K20-My13272	CP	%	97			70-130	Pass	
Endrin ketone	K20-My13272	CP	%	103			70-130	Pass	
g-BHC (Lindane)	K20-My13272	CP	%	107			70-130	Pass	
Heptachlor	K20-My13272	CP	%	94			70-130	Pass	
Heptachlor epoxide	K20-My13272	CP	%	107			70-130	Pass	
Methoxychlor	K20-My13272	CP	%	81			70-130	Pass	
trans-Chlordane	K20-My13272	CP	%	94			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K20-My13272	CP	%	80			70-130	Pass	
Acenaphthylene	K20-My13272	CP	%	82			70-130	Pass	
Anthracene	K20-My13272	CP	%	89			70-130	Pass	
Benz(a)anthracene	K20-My13272	CP	%	80			70-130	Pass	
Benzo(a)pyrene	K20-My13272	CP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	K20-My13272	CP	%	75			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	K20-My13272	CP	%	85			70-130	Pass	
Benzo(k)fluoranthene	K20-My13272	CP	%	94			70-130	Pass	
Chrysene	K20-My13272	CP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	K20-My13272	CP	%	89			70-130	Pass	
Fluoranthene	K20-My13272	CP	%	88			70-130	Pass	
Fluorene	K20-My13272	CP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K20-My13272	CP	%	86			70-130	Pass	
Naphthalene	K20-My13272	CP	%	82			70-130	Pass	
Phenanthrene	K20-My13272	CP	%	73			70-130	Pass	
Pyrene	K20-My13272	CP	%	86			70-130	Pass	
Spike - % Recovery									
				Result 1					
Copper	K20-My13281	CP	%	92			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K20-My13281	CP	%	96			70-130	Pass	
Lead	K20-My13281	CP	%	101			70-130	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Cadmium	K20-My13281	CP	%	105			70-130	Pass	
Chromium	K20-My13281	CP	%	92			70-130	Pass	
Nickel	K20-My13281	CP	%	88			70-130	Pass	
Zinc	K20-My13281	CP	%	101			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
4.4'-DDE	K20-My13282	CP	%	119			70-130	Pass	
a-BHC	K20-My13282	CP	%	114			70-130	Pass	
Aldrin	K20-My13282	CP	%	118			70-130	Pass	
b-BHC	K20-My13282	CP	%	102			70-130	Pass	
Chlordanes - Total	K20-My13282	CP	%	120			70-130	Pass	
cis-Chlordane	K20-My13282	CP	%	118			70-130	Pass	
d-BHC	K20-My13282	CP	%	115			70-130	Pass	
Dieldrin	K20-My13282	CP	%	113			70-130	Pass	
Endosulfan I	K20-My13282	CP	%	130			70-130	Pass	
Endosulfan II	K20-My13282	CP	%	129			70-130	Pass	
Endosulfan sulphate	K20-My13282	CP	%	121			70-130	Pass	
Endrin	K20-My13282	CP	%	114			70-130	Pass	
Endrin ketone	K20-My13282	CP	%	121			70-130	Pass	
g-BHC (Lindane)	K20-My13282	CP	%	123			70-130	Pass	
Heptachlor	K20-My13282	CP	%	105			70-130	Pass	
Heptachlor epoxide	K20-My13282	CP	%	125			70-130	Pass	
trans-Chlordane	K20-My13282	CP	%	122			70-130	Pass	
Spike - % Recovery									
				Result 1					
Copper	K20-My13291	CP	%	85			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K20-My13291	CP	%	89			70-130	Pass	
Lead	K20-My13291	CP	%	91			70-130	Pass	
Spike - % Recovery									
Metals M7 (NZ MfE)				Result 1					
Cadmium	K20-My13291	CP	%	94			70-130	Pass	
Chromium	K20-My13291	CP	%	87			70-130	Pass	
Nickel	K20-My13291	CP	%	85			70-130	Pass	
Zinc	K20-My13291	CP	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Copper	K20-My13260	CP	mg/kg	34	23	39	30%	Fail	Q15
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K20-My13260	CP	mg/kg	4.9	3.9	23	30%	Pass	
Lead	K20-My13260	CP	mg/kg	47	48	<1	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Cadmium	K20-My13260	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	K20-My13260	CP	mg/kg	15	12	22	30%	Pass	
Nickel	K20-My13260	CP	mg/kg	18	11	43	30%	Fail	Q15
Zinc	K20-My13260	CP	mg/kg	56	47	19	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K20-My13260	CP	%	18	19	7.0	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-BHC	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-BHC	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-BHC	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K20-My13261	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin ketone	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-BHC (Lindane)	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K20-My13261	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K20-My13261	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K20-My13261	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K20-My13261	CP	mg/kg	0.06	0.06	4.0	30%	Pass	
Benz(a)anthracene	K20-My13261	CP	mg/kg	1.9	1.8	8.0	30%	Pass	
Benzo(a)pyrene	K20-My13261	CP	mg/kg	1.9	1.7	7.0	30%	Pass	
Benzo(b&j)fluoranthene	K20-My13261	CP	mg/kg	1.7	1.4	16	30%	Pass	
Benzo(k)fluoranthene	K20-My13261	CP	mg/kg	1.7	1.8	4.0	30%	Pass	
Chrysene	K20-My13261	CP	mg/kg	1.9	1.9	2.0	30%	Pass	
Fluoranthene	K20-My13261	CP	mg/kg	2.2	2.0	11	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Fluorene	K20-My13261	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K20-My13261	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K20-My13261	CP	mg/kg	0.04	0.04	1.0	30%	Pass	
Pyrene	K20-My13261	CP	mg/kg	2.3	2.2	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Copper	K20-My13270	CP	mg/kg	9.5	12	24	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K20-My13270	CP	mg/kg	3.7	3.9	4.0	30%	Pass	
Lead	K20-My13270	CP	mg/kg	11	9.7	8.0	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Cadmium	K20-My13270	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	K20-My13270	CP	mg/kg	14	17	17	30%	Pass	
Nickel	K20-My13270	CP	mg/kg	12	18	36	30%	Fail	Q15
Zinc	K20-My13270	CP	mg/kg	21	22	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K20-My13270	CP	%	27	26	4.0	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-BHC	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-BHC	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-BHC	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-BHC (Lindane)	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K20-My13271	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Benzo(g.h.i)perylene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K20-My13271	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K20-My13271	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Copper	K20-My13280	CP	mg/kg	12	12	1.0	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K20-My13280	CP	mg/kg	3.5	3.7	7.0	30%	Pass	
Lead	K20-My13280	CP	mg/kg	11	11	7.0	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Cadmium	K20-My13280	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	K20-My13280	CP	mg/kg	16	14	13	30%	Pass	
Nickel	K20-My13280	CP	mg/kg	15	14	12	30%	Pass	
Zinc	K20-My13280	CP	mg/kg	20	21	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K20-My13280	CP	%	24	21	15	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-BHC	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-BHC	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-BHC	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K20-My13281	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin ketone	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-BHC (Lindane)	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K20-My13281	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K20-My13281	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K20-My13281	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K20-My13281	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K20-My13281	CP	mg/kg	0.15	0.15	<1	30%	Pass	
Benzo(a)pyrene	K20-My13281	CP	mg/kg	0.18	0.19	6.0	30%	Pass	
Benzo(b&j)fluoranthene	K20-My13281	CP	mg/kg	0.13	0.16	22	30%	Pass	
Benzo(g.h.i)perylene	K20-My13281	CP	mg/kg	0.09	0.09	2.0	30%	Pass	
Benzo(k)fluoranthene	K20-My13281	CP	mg/kg	0.18	0.18	<1	30%	Pass	
Chrysene	K20-My13281	CP	mg/kg	0.19	0.18	5.0	30%	Pass	
Dibenz(a.h)anthracene	K20-My13281	CP	mg/kg	< 0.03	0.04	14	30%	Pass	
Fluoranthene	K20-My13281	CP	mg/kg	0.33	0.25	27	30%	Pass	
Fluorene	K20-My13281	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K20-My13281	CP	mg/kg	0.09	0.09	7.0	30%	Pass	
Naphthalene	K20-My13281	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Pyrene	K20-My13281	CP	mg/kg	0.34	0.29	18	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Copper	K20-My13290	CP	mg/kg	15	15	1.0	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K20-My13290	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Lead	K20-My13290	CP	mg/kg	6.5	6.3	4.0	30%	Pass	
Duplicate									
Metals M7 (NZ MfE)				Result 1	Result 2	RPD			
Cadmium	K20-My13290	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	K20-My13290	CP	mg/kg	6.6	6.5	2.0	30%	Pass	
Nickel	K20-My13290	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	K20-My13290	CP	mg/kg	20	21	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K20-My13290	CP	%	22	23	4.0	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-BHC	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-BHC	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-BHC	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K20-My13291	CP	mg/kg	0.02	0.02	14	30%	Pass	
Endosulfan sulphate	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K20-My13291	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin ketone	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-BHC (Lindane)	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
Heptachlor epoxide	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K20-My13291	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K20-My13291	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K20-My13291	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Swati Shahaney	Analytical Services Manager
Michael Ritchie	Senior Analyst-Organic (NZN)
Shasti Ramachandran	Senior Analyst-Metal (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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