REPORT

Watercare Services Ltd

Desk Study and Ground Contamination Assessment - Main Works
Central Interceptor Project

Report prepared for:

WATERCARE SERVICES LTD

Report prepared by:

Tonkin & Taylor Ltd

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1 Introduction

Tonkin & Taylor Ltd (T&T) has been engaged by Watercare Services Ltd (Watercare) to carry out a ground contamination assessment for the Central Interceptor Project. The work was undertaken in accordance with our proposal dated 16 September 2011.

1.1 Background

The Central Interceptor Project involves the construction of a 4.5 m diameter 13 km long tunnel. The tunnel will extend from Western Springs Park to the Mangere Wastewater Treatment Plant and will connect to the existing Watercare network at key connection points. The tunnel invert depth will be between 32 m and 110 m below ground surface. The soil at that depth is likely to comprise natural ground and is highly unlikely to be contaminated.

A number of construction sites are required to facilitate completion of the works. Three (3) major construction bases are proposed. These will be located at Western Springs, May Road and Mangere (WS1 to WS3). These sites will be used for delivering construction materials and removing tunnel spoil for the main tunnel and construction of permanent facilities. Smaller construction sites are proposed at sixteen (16) other locations (L1S1, L2S1, L3S1 to L3S5 and AS1 to AS7) along the tunnel route. Activities at the secondary sites on the main tunnel will include shaft sinking and the construction of surface facilities and at the link sewer sites will also include launching or retrieving the microtunnel boring machine. There are two options for the AS7 construction site: Ambury Park and Kiwi Esplanade. Figure 1 in Appendix A shows the approximate location of the construction sites. Activities at the construction sites will involve disturbance of near surface soil. They will include possible removal of vegetation, earthworks, relocation of services, establishment of site access, construction yards and lay down areas and site reinstatement. The near surface soils at these sites have the potential to have been contaminated by historical on-site activities.

The construction work is expected to commence in 2017 and will be undertaken in stages, with completion planned in 2023.

For the purposes of this report, the following definitions are used to refer to the various relevant areas.

Construction site	Area of land that Watercare proposes to occupy during construction. The extents of the 19 construction sites are shown in drawings provided in the Drawing Set which accompanies the Assessment of Effects on the Environment (AEE) Report (or the AEE Drawing Set).
Property	Area of land covered by the legal description in which the construction site is proposed to be located. For example, the property for the Western Springs Depot construction site is land covered by Lot 10 DP 168863 and is 8.72 hectare in area. For a number of construction sites, e.g. Lyon Ave and Whitney Street, the property extends across land covered by more than one legal description.

1.2 Objectives and scope

Watercare is seeking contaminated land related consents under the Auckland Council Regional Plan: Air, Land and Water and the NES regulations to undertake the project. This ground contamination assessment and report have been prepared to assist with the resource consent approval process for the project.

The assessment was undertaken in 2 phases. The first phase involved reviewing the history of each of the construction sites to establish the potential for current and historic activities to have

caused ground contamination at each of the construction sites. The second phase involved undertaking subsurface investigations on priority sites to establish the presence or absence of any ground contamination.

The scope of work comprised:

- Review of concept designs, site layouts and available construction information.
- Review of T&T project database for relevant information at or close to each of the construction sites.
- Obtaining and reviewing the Auckland Council (AC) special land feature map for each of the construction sites.
- Review of the AC property file for the construction site if it was identified as a potentially contaminated site on the AC special land feature map.
- Review of historical aerial photographs for each of the construction sites.
- Making a contamination enquiry to the contaminated land team at AC regarding pollution incidents at each of the construction sites.
- Reviewing certificates of title to determine property ownership details and requesting historical titles, where relevant.
- Undertaking a brief walkover inspection of each of the construction sites from nearby and adjacent public locations.
- Identifying priority sites for sub surface investigation work and carrying out soil sampling and testing.
- Assessing the soil testing results against relevant regulatory and soil disposal requirements.
- Preparing this report.

The persons undertaking, managing reviewing and certifying this report are suitably qualified and experienced practitioners as defined in the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

2 Site location and description

The Central Interceptor Project area extends across almost the entire width of the Auckland isthmus. The proposed tunnel alignment including the 19 construction sites is shown on Figure 1 in Appendix A. Table 2.1 below summarises the addresses and legal descriptions of the properties on which the construction sites are proposed to be located. The construction sites on the table (including subsequent tables in this report) are described according to the size of the construction site. A major construction site is greater than 5,000 m^2. An intermediate site is generally between 1,000 m^2 and 5,000 m^2 in size and a small site is less than about 1,000 m^2.

Table 2.1: Locations of proposed construction sites

Site ID	Site Name	Site address	Legal Description for construction site area	Current zoning/ land use	Approx size (m^2)
Major Construction Sites					
WS3	Mangere WTP	Island Road, Mangere	Lot 2 DP 156421	Designated for wastewater purposes	23,000
WS2	May Road	105 May Road	Lot 2 DP 116924	Business 4/ undeveloped	15,000
WS1	Western Springs	Main site: 731 Great North Road	Lot 12 DP 168863	Open space (designated for Council car park)/ recreational	8,400
		Secondary site: 770 Great North Road (located to south of Western Springs, adjacent service station)	Made up of Pt Lot 3 DP 10276, Allot 76 Sec 7 Suburbs of Auckland and Pt Lot 3 DP10276	Road reserve	1,050
Intermediate Construction Sites					
L1S1	Motions Road	134-136 Motions Road, Western Springs	Allot 49 Sec 9 Suburbs of Auckland; Allot 57 Sec 9 Suburbs of Auckland; Lot 1 DP 168863. Local purpose reserve (Lot 1 Esplanade, Allot 49 car park)	Open space / recreational	2100
L2S1	Rawalpindi Reserve	9a Rawalpindi St, Mt Albert	Lot 32 DP 41107	Open space/ recreational	4800
AS1	Mt Albert War Memorial Reserve	751-773 New North Road, St Lukes 7 Wairere Ave	Pt Allotment 38 Parish of Titirangi (DP 6763), Pt Allotment 38 Parish of Titirangi (SO 35759), Lot 14 DP 7029	Open space/ recreational	4,400

Site ID	Site Name	Site address	Legal Description for construction site area	Current zoning/ land use	Approx size (m^2)
AS2	Lyon Ave	30-36 Alberton Ave 19 Morningstar Place	Pt Allot 41 Parish of Titirangi SO 34849, Pt Allot 168 Sec 10 Suburbs of Auckland, Pt Allot 169 Sec 10 Suburbs of Auckland. Lot 15 DP 7699 & Lot 2 DP 206560.	Education/ playing fields Business 4/ reserve	4,050
AS3	Haverstock Road	118-120 Mt Albert Road 98-102 Haverstock Road	Lot 2 DP 334046 Site access: Lot 15 DP 45495	Education/ research facility Residential	4,200
AS4	Walmsley Park	26a Beagle Ave, Owairaka	Lot 112 DP 43048	Open space/ recreational	2,550
L3S1	PS25	32b Miranda Street, Avondale	Lot 90 DP 39331	Open space/ recreational/ designated for wastewater purposes	5,800
AS5	Keith Hay Park	53 Arundel Street 51 Arundel Street 49 Arundel Street 20 Gregory Place 22 Gregory Place	Allotment 77 Sec 13 Suburbs of Auckland Lot 1 DP 52047 Lot 2 DP 52047 Lot 28 DP 49583 Lot 27 DP 49583	Park/recreation Road and road reserve Residential	2,900
AS6	PS23	39 Frederick Street, Mt Roskill	Lot 1 DP 161858	Designated for wastewater purposes	1,700
AS7 Option A	Kiwi Esplanade	84R & 86R Kiwi Esplanade, Mangere Bridge	Lot 1 – Lot 2 DP 77585	Open space/ recreational	3,400
AS7 Option B	Ambury Park	Ambury Road, Mangere Bridge	Lot 3 DP 156421	Open space/ recreational/ Designated for wastewater purposes	1,800
L2S2	Norgrove Avenue	Norgrove Ave	n/a	Road	2,900
CC3A1-MH1		17C Verona Ave, Mt Albert	Pt Allotment 36 Parish of Titirangi.	Open Space/ Recreational	
Small Construction Sites					

Site ID	Site Name	Site address	Legal Description for construction site area	Current zoning/ land use	Approx size (m^2)
L1S2	Western Springs Depot	859 Great North Rd, Western Springs	Lot 11 DP 168863	Open space works depot	760
L3S2	Miranda Reserve	32b Miranda Street, Avondale	Lot 90 DP 39331	Open space/ recreational	1,000
L3S3	Whitney Street	n/a	n/a	Road reserve	500
L3S4	Dundale Ave	Dundale Ave	n/a	Road reserve	1,100
L3S5	Haycock Ave	4 Haycock Ave	Lot 79 DP 48241	Residential	680

The construction sites generally occupy a small portion of the property or properties. The extent, current layout and concept draft layout of the construction sites are shown on drawings provided in AEE Drawing Set.

3 Environmental setting

3.1 Land use

A description of the current land use of each of the construction sites is provided in Table 2.1. The current and surrounding land uses for each of the construction sites are shown on drawings provided in AEE Drawing Set. A brief site inspection (from publicly accessible areas) has been undertaken for each, the results of which are summarised in Appendix C.

The majority of the proposed construction sites are located on public open space land or road reserve, close to residential sites. The May Road site (WS2) is the only site that is zoned Business 4 and is surrounded by commercial/industrial and residential properties. The site is currently undeveloped, and owned by May Road Properties. There are also sites in the road reserve and in residential properties.

3.2 Geology

The surface geology of the project area is described by Kermode[1] and is presented on Figure 2 in Appendix A. The map shows that the Central Interceptor Project area can be divided into three distinct surface geology zones as follows:

North (Western Springs to Mt Roskill): Basaltic flows with variable cover of tuff and ash.

Central (Mt Roskill to Hillsborough): Waitemata group rocks.

South (Manukau Harbour to Mangere): Basalt flows.

Pockets of Tauranga Group alluvial deposits are present within the paleo-drainage channels in the three zones. Subsurface geology is dominated by sandstones and mudstones of the Waitemata Group Rocks.

T&T has undertaken a number of geotechnical investigations in the vicinity of the proposed construction sites. The investigations include geological information from machined drilled boreholes, hand augers and test pits. A review of the geological information has been carried out.

Table 3.1 below summarises the local geology for each of the construction sites based on the published map, including information collated from the nearby borehole records.

[1] Kermode, L.O. 1992. Geology of the Auckland urban area, Sheet R11. Scale 1:50,000. Institute of Geological and Nuclear Sciences geological map 2. 1 sheet + 63p. Institute of Geological and Nuclear Sciences Ltd., Lower Hutt, New Zealand.

Table 3.1 Summary of local geology for proposed construction sites

Site ID	Site Name	Geology
Major Construction Sites		
WS3	Mangere WTP	At the edge of volcanic tuff from Mt Mangere and Tauranga Group alluvial deposits. There are two geotechnical boreholes (CI-06 and CI-26) which indicate 3m of fill materials consisting of gravels, cobbles, boulders, concrete and silty clay. The fill is underlain by tuff and Puketoka Formation soils (Tauranga Group).
WS2	May Road	At the edge of the Mt Roskill volcanic and Waitemata Group rocks. Geotechnical boreholes within and close to the construction site indicates 3m of fill (boulders and sandy clay) underlain by Waitemata Group rock.
WS1	Western Springs	Tauranga Group undifferentiated alluvium. Geotechnical borehole logs within and in close proximity of the site show up to approximately 2 m of fill underlain by alluvial sediments. The fill comprises clays and silt intermixed with occasional gravel.
Intermediate Construction Sites		
L1S1	Motions Road	At the edge of volcanic tuff from the Mt Eden volcano. Geotechnical borehole logs within and in close proximity of the construction site indicate that there is up to 1.5m of fill (silt) overlying Auckland volcanic field (AVF) basalt and Waitemata group sediments.
L2S1	Rawalpindi Reserve	Waitemata Group. One geotechnical borehole in close proximity (80m SE) of the construction site shows 2m of fill underlain by the East Coast Bays Formation (ECBF) Waitemata Group.
AS1	Mt Albert War Memorial Reserve	Mt Albert/Mt Eden volcanic rock. No investigations are known to have been undertaken on the construction site. The closest boreholes are located at least 100m away from the construction site.
AS2	Lyon Ave	Tauranga Group undifferentiated alluvium. There is one geotechnical borehole log (CI-01) on the northern side of the construction site. This borehole indicates that there is up to 4.5 m of fill overlying AVF basalt and Tauranga Group sediments. The fill material consists of a gravelly silt mixed with demolition materials.
AS3	Haverstock Road	At the edge of the Mt Albert volcanic and Waitemata Group rocks. There is one geotechnical borehole (BH4) on the eastern side of the construction site. This borehole indicates that there is just over 2m of fill overlying Auckland volcanic field basalt and Tauranga Group alluvial. The fill material consists of gravel of mixed volcanic and alluvial origin.
AS4	Walmsley Park	Tauranga Group undifferentiated alluvium. No investigations are known to have been undertaken on or near the construction site.
L3S1	PS25	Tauranga Group alluvial deposits. One geotechnical borehole (CI-13) located within the construction site indicates it is underlain by Tauranga Group deposits.

Site ID	Site Name	Geology
AS5	Keith Hay Park	Tauranga Group undifferentiated alluvium. No investigations are known to have been undertaken within the construction site. A few hand augers undertaken about 60 m southwest of the construction site indicate that there is up to 2 m thickness of fill. The fill consists of silt and clay. The nearest borehole record is about 350 m away carried out for the SH20 Extension Project. The borehole log indicates a thin layer of topsoil underlain by AVF Basalt and Tauranga Group.
AS6	PS23	Waitemata Group rocks and some reclamation. No investigations are known to have been undertaken on or near the construction site. A geotechnical borehole (CI-09), located about 230 m to the west of the construction site indicates the presence of ECBF (Waitemata Formation).
AS7 Option A	Kiwi Esplanade	Near the edge of volcanic rock from Mt Mangere and construction fill (reclaimed land). One geotechnical borehole to the west of the construction site (CI-04) indicates that there is up to 2m of scoria gravels overlying marine sediments, AVF, Tauranga Group, and Waitemata Group (ECBF). The borehole is located close to edge of the property and Manukau Harbour and the scoria gravels may be indicative of bund materials placed around the reclaimed land. Another geotechnical borehole to the east of the construction site (CI-19) indicates a thin layer of topsoil overlying basalt rock. Sands and silts of the Puketoka Formation and ECBF underlay the basalts from approximately -13 m RL.
AS7 Option B	Ambury Park	Volcanic rock from Mt Mangere. No investigations are known to have been undertaken at the construction site. One geotechnical borehole to the west of the site (CI-05) encountered over 20 m of basalt overlying Puketoka Formation and ECBF.
L2S2/ CC3A1-MH1	Norgrove Avenue	Near the edge of volcanic tuff from the Mt Eden volcano. Two geotechnical boreholes in close proximity of the construction site indicate that there is up to 1m of fill (silt - topsoil) overlying Auckland volcanic field (AVF) basalt, Tauranga Group and Waitemata Group sediments.
Small Construction Sites		
L1S2	Western Springs Depot	Tauranga Group undifferentiated alluvium. There are two geotechnical boreholes (close proximity to the construction site. These logs indicate that there is up to 1.75 m of fill (clayey silt) overlying silty clay and AVF basalt.
L3S2	Miranda Reserve	Tauranga Group alluvial deposits. No investigations are known to have been undertaken on or near the construction site.
L3S3	Whitney Street	Near the edge of the Tauranga Group alluvial deposits and Waitemata Group rock. One geotechnical borehole (CI-12) approximately 15m west of the construction site indicates the area is underlain by natural sediments of the Puketoka Formation (Tauranga Group) and the ECBF (Waitemata Group).

Site ID	Site Name	Geology
L3S4	Dundale Ave	At the edge of the Tauranga Group alluvial deposits and Waitemata Group rock. One geotechnical borehole (CI-33) indicates that the construction site is underlain by approximately 1.5m of fill. The fill comprise gravelly clayey silt and is underlain by Tauranga Group deposits and Waitemata Group rock.
L3S5	Haycock Ave	Tauranga Group alluvial deposits. One geotechnical borehole (CI-11) approximately 75m SE of the construction site indicates the area is underlain by natural sediments of the Puketoka Formation (Tauranga Group).

3.3 Groundwater

There is limited published groundwater depth information for the construction sites. Groundwater within the Auckland isthmus tends to be generally within a few metres of the ground surface in either basalt rock or alluvial sediments. Groundwater flow direction generally follows the surface topography and discharges to the nearest surface water body.

3.4 Surface water

The construction sites are located in various surface water catchments within the Auckland Isthmus. The main catchments are:

- Meola and Motions Creek surface water catchments for the construction sites located in the northern part of the Central Interceptor Project area.
- Oakley Creek surface water catchment for the construction sites in the central section of the Central Interceptor Project area.
- Whau Creek surface water catchment for the construction sites located along the southern-most link tunnel (i.e. Miranda Reserve, Whitney Street and Dundale Ave sites)

4 Auckland Council special land features maps

The special land features maps were obtained from AC for all the construction sites, with the exception of Kiwi Esplanade/Ambury Park (AS7) and Mangere Wastewater Treatment Plant (WWTP) (WS3). The latter two construction sites fall within the former Manukau district where these maps are unavailable.

The maps identify known and possible contaminated sites, soil report areas, flood plains, soil warning areas which include filled/weak ground, unstable/suspect ground and refuse tip site/weak ground. Results of the review of the maps for each of the sites are provided in the Table 4.1 below. Copies of the maps can be provided upon request.

Key findings from the review relating to potential for contamination are as follows:

- Haverstock Road construction site (AS3) is a potentially contaminated site.
- Motions Road construction site (L1S1) is identified as a refuse tip site/weak ground, and
- The following construction sites are identified as filled/weak ground:
  - Western Springs Depot (L1S2).
  - Mt Albert War Memorial (AS1).
  - Lyon Ave (AS2).
  - Walmsley Park (AS4).
  - May Road (WS2).
  - Western part of Keith Hay Park (AS5).
  - PS23 (AS6).

Table 4.1 Key information from AC special land features map review

Site ID	Site Name	Auckland Council special land feature summary
Major Construction Sites		
WS3	Mangere WTP	Not applicable.
WS2	May Road	Flood risk area. Adjacent sites are possible contaminated sites, filled weak ground, and have a soil report.
WS1	Western Springs	Flood risk area, unstable/suspect ground.
Intermediate Construction Sites		
L1S1	Motions Road	Refuse tip site / weak ground.
L2S1	Rawalpindi Reserve	Flood plain. Neighbouring site (golf course) is a possible contaminated site and has a soil report.
AS1	Mt Albert War Memorial Reserve	100 year flood plain, filled/weak ground, soil report held.
AS2	Lyon Ave	100 year flood plain, filled/weak ground, soil report held.
AS3	Haverstock Road	100 year flood plain, possible contaminated site and soil report held.

Site ID	Site Name	Auckland Council special land feature summary
AS4	Walmsley Park	Flood risk area, filled/weak ground.
L3S1	PS25	Unstable/suspected ground, 10 year flood plain.
AS5	Keith Hay Park	Western part of the site is filled/weak ground, soil report held.
AS6	PS23	Filled/weak ground, unstable/suspected ground, soil report held, highest astronomical tide (HAT) flood plain.
AS7	Kiwi Esplanade/ Ambury Park	No information.
L2S2/ CC3A1-MH1	Norgrove Avenue	Flood risk Neighbouring site (Chamberlain Park) is possibly contaminated with filled weak ground. A soil report exists for this site.
Small Construction Sites		
L1S2	Western Springs Depot	Flood plain, soil report held, filled weak ground.
L3S2	Miranda Reserve	Unstable/suspected ground, 10 year flood plain adjacent to site.
L3S3	Whitney Street	No special features
L3S4	Dundale Ave	Unstable/suspected ground, soil report held, 10 year flood plain.
L3S5	Haycock Ave	10 year flood plain to the south of the site.

5 Aerial photograph review

A series of historic aerial photographs were obtained from the T&T library and Auckland Council website and reviewed. These spanned the years 1940 – 2008. Relevant features from the aerial photographs are summarised in Appendix B and the key features are described briefly below in Table 5.1 for each construction site.

Sites with potentially contaminating activities visible on the aerial photographs have been identified as:

Areas of previous infill:

- Motions Road.
- PS23.
- Mangere WWTP.

Areas of (or bordering) commercial activities:

- Western Springs Depot.
- Western Springs (site adjacent service station).
- Mt Albert War Memorial.
- Lyon Ave.
- Mays Road.

Areas of previous horticultural activities:

- Haverstock Road.

Table 5.1 Summary of Features from Aerial Photographs

Site ID	Site Name	Key Features
Major Construction Sites		
WS3	Mangere WWTP	Potential area of infill during late 1950s. Area grassed over by early 1970s; possible use of part of site for storage in 1980s. A building is visible on the construction site in 1990s. 2008 aerial shows storage area visible on area of future construction site.
WS2	May Road	No significant changes visible within construction site, which has remained undeveloped. The site has been bordered by commercial development to N, NE, E & SE since the 1970s and 1980s, with potential implications regarding cross-boundary pollution.
WS1	Western Springs	**Main construction site:** No significant change over time. Playing fields, bordered by bush to the north that extended into the construction site in the 1980s and 1990s. **Secondary construction site (located to south of Western Springs, adjacent service station):** Main change to construction site occurred with development of access roads for the motorway. Prior to this the construction site appeared to be an undeveloped lot within a residential area. No significant change visible since the 1980s, when building visible on site (Watercare facility).

Site ID	Site Name	Key Features
Intermediate Construction Sites		
L1S1	Motions Road	Aerials show former use of the construction site as an access road pre 1959. From the 1980s the area was largely grassed over, but there are signs of disturbed ground and historic infilling. Most recent use as a grassed reserve.
L2S1	Rawalpindi Reserve	Construction site has been part of a reserve since 1940. No significant change visible with time.
AS1	Mt Albert War Memorial Reserve	Building visible to the south of construction site between 1959 and 1996, with remainder of property as yard area for storage/workshops. From 2006, aerials show buildings removed and construction site is now part of park; grassed with planted areas visible.
AS2	Lyon Ave	No significant change identified within construction site, which has remained within reserve. Northern and eastern boundaries have bordered industrial sites, with potential implications regarding cross-boundary pollution.
AS3	Haverstock Road	Aerials show history of farming and horticulture in the area. Horticulture activities, and possibly glass houses (1980s and 1990s), visible within the construction site.
AS4	Walmsley Park	Construction site has remained vegetated and undeveloped since 1940. The property was used as green space/park from 1959, the surrounding residential area was developed in the 1950s.
L3S1	PS25	Construction site has remained within a reserve. Development of buildings post 1959, remainder of area vegetated.
AS5	Keith Hay Park	The construction site has been partially undeveloped since 1940, with land use as fields and park land. 2008 aerial shows disturbed ground in the park, suggesting the site area has undergone recent earthworks. Residential buildings were developed from the 1950s, with a racecourse present in the northern part of the residential area until the 1960s.
AS6	PS23	Aerials show construction site is an area of reclaimed land with infill present. Watercare facility developed on site post 1959.
AS7 Option A	Kiwi Esplanade	Construction site visible within grassed reserve area since 1950s. Prior to this the land to the west of the construction site had been reclaimed, with potential infill. A boat club was established on site in 1972. No boat building or maintenance activities were apparent.
AS7 Option B	Ambury Park	The site was farmland and pasture prior to the 1950s and has since been converted to parkland/recreation.
L2S2	Norgrove Avenue	Construction site has been part of the roadway in a residential area from 1940 to 2008.
CC3A1-MH1		Construction site has been part of a reserve since 1940. No significant change visible with time. The surrounding land use is residential.

Site ID	Site Name	Key Features
Small Construction Sites		
L1S2	Western Springs Depot	Construction site has been used as a works depot and supporting infrastructure for the nearby reserve/stadium since 1959. No significant change in use since this time.
L3S2	Miranda Reserve	Land use as reserve area with playground area; largely unchanged over time. No significant development of the construction site area visible over period reviewed.
L3S3	Whitney Street	Construction site is on road reserve in a residential area that was construction in the 1950s. No significant changes to the construction site area visible over period reviewed.
L3S4	Dundale Ave	Construction site is within undeveloped grassed road reserve. No significant changes to the construction site area visible over period reviewed.
L3S5	Haycock Ave	No significant changes to the construction site area visible over period reviewed. Developed as residential area in 1950s to 1970s. Earthworks were also observed in the surrounding area in the 1959 aerial photograph.

6 Certificate of title review

A review of the ownership of the properties for the nineteen construction sites has been undertaken. In summary, the review showed that fourteen out of the nineteen construction sites are owned by Auckland Council or Council controlled organisations such as Regional Facilities Auckland Ltd or Watercare Services Limited. Four construction sites are privately owned. The privately owned construction sites are Lyon Ave, Haverstock Road, May Road, and Haycock Ave. The Keith Hay Park construction site is partly privately owned and partly owned by Auckland Council. The construction sites which have been previously occupied by industrial activities are Lyon Ave, Haverstock Road and May Road.

Key findings of the review are outlined in Table 6.1 below, with detailed information provided in Appendix B.

Table 6.1: Certificate of title review

Site ID	Site Name	Ownership
Major Construction Sites		
WS3	Mangere WTP	Watercare Services Ltd.
WS2	May Road	May Road Properties since 1987 Prior owners include The Aluminium Company of NZ Ltd (1956 – 1987), Auckland Electric Power Board (1968) Foodstuffs (1987).
WS1	Western Springs	Main construction site: Regional Facilities Auckland Limited. Secondary site: Auckland Council and New Zealand Transport Authority (NZTA) and Tawa Farms Limited
Intermediate Construction Sites		
L1S1	Motions Road	The Auckland City Council (Auckland Council).
L2S1	Rawalpindi Reserve	The Auckland City Council (Auckland Council).
AS1	Mt Albert War Memorial Reserve	Mt Albert Borough Council (Auckland Council).
AS2	Lyon Ave	Two properties; currently owned by Mt Albert Grammar and unit tiles for residential developments to the north belonging to Morning Star. Prior to Morning Star, the property was owned by industry (Precision Plastics and Alex Harvey Industries).
AS3	Haverstock Road	Three properties; two are owned by Housing NZ Limited and one by Horticulture and Food Research Institute of NZ.
AS4	Walmsley Park	No title, Gazetted 1957. (Auckland Council).
L3S1	PS25	The Auckland City Council (Auckland Council).
AS5	Keith Hay Park	Auckland Council and Yvonne and Rohan Taylor.

Site ID	Site Name	Ownership
AS6	PS23	Watercare Services Ltd.
AS7 Option A	Kiwi Esplanade	The Manukau City Council (Auckland Council). Part reclaimed completed by 1967.
AS7 Option B	Ambury Park	The Manukau City Council (Auckland Council).
L2S2/CC3A1-MH1	Norgrove Avenue	Road (Auckland Council) and Mt Albert Borough Council (Auckland Council).
Small Construction Sites		
L1S2	Western Springs Depot	Auckland Council
L3S2	Miranda Reserve	The Auckland City Council (Auckland Council).
L3S3	Whitney Street	Road (Auckland Council).
L3S4	Dundale Ave	Road (Auckland Council).
L3S5	Haycock Ave	Violet and William Laughland

7 Auckland Council contamination enquiry

Contaminated site information for the property in which the construction site is to be located was requested from the AC contaminated land management team. Copies of the AC response are provided in Appendix D. Pertinent information is summarised in Table 7.1 below.

Table 7.1 Key information from AC contamination enquiry

Site ID	Site Name	Auckland Council contamination enquiry
Major Construction Sites		
WS3	Mangere WWTP	**Comprehensive history of pollution incidents:** No specific details given. **Consents issued for property activities include:** - Numerous consents relating to the construction of boreholes for geotechnical and water quality purposes, including a borehole consent application by BP Oil New Zealand Limited (exact location unknown). - Landfill discharge of biosolids to land comprising sludge from a wastewater treatment plant. Increasing the overall volume of biosolids being placed (Pond 2 Landfill). - Remediation of a site previously used for disposal of construction waste near boundary with Ambury Park (about 640 m north of the construction site). - Discharge of contaminants to air from wastewater treatment processes, including decommissioning, restoration and waste management activities. - Numerous consents relating to the treatment of water with methoprene and maldison "50" to control midges.
WS2	May Road	**Five pollution files relating to the property:** - Burning. - Oil in drain. - 2 incidents involving oil in a stream. - Strong petrol and oil smell and sheen from drain on property during development. **Consents within 200m of the property:** - UST removal - 56 Roma Road, Mt Roskill, a property located directly adjacent to the northern boundary of the construction site.
WS1	Western Springs	**One pollution file within 200m of the property:** - Washing forecourt to stormwater *(Challenge - 778-802 Great North Road).* **Consents within 200m of the property:** - Four borehole consents.

Intermediate Construction Sites		
L1S1	Motions Road	**<u>Two pollution files relating to the property:</u>** - A catchment file incident relating to dead eels in Meola Creek. - A catchment file incident relating to green discolouration in a creek. **<u>Consents issued within 200m of the property:</u>** - Numerous borehole consents. - Discharge of leachate from a closed sanitary landfill into the ground and groundwater beneath the site, and to divert leachate into a collection system *(Old Motions Road Landfill - 190 Meola Road)*. - Consent to discharge contaminants into air from the operation of a building (the blister/belfast hangar) and associated processes situated on the closed Motions Road landfill.
L2S1	Rawalpindi Reserve	**<u>One pollution file relating to the property:</u>** - Wastewater overflow - location not specific.
AS1	Mt Albert War Memorial Reserve	**<u>Consents issued for property activities:</u>** - One contaminated site discharge to remediate lead contaminated soil by Auckland Council. **<u>Consents within 200m of the property:</u>** - Contaminated Site Discharge at 770 New North Road (200 m to the south of the construction site) to remove five UST's and lines, and to install two new tanks. A SVR was provided to the Council. - Four borehole consents for stock and domestic supply, groundwater levels and groundwater chemistry.
AS2	Lyon Ave	**<u>One pollution file relating to the property:</u>** - Potential discharge of sediment to stormwater. **<u>Three pollution files within 200m of the property:</u>** - Sediment discharge to stormwater *(Block C - Morning Star Place)* - A consent relating to odour - non specific (*11 Morning Star Place*). - Electroplating waste contaminating unsealed ground (*15 Lyon Avenue - Hermetic/Southcorp NZ Ltd)*. **<u>Consents within 200m of the property:</u>** - Contaminated Site Discharge at Brebner Printers (7 Wagener Place located about 220 m east of the construction site). A desktop investigation identified that the risk to the environment was considered low. - A borehole consent issued to Mobil Oil NZ Ltd for the construction of boreholes. - Numerous borehole consents.

AS3	Haverstock Road	**Three pollution files relating to the property:** - Two burning incidents - Discharge of radioactive chemicals down sink (Mt Albert Horticulture Research Centre). - One non specific incident. **Consents issued for property activities:** - Two non specific contaminated site discharges *(Hort Research).* **Consents within 200m of the property:** - Contaminated Site Discharge - Redevelopment of horticultural land, low level contamination *(94 Haverstock Road* located adjacent to the eastern boundary of the construction site*).*
AS4	Walmsley Park	No pollution files and/or consents were identified.
L3S1	PS25	**One pollution file relating to the property:** - Wastewater overflow.
AS5	Keith Hay Park	**One pollution file relating to the property:** - Discoloured stream.
AS6	PS23	**One pollution file relating to the property:** - Broken Watercare line, wastewater discharge to harbour.
AS7 Option A & B	Kiwi Esplanade & Ambury Park	**Three pollution files were identified for Ambury Park (Option B):** - Wastewater overflow (2011) - Cooking fire using untreated wood (2010) - Suspected bird poisoning (1995). **Consents issued within 200m of the property:** Several consents have been issued for the discharge of water containing methoprene for the control of midge flies at the Manukau Wastewater Treatment facility to the south.
L2S2/ CC3A1-MH1	Norgrove Avenue	**Consents issued within 200m of the property:** - Five borehole consents
Small Construction Sites		
L1S2	Western Springs Depot	**Five pollution files relating to the property:** - Dying swans and fish, suspected poisoning (1991) - Wastewater overflow - 200-1000 L (2010) - Oil reported in creek (2010) - Concrete wastewater (2010) - Wastewater overflow (2010) **Several consents issued within property:** - Several borehole consents - Permission to discharge pesticides to lake for control of grass carp - Treatment for microbiological contaminants in water - Discharge from zoo enclosures to Motions Creek
L3S2	Miranda Reserve	**Three catchment files relating to the property:** - All three files relating to wastewater overflows.

Small Construction Sites		
L3S3	Whitney Street	Road reserve – no information held by Council.
L3S4	Dundale Ave	Road reserve – no information held by Council.
L3S5	Haycock Ave	No pollution files and/or consents were identified.

8 Property file review

Property files were obtained from AC for the construction sites which were identified on the AC special land features map to have been former refuse/tip sites, filled weak ground or a potential contaminated site. No property files were available for the Kiwi Esplanade (AS7) and Norgrove Avenue construction sites.

Results of the property file review are outlined in Appendix B. Pertinent information relating to potential for contamination on the construction site is provided in Table 8.1 below.

Table 8.1: Summary of pertinent information from property file review

Site ID	Site Name	AC special land features map	Pertinent information from property file review
Major Construction Sites			
WS2	May Road	Filled/weak ground	- No buildings ever located on site.
WS3	Mangere WWTP	Not applicable	- A number of plans indicate that a sludge dewatering building is located within the site area.
Intermediate Construction Sites			
L1S1	Motions Road	Refuse tip	- No information relevant to the construction site was found on file.
AS1	Mt Albert War Memorial Reserve	Filled/weak ground	- The property file indicated the construction of a council depot and workshops in 1955. Plans indicate that the position of the depot appears to be bordering the east of the construction site. It is unclear whether additional workshop buildings were located across the construction site. Buildings on the property were reported to have been demolished in 2001 to create the City Council Recreation Precinct Car Park. - An underground storage tank was installed within the council depot in 1971. The property file contains a sketch showing an approximate location of the tanks and dispense points but no "as built plans". The UST was located to the south of the workshops and east of the proposed construction site. There are no details to confirm removal of the tank(s) and underground pipelines. - A transformer building was constructed as an extension to the council depot in 1975. The location of the transformer building is south of the proposed construction area. - Geotechnical investigations indicate that a layer of gravel fill comprising basalt is present across the site.

Site ID	Site Name	AC special land features map	Pertinent information from property file review
AS2	Lyon Ave	Filled/weak ground	- Numerous consents and geotechnical reports for the development of Mount Albert Grammar, however none appear to relate to the construction site. - The property file indicated the construction of a number of industrial manufacturing premises on the portion of site relating to 15 Lyon Ave starting in the early 1960s including Precision Plastics Ltd, O J Neilson Ltd, Huge Wright Ltd and Wegener Construction Ltd. - Telecom NZ Ltd redeveloped the portion of site relating to 15 Lyon Ave in the early 1990s. Most of the buildings on the property were demolished in 2001 to create a new residential development. - Geotechnical investigations carried out in 2001 and 2003 indicate the presence of a layer of compacted hardfill, overlying scoria gravels, basalt boulders and clay across the site. These investigations found no signs of contamination although no testing was carried out. - A Project Information Memorandum indicated that a Hazardous Activity Industrial List (HAIL) activity previously occurred on the property, however, no contamination was found during redevelopment. - In 2001 prior to the demolition of the Precision Plastics Factory, an inspection for asbestos containing material (ACM) was carried out by Dowdell and Associates. Testing showed that building material contained ACM.

Site ID	Site Name	AC special land features map	Pertinent information from property file review
AS3	Haverstock Road	Potential contaminated site	- The property was developed as a scientific and horticultural research centre in the 1920s. The file contained records of consents and permits for the development of various buildings from 1961 onwards. It appears from the consent documents that no buildings have been constructed on the construction site. - As part of land use and subdivision consents, a number of expert reports have been produced relating to the property. These reports included contamination assessments, site investigations, and a site validation report. - The contamination assessment report (BCL, 2007) indicates that parts of the property were used for testing insecticides, pesticides and fertilisers before they were allowed to be used in NZ. The report also indicated that no external research work has been conducted within the property in the last 20 years and that radioactive material may have been disposed of under glasshouses on the property. - Previous investigations on land immediately south of the construction site recorded some high arsenic, copper, lead and DDT concentrations in relation to the ALW Plan PA criteria as described in Section 11 of this report. One location recorded arsenic concentrations in the near surface soils above the NES criteria for commercial land use. The contaminated soils have since been remediated and the area redeveloped for residential purposes.
AS4	Walmsley Park	Filled/weak ground	- No information relevant to the construction site.
AS5	Keith Hay Park	Filled/weak ground on western part of construction site	- The buildings located on the construction site were built in the early 1950s-1960s. - Numerous geotechnical investigations have been undertaken at Keith Hay Park as part of various building consent applications. These investigations indicate that a layer of non-engineered fill comprising gravelly silt is present across Keith Hay Park. The fill is underlain by Tauranga Group sediments comprising a mixture of clays and silts. - The geotechnical reports indicate that the building closest to the construction site (about 60 m to the south) was once a council depot.
AS6	PS23	Filled/weak ground	- The property file contained information relating to observations made by neighbours indicating that reclamation has occurred on site. The reclaimed area is a result of material deposited after a beach clean-up undertaken in 1992/1993 by the Auckland City, Mt Eden – Mt Roskill Parks Section.

Site ID	Site Name	AC special land features map	Pertinent information from property file review
Small Construction Sites			
L1S2	Western Springs Depot	Filled /weak ground	- Several consents granted for upgrading of park facilities such as pedestrian bridges and toilet facilities - Boreholes within the park indicate widespread filling **<u>Adjacent site (Western Springs Stadium):</u>** - Numerous references to the property and surrounding area as a rubbish tip/weak ground. - A number of plans dated from 2002 indicate that hazardous goods and diesel are stored near the depot located on the north-western boundary of the property. Chemicals are also stored in the workshop near the entry gate on the southern side of the property. The stores are located about 250 m to the west of the construction site.

9 Potential for contamination

The desk study review indicated that historical activities at a number of the construction sites have the potential to have caused contamination. Table 9.1 below summarises the potentially contaminating activities for each of the 19 construction sites, likely contaminants and the predicted extent.

Table 9.1 Potentially contaminating activities on each construction site

Site ID	Site Name	Potentially contaminating activities	Likely contaminants	Predicted extent and risk assessment
Major Construction Sites				
WS3	Mangere WTP	Sludge dewatering facility & reclamation	Unknown but typically metals, hydrocarbons, ACM	Geological information (Table 3.1) shows the fill on the construction site could comprise construction fill. Low to moderate levels of contamination across the construction site may be present.
WS2	May Road	Multiple contamination and pollutions events from and near the site Fill	Unknown but typically metals, hydrocarbons, ACM	The various pollution incidents indicate that there is moderate risk for contamination to be present around drains that cross the site. Based on aerial photography the site was never developed so the risk for contamination from previous industrial use is considered low. The site has been filled and the fill quality has not been determined. Because the property has been unoccupied and undeveloped for a long period of time, the risk of uncontrolled filling is high. The fill may contain low to moderate levels of contamination.
WS1	Western Springs	Fill	Unknown but typically metals, hydrocarbons, ACM	Geological information (Table 3.1) indicates that the fill on the construction site is likely to comprise silt/clay. The likelihood of significant contamination to be present is low and low levels are predicted across the construction site.
Intermediate Construction Sites				
L1S1	Motions Road	Refuse landfill	Unknown but typically metals, hydrocarbons, ACM, landfill gas (LFG) including methane	Geological information (Table 3.1) indicates that fill within the construction site is likely to comprise silt. Hence, the likelihood for significant contamination to be present is low. Based on the desk study review, low to moderate levels of contamination are likely across the construction site.

Site ID	Site Name	Potentially contaminating activities	Likely contaminants	Predicted extent and risk assessment
L2S1	Rawalpindi Reserve	Wastewater overflow incidents	Metals, nitrates	The incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk for significant contamination is considered to be low.
AS1	Mt Albert War Memorial Reserve	Fill, UST located adjacent to site	Unknown but typically metals, hydrocarbons, ACM	There is currently no information about the fill material in the vicinity of the construction site. Based on the desk study review, low to moderate levels of contamination appear likely across the construction site.
AS2	Lyon Ave	Fill, Plastic, electronic and electroplating manufacturing, former UST located at the portion of site relating to 15 Lyon Avenue.	ACM, metals (including Hg) and hydrocarbons.	Based on previous site use for industrial activities, there is potential for low to moderate levels of contamination to be present in near surface soils across the construction site. Deeper contamination may be present if the UST is located close to the construction site.
AS3	Haverstock Road	The use of sprays and radioactive material associated with horticultural research activities	Spray residue including metals (arsenic, copper and lead), organochlorine pesticides (OCP) and radioactive materials.	There is potential for low level near-surface contamination across the areas used for horticultural research. Hotspots of higher contamination levels could be present around chemical storage areas. It is unclear if any storage area was present within the construction site. While no testing has been undertaken on the construction site to date, previous contamination investigations on the property indicate low to moderate levels are likely to be present in near surface soils across the construction site.
AS4	Walmsley Park	Fill	Unknown but typically metals, hydrocarbon and ACM	There is currently no information about the fill in the vicinity of the construction site. Low to moderate levels of contaminants could be present in the fill across the construction site.
L3S1	PS25	Wastewater overflow incidents	Metals, hydrocarbons, nitrates	Geological information (Table 3.1) shows no fill on the construction site. The wastewater overflow incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk of significant contamination is considered to be low.

Site ID	Site Name	Potentially contaminating activities	Likely contaminants	Predicted extent and risk assessment
AS5	Keith Hay Park	Fill and wastewater overflow incidents	Metals, hydrocarbons, nitrates	No known potentially contaminating activities have occurred on majority of the site. Potentially contaminating activities have only been identified on a small portion of the site confined to the western fringes of the site. Geological information (Table 3.1) shows the fill on the western part of the construction site comprise silt and clay. The wastewater overflow incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk of significant contamination is considered to be low.
AS6	PS23	Reclamation and wastewater overflow incidents	Metals, hydrocarbons, nitrates	There is only anecdotal information on the reclamation fill. The wastewater overflow incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk for significant contamination is considered to be low.
AS7 Option A	Kiwi Esplanade	None identified	-	-
AS7 Option B	Ambury Park	Wastewater overflow	Nitrates	The wastewater overflow incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk for significant contamination is considered to be low.
L2S2/ CC3A1-MH1	Norgrove Avenue	None identified	-	-
Small Construction Sites				
L1S2	Western Springs Depot	Fill	Unknown but typically metals, hydrocarbons, ACM	Based on geological information (Table 3.1), the fill is likely to comprise silt/clay and the likelihood for significant contamination to be present is low. Generally low levels of contamination are likely across the construction site.
L3S2	Miranda Reserve	Wastewater overflow incidents	Metals, nitrates	The wastewater overflow incidents are likely to have resulted in some low level contamination in the vicinity of the sewer pipeline. The risk of significant contamination is considered to be low.
L3S3	Whitney Street	None identified	-	-

Site ID	Site Name	Potentially contaminating activities	Likely contaminants	Predicted extent and risk assessment
L3S4	Dundale Ave	None identified	-	-
L3S5	Haycock Ave	None identified	-	-

The site history review indicates that no known potentially contaminating activities have occurred on four of the nineteen construction sites. The four sites are :

- Norgrove Ave;
- Haycock Ave;
- Whitney Street;
- Dundale Ave.

For the other fifteen sites, potentially contaminating activities are known to have occurred. While no known potentially contaminating activities have occurred on the proposed Kiwi Esplanade (AS7 Option A) construction site, some potentially contaminating activities have occurred on the Ambury Park (AS7 Option B) construction site. The potentially contaminating activities are likely to have affected shallow soils within the construction sites. Contaminants will typically be metals and petroleum hydrocarbons, including any contaminants specific to industry type, e.g. volatile organic compounds if solvents stored on site, pesticides for horticultural sites, nitrates for wastewater overflows and ACM for landfilled areas.

Contaminant levels are unlikely to be at concentrations that would exceed human health criteria for recreational and/or commercial/industrial landuse. Hence, the potential for risk to construction workers and general public is likely to be low. However, for some sites, contaminant concentrations could be above published background concentrations and/or the permitted activity acceptance criteria for the Auckland Regional Plan: Air Land and Water. Construction work should be able to be undertaken safely and securely with minimal risks to the environment at the potentially contaminating sites by implementing appropriate strategies such as testing of soil to establish contaminant levels and determine spoil disposal requirements prior to bulk excavation work. A draft Remedial Action Plan/Site Management Plan (RAP/SMP)[2] for the project has been prepared and is attached to this report.

Where refuse/landfill is likely to be present (e.g. Motions Road, Western Springs, May Road and Mangere WWTP), advance investigation has been undertaken to define the nature and extent of the material present.

The methodology and findings of the intrusive investigations are set out in the following sections of the report.

[2] Hereafter referred to as a Site Management Plan (SMP)

10 Site Investigation Works

10.1 Objectives

The preliminary investigation work was targeted to assess the contaminant condition of soils that would be disturbed during development works at the five high risk sites. The results of the investigations are used to establish the implications of the proposed works.

10.2 Fieldwork

The investigation works were undertaken between 21 October and 01 December 2011. Tracked excavators were used to excavate test pits across each proposed construction site. The excavators ranged in size between 1.5 tonne and 12 tonne and were supplied by City Parks Services and Boler Earthmoving Ltd. On a number of sites, the test pits were supplemented by hand augers, particularly where access was problematic. All the sampled locations are illustrated on the figures in Appendices E to H. Generally, a test pit was excavated at or in the vicinity of each of the proposed shaft locations within the construction sites. Test pits and/or hand augers were also placed at between 25 m and 60 m spacing across the construction sites.

The soils encountered in each test pit or hand auger during the site investigations were logged in general accordance with the NZ Geotechnical Society "*Guidelines for the classification and field description of soils and rocks for engineering purposes*". The test pit logs for each site are attached in Appendices E to I.

Soil samples were collected from the surface of the test pits or hand augers, from 0.25 m and a selection of depths thereafter. The soil samples were collected using a stainless steel trowel and/or freshly gloved hand. All samples were placed immediately into 300 ml glass jars in accordance with MfE sampling protocols. The trowel was decontaminated between each sample location using clean potable water and Decon 90 (a phosphate-free detergent).

Where the presence of fill material and/or municipal refuse was considered a possibility, landfill gas monitoring was undertaken using a portable landfill gas meter. A Photo-Ionisation Detector (PID) was also used to monitor concentrations of volatile organic compounds in selected soil samples collected from the test pits.

All samples were shipped in chilled containers to Watercare Laboratories Ltd, Mangere or Dowdell & Associates, Penrose under the appropriate chain of custody documentation. Selected samples were analysed for a range of possible contaminants based on the site historical review information as outlined on Table 9.1 above.

Site specific information is provided for each construction site in Section 13 of this report.

11 Regulatory Framework and Assessment Criteria

The rules and associated assessment criteria relating to the control of contaminated sites in the Auckland region are specified in the Regional Plan and also regulations introduced by the new National Environmental Standards (NES) for contaminated sites that came into effect on 01 January 2012.

The regulatory framework and criteria used to assess the site investigation results are set out below.

11.1 Auckland Council Regional Plan: Air, Land and Water

The Auckland Council Regional Plan: Air, Land and Water (ALW Plan) includes a series of rules related to contaminated sites. The contaminated land rules are now operative.

The relevant Permitted Activity (PA) rules can be briefly summarised as follows:

- Small scale earthworks on land containing contaminants are a PA (Rule 5.5.40) providing the volume of earthworks open at any one time is less than 200 m^3 and works are completed within one month (this rule is principally to allow the installation of services, or similar minor works, without the need for consent). There are a number of other requirements relating to notification and appropriate stormwater and erosion controls along with appropriate off-site soil disposal; and
- Rule 5.5.41 states that if soil concentrations or the 95% upper confidence limit (UCL) of the mean of soil concentrations are below the relevant guidelines for the current (or proposed, if change is planned) land use and the land does not contain separate phase hydrocarbons, then a resource consent is not required for the site. If soil contaminant concentrations exceed these relevant guidelines or separate phase is present, then consent will be required under the ALW Plan.

In assessing if the presence of soil contamination is a PA under Rule 5.5.41, the following requirements are specified in the Operative Contaminated Land Rules within the ALW Plan:

a Discharge criteria set out in Schedule 10 apply where the effects of land use on human health are expressly authorised through District Plan rules or a consent granted by the territorial authority. The 'discharge' criteria have been used in our assessment rather than the human health criteria in Schedule 10 because human health is already considered by the NES.

b For contaminants not included in Schedule 10, analytical results should be assessed against Tier 1 soil acceptance criteria for the current land use or, if the land use is to change, the proposed land use. The soil acceptance criteria shall protect both human health and sensitive groundwater, as specified in the following documents:

- 'Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand', Ministry for the Environment (MfE) 1999;
- 'Canadian Environmental Quality Guidelines', (Canadian Council of Ministers of the Environment, CCME 1991 (update 2002);
- 'Identifying, Investigating and Managing Risks Associated with Former Sheep-Dip Sites: A guide for local authorities', MfE 2006 (dieldrin and lindane only).

c If background levels of contaminants at the site are greater than the criteria in (a) or (b) above then the soil contamination concentrations shall be assessed against the background levels instead, derived from either:

- The natural background levels for that soil at the site; or

- ARC Technical Publication 'Background Concentrations in Inorganic Elements in Soils from the Auckland Region', TP 153, October 2001.

The ALW Plan criteria are shown together with the analytical results on the tables provided in Appendices E to I of this report.

11.2 National Environmental Standards

The National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) under the Resource Management Act (1991) came into effect on 01 January 2012. The main objectives of the NES are to set out nationally consistent planning controls appropriate to district and city councils for assessing contaminants in soil and to provide a set of chemical specific soil contaminant thresholds (or soil contaminant standards) that define an adequate level of protection for human health for a range of differing land-uses in New Zealand. All territorial authorities were required to implement the NES from 01 January 2012.

NES soil contaminant standards (SCS) for 13 priority contaminants were derived and published in the MfE, April 2012 Users' Guide. The NES requires that the *Contaminated Land Management Guideline No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values* be used where an NES contaminant standard is not provided. However, the NES do not consider environmental receptors, accordingly guidelines relevant to environmental receptors are implemented according to the MfE *Contaminated Land Management Guideline No.2* and any relevant rules in Regional Plans.

The NES also includes a series of requirements related to soil disturbance, fuel systems removal, subdivision and land use change. The Users' Guide sets out a number of methods to assess if the NES apply to a site. Depending on this assessment, an activity on a site will be classed as permitted, controlled, restricted discretionary or discretionary.

For this project, the soil disturbance rules are applicable, as summarised below:

- Disturbance of small volumes of soil is a permitted activity subject to the following conditions, as set out in Regulation 8(3):
  - Installation of controls to minimise exposure of humans to mobilised contaminants.
  - The soil must be reinstated to an erosion free state within one month of completing the land disturbance.
  - The volume of the disturbance must be no more than 25 m^3 per 500 m^2.
  - Soil must not be taken away unless it is for laboratory testing or, for all other purposes combined, a maximum of 5 m^3 per 500 m^2 of soil may be taken away per year.
  - Soil taken away must be disposed of at an appropriately licensed facility.
  - The duration of land disturbance must be no longer than two months.
- Disturbance or removal of greater volumes of soil requires a consent
  - if a detailed site investigation states that contamination levels are:
    - below the standards detailed in the NES – controlled activity.
    - above the standards detailed in the NES – restricted discretionary activity.
  - if a detailed site investigation is not available, the activity would be considered a discretionary activity.

In addition to the soil disturbance regulations described above, Regulation 5(9) indicates the NES does not apply to a site already identified on the HAIL – Hazardous Activities and Industries List

(refer sub-clause (7) or (8)) if a detailed site investigation demonstrates contaminants in or on the land are at, or below, background concentrations.

The NES standards and local background concentrations are shown together with the analytical results on the Tables in Appendix E to I and conclusions are drawn for each site in Section 13.

11.3 Soil disposal

Auckland Council also controls the management of fill moved to other sites. To be disposed of at a cleanfill site, soil must meet local background concentrations of metals at the disposal site and have no organic contamination (e.g. petroleum hydrocarbons). To make an assessment of soil disposal options the soil test results have been evaluated against the generic cleanfill criteria used for the Auckland Region.

Slightly contaminated fill may be disposed of at a managed fill site, with acceptance criteria defined by the site's resource consent. Fill not acceptable at a cleanfill or managed fill site must be disposed of at a licensed landfill.

The acceptance criteria for managed and licensed landfills are typically defined by the consent conditions issued for the individual landfill sites and have therefore not been assessed in detail here. However, **an example** of current managed fill requirements in the region is provided. It is recommended that disposal sites are contacted by the appointed contractor to confirm acceptance (and associated rates) prior to commencement of works.

11.4 Asbestos-containing material

T&T is not aware of a defined guideline value for asbestos fibres in soil in New Zealand. Various regulatory authorities around the world have considered the subject and provided some guidance. Most of that consideration has been focused on what particular concentration in soil might result in an unacceptable concentration of asbestos fibres in air.

In the Flat Bush area of Manukau City (Auckland) asbestos-containing waste had been used to infill gullies and to form farm tracks/driveways etc. during a period when the land was rural and predominantly used for farming. Areas of asbestos-contaminated land became an issue with increasing residential development in the area. In 1999 Manukau City Council (MCC) engaged a consultant to review information available for asbestos contaminant levels and propose a risk management strategy for various site categories[3]. The consultant concluded that on residential lots where there were typically up to 20 asbestos-containing chips/500 m^2 (estimated to be less than 0.01% by mass of the soil), there could be in the order of up to 0.001% free fibre in the soil.

A semi-quantitative estimate of 0.001% asbestos content was accepted by MCC as a guideline, based on the mass of fibres in hand-picked samples and the mass of soil examined. A value of 0.01% by weight of asbestos-cement chips (approximately 20/500 m^2) is currently referenced in a number of consultancy reports. Asbestos in soil assessment is generally on the basis of visible contamination (chips and/or fibre bundles) with laboratory confirmation of the presence of asbestos fibres.

In Australia, EnHealth has published[4] guidance on the management of asbestos in the non-occupational environment, but without setting any soil guidelines. The report notes that the Australian Contaminated Land Consultants Association Inc (NSW) (2001) proposed a health

[3] Flat Bush Investigation, Phase 3 – Examination and Recommendations, Risk Categorisation Framework, Alan Rogers OH&S Pty Ltd, December 1999.

[4] Management of asbestos in the non-occupational environment, Australian Government, 2005 – Publication approval number 3663 (JN9050).

investigation level for asbestos of 0.01% fibres in soil and that a level of < 0.001% in soil was suggested by Imray and Neville[5] to classify a site as uncontaminated or unrestricted and suitable for all land uses.

Some guidance is available in the UK from the Interdepartmental Committee on the Redevelopment of Contaminated Land (Asbestos on contaminated sites, ICRCL Guidance Note 64/85, second edition, October 1990). This is based on historical work by the Institute of Occupational Medicine[6] which identified a threshold of 0.001% weight as an action level. Laboratory testing under controlled conditions had shown that the asbestos concentration in air is unlikely to occur above 0.1 fibre/mL where 5 mg/m^3 of respirable dust is generated from dry soil containing 0.001% asbestos. The study recommended a level of 0.001%, below which no action would be required to decontaminate further or to protect workers specifically from asbestos dust.

The Netherlands has an agreed level of 100 mg/kg (0.01%) on contamination levels in soils as a remedial target or for re-use of soils[7]. The 100 mg/kg criterion has involved a weighting calculation based on the type of asbestos present with amphibole asbestos rated 10 times more hazardous than serpentine (e.g., chrysotile) asbestos. It also assumes that activities such as digging, tipping and sifting of soil material are not systematically involved and the top layer of the soil is damp for a large part of the year. Site specific lower criteria are required where these conditions cannot be met.

As discussed above, guidance on acceptable levels of asbestos in soils is variable. In principle, most regulatory regimes consider that there should not be any asbestos present, especially in a residential setting, but acknowledge that this is unrealistic. Therefore, guidance values have been set that generally range from 0.001% to 0.01% asbestos in soil, although the higher value has a qualification associated with site characteristics. The guideline value set by Manukau City Council for asbestos fibre in residential soil in New Zealand is 0.001%. This is consistent with the value used in the UK and Australia and we consider it appropriate for the purposes of this project.

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[5] Imray P and Neville G "Approaches to the Assessment and Management of Asbestos Contaminated Soil", in A Langley & M Van Alplen, *The Health Risk Assessment and Management of Contaminated Sites*, Contaminated Sites Monograph Series No 2, 1993.

[6] Addison J, Davies LST, Robertson A, Wiley RJ, *The release of dispersed asbestos fibres from soil*, Report No. TM/88/14, Institute of Occupational Medicine, Edinburgh, 1988

[7] *Assessing risks of soil contamination with asbestos*, FA Swartjes, PC Tromp, JM Weezenbeck, RIVM report 711701034/2003.

12 Analytical Results

Full laboratory transcripts and tabulated results for all soil analysis results discussed in this section are attached in Appendices E to I.

For evaluating the carcinogenic PAH compounds, benzo(a)pyrene equivalent (B(a)P eq.) values have been calculated. B(a)P is the most studied PAH compound and the B(a)P eq. value represents an estimate of the cumulative effects of seven common carcinogenic PAH species listed by USEPA.

Where required statistical analysis has been undertaken to the 95% upper confidence limits (UCL) of the mean concentration of the soil contaminants in accordance with Rule 5.5.41 of the ALW Plan. Where concentrations exceed two times the acceptance criteria, MfE advises they should be treated as outliers and excluded from the UCL calculation. The upper confidence limits, calculated using the statistical methods outlined in ProUCL, are provided on the ProUCL worksheets attached in Appendix I.

12.1 Quality assurance/quality control

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

- Sampling equipment decontamination between sampling locations.
- Preservation of samples with ice during transport from the field to the laboratory.
- Transportation of samples with accompanying Chain of Custody documentation.
- Collection of laboratory replicate samples and review of calculated relative percent differences (RPDs).
- Comparison of field and analytical data.
- Compliance with sample holding times.

Standard laboratory QA/QC reports were not examined as part of this project, but are available from the laboratory on request.

A quantitative measure of the precision of the results was undertaken independently of the laboratory for a number of the sites by calculating the RPD values for replicate pairs. The RPD values were calculated using the following equation.

$$\mathrm{RPD} := \frac{\left(C_0 - C_s\right)\cdot 100\%}{\frac{\left(C_0 + C_s\right)}{2}}$$

where Co = concentration obtained from the original sample

Cs = concentration obtained from the split or duplicate sample

For RPD values that are within a generally accepted 30% to 50% limit, the correlation of data between the sample pair is considered good. RPDs calculated for the duplicate sample results from the individual construction sites (refer to the tabulated results in Appendices E to I) are generally within this range.

Based on the above, the sampling and analytical program is considered acceptable and the results obtained are of reliable quality and suitable for interpretation.

13 Site Specific Investigations

13.1 Mangere Wastewater Treatment Plant

13.1.1 Site description and environmental setting

The construction site is located at the northern extent of the Watercare Services Ltd wastewater treatment plant in Mangere. The proposed construction site is located on flat ground, at approximately 5 m above mean sea level. The Manukau Harbour is located adjacent to the construction site as shown in Figure E-1 in Appendix E.

The desk study review showed that the construction site was reclaimed in the late 1950s and was developed in the 1980s and used as a sludge dewatering facility. Contaminants of concern identified include metals, hydrocarbons and ACM.

13.1.2 Site investigation

The site investigation work was undertaken on 21 October and 25 October 2011. A 5 tonne tracked excavator supplied by City Parks Services Ltd was used to excavate ten test pits across the site. The test pit locations (TP1 to TP10) are illustrated on Figure E-1 in Appendix E. TP2 was located at the proposed location of the shaft. The other test pits were located at about 60 m grid spacing across the site to provide 35 m radius hot spot detection to 95% confidence.

All the test pits were excavated to between 2.2 m and 3.2 m depth below ground surface.

13.1.3 Ground conditions

According to the published geological map[2], the construction site is located at the edge of the Mt Mangere volcanic tuff and Tauranga Group alluvial sediments.

The investigations indicate that the construction site is underlain by fill material to between 1.9 m and 3.1 m depth below ground surface. The fill material predominantly comprises clayey silt and silt. Gravel was recorded as a minor constituent near the surface in the majority of test pit locations. A 1.2 m thick layer of sand, between 0.9 m and 2.1 m depth below ground surface, was encountered at TP2 and fragments of brick, timber, concrete and plastic was recorded in the fill in TP1 and TP10 respectively. No ACM was observed in the fill material.

Estuarine mud is present beneath the fill material across site, but was only observed at seven test pit locations. Groundwater encountered at about 2 m depth below ground surface made it difficult to extend the test pits beyond the estuarine mud.

No staining or olfactory evidence of contamination was observed in the soil at the investigated locations. PID measurements taken from samples from each test pit were variable. Concentrations of volatile organic compounds were not detected in test pits TP2, TP4, TP5 and TP10. In the remaining test pits, PID concentrations ranged from 4 ppm to 35 ppm.

Geological logs are provided in Appendix E.

13.1.4 Groundwater conditions

As discussed above, groundwater was encountered in all test pits at about 2 m depth below ground surface. Groundwater is expected to flow in a westerly direction towards the Manukau Harbour located adjacent to the site (refer Figure E-1).

Groundwater is not used in the vicinity of the construction site because of low permeability ground conditions and proximity to the harbour. In addition, the site is not shown to be located on a High Use or Quality Sensitive Aquifer Management Area on the ALW Plan planning maps.

13.1.5 Analytical testing

Twenty samples from the top 0.5 m of the site surface comprising mainly the fill material were selected for analysis. Deeper samples (up to 2.3 m below ground surface) including a sample of the estuarine sediments beneath the fill were taken from the proposed shaft location at TP2.

All samples were tested for metals and polycyclic aromatic hydrocarbons (PAH). Selected samples of the fill were analysed for semi-volatile organic compounds (SVOC) concentrations and the presence of asbestos fibres.

The testing results are summarised in the Tables in Appendix E.

13.1.6 Assessment of testing results

The analytical results have been evaluated against acceptance criteria for commercial/industrial end use selected in accordance with the conditions of the ALW Plan and the NES (as described in Section 11). The site will be used for commercial/industrial purposes so the NES SCS for commercial/industrial outdoor worker (unpaved) landuse scenario are appropriate to assess the soil results during and following the proposed land disturbance activities. The soil test results have also been evaluated against the Auckland Council default cleanfill criteria (non-volcanic background concentrations), background concentrations for volcanic soils and an example of managed fill criteria for off-site soil disposal options (refer Table 3 and Table 4, Appendix E).

Key findings are summarised below.

- Asbestos fibres were not detected in the three samples of fill material analysed by Dowdell & Associates.
- All metals, PAH and SVOC concentrations are below the NES contaminant standards for a commercial/industrial end use. However, a significant proportion of the results are above the defined range of background concentrations.
- All PAH and SVOC concentrations are below the ALW Plan PA soil criteria (discharges). However, metals concentrations in samples collected from TP1, TP2, TP4, TP6, TP7 and TP8 exceed the ALW Plan PA soil criteria (discharges).
- The majority of samples contained metals, and some PAH and SVOC (mainly DDT compounds) concentrations that exceed the Auckland Council generic cleanfill criteria and also background concentrations for volcanic soils. Metals exceedances in TP2, TP6 and TP7 suggest the near surface fill material is unlikely to be accepted as managed fill.
- The one sample taken of the estuarine sediments shows metals concentrations generally below the Auckland Council generic cleanfill criteria, except nickel. The nickel concentration in the sample (86 mg/kg) is below the published background for the area (168 mg/kg). Given the proximity to the Mt Mangere volcano, it is likely that the nickel concentration in the sample is attributable to the natural mineral composition of the sediments which are volcanically derived.

13.1.7 Conclusions and development implications

The results of the asbestos testing and comparison of the analytical results against the NES contaminant standards for commercial/industrial end use indicate that there would be no risk to construction workers during the proposed development works and future on-site users.

However, some soil concentrations exceed published background for the site and the ALW Plan PA soil acceptance criteria.

Any excavated surplus soil that needs to be removed off-site should be removed to an appropriate disposal facility. All fill material should be disposed to either a managed fill site that is authorised to take the metal contaminant levels in the fill or to a licensed landfill such as Redvale Landfill or Hampton Downs Landfill. The underlying estuarine sediments could be disposed to a cleanfill site that is authorised to accept volcanic type soils or to a managed fill site.

13.2 May Road

13.2.1 Site description and environmental setting

The May Road construction site is an undeveloped piece of land (refer Figure F -1 in Appendix F) that is surrounded by commercial/ industrial properties except on the southern boundary where residential properties are present. The proposed construction site is located on relatively flat ground, at approximately 50 m above mean sea level. There is a drainage ditch along the northern boundary and a number of ditches that cross the northern part of the site. The Oakley Creek tributary/drain is located about 500 m to the north of the construction site.

The desk study review showed that the construction site has been filled and has had multiple pollution incidents on or near the site. Because the property has been unoccupied, the risk of uncontrolled filling is high. Identified contaminants of concern include metals, hydrocarbons and ACM.

13.2.2 Site investigation

The site investigation work was undertaken on 26 October 2011 and 11 November 2011. A 5 tonne tracked excavator supplied by City Parks Services Ltd was used to excavate eight test pits across the site. Test pits TP5 and TP6 are positioned close to the proposed shaft locations. In addition, four auger holes were drilled by hand along the mid portion of the northern boundary to assess the condition of the soil adjacent to the drain where the access road is proposed to be constructed. The test pit and hand auger locations (TP1 to TP8 and HA1 to HA4) are shown on Figure F-1 in Appendix F. The investigation locations were spread between about 20 m and 50 m spacing across the construction site.

The test pits were excavated to between 0.5 m and 2 m depth below ground surface. The hand augers were drilled to between 1.2 m and 2.2 m depth below ground surface

13.2.3 Ground conditions

According to the published geological map[2], the construction site is located at the edge of the Mt Roskill volcanic lava flow and Waitemata Group rocks.

Fill material was encountered during the investigations in three of the eight test pits (TP1, TP2 and TP3) and in all four hand augers and coincided with raised ground along the north eastern boundary of the site. The fill material was encountered to between 0.4 m and 1.7 m depth below ground surface. It generally comprised clay and clayey silt with minor constituents of gravel, wood, metal and in places, trace fragments of charcoal.

Natural soils on the north western part of the site (TP3 to TP6) comprise clayey silt with basalt gravel and boulders. Elsewhere on the site the natural soils generally consist of dark brown or dark grey clayey silt or silty clay.

No evidence of any soil discolouration or odour was observed in the fill and natural materials. The PID measurements taken from every sample collected from the test pits did not detect the

presence of volatile organic compounds in the soil. Landfill gas readings recorded normal ambient levels.

ACM was not observed in any of the fill material encountered during the investigations.

Geological logs are provided in Appendix F.

13.2.4 Groundwater conditions

Groundwater was not encountered in any of the test pits or hand augers. Groundwater depth is likely to be less than 5 m below ground surface and is expected to flow following the topography in a northerly direction towards the Oakley Creek.

There are no groundwater users within 1 km of the construction site. In addition, the site is not shown to be located on a High Use or Quality Sensitive Aquifer Management Area on the ALW PLANplanning maps.

13.2.5 Analytical testing

Twenty nine samples collected from various depths ranging between 0.0 m and 1.6 m below ground surface were selected for analytical testing. Slightly more than half of the samples tested were near surface topsoil and fill material overlying the natural soils.

All samples were tested for metals and PAH concentrations. One sample collected from HA2 was analysed for total petroleum hydrocarbons (TPH). Four samples of the fill were analysed for the presence of asbestos fibres.

The analysis of two duplicate samples (TP3 0.0 m and TP7 0.0 m, refer Table 1 Appendix F) indicated relative percentage difference values of less than 20%, which suggests the correlation between the data pair is good.

13.2.6 Assessment of testing results

The testing results have been assessed against the assessment criteria described in Section 11. The site is used for commercial/industrial purposes so the NES SCS for commercial/industrial outdoor worker (unpaved) landuse scenario are appropriate to assess the soil results during and following the proposed land disturbance activities. The results and assessment criteria are summarised in the Tables in Appendix F. Key findings are summarised below.

- All metals, PAH and total petroleum hydrocarbon (TPH) concentrations are below the NES contaminant standards for commercial/industrial end use and ALW Plan PA soil criteria (discharges). However, contaminant concentrations exceed defined background concentrations.
- Asbestos is not present in the samples collected from TP1 0.0 m and TP1 0.25 m depth, however, chrysotile has been recorded in the sample collected from TP2 0.25 m (0.002%), and chrysotile and amosite were recorded in TP3 0.0 m (0.002%). The concentrations of asbestos fibres recorded in the soil are marginally above the current international 'best practice' guideline of 0.001% (refer Section 11.4 above). At these concentrations, the asbestos fibres are unlikely to pose a significant risk to workers during land disturbance and on-site users following development.

The soil test results have also been evaluated against the Auckland Council default cleanfill criteria (non-volcanic background concentrations) and an example of managed fill criteria for off-site soil disposal options (refer Table 3 and Table 4, Appendix F). The results are summarised below.

- In the majority of samples, the cadmium laboratory detection limit (0.9 mg/kg) is slightly above the Auckland Council default cleanfill criteria of 0.65 mg/kg. The majority of the

samples showed cadmium concentrations below the detection limit. Further testing to trace level may be required to confirm the acceptability of the fill for disposal to cleanfill. This can reasonably be undertaken just before any soil needs to be removed from the site.

- All near surface/fill samples contain metals (copper, chromium, lead and nickel) and PAH concentrations exceeding the Auckland Council generic cleanfill criteria, however, all contaminant concentrations are below the example managed fill criteria.
- All soil samples collected from the natural ground show metal concentrations below the greater of the Auckland Council generic cleanfill criteria or the published background for the area, with the exception of cadmium (discussed above) and chromium in the sample collected from TP4 at 1.5 m depth below ground surface. Sample TP4 1.5 m recorded 200 mg/kg chromium which is about two times the published background concentration for the area (101 mg/kg). A shallower sample of the volcanic soil taken from 0.5 m depth below ground surface contained a chromium concentration of 71 mg/kg, less than the published background concentration. The elevated concentration from the 1.5 m depth sample could be a sampling/analytical error. Further testing is recommended if natural soil in the vicinity of TP4 is required to be excavated and removed off-site.

13.2.7 Conclusions and development implications

Contaminant concentrations are all below the ALW Plan PA soil criteria and the NES contaminant standards for commercial/industrial end use.

The results of the asbestos and contaminant soil testing indicate that the risk to construction workers during the proposed development works and future on-site users will be low.

Based on the results, any excavated topsoil and fill that cannot be reused and needs to be removed off-site should be removed to a managed fill site that is authorised to take the low level metal, hydrocarbon and asbestos concentrations in the fill. If the managed fill site is not able to accept the low level asbestos contaminated soil, then the surplus fill may have to be disposed of at an appropriately licensed landfill. Further asbestos testing of the fill material may be required by the managed fill operator to confirm suitability.

The underlying natural soil at the proposed shaft locations (TP5 and TP6) should be able to be disposed to a cleanfill site that is authorised to accept volcanic type soils or a managed fill site providing further testing confirms that the chromium concentration ration at TP4 1.5 m is an isolated result. All fill sites should be contacted to confirm suitability before the soil is trucked to the disposal site.

13.3 Western Springs Reserve

13.3.1 Site description and environmental setting

The Western Springs Reserve construction site comprises a main site located on the Outer Fields of the Western Springs Reserve on the northern side of Great North Road. It also includes a secondary site located on the road reserve on the southern side of Great North Road as shown on Figure G-1 in Appendix G.

The proposed construction sites are located on relatively flat ground, at approximately 15 m above mean sea level. The nearest surface water body is the Western Springs Lake, located about 230 m to the south west of the main construction site (refer Figure G-1). The lake discharges into the Motions Creek located on the northern side of the lake.

The desk study review showed that the Western Springs property is an old landfill, however, information indicates that the landfill does not extend into the construction site (refer Figure G-1

in Appendix G). The secondary site is located adjacent to a service station, however, the underground fuel tanks and associated facilities are located more than 20 m away from the proposed construction site. Investigations have been undertaken to confirm this. The main contaminants of concern include metals, hydrocarbons and ACM.

13.3.2 Site investigation

The site investigation work was undertaken on 10 November 2011. A 5 tonne tracked excavator supplied by City Parks Services Ltd was used to excavate nine test pits (TP1 to TP9) across the proposed construction site. Two augers were drilled by hand, HA1 and HA2. The test pit and hand auger locations (TP1 to TP9 and HA1 and HA2) are illustrated on Figure G1 in Appendix G.

TP2 and HA1 are located at the proposed shaft locations on the main and secondary construction sites respectively. The investigation locations on the main construction site are spaced about 25 m apart to give a 15m radius hotpot detection to 95% confidence.

The test pits were excavated to between 0.5 m and 2 m depth below ground surface. Hand augers HA1 and HA2 were drilled to about 0.8 m and 1 m depth below ground surface respectively.

13.3.3 Ground conditions

According to the published geological map[2], the construction site is underlain by Tauranga Group sediments.

On the main construction site, fill material was encountered at four locations (HA1, TP3, TP6 and TP8) to between 0.3 m and 1.2 m depth. The fill material is variable and consists of silt with ceramic tile fragments, silt with sand and scoria gravel and large fragments of wood, and large scoria gravels in a silt matrix. Natural soil of the East Coast Bay Formation was encountered in all of the investigated locations on the main construction site.

The 0.5 m thick layer of topsoil on the secondary construction site is underlain by reworked clayey silt fill. Natural soil was not encountered in HA1 because of an obstruction.

No evidence of any soil discolouration or odour was observed in the fill and natural materials in any of the holes drilled during this investigation. PID measurements taken from samples collected from each test pit were variable. PID readings from both construction sites ranged between 1.3 ppm to 1.8 ppm on the secondary construction site to 2.6 ppm to 35 ppm on the main construction site. Landfill gas readings recorded normal ambient levels.

ACM was not observed in any of the fill material found during the investigations.

Geological logs are provided in Appendix G.

13.3.4 Groundwater conditions

Groundwater was not encountered in the test pits or hand augers although the soils near the base of the test pits were saturated. Groundwater depth is likely to be less than 5 m below ground surface and it is expected to flow following the topography in the southwesterly and northwesterly direction towards the Western Springs Lake from the main and secondary construction sites respectively.

There are no groundwater users within 1 km of the construction site. In addition, the site is not shown to be located on a High Use or Quality Sensitive Aquifer Management Area on the ALW Plan planning maps.

13.3.5 Analytical testing

Thirteen samples (including one duplicate) collected from various depths from each test pit and hand augers were selected for analysis. Nine of the samples were collected from near surface and comprised topsoil and fill material overlying the natural sediments. All samples were analysed for metals, TPH and PAH concentrations.

Two samples of fill, collected from TP3 and TP8 respectively, were also tested for the presence of asbestos fibres.

13.3.6 Assessment of testing results

The testing results have been assessed against the assessment criteria described in Section 11. The site is a reserve. The NES SCS for commercial/industrial outdoor worker (unpaved) landuse scenario are appropriate to assess the soil results during land disturbance activities. The results have also been evaluated against the NES SCS for recreational/parkland for continued use of the site as a reserve. The results and assessment criteria are summarised in the Tables in Appendix G. Key findings are summarised below.

Main construction site:

- All metals, TPH and PAH results are below the ALW Plan PA soil criteria (discharges) and the NES contaminant standards for commercial/industrial and recreational/parkland scenario. However, contaminant concentrations exceed the defined background concentrations for Auckland.
- All of the samples contained metals, TPH and/or PAH concentrations that exceed the Auckland Council default cleanfill criteria. The natural soil sample at the proposed shaft location at TP2 showed metals and TPH concentrations below the Auckland Council default cleanfill criteria but detected low concentrations of PAHs. The low PAH concentrations are close to the laboratory detection limit and within the analytical testing variation.
- Of the two samples tested for asbestos fibres, one sample from TP3 at 0.5 m depth detected Chrysotile as one loose fibre group (0.00001%), below the assessment criterion of 0.001%.

Secondary construction site:

- Metals and TPH results for the single sample of near surface soil from HA1 are below the ALW Plan PA soil criteria (discharges) and the NES contaminant standards for a commercial/industrial end use. However, contaminant concentrations exceed the adopted background concentrations for the site[8].
- However, the benzo(a)pyrene equivalent (B(a)P eq.) concentration at 3.46 mg/kg in the sample exceeds the ALW Plan soil criterion of 2.15 mg/kg.
- The sample showed TPH and PAH concentrations that exceed Auckland Council default cleanfill criteria but meet the example managed fill criteria.

13.3.7 Conclusions and development implications

The testing undertaken confirms that the landfill does not extend onto the main construction site. Some fill soil is present on both the main and secondary site and it generally contains low level contamination which is unlikely to pose a risk to workers or future users but would have some implications for the development.

[8] ARC, TP153, Background concentrations of inorganic elements in soils from the Auckland Region (Kepa Bush Park, Kauri Point Centennial Park and Takapuna Grammar)

Fill material from both the main and secondary construction sites cannot be disposed to a general cleanfill site and must be disposed to either a managed fill site or a licensed landfill. The natural soils underlying the fill should be suitable for disposal to a general cleanfill site, subject to further testing.

13.4 Motions Road

13.4.1 Site description and environmental setting

The construction site is located on the western side of Motions Road adjacent to the Auckland Zoo as shown on Figure H-1 in Appendix H. The construction site falls towards the Meola Creek on the western boundary. The ground surface of the construction site is between about 5 m and 10 m height above mean sea level.

The desk study review showed that the property the construction site is on is a closed landfill. Based on the review of the aerial photographs and site topography, the landfill was not considered likely to extend onto the construction site as shown on Figure H-1 in Appendix H. These investigations were carried out to confirm the presence or absence of any refuse material within the construction site. Identified contaminants of concern include metals, hydrocarbons and ACM.

13.4.2 Site investigation

The site investigation work was undertaken on 22 November 2011 and 01 December 2011. Initially intrusive investigations were undertaken with a hand auger. However, because of the difficult ground conditions encountered, a 5 tonne tracked excavator, supplied by Boler Earthmovers Ltd, was used to excavate four test pits across the proposed construction site.

The hand auger and test pit locations (HA1 to HA4 and TP1 to TP4) are illustrated on Figure H-1 in Appendix H. HA2 and TP3 were excavated at the proposed shaft location.

The hand augers were excavated to no more than 0.45 m depths. The test pits were excavated to the depth of rock encountered at depths between 0.4 m and 0.85 m below ground surface.

13.4.3 Ground conditions

According to the published geological map[2], the construction site is situated at the edge of volcanic rock from the Mt Eden volcano.

Topsoil comprising silt with gravel was encountered in each test pit. Glass and crockery fragments were recorded in TP1 and TP2. A fragment of potential asbestos containing material was also observed in TP2. Fill material beneath the topsoil is variable, consisting of silt with basalt boulders and occasional brick and silt with some charcoal and gravel.

Each test pit was terminated on large basalt boulders or rock. A layer of orange brown clayey silt above the basalt was present in TP1 and TP3.

No evidence of any hydrocarbon or solvent odour was observed in the fill and natural materials in any of the holes excavated during this investigation. Landfill gas readings recorded normal ambient levels. PID readings were not collected because there was no evidence of hydrocarbon or solvent odours.

Geological logs are provided in Appendix I.

13.4.4 Groundwater conditions

Groundwater was not encountered in the test pits or hand augers. Groundwater depth is likely to be less than 5 m below ground surface and it is inferred to flow in a westerly direction towards Meola Creek.

There are no groundwater users within 1 km of the construction site. In addition, the site is not shown to be located on a High Use or Quality Sensitive Aquifer Management Area on the ALW Plan planning maps.

13.4.5 Analytical testing

Six samples collected from various depths from each test pit were selected for analysis. Five out of six of the samples represent fill material. One sample of the natural soil underlying the fill material in TP3 at the proposed shaft location was analysed.

All samples were tested for metals concentrations. The five fill samples were analysed for TPH and PAH concentrations and four of them were analysed for the presence of asbestos fibres in soil and cement board.

13.4.6 Assessment of testing results

The testing results have been assessed against the assessment criteria described in Section 11. The site is a reserve. The NES SCS for commercial/industrial outdoor worker (unpaved) landuse scenario are appropriate to assess the soil results during land disturbance activities. The results have also been evaluated against the NES SCS for recreational/parkland for continued use of the site as a reserve. The results and assessment criteria are summarised in the Tables in Appendix I. Key findings are summarised below.

- All metals, TPH and PAH concentrations are below the new NES contaminant standards for commercial/industrial and recreational/parkland land use scenarios. However, a significant proportion of results are above the defined background concentrations.
- All metals and the majority of PAH concentrations are below the ALW Plan PA soil criteria (discharges). The exception is a single concentration of B(a)P eq. of 8.8 mg/kg in TP2 0.15 m that exceeds the ALW Plan soil criterion of 2.15 mg/kg by about 4 times.
- Asbestos fibres were not detected in the soil collected from HA1 and HA3, however, cement board collected from HA1 (F) and HA2 contained chrysotile and amosite.
- The majority of individual PAH compounds and some metals concentrations recorded contaminant concentrations that exceed the Auckland Council generic cleanfill criteria, however, all contaminant concentrations are below the example managed fill criteria.
- The sample of the natural soil shows metals concentrations generally below the Auckland Council default cleanfill criteria and published background concentrations for the site.

13.4.7 Conclusions and development implications

The investigations confirmed that the landfill does not extend onto the proposed construction site. There is a small layer of overlying fill, less than 1 m thick. The investigations show that there is asbestos cement board within the fill. The asbestos cement board is likely to be from a building formerly located on the northwestern corner of the proposed construction site as shown on Figure H-1 in Appendix H.

Analytical testing of the fill shows that it contains low level hydrocarbon contamination. Comparison of the analytical results against the NES contaminant standards for commercial/industrial end use indicates that there would be no risk from the low level

hydrocarbon contaminants to construction workers during the proposed development works and future on –site users.

The investigation results have some development implications and these are discussed below.

- Asbestos bound together in cement board and left undisturbed should not pose a risk to human health. However, during the proposed development works the asbestos-containing cement board could be disturbed and asbestos fibres could become airborne. On this basis, the proposed works should be controlled to prevent the generation of airborne asbestos fibres to affect human health of excavation workers.
- Excess fill material required to be disposed off-site during the proposed development works may be accepted at an appropriately licensed managed fill facility. However, the presence of ACM in the fill material could result in some surplus fill having to be disposed of at an appropriately licensed landfill. Further testing of the fill material may be required by the managed fill operator to confirm suitability.
- Natural soil from the proposed shaft location will be suitable for disposal at a cleanfill site that is authorised to accept volcanic type soils or a managed fill site.

13.5 Site investigation results summary

The soil results and development implications for the 4 investigated sites are summarised in Table 13.1 below.

Table 13.1: Summary of analytical results and development implications

Site name	Soil concentrations			Soil disposal location	
	Above ALW Plan PA criteria	Above published background	Above NES SCS	Fill	Natural
Mangere WTP	Yes	Yes	No	Managed fill (Average depth across site of fill requiring disposal = 2.5 m)	Volcanic cleanfill, otherwise managed fill
May Road	No	Yes	No	Managed fill but presence of ACM may require all fill to be disposed to licensed landfill (Average depth across site of fill requiring disposal = 1 m)	Volcanic cleanfill, otherwise managed fill
Western Springs Main site	No	Yes	No	Managed fill (Average depth across site of fill requiring disposal = 0.8 m)	Cleanfill, subject to further testing, otherwise managed fill

Site name	Soil concentrations			Soil disposal location	
	Above ALW Plan PA criteria	**Above published background**	**Above NES SCS**	**Fill**	**Natural**
Western Springs Secondary site	Yes	Yes	No	Managed fill (Likely depth across site of fill requiring disposal = 1 m)	Not able to be tested
Motions Road	Yes	Yes	No	Managed fill but presence of ACM may require all fill to be disposed to licensed landfill (Average depth across site of fill requiring disposal = 0.5 m)	Volcanic cleanfill, otherwise managed fill

14 Assessment of environmental effects

For any on-site contamination to have an effect, there has to be a mechanism (pathway) for the contamination to affect either human health or the environment (receptor). This is the source-pathway-receptor model. Potential exposure pathways for any onsite contamination to affect the environment include:

- contact with and subsequent ingestion of the contaminated soil by workers and general public during land disturbance activities;
- contact with and subsequent ingestion of the contaminated soil by future site users; and
- mobilisation and discharge of contaminated soil to land and/or surface water during land disturbance activities.

Analytical results for the four investigated sites show contaminant levels at concentrations that do not exceed human health criteria for recreational and/or commercial/industrial land use but exceed published background concentrations. Three of the four sites contain contaminant concentrations above the permitted activity acceptance criteria for the Auckland Council Regional Plan: Air Land and Water. Preliminary assessment of the other potentially contaminated sites indicates that contaminant levels at those sites are likely to be similar to or lower than the four investigated sites.

Based on the results of the testing, the potential for risk to construction workers, general public and future site users during and following the proposed works will be low. Precautionary mitigation measures and health and safety requirements are provided in the draft SMP/RAP in Appendix J of this report.

The construction works will need to be managed to minimise the potential and actual effects of contaminated soil discharges during the proposed works. The strategies include soil testing to establish appropriate landfill sites, controlling rainfall runoff, dust and sediment generation. These strategies are also set out in the draft SMP/RAP in Appendix J in this report.

If the procedures set out in the SMP are implemented during the proposed construction works, the potential for any effects on the environment will be less than minor.

15 Conclusions

A ground contamination assessment has been undertaken for the nineteen construction sites proposed for the Central Interceptor project. The persons undertaking, managing, reviewing and certifying this report are suitably qualified and experienced practitioners as defined in the NES (Soil).

The contamination assessment included a review of site history to establish if potentially contaminating activities have occurred on the sites. The review indicates that potentially contaminating activities are known to have occurred at fifteen out of the nineteen construction sites. The potentially contaminating activities are likely to have affected shallow soils within the construction sites. Contaminant levels are unlikely to be at concentrations that would exceed human health criteria for recreational and/or commercial/industrial land use. However, for some sites, contaminant concentrations could be above published background concentrations and/or the permitted activity acceptance criteria for the Auckland Regional Plan: Air Land and Water.

Intrusive investigations were undertaken at four construction sites where refuse/landfill material was identified to be potentially present within the site. The work was undertaken between October 2011 and December 2011. The investigations indicated that the sites would require consents. Some of the surplus soil would need to be disposed to an appropriately licensed facility.

An assessment of environmental effects has been undertaken. The assessment indicates that risk to construction workers during the proposed development works and future site users is likely to be low. However, the construction works will need to be managed to minimise the potential and actual effects of contaminated soil discharges during the proposed works. A number of strategies, precautionary mitigation measures and health and safety requirements are provided in the draft SMP/RAP in Appendix J of this report. If the procedures set out in the SMP are implemented during the proposed construction works, the potential for any effects on the environment will be less than minor.

16 Applicability

This report has been prepared for the benefit of Watercare Services Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Recommendations and opinions in this report are based on borehole data collated from the desk study review. The nature and continuity of soil away from these locations are inferred and it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Prepared by:	Authorised for Tonkin & Taylor Ltd by:
.....	.....
Lean Phuah	Gerard Bird
Senior Environmental Engineer	Project Director

Report certified by a suitably qualified and experienced practitioner as prescribed under the NES (Soil)

plp/lp

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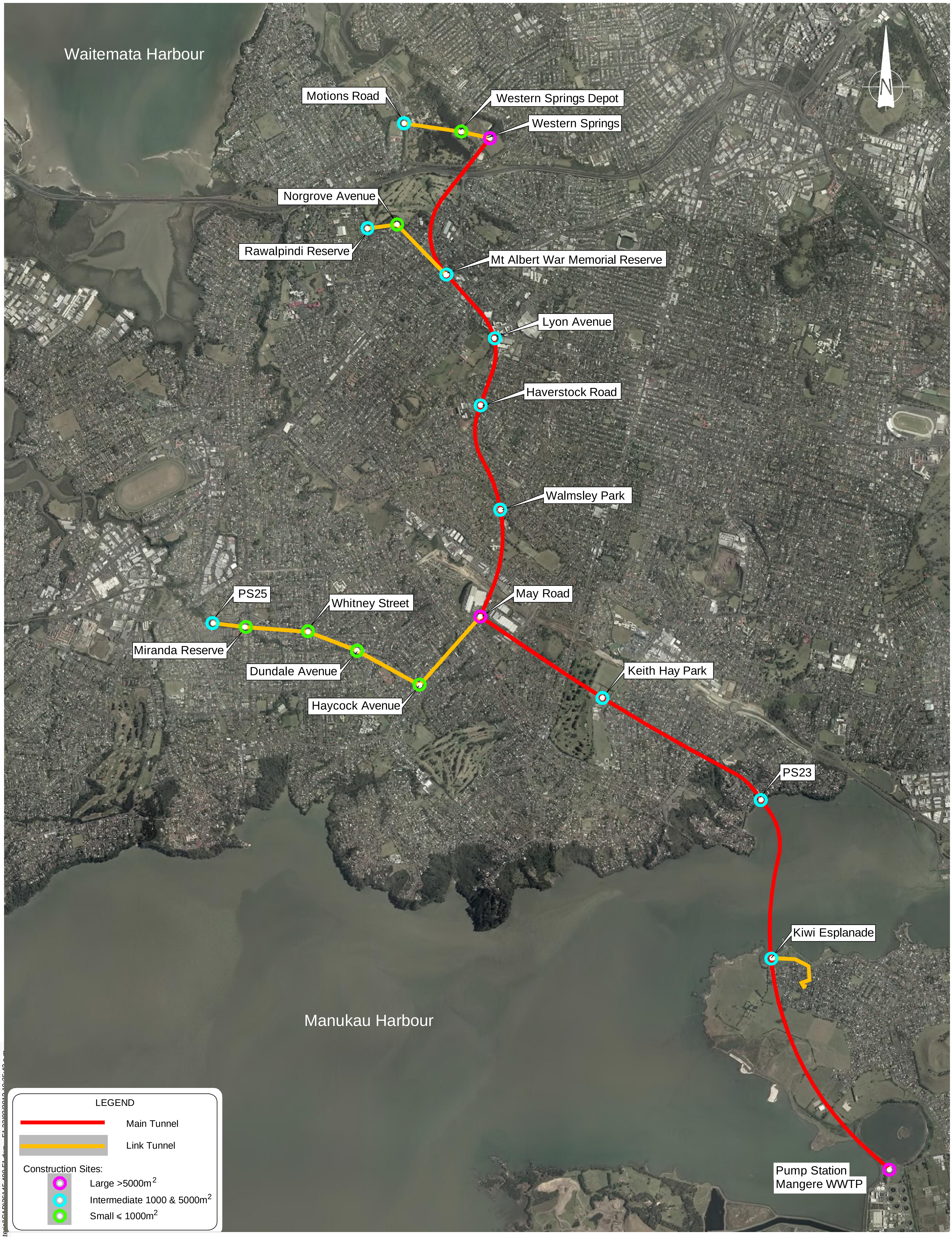
Appendix A: Figures



SCALE 1: 35,000

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Aerial photo sourced from Terralink International

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DRAWN	RBS	Oct.11
DRAFTING CHECKED		
APPROVED		
CADFILE : 26145.400–F1.dwg		
SCALES (AT A3 SIZE) 1: 35000		
PROJECT No. 26145.400		

watercare services limited

CENTRAL INTERCEPTOR

Overall Location Plan

FIG. No. Figure 1

REV. 0

L:\26145\26145.400\WorkingMate...

Waitemata Harbour

Motions Road

Western Springs Depot

Western Springs

Norgrove Avenue

Rawalpindi Reserve

Mt Albert War Memorial Reserve

Lyon Avenue

Haverstock Road

Walmsley Park

PS25

Whitney Street

May Road

Miranda Reserve

Dundale Avenue

Keith Hay Park

Haycock Avenue

PS23

Kiwi Esplanade

Pump Station
Mangere WWTP

Manukau Harbour

LEGEND

Main Tunnel

Link Tunnel

Construction Sites:

Large >5000m^2

Intermediate 1000 & 5000m^2

Small ≤ 1000m^2

avl — Basalt & basanite lava

avs — Basalt & basanite scoria

avt — Lithic tuff

ta — Undifferentiated alluvium

tp — Puketoka Formation

re — East Coast Bays Formation

SCALE 1: 35,000

0 350 700 1050 1400 1750 (m)

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Tonkin & Taylor
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DRAWN	RBS	Jan.12
DRAFTING CHECKED		
APPROVED		
CADFILE : 26145.400–Geology.dwg		
SCALES (AT A3 SIZE) 1: 35000		
PROJECT No. 26145.400		

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CENTRAL INTERCEPTOR

Geology Plan

FIG. No. Figure 2

REV. 0

Appendix B: Summary of property information

- **Summary of property information table**
- **Certificates of titles summary table**
- **Aerial photograph summary table**

Table B1 - Summary of Property Information

Plan Ref	Site Name	Address	Legal Description	Special Land features	T&T Jobs	Contamination Enquiry	Notes:
L1S1	Motions Road	134-136 Motions Road, Western Springs	Allot 49 Sec 9 Suburbs of Auckland; Allot 57 Sec 9 Suburbs of Auckland; Lot 1 DP 168863. Local purpose reserve (Lot 1 Esplanade, Allot 49 carpark)	Refuse tip site/weak ground	Zoo: 4924 - GT, 5240 - GT, 10424 - WR, 11243 - GT; Meola Res: 613813 - GO, 11666, 11867, 13959, 13960, 13961; Western Springs Collage: 15227 - CI, 21749, 25281, 26330 - GT, 25145 - EV (15227, 20196, 21111, 21749) 21749.201 - GT	<u>Two pollution files relating to the site:</u> - A catchment file incident relating to dead eels in Meola Creek. - A catchment file incident relating to discolouration of a creek (green). <u>Consents issued within 200m of the site:</u> - Numerous borehole consents for borehole installations. - Discharge of leachate from a closed sanitary landfill into the ground and groundwater beneath the site, and to divert leachate into a collection system *(Old Motions Road Landfill - 190 Meola Road)* . - Consent to discharge contaminants into air from the operation of a building (the blister/belfast hangar) and associated processes situated on the closed Motions Road landfill.	- no relevant information
L1S2	Western Springs Depot	859 Great North Road, Western Springs	Lot 11 DP 168863	Flood Plain, Soil Report, Filled weak ground	Western Springs: 7414 - GT, 20333 - GT, 21108.100 - GT, 27115 - GT 27554 - GT 12535 - GT	<u>Consents within 200m of the site:</u> - Numerous consents relating to Animal Waste Discharges from Auckland Zoo enclosures into motions creek.	- Geotechnical Report, T&T, 6402 - Diesel tanks near depot (Hazardous Goods storage), - Planning report indicates soil warning area (refuse tip site/ weak area)
WS1	Western Springs	731 Great North Road, 770 Great North Road, Western Springs	Lot 12 DP 168863; Pt Lot 3 DP 10276, Allot 76 Sec 7 Suburbs of Auckland; Pt Lot 3 DP10276	Flood Risk Area, Unstable/suspect ground	61394 - EC, 23653 - GT	<u>One pollution files within 200m of the property:</u> - Washing forecourt to stormwater (Challenge - 778-802 Great North Road) <u>Consents within 200m of the property:</u> - Four borehole consents.	- Nil from 770 GN Rd
AS1	Mt Albert War Memorial Reserve	751-773 New North Road, 7 Wairere Ave, St Lukes	Pt Allotment 38 Parish of Titirangi; Pt Allotment 38 Parish of Titirangi (DP 6763); Pt Allotment 38 Parish of Titirangi (SO 35759); Lot 14 DP 7029	Flood Plain Filled/weak ground Soil Report	20018 - GT	<u>Consents issued for property activities:</u> - One contaminated site discharge to remediate lead contaminated soil (Auckland Council). <u>Consents within 200m of the property:</u> - Contaminated Site Discharge at 770 New North Road to remove five UST's and lines, and to install two new tanks. An SVR was provided to the Council. - Four borehole consents for stock supply and groundwater levels and chemistry	- The property file indicated the construction of a council depot and workshops in 1955. Plans indicate that the position of the depot appears to be outside of the site area. It is unclear whether additional workshop buildings were located across the site. The buildings were demolished in 2001 to create the City Council Recreation Precinct Carpark. - A transformer building was constructed as an extension to the council depot in 1975. - Geotechnical investigations indicate that a layer of gravel fill comprising basalt is present across the site.
AS2	Lyon Ave	30-36 Alberton Ave 19 Morning Star Place	Mt Albert Grammar: Pt allot 41 Parish of Titirangi SO 34849; Pt Allot 168 Sec 10 Suburbs of Auckland; Pt Allot 169 Sec 10 Suburbs of Auckland. Morning Star: Lot 15 DP 7699, Lot 2 DP 206560.	Filled/weak ground, Soil report, Flood plain	Mt Albert Grammar: 1201, 1567, 2302, 13185, 15467, 16731, 17007, 18558, 23595 - GT; St Lukes: 23782.0, 23782.001 - GT, 23782.003 - CI, 20917 - GT; 20598 - GT Wagener Place: 17308, 17315 - EV, 17548, 17658 - GT, 18156 - EV, 18156.002 - GT, 23179.100 - EV, 23908 - GT	<u>One pollution file relating to the site:</u> - Potential sediment to stormwater. <u>Three pollution files within 200m of the site:</u> - Sediment to stormwater *(Block C - Morning Star Place)* - A consent relating to odour - non specific (*11 Morning Star Place*). - Electroplating waste contaminating unsealed ground (*15 Lyon Avenue - Hermetic/Southcorp NZ ltd)* . Numerous consents <u>Consents within 200m of the site:</u> - Contaminated Site Discharge at Brebner Printers (7 Wagener Place). A desktop investigation identified that the risk to the environment was considered low.	- Mount Albert Grammar, - Geotechnical Reports 2001, 2003 Foundation Engineering - Soakage testing, - Contamination tag on PIM related to HAIL list, none found during redevelopment
AS3	Haverstock Road	118-120 Mt Albert Road 98-102 Haverstock Road	Lot 2 DP 334046. Site access: Lot 15 DP 45495	Possible contaminants, Soil Report	14667 - GT 20315 - GT Hort Research Site: 26534.002 - GT, 26672 - GT, 27369 - GT; 21422 - GT 21672 - GT	<u>Three pollution files relating to the site:</u> - Two burning incidents - Discharge of radioactive chemicals down sink (Mt Albert Hort Research Centre). - One non specific incident. <u>Consents issued for site activities:</u> - Two non specific contaminated site discharges *(HORT Research).* <u>Consents within 200m of the site:</u> - Contaminated Site Discharge - Redevelopment of horticultural land, low level contamination *(94 Haverstock Road).*	- Horticultural Site - Numerous site investigations for development and subdivision
AS4	Walmsley Park	26a Begale Ave, Owairaka	Lot 112 DP 43048	Filled/weak ground, Flood plain	Nil	Nil	
WS2	May Road	111/105 May Road	Lot 2 DP 116924	Flood Plain Adjacent sites possible contaminants, filled weak ground, and soil report	14542 - EV 4717 - GT 16467 - WR 19366 - GT 19991 - GT 20060 - GT 21443 - GT	<u>Five pollution files relating to the property:</u> - Burning - Oil in drain - 2 incidents involving oil in a stream. - Strong petrol and oil smell and sheen from drain on property during development. <u>Consents within 200m of the site:</u> - UST removal (*56 Roma Road, Mt Roskill*)	
AS5	Keith Hay Park	53 Arundel St 51 Arundel Street 49 Arundel Street 20 Gregory Place 22 Gregory Place	Pt Allot 77 Sec 13 Suburbs of Auckland, Lot 1 DP 52047, Lot 2 DP 52047, Lot 28 DP 49583, Lot 27 DP 49583	Filled/weak ground, Soil report, Neighbouring site possible contaminants (golf course)	1082 - GT, Hay Park: 8811, 10279, 10326 - WR; 12197 - GT, 16213 - GT, 22043 - GT	<u>One pollution file relating to the site:</u> -Discoloured Stream	
AS6	PS23	39 Frederick St, Mt Roskill	Lot 1 DP 161858	Filled/weak ground, Unstable/suspected ground, Soil report, Flood plain	Frederick St: 19203 - CI, 11407, 15581, 20721 - GT, 11407 - GT; 12603 - GT, 7104 - GT	<u>One pollution file relating to the site:</u> -Broken water care line, sewage discharge to harbour	
AS7	Option A: Kiwi Esplanade	84R & 86R Kiwi Esplanade, Mangere Bridge	Lot 1-2 DP 77585	Landfill	Nil	Nil	Nil
	Option B: Ambury Park	Ambury Road, Mangere Bridge	Lot 3 DP 156421	Nil	Nil	<u>Three pollution files relating to the site:</u> - Burning of untreated wood for cooking fire (1995) - Suspected poisening of birds (2011) - Sewage overflow (2010) Consents within 200 m of the site: Several consents for dicharge of organic pesticides to control midge fly at Wastewater Treatment Plant to the south of the site	Several files relate to construction of farm and educational buildings in the south of the park, at some distance from the option B project site

Plan Ref	Site Name	Address	Legal Description	Special Land features	T&T Jobs	Contamination Enquiry	Notes:
WS3	Mangere WTP	Island Road, Mangere	Lot 2 DP 156421	-	3887 - GT, 3769 - GT, 17438.002 - WR, 19178.100 - EV, 19424 - CI, 23167 - GT	Comprehensive history of pollution incidents : no specific details given. Consents issued for site activities: - Numerous consents relating to the construction of boreholes for geotechnical, geological and water quality purposes. - A borehole consent application by BP Oil New Zealand Limited for the construction of boreholes. - landfill discharge of biosolids to land from sewage sludge from a wastewater treatment plant. Increasing the overall volume of biosolids being placed (Pond 2 Landfill). - Remediation of a site previously used for disposal of construction waste. - Discharge of contaminants to air from wastewater treatment processes, including decommissioning, restoration and waste management activities. - Emergency works for discharging of contaminants (insecticide) to water. - Numerous consents relating to the treatment of water with methoprene for the control of midges. -Spray maldison "50" to a water course to control midge fly.	Nil
L2S1	Rawalpindi Reserve	9a Rawalpindi St, Mt Albert	Lot 32 DP 41107	Flood plain, Neighbouring site possible contaminants and soil report (golf course)	21607 - GT (slip) 50-52 Carrinton Road: 14453, 15934 - GT, 17666.001	One pollution file relating to the site: - Sewage overflow - location not specific.	-
L2S2	Norgrove Ave	Norgrove Ave, Mt Albert	n/a road.	Adjacent property possible contaminants, soil report, and flood plain (golf course)	254 - GT, 21607 - GT (slip)	N/A	N/A
CC3A1-MH1	Norgrove Avenue	17C Verona Avenue, Mt Albert.	Pt Allotment 36 Parish of Titirangi.	Flood Risk Area, Neighbouring site possible contaminants and soil report (golf course)	20082 - GT, 3527 - GT.	Consents issued within 200m of the property: - Five borehole consents	- no relevant information
L3S1	PS25 (Miranda Reserve)	32b Miranda St, Avondale	Lot 90 DP 39331	Unstable/suspected ground, Flood plain	20723 - GT (slip) 22819 - GT (filters)	Sewage Overflow	-
L3S2	Miranda Reserve	32b Miranda St, Avondale	Lot 90 DP 39331	Unstable/suspected ground, Flood plain	21321- WR (stream model) Slips - 10372, 14447, 17434.002, 17434.004, 17434.021; 19335.400 -CI (s/w upgrade)	Three catchment files relating to the site area: - All three files relating to sewage overflows.	-
L3S3	Whitney Street	Whitney St	n/a road.	Neighbouring site filled/weak ground and soil report	Nil	Nil	-
L3S4	Dundale Ave	Dundale Ave	n/a road.	Unstable/suspected ground, Soil report, Flood plain	16371 - GT 19335 - CI (s/w upgrade) 20041 - GT 20773.100 - WR	N/A	N/A
L3S5	Haycock Ave	4 Haycock Ave	Lot 79 DP 48241	Nil	Nil	Nil	-

Table B2 - Summary of Certificates of title

Plan Ref	Site Name	Address	Legal Description	Ct - Issued	Current Owner	Historical	Transfers
WS1	Western Springs	731 Great North Road 770 Great North Road	Lot 12 DP 168863; Pt Lot 3 DP 10276, Allot 76 Sec 7 Suburbs of Auckland; Pt Lot 3 DP10276	NA103A/1 Issued 13/06/1996	Regional Facilities Auckland Limited	NA20B/492 and NZ932/171	N/A
AS1	Mt Albert War Memorial Reserve	751-773 New North Road, St Lukes 7 Wairere Ave	Pt Allotment 38 Parish of Titirangi	Part Cancelled NA217/108 Issued 20 February 1914	Mt Albert Borough Council	APP 5058 PROC A6176	N/A
AS2	Lyon Ave	30-36 Alberton Ave 19 Morning Star Place	Mt Albert Grammar: Pt allot 41 Parish of Titirangi SO 34849; Pt Allot 168 Sec 10 Suburbs of Auckland; Pt Allot 169 Sec 10 Suburbs of Auckland. Morning Star: Lot 15 DP 7699, Lot 2 DP 206560.	NA103A/1 Issued 13/06/1996	GAZ 1948 P1142 - Grammar School	NA10D/1202, NA135A/60	Historical Search Copy (NA10D/1202)- Transfer 230899, A408199: Transfer to Precision Plastics Ltd. 505753.5: Transfer to Alex Harvey Industries. B789250.2: Transfer to Ashling Achievements Ltd. 550742.1: Transfer to Morning Star Ltd.
AS3	Haverstock Road	118-120 Mt Albert Road 98-102 Haverstock Road	Lot 2 DP 334046. Site access: Lot 15 DP 45495	NA49C/850 Issued 4 September 1981	Housing New Zealand Ltd	NA2075/84	N/A
				139489 Issued 25 October 2005	Horticulture and Food Research Institute of New Zealand	NA132D/77	Transfer 655655: Water right affects part Lot 2 DP 334046
AS4	Walmsley Park	26a Begale Ave, Owairaka	Lot 112 DP 43048. Gazette notices 1957/1746/4, 1958/386/9, 1981/1330/5, GN16176	No title - reserve	Auckland Council	-	Vested with Mt Roskill Borough Council
WS2	May Road	111/105 May Road	Lot 2 DP 116924	NA66C/174 Issued 20 August 1987	May Rd Properties	NA15C/1444, NA63C/150	Historical Search Copy (NA15B/1444)- Issued Auckland Electric Power Board (1968): Transfer to Foodstuffs (Auckland) Ltd. 719301.1 (1987): (NA9D/458)- Issued to The Aluminium Company of NZ Ltd (1966): (NA1122/157)- Issued to The Aluminium Company of NZ Ltd (1956).
AS5	Keith Hay Park	53 Arundel St 51 Arundel Street 49 Arundel Street 20 Gregory Place 22 Gregory Place	Pt Allot 77 Sec 13 Suburbs of Auckland, Lot 1 DP 52047, Lot 2 DP 52047, Lot 28 DP 49583, Lot 27 DP 49583	NA8D/230 Issued 19 May 1966 NA2098/6 Issued 24 Oct 1962 NA129A/172 Issued 28 April 2000 139C/70 Issued 3 July 2002 175714 Issued 19 April 2005 2C/1200 Issued 2 Dec	Auckland Council and Yvonne & Rohan Taylor	NA1644/26	N/A
AS6	PS23	39 Frederick St, Mt Roskill	Lot 1 DP 161858	NA97C/394 issued 4 April 1995	Watercare Services Limited	NA 89C/566, NA9B/1172	Transfer A136861
AS7	Kiwi Esplanade	Option A: 84 R & 86R Kiwi Esplanade, Mangere Bridge Option B: Ambury Park, 66 Wellesley Rd, Mangere Bridge	Option A: Lot 1 DP 77585, Lot 2 DP 77585 Option B: Lot 3 DP 156421	Option A: NA33D/1223 Issued 3 Feb 1977, and NA94A/55 issued 23 Dec 1993 Option B:	Option A and B: The Manukau City Council	Option A: NA1820, NA760/277, NA9B1172, NA751/1, NA760/277, NA1820/80 and, GN 157922.1, NA 1328/7, NA1385/18, NA1509/75, NA 15B/1367, NA15D/283, NA 15D/284, NA 16A/1242, NA 25D/1433, NA 26B/1260 Option B:	N/A
WS3	Mangere WTP	Island Road, Mangere	Lot 2 DP 156421	NA94A/54 Issued Dec 1993	Watercare Services Limited	Prior References: NA1175/100, NA1396/79, NZ16A/1241, NA20B/400, NA89C/607, NA1325/26, NA1509/75, NA16A/1242, NA81A/549, NA9B/1172, NA1328/7, NZ1616/63, NA2055/81, NA853/261, NA9D/168	Transfer 390172, Transfer 577139, Transfer 680335, Transfer C245717.2, Transfer A415549, Transfer D697343.3, Transfer D697343.4
L1S1	Motions Road	134-136 Motions Road, Western Springs	Allot 49 Sec 9 Suburbs of Auckland; Allot 57 Sec 9 Suburbs of Auckland; Lot 1 DP 168863. Local purpose reserve (Lot 1 Esplanade, Allot 49 carpark)	NA102C/992 Issued 13 June 1996	The Auckland City Council	NA20B/492, NZ26C/1104, NZ932/171	N/A
				NA13A/1476 Issued 5 Oct 1973	The Auckland City Council	GN A293029	N/A
				NA43B/991 Issued 23 May 1980	The Auckland City Council		N/A
L1S2	Western Springs Depot	859 Great North Road, Western Springs	Lot 11 DP 168863	NA102C/1000 Issued 13 June 1996	Auckland Council	NA932/171	N/A

Plan Ref	Site Name	Address	Legal Description	Ct - Issued	Current Owner	Historical	Transfers
L2S1	Rawalpindi Reserve	9a Rawalpindi St, Mt Albert	Lot 32 DP 41107	NA26B/398 Issued 1 March 1973	The Auckland City Council	OIC030323	N/A
L2S2	Norgrove Ave	Norgrove Ave	Pt Allot 36 Parish of Titirangi	Road	-	-	-
L3S1	PS25 (Miranda Reserve)	32b Miranda St, Avondale	Lot 90 DP 39331	NZ26B/363 Issued 28 May 1973	The Auckland City Council	GN0388595	Transfer 252154 (drainage)
L3S2	Miranda Reserve	32b Miranda St, Avondale	Lot 90 DP 39331	NA114C/995 Issued 19 August 1988	The Auckland City Council	NA22/296	-
L3S3	Whitney Street	Whitney St	-	Road	-	-	-
L3S4	Dundale Ave	Dundale Ave	-	Road	-	-	-
L3S5	Haycock Ave	4 Haycock Ave	Lot 79 DP 48241	NA1875/79 Issued 17 October 1960	Violet and William Laughland	-	N/A
CC3A1-MH1	Norgrove Avenue	17C Verona Avenue, Mt Albert.	Pt Allotment 36 Parish of Titirangi.	No title - reserve	Mt Albert Borough Council (Auckland Council).	Prior References: 740/40, 32/246.	Historical Search Copy (32/246) - Transfer to Thomas Finlay (1922). Transfer to James Logan (1914), Transfer to Annie Fry (1909), Transfer to Daniel Fry (1908), Transfer to Eunice Jones (1890), Transfer to Clement Gorett (1885), Transfer to Phillip Wright (1883). Transfer to James Cooper (1883). Transfer to Jane Skeen (1845).

Table B3 - Aerial Photographs Review

Site ID	Location	1940	1959	1972	1975	1980/81	1987/88	1996	2006-2008	Summary of aerial photographs
L1S1	Motions Road	Buildings visible in northern section of Motions Road Reserve. Works area appears to be used as access road.	Works area visible as largely non vegetated area. Appears to be used as access road from Motions Road. Structure visible to west of works area.	-	-	Work area vegetated. Access road off motion road onto site visible.	Works area largely grassed over. Two areas of disturbed ground visible within the work area.	As 2006, but no structures visible.	Area of grassed reserve; pathway crosses site east-west. Uneven coverage of grass may suggest previous land disturbance and infill. Small structures visible (landfill gas wells).	Aerials show former use of the works area as an access road pre 1959. From the 1980's the area is largely grassed, but there are signs of disturbed ground and historic infilling. Most recent use as a grassed reserve.
L1S2	Western Springs Depot	Bush to south of works area. Works area appears grassed, not hard surfaced. Stadium grounds present to north.	Buildings present on works area, in addition to parking. Bush to south present in 1940 now cleared; area of disturbed ground visible.	-	-	Hard surfaced area, bordered by building to the north and line of vegetation to the south.	No significant change.	No significant change.	Works area visible as hard surfaced area used for parking.	Works area has been used for parking and supporting infrastructure for the stadium since 1959. No significant change in use since this time.
WS1	Western Springs	Fields, bordered by bush to north.	Playing fields. Bush clearance/ area of disturbed ground visible to north.	-	-	Playing fields with bush bordering to north.	No significant change from 1996.	Bush extends over part of works area. Remaining area fields.	Area of parkland/playing fields, with bush bordering northern edge	No significant change over time. Playing fields, bordered by bush to the north, which extended into the works area in the 80's & 90's.
WS1	Western Springs (adjacent service station)	Fewer properties line the road than in 1959. Similar to 1959, lot appears to be grassed area adjacent to property.	Aerial shows works area prior to current road infrastructure. No on-off access roads to motorway visible. Road lined with properties; work area apears to be undeveloped grassed area adjacent to a building .	-	-	Parts of site are developed, with visible structures and hard surfacing (watercare facility). Rest is grassed over.	No significant change.	No significant change.	No significant change.	Site to south of Western Springs (adjacent service station): Main change to works area occurred with development of access roads for the motorway. Prior to this the works area appears to be an undeveloped lot within a residential area. No significant change visible since the 1980's, when building visible on site (watercare facility).
L2S1	Rawalpindi Reserve	Part of larger reserve area prior to encroachment of housing	Residential development to east between 1940 & 1959, reduces reserve area to current size. Areas of vegetation clearance visible. To south may correspond with future area of hard standing.	-	-	Works area within reserve area adjacent Chamberlain Golf Course. Area of hard standing visible.	No significant change	No significant change	No significant change	Works area has continued to be part of a reserve since 1940. No significant change visible with time.
L2S2	Norgrove Ave	Works area within roadway in residential area	No significant change	-	-	No significant change	No significant change	No significant change	No significant change	Works area has continued to be part of the roadway in a residential area 1940-2008.
AS1	Mt Albert War Memorial Reserve	No buildings present. Vacant lot, grassed over.	Building present at southern end of works area. Remaining area grassed over.	-	-	Building present in south of the works area. Works area appears to be yard with structures present, possible for storage/ workshops.	As 80/81.	Building present in works area to the south. Remaining area appears to be yard area (un-grassed) with possible stockpiling of material	Area of parkland. No structures visible. Grassland bordered by planted areas.	Building visible at southern end of works area between 1959 and 1996, with remainder of lot as yard area for storage/workshops. From 2006, aerials show buildings removed and area is now part of park; grassed with planted areas visible.

Site ID	Location	1940	1959	1972	1975	1980/81	1987/88	1996	2006-2008	Summary of aerial photographs
AS2	Lyon Ave	Part of larger reserve area prior to development in the area.	No commercial development to east visible. Reserve covers larger area than present.	-	-	Reserve area in between school (W) and industrial area (N, NE).	No significant change	No significant change	No significant change	No significant change identified within works area, which has remained within reserve. Northern and eastern boundaries have bordered industrial sites, with potential implications regarding transboundary pollution.
AS3	Haverstock Road	Within area of farming activities. Work area within defined field.	Signs of horticultural activities in adjacent fields. Small structures visible in work area. Possibly glass houses.	-	-	Crops present within works area. No structures.	One structure visible within works area. Possibly glass house.	Three structures visible within and adjacent works area. Possibly glass houses.	Part of horticulture research institute. Crops present within works area. No structures.	History of farming and horticulture in area. Horticulture activities, and possibly glass houses (1980's and 1990's), visible within the works area.
AS4	Walmsley Park	Surrounding area largely undeveloped. Works area grassed, vacant lot.	Significant development from 1940 of residential development. Works area remains as grassed area.	-	-	Works area within park in residential area.	No significant change	No significant change	No significant change	Works area has remained vegetated and undeveloped 1940. Use as green space/park since 1959 following the development of surrounding residential area in the 1950's.
WS2	May Road	Surrounding area rural, farmland. Properties visible on southern part of the lot, but not within works area. Works area within fields.	Building present in southern part of lot. Works area undeveloped, covered in vegetation.	No significant change. Commercial development to east and south-east of site.	No significant change. Commercial development to north and east of site. Not immediately adjacent	No significant change. Further commercial development visible to north and north-west of reserve.	No significant change.	As 2006. Areas of disturbed ground visible to south of works area.	Works area within reserve with no structures visible. Commercial area to N, NE, E & SE. Residential to W & SW.	No significant changes visible within works area, which has remained undeveloped. The site has been bordered by commercial development to N,NE, E & SE since the 1970's and 1980's, with potential implications regarding transboundary pollution.
L3S1	PS25	Work area within reserve. No buildings present, but pipeline visible. Horticulture visible to south of the reserve.	No buildings present, but pipeline visible. Work area mainly covered in vegetation; parts of area visible as disturbed ground.	As 1975.	Main building visible; remaining area grassed over.	Presence of two existing buildings in works area, in addition to access road and grassed area. Pipeline visible to rear of main building.	No significant change.	No significant change.	No significant change.	Works area has remained within a reserve. Development of buildings post 1959, remainder of area vegetated.
L3S2	Miranda Reserve	Undeveloped, vegetated lot . Limited development visible in the area.	Signs of ground clearance. Possibly for playground area visible later. Significant residential development in surrounding area from 1940.	Works area within reserve. Grassed area & playground area.	No significant change.	No significant change.	No significant change.	No significant change.	No significant change.	Land use as reserve area with playground area; largely unchanged over time. No significant development of works area visible over period reviewed.
L3S3	Whitney Street	Lot vacant. Limited development in the area.	Prior to development of property. Construction works visible in surrounding area.	Works area in grassed yard to west of property.	No significant change.	No significant change.	No significant change.	No significant change.	No significant change.	Works area within back yard of property. No significant changes to works area visible over period reviewed.
L3S4	Dundale Ave	Limited development in surrounding area. Works area partially grassed. Area of disturbed ground.	Undeveloped grassed area. Increase in residential development in surrounding area.	Grassed road reserve within residential area. Stream visible on northern boundary.	No significant change.	No significant change.	No significant change.	No significant change.	No significant change. 2008 maps show cars parked on works area.	Works area within undeveloped grassed road reserve. No significant changes to works area visible over period reviewed.
L3S5	Haycock Ave	Rural area with disperse properties. No activity/ structures visible on site.	Surrounding are shows significant earthworks. Major construction of residential development in area. Presence of building on the site.	No significant change.	No significant change.	No significant change.	No significant change.	No significant change.	Residential property with house, outhouse and garden area.	No significant changes to the works area visible over period reviewed. Developed as residential area in 1950's.

Site ID	Location	1940	1959	1972	1975	1980/81	1987/88	1996	2006-2008	Summary of aerial photographs
AS5	Keith Hay Park	Works area in corner of field. Residential area encroaching from east. No activities/structures visible.	Works area within field. No activities/structures visible. Buildings to south not visible.	Area of parkland. Buildings visible to south of works area	No significant change.	No significant change.	No significant change.	Works area in corner of field. Vertical striations visible across the field.	Works area occupies a corner of the park, near car park and community buildings to the south. 2008 aerial shows disturbed ground, suggesting already had earthworks.	Works area has continued to be undeveloped since 1940, land use as fields and park land. 2008 aerial shows disturbed ground, suggesting works area has undergone recent earthworks.
AS6	PS23	Works area within Harbour. Prior to land reclamation.	Area of filled material. No structures present at this time.	Structure now visible within works area.	No significant change.	No significant change.	No significant change.	No significant change.	Work area on shoreline of Manukau Harbour. Structure present (Watercare facility). 2006 aerial shows facility extended further into floodplain.	Aerials show works area is an area of reclaimed land with infill present. Watercare facility developed on site post 1959.
AS7	Kiwi Esplanade	Option A: Area used for farming/pasture. Only minimal development in surrounding area (residential). Option B: Area used for farming. One house present to the south of the site.	Option A: Prior to reserve formation. Area undergoing land reclamation. Existing coastline visible alongside defined future shoreline boundary. Option B: No signficant change	Option A: Reserve in place as grassed area. Signs of disturbed ground visible. Option B: No significant change since previous photo	Option A: Works area within shoreline reserve area; area grassed over . Option B: No change since previous photo	No significant change.	No significant change.	No significant change.	No significant change.	Option A: Works area visible within grassed reserve area since 1970's. Prior to this the land has been reclaimed, with potential infill. Option B: Farm land prior to establishment of farm park. Land use has not changed over timespan of aerial photos
WS3	Mangere WTP	Not covered by aerials.	Works area within significant area of disturbed ground. Major earthworks. Potential infill.	As 1995.	Works area grassed over. No structures visible.	No pump station visible. On eastern side of works area, signs of disturbed ground. Structures present, possible storage area.	No pump station visible. Works area grassed. Oxidation tanks are located to south.	As 2006, but access road to south from the pump station visible through the grassed area.	2008- Pump station occupying northern part of works area, remaining area grassed. Storage area visible in mid-section of area reserved for future construction.2006 –as 2008, although grassed area where storage visible.	Potential area of infill during late 1950's. Area grassed over by early 1970's; possible use of part of site for storage in 1980's. Pump station visible on site in 1990's.2008 aerial shows storage area visible on area of future construction.
CC3A1-MH1	Norgrove Avenue	Reserve. Grassed and covered with bush. A culvert/stream appears to be running through the property. No buildings present. Surrounding landuse is residential.	No significant change.	-	-	-	No significant change	No significant change	No significant change	Land use as a reserve area with a concrete open culvert running from north to south through the property. Largely unchanged over time. No significant development of works area visible over period reviewed.

Appendix C: Site walkover summary table

Table C1 - Site inspection findings

Plan Ref	Site Name	Address	Site Walkover
L1S1	Motions Road	134-136 Motions Road, Western Springs	The property is currently vacant parkland, which is generally flat with a gentle-moderate slope westwards from Motions Road towards Meola Creek on the western boundary. A path is located across the centre of the site and crosses over the creek. There are three picnic tables located on the western side of the site close to the creek and a number of manholes. Three landfill gas wells are also located on the property. The surrounding area is largely recreational, a school is located to the north and south, a zoo to the east, and parkland to the west.
L1S2	Western Springs Depot	751 Great North Road, Western Springs	The property is currently mixed use including a stadium complex, rugby club and parkland. The works areas is flat and is currently used as a carpark for the stadium building. It is sealed with concrete in good condition. The council works depot is located adjacent to the works area, this facility has at least three dangerous goods stores which are located approximately 8m to the northwest of the works area, they all appeared to be in good condition from a distance. The surrounding area is largely parkland.
WS1	Western Springs	731 Great North Road 770 Great North Road	The property is currently parkland which is used as a number of rugby fields. The works areas is flat and is bound to the north by a bank of bush, along the base of the bush and bank is an open drain which contained orange stained soil and water. This could be leachate draining from the filled area to the north north-west of the works area. The surrounding area is largely parkland, to the east of the site is commercial and residential buildings. A second works area is located on a small area of land bound by Great North Road and the Auckland Kumeu Motorway (SH16). This area is currently occupied by a small water care facility, a transformer and a cell tower, the remainder of the area is grassed. On the adjacent site to the south west is a Caltex petrol station, whose tanks are located on the north-western boundary closest to the works area.
AS1	Mt Albert War Memorial Reserve	751-773 New North Road, St Lukes 7 Wairere Ave	The property is currently a park with a number of community facilities and large areas for parking. The works area slopes moderately to the east and is slightly undulating. This area consists of a mix of gardens and grass. Around the property basalt boulders are visible exposed at the grounds surface indicating this area has possibly been filled. The surrounding area is largely residential.
AS2	Lyon Ave	30-36 Alberton Ave 19 Morning Star Place	The property is currently a park/walkway on the boundary of Auckland Grammar School and a mix of residential and retail premises. The works area slopes moderately to the south towards the Meola Creek and is slightly undulating. The works area covers a section of the walkway covered with native and riparian planting. The Meola Creek contains a number of structures including an exposed pipe and a large concrete chamber. The surrounding area is a mix of residential, retail, and parkland.
AS3	Haverstock Road	118-120 Mt Albert Road 98-102 Haverstock Road	Not accessible
AS4	Walmsley Park	26a Begale Ave, Owairaka	The property is currently vacant parkland, which is slightly hummocky with small field drains sloping towards Oakley Creek which is located in the centre of the park. The surrounding area is largely residential.
WS2	May Road	111/105 May Road	This property was not accessible but appeared to be hummocky and was covered by vegetation (gorse, grass, tress and toitoi). A drain is located on the northern side of the property. Residential properties are located to the south-west, the remaining surrounding area is occupied large commercial premises.
AS5	Keith Hay Park	53 Arundel St	The property is currently a park with a number of community facilities and large areas for parking. The community facilities are located adjacent to the works site to the south and include a soccer club and storerooms/changing sheds, a swimming pool complex, gym, and playcentre. The works area is flat and is located on one of the sports fields. To the east of the works area near the boundary is a tributary of the Oakley Creek. The surrounding area is largely residential.
AS6	PS23	39 Frederick St, Mt Roskill	Not accessible
AS7	Kiwi Esplanade	86R Kiwi Esplanade, Mangere Bridge	The property is currently a reserve, which is flat to gently undulating. much of the reserve is vacant with the exception of a water care pump station and the Manukau Yacht and Motor Boat Club, located to the west of the works area. A sign on the reserve indicates that the reserve is a bird sanctuary. Basalt and concrete walls are located along the edge of the reserve protecting it from erosion by the sea. The wall is approximately 2m above the low tide line. Ambury Regional Park is located to the east of the reserve.
WS3	Mangere WTP	Island Road, Mangere	The property is currently part of the Mangere Water Treatment Plant, which is flat to gently undulating. Much of the works area is vacant with the exception of a building and associated concrete tanks are located on the western side of the works area. A sign on the building indicates that it is used for biosolids research. An area to the south of this building, outside the works area, appears to be a contractors compound which is unsealed and contains a small above ground tanks.
L2S1	Rawalpindi Reserve	9a Rawalpindi St, Mt Albert	The property is currently vacant parkland, which slopes moderately to the east towards Meola Creek on the eastern boundary. There is an asphalt driveway that leads onto the property, along this is a number of manholes and at the end of the asphalt is a small pump station. To the east of the pump station is a large overflow into the creek. The surrounding area is residential.
L2S2	Norgrove Ave	Norgrove Ave	The works site is currently a road and is flat. The works area is bound to the north by a retaining wall below which is Meola Creek, this has been modified and contains a weir and large chambers. The surrounding are is largely residential and chamberlain park golf course is located to the north.
CC3A1-MH1		17C Verona Avenue, Mt Albert.	The property is currently a small park on the boundary of residential properties. The park steeply dips on both sides and forms a gully in the middle of the property. The gully is transected by a culverted stream which runs north to south through the property. The construction site is grassed, lies adjacent to an existing manhole/sewer system and dips west towards the gully. The water within the culvert appeared clear at the time of the inspection. The surrounding area is residential.
L3S1	PS25 (Miranda Reserve)	32b Miranda St, Avondale	The property is currently parkland, which is generally flat with a gentle-moderate slope south towards the Whau Stream on the south boundary of the works area. The works area is accessed via an asphalt driveway which leads to a basketball court and a large brick pumphouse and small outbuilding. At the rear of the pumphouse a gravel area and a large above ground concrete pipe which crosses the stream. The surrounding area is largely residential.
L3S2	Miranda Reserve	32b Miranda St, Avondale	The property is currently parkland, which is generally flat with a gentle-moderate slope southwest from Blockhouse Bay Road towards Whau Stream on the south-western boundary. A playground is located near the centre of the site and path is runs along the northern boundary. The surrounding area is largely residential.
L3S3	Whitney Street	126-130 Whitney St	The land relating to 128-130 Whitney Street is currently occupied by the Alpine superette with a residential dwelling situated above the shop. The land relating to 126 Whitney Street is currently occupied by residential dwellings. The works area is vacant and is a mixture of grass and accessways. This property slopes steeply to the west. The surrounding properties are largely residential.
L3S4	Dundale Ave	Dundale Ave	The works site is currently a grassed road reserve, which is generally flat sloping gently towards the Whau Stream on the northern boundary. The stream has been modified and straightened. The surrounding are is largely residential.
L3S5	Haycock Ave	2-4 Haycock Ave	The property is currently occupied by residential houses. The property backs onto a small reserve and a tributary of the Whau Stream. The surrounding properties are residential.

Appendix D: AC contamination site enquiries

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 500 Island Road, Mangere Bridge

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	7-43-3117		
File Name	500 Island Road, Mangere		
Site Occupier Name	Watercare Services Limited		
Pollution Date	Various	Comment	Comprehensive history of pollution incidents

File Reference	10850		
File Name	500 Island Road, Mangere		
Site Occupier Name	Watercare Services Limited		
Pollution Date	Various	Comment	Comprehensive history of pollution incidents

The general catchment file and site visit file for the catchment (7-43 and 7-43-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: Ground Floor, Kotuku House, 4 Osterley Way, Manukau Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	To authorise the construction of 9 bores for groundwater monitoring purposes.
ACTIVITY ID:	22222
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30079
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20051105
FILE REFERENCE:	C512-12-3414*
GRANTED DATE:	20041104
LOC TYPE:	Point
PROCESSING OFFICER:	Naveen Kumar
PROPERTY ADDRESS:	54 Greenwood Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of 9 bores for groundwater monitoring purposes.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of nine 50mm diameter bores to an approximate depth of 21m. Installation of PVC casing to an approximate depth of 2m. Top screen depth to 2m with a bottom of 3m. Screen material of PVC with a proposed grouting of 1m and grade of E.

ACTIVITY DESCRIPTION:	To authorise the construction of 9 bores for groundwater monitoring purposes.
ACTIVITY ID:	22222
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30079
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20051105
FILE REFERENCE:	C512-12-3414*
GRANTED DATE:	20041104
LOC TYPE:	Point
PROCESSING OFFICER:	Naveen Kumar
PROPERTY ADDRESS:	54 Greenwood Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of 9 bores for groundwater monitoring purposes.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of nine 50mm diameter bores to an approximate depth of 21m. Installation of PVC casing to an approximate depth of 2m. Top screen depth to 2m with a bottom of 3m. Screen material of PVC with a proposed grouting of 1m and grade of E.

ACTIVITY DESCRIPTION:	Construction of three 50mm dia. piezometers to 15m depth. Installation of PVC casing to 9m and PVC screen from 9m to 15m. Construction of a 50mm dia piezometer to 70m depth. Installation of PVC casing to 64m and PVC screens from 64m to 70m.
ACTIVITY ID:	4866
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Pattle Delamore Partners Limited
CONSENT NUMBER:	14023
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960707
FILE REFERENCE:	C512-12-1594*
GRANTED DATE:	19950707
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of four (4) piezometers for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Mangere Sewage Treatment plant Lagoons
SITE NAME:	Watercare BH LW3B
WORKS DESCRIPTION:	Construction of three (3) 50mm dia. piezometers to approx 15m depth. Installation of PVC casing to approx 9m and PVC screen from approx. 9m to 15m if required. Construction of a 50mm dia piezometer to 70m depth. Installation of PVC casing to 64m and PVC

ACTIVITY DESCRIPTION:	Authorise the construction of up to fifty (50) piezometers or bores for geotechnical investigations. Related BC 20481, 20482, 20843, 20484, 20485, 20486, 20487.
ACTIVITY ID:	20211
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	21399
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19980501
FILE REFERENCE:	C512-12-2186*
GRANTED DATE:	19980430
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0500 ISLAND RD MANGERE BRIDGE
PURPOSE:	Authorise the construction of up to fifty (50) piexometers or bores for geotechnical investigation.
REVIEW DATE:	Null
SITE DESCRIPTION:	Wastewater plant Mangere, Cnr Greenwood & Island Rds, Mangere

SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to fifty (50) piezometers or bores to 30m depth. Installation of PVC casing and screen as required.

ACTIVITY DESCRIPTION:	Test and production bore for Manukau Wastewater Services Ltd. Associated with permit C512-12-2422* and consents 27686 and 23119
ACTIVITY ID:	20919
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Manukau Wastewater Services Limited
CONSENT NUMBER:	22848
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20000720
FILE REFERENCE:	C512-12-2422*
GRANTED DATE:	19990720
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorise the construction of a test prodution bore.
REVIEW DATE:	Null
SITE DESCRIPTION:	500 Island Rd, Mangere
SITE NAME:	MSTP Bore DWBH 1
WORKS DESCRIPTION:	Construction of a 200mm diameter bore to a depth of approximately 45m. Installation of PVC casing to approximately 35m depth and PVC screen from 35-45m depth or as required.

ACTIVITY DESCRIPTION:	6 monitoring bores
ACTIVITY ID:	4852
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Beca Carter Hollings & Ferner Ltd
CONSENT NUMBER:	13956
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960622
FILE REFERENCE:	C512-12-1587*
GRANTED DATE:	19950622
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of six (6) piezometers for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	South side of Island Road, Mangere
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of five (5) 100mm dia. piezometers to approx 35m depth. Installation of PVC screens at approx. 17-19m and 32-34m or as required. Construction

	of a 100mm dia. piezometer to 55m depth and installation of PVC screens as required .

ACTIVITY:	Discharge To Air
ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	3834
ACTIVITY STATUS:	Null
APPLICANT:	Null
APPLICATION:	13918
APPLICATION STATUS:	Withdrawn
EASTING:	1758300
FILE REFERENCE:	AIR9510429
LOC TYPE:	Point
LODGED DATE:	19950529
NORTHING:	5907500
PROCESSING OFFICER:	_David McKnight
PROPERTY ADDRESS:	ISLAND ROAD MANGERE Manukau City
PURPOSE:	To discharge contaminants to air
SITE DESCRIPTION:	Null
SITE NAME:	MANGERE SEWERAGE PURIFICATION WORKS
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5491
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	BP Oil New Zealand Limited
CONSENT NUMBER:	15766
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19971211
FILE REFERENCE:	C512-12-1891
GRANTED DATE:	19961211
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	WATERCARE SERVICES, WASTEWATER TREATMENT PLANT, PUKETUTU ISLAND
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 50mm dia. bore to approx 10m depth. Installation of PVC casing to approx 7m and PVC screen from approx. 7m to 10m if required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5558
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	BP Oil New Zealand Limited
CONSENT NUMBER:	15861
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.

EXPIRY DATE:	19980123
FILE REFERENCE:	C512-12-1909*
GRANTED DATE:	19970123
LOC TYPE:	Point
PROCESSING OFFICER:	Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	WATERCARE SERVICES, WASTEWATER TREATMENT PLANT, PUKETUTU ISLAND
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of fifteen (15) 50mm dia. bores to approx 10m depth. Installation of PVC casing to approx 7m and PVC screen from approx. 7m to 10m if required.

ACTIVITY:	Bore
ACTIVITY DESCRIPTION:	To constuct up to six bores for geotechnical, geological and ground water quality investigations.
ACTIVITY ID:	23548
ACTIVITY STATUS:	Proposed
CONSENT STATUS:	Assessment Completed
EASTING:	1757864.4
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4576*
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5908492.4
PERMITTED:	Bore
PERMITTED ACTIVITY TYPE :	52357
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To constuct up to six bores for geotechnical, geological and ground water quality investigations.
REVIEW DATE:	Null
SITE DESCR:	Various sites Mangere WTP, Belfast Reserve, Road reserves - 35 Hoskins Ave. Hillsborough, 2 Haycock Ave. Lynfield, 56 Margate Road Blockhouse Bay, Miranda Reserve.
SITE NAME:	Watercare Services Ltd
WORKS DESCRIPTION:	To constuct up to six 100mm diameter bores to depths between 40-70m.

ACTIVITY DESCRIPTION:	To discharge biosolids to land from sewage sludge from a wastewater treatment plant. Increasing the overall volume of biosolids being placed.
ACTIVITY ID:	20031
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Landfill Discharge
CONSENT HOLDER:	Watercare Services Limited

CONSENT NUMBER:	33167
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20321231
FILE REFERENCE:	19347
GRANTED DATE:	20090128
LOC TYPE:	Point
PROCESSING OFFICER:	Kevin Bews
PROPERTY ADDRESS:	E 500 Island Road Mangere Bridge Manukau City
PURPOSE:	To discharge contaminants onto and into the ground and groundwater at the property of Watercare Services Ltd at Island Road, Mangere and in the Pond 2 Landfill on land designated as part of the Mangere Wastewater Treatment Plant (MWTP), including; discha
REVIEW DATE:	20091031
SITE DESCRIPTION:	Null
SITE NAME:	Watercare - Pond 2 Landfill
WORKS DESCRIPTION:	Null

ACTIVITY:	Bore
ACTIVITY DESCRIPTION:	To authorise the construction two bores for Groundwater Investigation &
ACTIVITY ID:	27862
ACTIVITY STATUS:	Proposed
CONSENT STATUS:	Assessment Completed
EASTING:	1757591
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4798*
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5906766
PERMITTED:	Bore
PERMITTED ACTIVITY TYPE :	52564
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	E 500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction two bores for Groundwater Investigation &
REVIEW DATE:	Null
SITE DESCR:	POND 2, Island Road, Mangere.
SITE NAME:	watercare services Ltd.
WORKS DESCRIPTION:	bores decomissioned , letter sent on 29 Mar 2011

ACTIVITY DESCRIPTION:	To authorise the construction of 4 bores for monitoring purposes.NOTE: Four bore logs received, only one entered, BH5535b. The others are on filewith separate bore IDs
ACTIVITY ID:	22751
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	33540
CONSENT STATUS:	Expired

DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20071213
FILE REFERENCE:	C512-12-3874*
GRANTED DATE:	20061214
LOC TYPE:	Point
PROCESSING OFFICER:	__Daryl Henehan
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of 4 bores for monitoring purposes.
REVIEW DATE:	Null
SITE DESCRIPTION:	Construction of four 50mm to an approximate depth of 20m. Installation of class D PVC casing material. Depth to top of screen to 16m and bottom to 20m. Proposed grouting to 5m length.
SITE NAME:	500 Island Road Mangere Bridge Manukau City
WORKS DESCRIPTION:	Construction of four 50mm to an approximate depth of 20m. Installation of class D PVC casing material. Depth to top of screen to 16m and bottom to 20m. Proposed grouting to 5m length.

ACTIVITY DESCRIPTION:	For sludge dewatering plant
ACTIVITY ID:	20445
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Manukau Wastewater Services Limited
CONSENT NUMBER:	22120
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19991214
FILE REFERENCE:	C512-12-2299*
GRANTED DATE:	19981211
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0500 ISLAND RD MANGERE BRIDGE
PURPOSE:	Authorise the construction of bores for the extraction of groundwater for industrial supply.
REVIEW DATE:	Null
SITE DESCRIPTION:	Island Rd wastewater treatment plant, Mangere.
SITE NAME:	Manukau Wastewater Services Ltd BH1
WORKS DESCRIPTION:	Construction of up to five (5) 200mm diameter bores to a depth of approximately 40m. Installation of PVC casing to approximately 30m depth and PVC screen from 30-40m depth or as required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	4883
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited

CONSENT NUMBER:	14083
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960816
FILE REFERENCE:	C512-12-1612
GRANTED DATE:	19950816
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Island Road, Mangere
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 50mm dia. bore to approx 15m depth. Installation of PVC casing to approx 13m and PVC screen from approx. 13m to 15m if required.

ACTIVITY DESCRIPTION:	Remediation of site previously used for disposal of construction waste.
ACTIVITY ID:	20020
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	22984
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20031231
FILE REFERENCE:	14274
GRANTED DATE:	20000120
LOC TYPE:	Area
PROCESSING OFFICER:	_Ray Scoble
PROPERTY ADDRESS:	Island Road/Wellesley Road Mangere Auckland City
PURPOSE:	To authorise the discharge of contaminants into ground and ground water from a bioremediation facility and a closed waste landfill at Mangere in accordance with Section 15(b) of the Resource Management Act 1991.
REVIEW DATE:	Null
SITE DESCRIPTION:	Old landfill site on boundary between WSL and ARC Ambury Park
SITE NAME:	Project Manukau / Ambury Park Boundary
WORKS DESCRIPTION:	Construction and operation of a landfarm bioremediation facility, re-deposition of treated soils, and installation of three (3) ground water monitoring wells.

ACTIVITY DESCRIPTION:	To authorise the construction of two bores for Environmental monitoring.
ACTIVITY ID:	23118
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited

CONSENT NUMBER:	35548
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20090304
FILE REFERENCE:	C512-12-4197*
GRANTED DATE:	20080305
LOC TYPE:	Point
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of two bores for Environmental monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	URS New Zealand
WORKS DESCRIPTION:	The construction of two 50mm diameter bores to an approximate depth of between 6 and 10m. Installation of Grade D PVC casing material to an approximate depth of between 6 and 10m.

ACTIVITY DESCRIPTION:	8 monitoring bores. Associated with BC 5187, 5188, 5189, 5190, 5191, 5192, 5193
ACTIVITY ID:	4884
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited
CONSENT NUMBER:	14082
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960816
FILE REFERENCE:	C512-12-1613*
GRANTED DATE:	19950816
LOC TYPE:	Point
PROCESSING OFFICER:	Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of six (6) piezometers for groundwater level and/or Chemistry investigations Associated with BC 4884 & 5187-5193
REVIEW DATE:	Null
SITE DESCRIPTION:	Mangere Wastewater treatment plant
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of six (6) 50mm dia. piezometers to approx 20m depth. Installation of PVC casing to approx 18m and PVC screen from approx. 18m to 20m if required.

ACTIVITY DESCRIPTION:	Water quality testing - monitoring - Oxidation Ponds
ACTIVITY ID:	22296
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited
CONSENT NUMBER:	30616
CONSENT STATUS:	Expired

DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20060309
FILE REFERENCE:	C512-12-3478*
GRANTED DATE:	20050308
LOC TYPE:	Point
PROCESSING OFFICER:	Naveen Kumar
PROPERTY ADDRESS:	E 500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of up to 5 bores for water quality testing.
REVIEW DATE:	Null
SITE DESCRIPTION:	500 E Island Road Mangere Bridge Manukau City
SITE NAME:	Watercare - oxidation ponds
WORKS DESCRIPTION:	Construction of up to five (5) 25mm diameter bore to an approximate depth of 10m. Installation of PVC casing to an approximate depth of 7m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	3841
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge To Air
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	14820
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20321231
FILE REFERENCE:	10850
GRANTED DATE:	19970502
LOC TYPE:	Point
PROCESSING OFFICER:	Michael Bird
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To discharge contaminants to air from wastewater treatment processes, including decommissioning, restoration and waste management activities.
REVIEW DATE:	Null
SITE DESCRIPTION:	Seabed adjacent to the Mangere Purification & Puketutu Island, Mangere
SITE NAME:	Mangere STP - Watercare
WORKS DESCRIPTION:	Watercare- Mangere Sewage Treatment Plant

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	4885
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited
CONSENT NUMBER:	14081
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960816
FILE REFERENCE:	C512-12-1611
GRANTED DATE:	19950816
LOC TYPE:	Point

PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Ambury Park Farm, Mangere
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 20m depth. Installation of PVC casing to approx 18m and PVC screen from approx. 18m to 20m if required.

ACTIVITY DESCRIPTION:	Approx 6 cmpd
ACTIVITY ID:	4589
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland Regional Council
CONSENT NUMBER:	13231
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950929
FILE REFERENCE:	C512-12-1398
GRANTED DATE:	19940929
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for stock and domestic supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Ambury Regional Park, Ambury Road, Mangere
SITE NAME:	ARC
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 40m depth and installation of steel casing to approx. 18m.

ACTIVITY:	Discharge Other
ACTIVITY DESCRIPTION:	Emergency works for discharging of contaminants (insecticide) to water
ACTIVITY ID:	20224
ACTIVITY STATUS:	Proposed
APPLICANT:	Watercare Services Limited
APPLICATION:	33894
APPLICATION STATUS:	Withdrawn
EASTING:	1756600
FILE REFERENCE:	19749
LOC TYPE:	Point
LODGED DATE:	20070209
NORTHING:	5909100
PROCESSING OFFICER:	__Glenn Starr
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Watercare

WORKS DESCRIPTION:	Null

ACTIVITY:	Discharge Other
ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
APPLICANT:	Watercare Services Limited
APPLICATION:	37029
APPLICATION STATUS:	Withdrawn
EASTING:	1756500
FILE REFERENCE:	8547
LOC TYPE:	Point
LODGED DATE:	20090616
NORTHING:	5909400
PROCESSING OFFICER:	Kevin Bews
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	23011
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20001101
LOC TYPE:	Point
PROCESSING OFFICER:	Robyn Floyd
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly and using Bac
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the

	control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	By tractor boom and/or helicopter and/or other manual methods.

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	26417
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20021212
LOC TYPE:	Point
PROCESSING OFFICER:	_Stuart Chapman
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly and using
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	26522
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20020315
LOC TYPE:	Point
PROCESSING OFFICER:	_Stuart Chapman
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC)

	spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30325
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20041224
LOC TYPE:	Point
PROCESSING OFFICER:	_Kylie Falconer
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30695
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20050801
LOC TYPE:	Point
PROCESSING OFFICER:	_Kylie Falconer
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15

	(1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	32307
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20060314
LOC TYPE:	Point
PROCESSING OFFICER:	Angela Mayson
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Quantity:Malathion: (a) The maximum weekly discharge volume shall not exceed 8000 litres, and(b) That the maximum weekly discharge volume shall not exceed 1000 litres subsequent to the breach of the Pond 4 seawall.Bti: That the maximum weekly discharge

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	32910
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.

EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20060906
LOC TYPE:	Point
PROCESSING OFFICER:	__Angela Mayson
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	20070331
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	33770
CONSENT STATUS:	Replaced
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20070830
LOC TYPE:	Point
PROCESSING OFFICER:	__Glenn Starr
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited

CONSENT NUMBER:	35210
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20181231
FILE REFERENCE:	8547
GRANTED DATE:	20080905
LOC TYPE:	Point
PROCESSING OFFICER:	Heidi Lynch
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus
REVIEW DATE:	20091231
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	37254
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20181231
FILE REFERENCE:	8547
GRANTED DATE:	20100115
LOC TYPE:	Point
PROCESSING OFFICER:	Kevin Bews
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the change of conditions for consent 35210 to increase the methoprene discharge limit to 20 mg/m3 for midge control.
REVIEW DATE:	20101231
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other

CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	8994
CONSENT STATUS:	Replaced
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19991231
FILE REFERENCE:	CR928547
GRANTED DATE:	19921022
LOC TYPE:	Point
PROCESSING OFFICER:	_Rinaldo Azzara
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	TO SPRAY MALDISON "50" TO A WATER COURSE TO CONTROL MIDGE FLY AT THE MANUKAU WASTEWATER TREATMENT PLANT.
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 105 May Road, Mt Roskill

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	A224-06		
File Name	Catchment File		
Incident Location	105 May Road, Mt Roskill		
Pollution Date	20/04/06	Comment	Burning

File Reference	5-46		
File Name	Catchment File		
Incident Location	105 May Road, Mt Roskill		
Pollution Date	27/01/02	Comment	Oil in drain
Pollution Date	04/03/01	Comment	Oil in stream
Pollution Date	13/03/00	Comment	Oil in stream

File Reference	P270-04-17		
Incident Location	105-109 May Road, Mt Roskill		
Pollution Date	30/08/96	Comment	Developing property, strong petrol/oil smell and sheen from drain on property

The general catchment file and site visit file for the catchment (5-46 and 5-46-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Michael Parsonson

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Use at commercial premises and for 3 staff houses, ablutions, cafeteria, cleaning, vehicle cleaning, gardens, general maintenance, fire pump testing. Approx 60 cmpd.
ACTIVITY ID:	4533
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Foodstuffs (Auckland) Limited
CONSENT NUMBER:	13107
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950830
FILE REFERENCE:	C512-12-1367
GRANTED DATE:	19940830
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for industrial ablution and vehicle washing supply
REVIEW DATE:	Null
SITE DESCRIPTION:	380 Richardson Road, Mt Roskill
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 600m depth and installation of steel casing to approx. 65m.

ACTIVITY DESCRIPTION:	3 monitoring bores
ACTIVITY ID:	4556
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Wiri Oil Services Limited
CONSENT NUMBER:	13168
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950916
FILE REFERENCE:	C512-12-1391*
GRANTED DATE:	19940916
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of three (3) bores for groundwater level and/or Chemistry investigations Associated with BC 4554, 4555, 4556.
REVIEW DATE:	Null
SITE DESCRIPTION:	Wiri Oil Services 149-187 Roscommon Road, Wiri
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of three (3) 50mm dia. bores to approx 5m depth. Installation of PVC casing to approx 5m and PVC screen from approx. 1m to 5m if required.

ACTIVITY DESCRIPTION:	Approx 30 cmpd

ACTIVITY ID:	1360
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	H J Ryan Limited
CONSENT NUMBER:	12776
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950623
FILE REFERENCE:	C512-12-1281
GRANTED DATE:	19940623
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for industrial supply.
REVIEW DATE:	Null
SITE DESCRIPTION:	Roma Road, Mt Roskill
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 150mm dia. bore to approx 20-40m depth and installation of steel casing to approx. 10-16m.

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	tank pull report
ACTIVITY ID:	20673
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Under Assessment
EASTING:	1754267
EXPIRY DATE:	Null
FILE REFERENCE:	5-46-3753
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5913677
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51584
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	58 Roma Road Mount Roskill Auckland City
PURPOSE:	UST removal assessment of ground conditions
REVIEW DATE:	Null
SITE DESCR:	UST removal
SITE NAME:	56 Roma Road, Mt Roskill
WORKS DESCRIPTION:	5-46-3753peter kavanagh

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 731 Great North Road, Grey Lynn

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-44 and 5-44-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101.

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Michael Parsonson

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 751 Great North Road, Grey Lynn

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file, and site visit file for the catchment (5-44 and 5-44-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Illeard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Envirolyte treatment system designed to treat all microbiological contaminants passing through hippo river. FionaM 29/9/0850608chg-Build a filtration system to improve water quality runoff from Hippo enclosure and general run off from zoo site.D/c f
ACTIVITY ID:	3874
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Animal Waste Discharge
CONSENT HOLDER:	Auckland Zoological Park c/- Auckland City Council
CONSENT NUMBER:	14169
CONSENT STATUS:	Replaced
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20061231
FILE REFERENCE:	CR9510568
GRANTED DATE:	19960920
LOC TYPE:	Point
PROCESSING OFFICER:	_Tony Thompson
PROPERTY ADDRESS:	99 Motions Road Westmere Auckland City
PURPOSE:	Discharges from auckland zoo animal enclosures into motions creek
REVIEW DATE:	Null
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Auckland City Zoo
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Envirolyte treatment system designed to treat all microbiological contaminants passing through hippo river. FionaM 29/9/08250608chg-Build a filtration system to improve water quality runoff from Hippo enclosure and general run off from zoo site.D/c f
ACTIVITY ID:	3874
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Animal Waste Discharge
CONSENT HOLDER:	Auckland Zoological Park c/- Auckland City Council
CONSENT NUMBER:	33069
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20171231
FILE REFERENCE:	CR9510568
GRANTED DATE:	20070516
LOC TYPE:	Point
PROCESSING OFFICER:	_Sarah McDonald
PROPERTY ADDRESS:	99 Motions Road Westmere Auckland City
PURPOSE:	To authorise the discharge of contaminants form the Auckland Zoological Park into Motions Creek in accordance with Section 15 (1)(b) of the Resource Management Act 1991.
REVIEW DATE:	20090131
SITE DESCRIPTION:	Motions Rd, Western Springs

SITE NAME:	Auckland City Zoo
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Envirolyte treatment system designed to treat all microbiological contaminants passing through hippo river. FionaM 29/9/08250608chg-Build a filtration system to improve water quality runoff from Hippo enclosure and general run off from zoo site.D/c f
ACTIVITY ID:	3874
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Animal Waste Discharge
CONSENT HOLDER:	Auckland Zoological Park c/- Auckland City Council
CONSENT NUMBER:	35981
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20171231
FILE REFERENCE:	CR9510568
GRANTED DATE:	20080926
LOC TYPE:	Point
PROCESSING OFFICER:	_Fiona Martin
PROPERTY ADDRESS:	99 Motions Road Westmere Auckland City
PURPOSE:	To authorise the discharge of contaminants form the Auckland Zoological Park into Motions Creek in accordance with Section 15 (1)(b) of the Resource Management Act 1991.
REVIEW DATE:	20090131
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Auckland City Zoo
WORKS DESCRIPTION:	Envirolyte treatment system consisting of a catholyte, anolyte and brine tank to treat microbiological contaminants flowing through the zoo and zoodoo composting area.

ACTIVITY:	Animal Waste Discharge
ACTIVITY DESCRIPTION:	Envirolyte treatment system designed to treat all microbiological contaminants passing through hippo river. FionaM 29/9/0850608chg-Build a filtration system to improve water quality runoff from Hippo enclosure and general run off from zoo site.D/c f
ACTIVITY ID:	3874
ACTIVITY STATUS:	Occurring
APPLICANT:	Auckland Zoological Park c/- Auckland City Council
APPLICATION:	31024
APPLICATION STATUS:	Invalid
EASTING:	1753470
FILE REFERENCE:	10568
LOC TYPE:	Point
LODGED DATE:	Null
NORTHING:	5919050

PROCESSING OFFICER:	_Sarah McDonald
PROPERTY ADDRESS:	99 Motions Road Westmere Auckland City
PURPOSE:	Discharges from auckland zoo animal enclosures into motions creek
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Auckland City Zoo
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Irrigations and animal watering (Zoo). Approx 335 cmpd
ACTIVITY ID:	1435
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	12994
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950803
FILE REFERENCE:	C512-12-1335
GRANTED DATE:	19940803
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for irrigation & stock watering supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Auckland Zoo
WORKS DESCRIPTION:	Construction of a 200 mm dia. bore to approx. 30m depth. Installation of steel casing to approx. 27m and stainless steel screen from approx. 27m to 30m if required

Auckland Council
Te Kaunihera o Tāmaki Makaurau

10 October 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel Pickett

Site Contamination Enquiry – 770 Great North Road and 778-802 Great North Road, Western Springs

This letter is in response to your enquiry requesting available site contamination information for the above sites. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The table below outlines the reference for the site files and pollution incident files available for the subject site:

File Reference	5-44-1673		
File Name	778-802 Great North Road, Western Springs		
Site Occupier Name	Challenge – Western Springs		
Pollution Date	7/11/02	Comment	Washing forecourt to stormwater
Site Visit Date	7/11/02	Comment	Site Audit

The general catchment file and site visit file for the catchment (5-44 and 5-44-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above sites is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the sites. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the sites. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the sites being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5205
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14906
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1724*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for stock and domestic supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Roadside berm, Cnr Leone Terrace & Martin Terrace, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 17m depth. Installation of PVC casing and PVC screen if required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5208
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14909
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1727*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Western Springs Park, (southwestern cnr, adjacent to MOTAT), Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx

	12m depth. Installation of PVC casing and PVC screen if required.
ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	20027
ACTIVITY STATUS:	NeverOccurred
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	NEW ZEALAND WATER MANAGEMENT LTD
CONSENT NUMBER:	22549
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20010531
FILE REFERENCE:	14074
GRANTED DATE:	19990422
LOC TYPE:	Area
PROCESSING OFFICER:	_Brent Evans
PROPERTY ADDRESS:	Great North Road Western Springs Auckland City
PURPOSE:	To discharge Prentox PrenfishTM pesticide to water (Western Springs Lake) as a trial for the purpose of controlling grass carp.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Western Springs Reserve
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	
ACTIVITY ID:	27791
ACTIVITY STATUS:	Assessment Completed
ACTIVITY TYPE:	Bore
PERMITTED ACTIVITY HOLDER:	Chevron
PERMITTED ACTIVITY NUMBER:	52524
PERMITTED ACTIVITY STATUS:	
FILE REFERENCE:	C512-12-4746
LOC TYPE:	
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	778 Great North Road Grey Lynn Auckland City
PURPOSE:	To authorise the construction of a bore to conduct a contaminated site investigation.
REVIEW DATE:	30-NOV-2010
SITE DESCRIPTION:	
SITE NAME:	Chevron EMC
WORKS DESCRIPTION:	The construction of a 50mm diameter bore to a maximum depth of 6m. Installation of a PVC casing material to an approximate depth of 6m.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 104-134 Motions Road, 136 Motions Road & 985 Great North Road, Pt Chevalier

This letter is in response to your enquiry requesting available site contamination information for the above sites. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	W224-44		
File Name	Catchment File		
Incident Location	134 Motions Road, Western Springs		
Pollution Date	18/05/09	Comment	Dead eels in Meola Creek

File Reference	W224-44		
File Name	Catchment File		
Incident Location	985 Great North Road, Point Chevilier		
Pollution Date	14/10/08	Comment	Green Creek

The general catchment file and site visit file for the catchment (5-44 and 5-44-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above sites are coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the sites. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the sites. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

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In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the sites being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Construction of a 100mm dia. bore to approx 10 m depth. Installation of PVC casing to approx 10 m and PVC screen from approx. 4 m to 10 m if required.
ACTIVITY ID:	46
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	10039
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19940430
FILE REFERENCE:	14/17/924
GRANTED DATE:	19930430
LOC TYPE:	Point
PROCESSING OFFICER:	_Ray Scoble
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Western Springs College, Motions Road, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 10 m depth. Installation of PVC casing to approx 10 m and PVC screen from approx. 4 m to 10 m if required.

ACTIVITY DESCRIPTION:	1 cmpd (max)
ACTIVITY ID:	20034
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Tonkin & Taylor Limited
CONSENT NUMBER:	20414
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19981028
FILE REFERENCE:	C512-12-2057*
GRANTED DATE:	19971024
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0040 -50 SHORTLAND ST AUCKLAND
PURPOSE:	Authorise constructionof bores for groundwater level and/or chemistry monitoring.
REVIEW DATE:	Null

SITE DESCRIPTION:	48 Shortland St, Auckland
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of two (2) 100mm diamter bores to a depth of approximately 20m. Installation of PVC casing to a depth of approximately 17m and PVC screen from 17-20m or as required.

ACTIVITY DESCRIPTION:	1 cmpd (max)
ACTIVITY ID:	20034
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Tonkin & Taylor Limited
CONSENT NUMBER:	20414
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19981028
FILE REFERENCE:	C512-12-2057*
GRANTED DATE:	19971024
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0040 -50 SHORTLAND ST AUCKLAND
PURPOSE:	Authorise constructionof bores for groundwater level and/or chemistry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	48 Shortland St, Auckland
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of two (2) 100mm diamter bores to a depth of approximately 20m. Installation of PVC casing to a depth of approximately 17m and PVC screen from 17-20m or as required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5209
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14910
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1728*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations

REVIEW DATE:	Null
SITE DESCRIPTION:	Road berm, Cnr Old Mill Rd & Motions Rd, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 25m depth. Installation of PVC casing and PVC screen if required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5699
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	WORKS CONSULTANCY SERVICES LIMITED -NOW KNOWN AS OPUS INTERNATIONAL CONSULTANTS
CONSENT NUMBER:	16031
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19980321
FILE REFERENCE:	C512-12-1958*
GRANTED DATE:	19970321
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Western Springs College, Motions Road, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx. 9m depth. Installation of steel casing to approx. 7.1m and PVC screen from approx. 7.1m to 8.7m if required

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5205
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14906
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1724*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner

PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for stock and domestic supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Roadside berm, Cnr Leone Terrace & Martin Terrace, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 17m depth. Installation of PVC casing and PVC screen if required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21630
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	26454
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20030304
FILE REFERENCE:	C512-12-2869*
GRANTED DATE:	20020304
LOC TYPE:	Point
PROCESSING OFFICER:	Roger Bannister
PROPERTY ADDRESS:	Motions Road Western Springs Auckland City
PURPOSE:	Authorise the construction of up to eighteen (18) bores for investigation purposes.
REVIEW DATE:	Null
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Meola Rd landfill
WORKS DESCRIPTION:	Construction of up to eighteen (18) 100mm and 120mm diameter bores to a depth of approximately between 10m to 20m. Installation of PVC and steel casing to a depth of approximately between10m to 15m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	3889
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Landfill Discharge
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14534
CONSENT STATUS:	Superseded
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20161231
FILE REFERENCE:	CG9510683
GRANTED DATE:	19960315
LOC TYPE:	Point

PROCESSING OFFICER:	_Eddie Grogan
PROPERTY ADDRESS:	190 Meola Road Point Chevalier Auckland City
PURPOSE:	TO DISCHARGE LEACHATE FROM A CLOSED SANITARY LANDFILL INTO THE GROUND AND GROUNDWATER BENEATH THE SITE, AND TO DIVERT LEACHATE INTO A COLLECTION SYSTEM
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Old Motions Road Landfill
WORKS DESCRIPTION:	SITE RECONTOURING, PARTIAL RECAPPING AND RETROFITTING OF LEACHATE INTERCEPTION TRENCHES

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	3889
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Landfill Discharge
CONSENT HOLDER:	Auckland Council
CONSENT NUMBER:	25048
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20161231
FILE REFERENCE:	10683
GRANTED DATE:	20010508
LOC TYPE:	Point
PROCESSING OFFICER:	_Stuart Chapman
PROPERTY ADDRESS:	190 Meola Road Point Chevalier Auckland City
PURPOSE:	To discharge leachate from a closed sanitary landfill into the ground and groundwater beneath the site.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Old Motions Road Landfill
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Two monitoring bores
ACTIVITY ID:	20030
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Beca Planning
CONSENT NUMBER:	20383
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19981017
FILE REFERENCE:	C512-12-2053*
GRANTED DATE:	19971016
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0000 * MOTIONS RD * *

PURPOSE:	Authorise construction of a bore for groundwater level and/or chemistry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	Motions Road, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of two (2) 100mm diameter bores to a depth of 10m. Installation of PVC casing to approximately 7m and steel screen between 7 and 10m.

ACTIVITY DESCRIPTION:	Construction of a 100mm dia. bore to approx 15 m depth. Installation of PVC casing to approx 10 m and PVC screen from approx. 12 m to 15 m if required.
ACTIVITY ID:	47
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	10040
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19940430
FILE REFERENCE:	14/17/925
GRANTED DATE:	19930430
LOC TYPE:	Point
PROCESSING OFFICER:	_Ray Scoble
PROPERTY ADDRESS:	KEITH HAY AIRFIELD WESTERN SPRINGS Auckland City
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	MOTAT2 Keith Hay Airfield, c/- MOTAT NZ Trust, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 15 m depth. Installation of PVC casing to approx 10 m and PVC screen from approx. 12 m to 15 m if required.

ACTIVITY DESCRIPTION:	Gas monitoring
ACTIVITY ID:	1272
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	12468
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950308

FILE REFERENCE:	C512-12-1213
GRANTED DATE:	19940308
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Meola Road Reserve, Westmere c/- Auckland City Council, Western Bays
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 150mm dia. bore to approx 7.5m depth. Installation of PVC screen from approx. 4.5m to 7.5m if required.

ACTIVITY DESCRIPTION:	Construction of a 100mm dia. bore to approx 10 m depth. Installation of PVC casing to approx 5 m and PVC screen from approx. 7 m to 10 m if required.
ACTIVITY ID:	48
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	10041
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19940430
FILE REFERENCE:	14/17/926
GRANTED DATE:	19930430
LOC TYPE:	Point
PROCESSING OFFICER:	_Ray Scoble
PROPERTY ADDRESS:	KEITH HAY AIRFIELD WESTERN SPRINGS Auckland City
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	MOTAT2 Keith Hay Airfield, c/- MOTAT NZ Trust, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 10 m depth. Installation of PVC casing to approx 5 m and PVC screen from approx. 7 m to 10 m if required.

ACTIVITY DESCRIPTION:	Application to discharge contaminants into air from a fully enclosed building on a closed landfill
ACTIVITY ID:	20359

ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Discharge To Air
CONSENT HOLDER:	Museum of Transport & Technology
CONSENT NUMBER:	35291
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20431031
FILE REFERENCE:	20480
GRANTED DATE:	20081024
LOC TYPE:	Point
PROCESSING OFFICER:	Gareth Noble
PROPERTY ADDRESS:	200 Meola Road Point Chevalier Auckland City
PURPOSE:	To discharge contaminants into air from the operation of a building (the blister/belfast hangar) and associated processes situated on the closed Motions Road landfill.
REVIEW DATE:	20100430
SITE DESCRIPTION:	Null
SITE NAME:	MOTAT
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Construction of a 100mm dia. bore to approx 5 m depth. Installation of PVC casing to approx 5 m and PVC screen from approx. 1.5 m to 5 m if required.
ACTIVITY ID:	44
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	10037
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19940430
FILE REFERENCE:	14/17/922
GRANTED DATE:	19930430
LOC TYPE:	Point
PROCESSING OFFICER:	_Ray Scoble
PROPERTY ADDRESS:	MEOLA ROAD PT CHEVALIER Auckland City
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Meola Road Reserve, c/- Auckland City Council, Western Bays
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 5 m depth. Installation of PVC casing to approx 5 m and PVC screen from approx. 1.5 m to 5 m if required.

ACTIVITY DESCRIPTION:	Irrigations and animal watering (Zoo). Approx 335 cmpd
ACTIVITY ID:	1435
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	12994
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950803
FILE REFERENCE:	C512-12-1335
GRANTED DATE:	19940803
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for irrigation & stock watering supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Motions Rd, Western Springs
SITE NAME:	Auckland Zoo
WORKS DESCRIPTION:	Construction of a 200 mm dia. bore to approx. 30m depth. Installation of steel casing to approx. 27m and stainless steel screen from approx. 27m to 30m if required

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 9a Rawalpindi Street, Mount Albert

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The table below outlines the reference for the site files and pollution incident files available for the subject site:

File Reference	P270-07-01-S		
Incident Location	Rawalpindi Street		
Pollution Date	26/09/08	Comment	Sewage Overflow

The general catchment file and site visit file for the catchment (5-45 and 5-45-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of

the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Hylleardp

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21878
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Metro Water Limited c/- Watercare Services Ltd
CONSENT NUMBER:	27822
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040404
FILE REFERENCE:	C512-12-3093*
GRANTED DATE:	20030403
LOC TYPE:	Point
PROCESSING OFFICER:	__Michelle Ip
PROPERTY ADDRESS:	38 Halston Road Balmoral Auckland City
PURPOSE:	Authorise the construction of up to seventeen (17) groundwater level and quality monitoring bores.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to seventeen (17) 50mm diameter bores to a depth of approximately between 5m and 70m. Installation of PVC casing to a depth of approximately 6m

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5221
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14979
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970311
FILE REFERENCE:	C512-12-1738
GRANTED DATE:	19960311
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Chamberlain Park, MT ALBERT
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 65mm dia. bore to approx. 23m depth and installation of PVC casing to

	approx. 12m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21877
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Westfield NZ Limited
CONSENT NUMBER:	27821
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040403
FILE REFERENCE:	C512-12-3092*
GRANTED DATE:	20030402
LOC TYPE:	Point
PROCESSING OFFICER:	__Michelle Ip
PROPERTY ADDRESS:	277 Broadway Newmarket Auckland City
PURPOSE:	Authorise the construction of up two six (6) groundwater sampling bores.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to six (6) 100mm diameter bores to a depth of approximately 10m. Installation of UPVC casing to a depth of approximately 10m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21877
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Westfield NZ Limited
CONSENT NUMBER:	27821
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040403
FILE REFERENCE:	C512-12-3092*
GRANTED DATE:	20030402
LOC TYPE:	Point
PROCESSING OFFICER:	__Michelle Ip
PROPERTY ADDRESS:	277 Broadway Newmarket Auckland City
PURPOSE:	Authorise the construction of up two six (6) groundwater sampling bores.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to six (6) 100mm diameter bores to a depth of approximately 10m. Installation of UPVC casing to a depth of approximately 10m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5222
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14980
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970311
FILE REFERENCE:	C512-12-1739
GRANTED DATE:	19960311
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Chamberlain Park, MT ALBERT
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 65mm dia. bore to approx. 25m depth and installation of PVC casing to approx. 12m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21877
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Westfield NZ Limited
CONSENT NUMBER:	27821
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040403
FILE REFERENCE:	C512-12-3092*
GRANTED DATE:	20030402
LOC TYPE:	Point
PROCESSING OFFICER:	__Michelle Ip
PROPERTY ADDRESS:	277 Broadway Newmarket Auckland City
PURPOSE:	Authorise the construction of up two six (6) groundwater sampling bores.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to six (6) 100mm diameter bores to a depth of approximately 10m. Installation of UPVC casing to a depth of approximately 10m.

ACTIVITY DESCRIPTION:	3 monitoring bores.
ACTIVITY ID:	4743
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	13662
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19960215
FILE REFERENCE:	C512-12-1528*
GRANTED DATE:	19950215
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of three (3) bores for groundwater level and/or Chemistry investigations Bore Codes 4743-45
REVIEW DATE:	Null
SITE DESCRIPTION:	Chamberlain Park Golf Course, St Lukes Road - Linwood Avenue, Mt Albert
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of three (3) 100mm dia. bores to approx. 12-16m depth. Installation of steel casing and screens as required.

ACTIVITY DESCRIPTION:	golf course irrigation - replacement bore
ACTIVITY ID:	21685
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Golf Course Limited t/a Chamberlain
CONSENT NUMBER:	26685
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20030516
FILE REFERENCE:	C512-12-2915
GRANTED DATE:	20020516
LOC TYPE:	Point
PROCESSING OFFICER:	Roger Bannister
PROPERTY ADDRESS:	0046 A LinwoodAVE Western Springs
PURPOSE:	Authorise the construction of a bore for irrigation purposes.
REVIEW DATE:	Null
SITE DESCRIPTION:	Lynwood Avenue, Western Springs
SITE NAME:	Chamberlain Park Golf Course
WORKS DESCRIPTION:	Construction of a 250mm diameter bore to a depth of approximately 33.5m. Installation of steel casing.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	21877
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Westfield NZ Limited
CONSENT NUMBER:	27821
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040403
FILE REFERENCE:	C512-12-3092*
GRANTED DATE:	20030402
LOC TYPE:	Point
PROCESSING OFFICER:	__Michelle Ip
PROPERTY ADDRESS:	277 Broadway Newmarket Auckland City
PURPOSE:	Authorise the construction of up two six (6) groundwater sampling bores.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of up to six (6) 100mm diameter bores to a depth of approximately 10m. Installation of UPVC casing to a depth of approximately 10m.

ACTIVITY DESCRIPTION:	Municipal supply
ACTIVITY ID:	4730
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	13345
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19951102
FILE REFERENCE:	C512-12-1440*
GRANTED DATE:	19941102
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for municipal supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Chamberlain Park, St Lukes Road -Linwood Avenue, Mt Albert
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 200mm dia. bore to approx 40m depth and installation of steel casing to approx. 20m.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

28 September 2011

Tonkin & Taylor Ltd
105 Carlton Gore Road
Newmarket
AUCKLAND

Attention: Rachael Pickett

Dear Rachael

Site Contamination Enquiry – 751-773 New North Road, St Lukes

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-45 and 5-45-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5205
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14906
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1724*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for stock and domestic supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Roadside berm, Cnr Leone Terrace & Martin Terrace, Western Springs
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 17m depth. Installation of PVC casing and PVC screen if required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5206
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	14907
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19970222
FILE REFERENCE:	C512-12-1725*
GRANTED DATE:	19960222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Roadside berm, Norrie Ave (southwestern side), Western Springs
SITE NAME:	Null

WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 25m depth. Installation of PVC casing and PVC screen if required.

ACTIVITY DESCRIPTION:	Remediation plan to manage soil contamination of lead residue to minimise risk to park users and staff
ACTIVITY ID:	20092
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Auckland Council
CONSENT NUMBER:	28289
CONSENT STATUS:	Issued
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20391231
FILE REFERENCE:	16774
GRANTED DATE:	20040330
LOC TYPE:	Point
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	751 New North Road St Lukes Auckland City
PURPOSE:	To authorise the discharge of contaminants to ground and groundwater in accordance with Section 15 of the Resource Management Act 1991.
REVIEW DATE:	20060331
SITE DESCRIPTION:	Null
SITE NAME:	Mt Albert War Memorial Park
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	To authorise the construction of a bore for environmental Monitoring supply.
ACTIVITY ID:	21970
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	28337
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20040918
FILE REFERENCE:	C512-12-3172
GRANTED DATE:	20030917
LOC TYPE:	Point
PROCESSING OFFICER:	__Amy Boulton
PROPERTY ADDRESS:	Corner of New North Rd & Wairere Ave Mt Albert Auckland City
PURPOSE:	To authorise the construction of a bore for environmental Monitoring supply.

REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 150mm diameter bore to a depth of approximately 10m. Installation of UPVC casing to a depth of approximately 10m.

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	SVR after tank removal provided to the AC on the 27 may 2010. A gauging Round also supplied 17 December 2010.
ACTIVITY ID:	21208
ACTIVITY STATUS:	Completed
CONSENT STATUS:	Assessment Completed
EASTING:	1753732
EXPIRY DATE:	Null
FILE REFERENCE:	5-45-3165
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5916985
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	52585
PROCESSING OFFICER:	Andrew Kalbarczyk
PROPERTY ADDRESS:	770 New North Road Mount Albert Auckland City
PURPOSE:	The UPSS removal comprised of one 20,000 litre petrol UST, one 10,000 litre diesel UST, one 30,000 litre petrol UST, one 15,000 litre diesel UST, one 50,000 litre petrol UST, fill lines, fill points and vent pipes. The site was retanked with two 60,000
REVIEW DATE:	Null
SITE DESCR:	SVR after tank removal provided to the AC on the 27 may 2010. A gauging Round also supplied 17 December 2010.
SITE NAME:	770 New North Road, Mount Albert
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	5267
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	ARC ENVIRONMENT
CONSENT NUMBER:	15182
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.

EXPIRY DATE:	19970517
FILE REFERENCE:	C512-12-1773
GRANTED DATE:	19960517
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Cnr of Selkirk, New North & St Lukes Rds, Mt Albert
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 50mm dia. bore to approx 35m depth. Installation of PVC casing to approx 23m and PVC screen from approx. 23m to 35m if required.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

22 September 2011

Tonkin & Taylor Limited
PO Box 5271
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 30-36 Alberton Avenue, 15 Lyon Avenue, 11-27 Morning Star Place, Mount Albert

This letter is in response to your enquiry requesting available site contamination information for the above sites. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	5-45-1894		
File Name	30 Alberton Avenue, Mount Albert		
Site Occupier Name	Mount Albert Grammar School		
Pollution Date	2/02/10	Comment	Potential sediment to stormwater

File Reference	W22-45		
File Name	Catchment File		
Incident Location	Block C Morning Star Place, Mount Albert		
Pollution Date	18/03/11	Comment	Sediment to stormwater

File Reference	W224-45		
File Name	Catchment File		
Incident Location	11 Morning Start Place, Mount Albert		
Pollution Date	20/01/11	Comment	Odour

File Reference	W224-45-2137 or 5-45-2137		
File Name	15 Lyon Avenue, Mount Albert		
Site Occupier Name	Hermetic / Southcorp NZ Ltd		
Site Visit Date	06/07/00	Comment	Site Audit
Site Visit Date	04/10/99	Comment	Site Audit
Pollution Date	Unknown	Comment	Electroplating waste contaminating unsealed ground

The general catchment file and site visit file for the catchment (5-45 and 5-45-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above sites are coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the sites. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the sites. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the sites being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Mleardp

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Desktop investigation has identified that the risk to the environment from a printers is consdiered low.
ACTIVITY ID:	20266
ACTIVITY STATUS:	Completed
CONSENT STATUS:	Under Assessment
EASTING:	1754345
EXPIRY DATE:	Null
FILE REFERENCE:	5-45-3418
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5916476
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51045
PROCESSING OFFICER:	Rebecca Cleghorn
PROPERTY ADDRESS:	7 Wagener Place Mount Albert Auckland City
PURPOSE:	Determine ALWP compliance
REVIEW DATE:	Null
SITE DESCR:	lots 1 & 2 DP 564337A Wagener Pl, St Lukes, PO Box 41028 St Lukes. 9-815 3262
SITE NAME:	Brebner Printers
WORKS DESCRIPTION:	PSI. No identified sources of contamintion on site. "Printing Works".

ACTIVITY DESCRIPTION:	Sample collection only
ACTIVITY ID:	20912
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Maunsell Limited
CONSENT NUMBER:	22842
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20000720
FILE REFERENCE:	C512-12-2421
GRANTED DATE:	19990716
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0001 * WAGENER PL **
PURPOSE:	Authorise the construction of a bore for groundwater level/chemistry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	1 Wagner Place, Mt Albert
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm diameter bore to a depth of approximately 3.5m. Installation of PVC casing to 1.5m depth and PVC screen from 1.5-3.5m depth or as required.

ACTIVITY DESCRIPTION:	Sample collection only
ACTIVITY ID:	20914
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore

CONSENT HOLDER:	Maunsell Limited
CONSENT NUMBER:	22843
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20000720
FILE REFERENCE:	C512-12-2420*
GRANTED DATE:	19990720
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	53 St Lukes Rd St Lukes Auckland City
PURPOSE:	Authorise the construction of bores for groundwater level and/or chemsitry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	53 St Lukes Rd, St Lukes
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of two 100mm diameter bores to a depth of approximately 5m. Installation of PVC casing to 1.5m depth and PVC screen from 1.5-3.5m depth or as required.

ACTIVITY DESCRIPTION:	Sample collection only
ACTIVITY ID:	20915
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Maunsell Limited
CONSENT NUMBER:	22844
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20000720
FILE REFERENCE:	C512-12-2419*
GRANTED DATE:	19990720
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	15 Lyon Avenue St Lukes Auckland City
PURPOSE:	Authorise the construction of bores for groundwater level and/or chemistry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	15 Lyon Ave, St Lukes
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of two 100mm diameter bores to a depth of approximately 5m. Installation of PVC casing to 1.5m depth and PVC screen from 1.5-3.5m depth or as required.

ACTIVITY:	Bore
ACTIVITY DESCRIPTION:	To authorise the construction of six bores for geological, geotechnical and groundwater investigation using piezometers.
ACTIVITY ID:	23475
ACTIVITY STATUS:	Proposed
CONSENT STATUS:	Under Assessment
EASTING:	1754147
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4505*

GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5916632
PERMITTED:	Bore
PERMITTED ACTIVITY TYPE :	52286
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	Muir Avenue Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of six bores for geological, geotechnical and groundwater investigation using piezometers.
REVIEW DATE:	Null
SITE DESCR:	Six locations in ACC & MCC. Morning Star Place, Belcher St, Margaret Griffen Park, Kiwi Esplanade reserve, Muir Avenue Reserve & Mangere Wastewater Treatment Plant.
SITE NAME:	Watercare Services Limited
WORKS DESCRIPTION:	* Driller TBA* All correspondance to go to consultant.

ACTIVITY DESCRIPTION:	Construction of 200mm dia. bores to approx. 30m depth, in a soakhole chamber and installation of slotted P.V.C. casing.
ACTIVITY ID:	747
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	ST LUKES SQUARE LTD
CONSENT NUMBER:	10919
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19920823
FILE REFERENCE:	14/17/681
GRANTED DATE:	19910815
LOC TYPE:	Point
PROCESSING OFFICER:	Andrew Millar
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of bores in a soakhole chamber for stormwater discharge into the ground. Associated with BC 746, 747, 748, 5100, 5101, 5103, 5104
REVIEW DATE:	Null
SITE DESCRIPTION:	50 St Lukes Rd, Mt Albert,
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of 200mm dia. bores to approx. 30m depth, in a soakhole chamber and installation of slotted P.V.C. casing.

ACTIVITY DESCRIPTION:	Construction of 200mm dia. bores to approx. 34.5m depth, in a soakhole chamber and installation of slotted P.V.C. casing.
ACTIVITY ID:	746
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	ST LUKES SQUARE LTD
CONSENT NUMBER:	10918

CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19920823
FILE REFERENCE:	14/17/680
GRANTED DATE:	19910815
LOC TYPE:	Point
PROCESSING OFFICER:	__Andrew Millar
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of bores in a soakhole chamber for stormwater discharge into the ground. Associated with BC 746, 747, 748, 5100, 5101, 5103, 5104
REVIEW DATE:	Null
SITE DESCRIPTION:	50 St Lukes Rd, Mt Albert,
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of 200mm dia. bores to approx. 34.5m depth, in a soakhole chamber and installation of slotted P.V.C. casing.

ACTIVITY DESCRIPTION:	Construction of a 200mm dia. bore to approx. 26m depth, in a soakhole chamber and installation of slotted P.V.C. casing.
ACTIVITY ID:	748
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	ST LUKES SQUARE LTD
CONSENT NUMBER:	10920
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19920823
FILE REFERENCE:	14/17/682
GRANTED DATE:	19910815
LOC TYPE:	Point
PROCESSING OFFICER:	__Andrew Millar
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction a bore in a soakhole chamber for stormwater discharge into the ground. Associated with BC 746, 747, 478, 5100, 5101, 5103, 5104
REVIEW DATE:	Null
SITE DESCRIPTION:	50 St Lukes Rd, Mt Albert,
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 200mm dia. bore to approx. 26m depth, in a soakhole chamber and installation of slotted P.V.C. casing.

ACTIVITY DESCRIPTION:	Soakhole
ACTIVITY ID:	20423
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	ST LUKES SQUARE LTD
CONSENT NUMBER:	21989
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19991015
FILE REFERENCE:	C512-12-2272

GRANTED DATE:	19981110
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0080 * ST LUKES RD * *
PURPOSE:	Authorise the construction of a soakhole and the deepening of an existing soakhole.
REVIEW DATE:	Null
SITE DESCRIPTION:	St Lukes Mall, 80 St Lukes Rd.
SITE NAME:	Null
WORKS DESCRIPTION:	Deepening of an existing 150mm soakhole from a depth of 12.7m to a depth of 22.4m. Construction of a new 200mm diameter soakhole to a depth of approximately 21.9m.

ACTIVITY DESCRIPTION:	Sample collection only
ACTIVITY ID:	20916
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Maunsell Limited
CONSENT NUMBER:	22845
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20000720
FILE REFERENCE:	C512-12-2418
GRANTED DATE:	19990720
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	0055 St LukesRD
PURPOSE:	Authorise the construction of a bore for groundwater level and/or chemistry monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	55 St Lukes Rd, St lukes
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm diameter bore to a depth of approximately 5m. Installation of PVC casing to 1.5m depth and PVC screen from 1.5-3.5m depth or as required.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	1409
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Mobil Oil NZ Ltd
CONSENT NUMBER:	12941
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	19950720
FILE REFERENCE:	C512-12-1319
GRANTED DATE:	19940720
LOC TYPE:	Point
PROCESSING OFFICER:	Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations

REVIEW DATE:	Null
SITE DESCRIPTION:	51 & 51a St. Lukes Road, Auckland
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx. 6m depth. Installation of PVC casing to approx. 2m and PVC screens from 2m to 6m if required.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 98-102 Haverstock Road & 118-120 Mt Albert Road, Mt Albert

This letter is in response to your enquiry requesting available site contamination information for the above sites. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outlines the reference for the site files and pollution incident files available for the subject site:

File Reference	5-45-4359
File Name	118-120 Mt Albert Road, Mt Albert

File Reference	5-45-4052		
File Name	100 Haverstock Road, Sandringham		
Site Occupier Name	Private Residence		
Pollution Date	4/04/05	Comment	Burning

File Reference	5-45		
File Name	Catchment File		
Site Occupier Name	Mt Albert Hort Research Centre, Mount Albert		
Pollution Date	28/05/97	Comment	Discharge of radioactive chemicals down sink

File Reference	A-224-06		
Incident Location	102 Haverstock Road, Sandringham		
Pollution Date	17/12/06	Comment	Burning

The general catchment file and site visit file for the catchment (5-45 and 5-45-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above sites are coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have

occurred at the sites. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the sites. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the sites being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	To authorise the construction of six bores for groundwater table monitoring.
ACTIVITY ID:	22926
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	34403
CONSENT STATUS:	Expired
DATE CREATE:	25/08/2011 7:16:18 p.m.
EXPIRY DATE:	20080722
FILE REFERENCE:	C512-12-4027*
GRANTED DATE:	20070730
LOC TYPE:	Point
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	Kitchener Road Sandringham Auckland City
PURPOSE:	To authorise the construction of six bores for groundwater table monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Haverstock Road Stormwater Upgrade
WORKS DESCRIPTION:	A construction of six100mm diameter bores to an approximate depth of 5-8m. Proposed grouting to 1.5m.

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Redevelopment of former HORT land.
ACTIVITY ID:	21011
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Assessment Completed
EASTING:	1754033.2
EXPIRY DATE:	Null
FILE REFERENCE:	5-45-4052
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5915921.4
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	52079
PROCESSING OFFICER:	Mark Crooks
PROPERTY ADDRESS:	94 Haverstock Road Sandringham Auckland City
PURPOSE:	Null
REVIEW DATE:	Null
SITE DESCR:	94-130 Harverstock Rd
SITE NAME:	Housing New Zealand
WORKS DESCRIPTION:	Redevelopment of former horticultural land, low level contamination. No contamination consent required.Assessment completed.

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	setting up wbs- now in PA d/base with new wbs no C51069/1
ACTIVITY ID:	20128
ACTIVITY STATUS:	Occurring
APPLICANT:	The Horticultural & Food Research Institute of NZ Limited

APPLICATION:	29993
APPLICATION STATUS:	Lodged
EASTING:	1753800
FILE REFERENCE:	17869
LOC TYPE:	Point
LODGED DATE:	Null
NORTHING:	5915800
PROCESSING OFFICER:	_Mary Manastyrski
PROPERTY ADDRESS:	120 118 Mount Albert Road Mount Albert Auckland City
PURPOSE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Hort Research - 120 Mt Albert Rd
WORKS DESCRIPTION:	Null

ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	setting up wbs- now in PA d/base with new wbs no C51069/1
ACTIVITY ID:	20128
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Assessment Completed
EASTING:	1753800
EXPIRY DATE:	Null
FILE REFERENCE:	17869
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5915800
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51069
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	120 118 Mount Albert Road Mount Albert Auckland City
PURPOSE:	Null
REVIEW DATE:	Null
SITE DESCR:	Null
SITE NAME:	Hort Research - 120 Mt Albert Rd
WORKS DESCRIPTION:	Null

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 727 Sandringham Road Extension, Sandringham

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-46 and 5-46-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101.

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 32b Miranda Street, Avondale

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	W24-30-S		
File Name	Catchment File		
Incident Location	Miranda Street, Blockhouse Bay		
Pollution Date	7/06/10	Comment	Sewage Overflow

File Reference	W224-30-S		
File Name	Catchment File		
Incident Location	32a Miranda Street, Blockhouse Bay		
Pollution Date	21/04/09	Comment	Sewage Overflow

File Reference	5-30-S		
File Name	Catchment File		
Incident Location	Miranda Reserve		
Pollution Date	22/10/04	Comment	Dry weather sewage overflow

The general catchment file and site visit file for the catchment (5-30 and 5-30-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Hylleardp

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Auckland Council
Te Kaunihera o Tāmaki Makaurau

1 June 2012

Tonkin & Taylor
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Lean Phuah / Laura Mills

Dear Lean / Laura

Site Contamination Enquiry – 20 & 22 Gregory Place, and 49 & 51 Arundel Street, Hillsborough

This letter is in response to your enquiry requesting available site contamination information for the above sites. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-46 and 5-46-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above sites are coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the sites. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the sites. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

PP David Hampson
Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Approx 300 cmpd
ACTIVITY ID:	4693
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	13508
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	19951222
FILE REFERENCE:	C512-12-1490
GRANTED DATE:	19941222
LOC TYPE:	Point
PROCESSING OFFICER:	_Marian Jenner
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level investigations.
REVIEW DATE:	Null
SITE DESCRIPTION:	Keith Hay Park, Arundel St, Mt Roskill
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 400-500m depth and installation of steel casing to approx. 91m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	2620
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Akarana Golf Club (Incorporated)
CONSENT NUMBER:	26948
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20030717
FILE REFERENCE:	C512-12-2949
GRANTED DATE:	20020717
LOC TYPE:	Point
PROCESSING OFFICER:	Roger Bannister
PROPERTY ADDRESS:	
PURPOSE:	Authorise the construction of a bore for irrigation supply.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 150mm diameter bore to a depth of approximately 30m. Installation of sched 40 welded casing to a depth of approximately 12m.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 39 Frederick Street, Hillsborough

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outlines the reference for the site files and pollution incident files available for the subject site:

File Reference	5-41-3653		
Incident Location	37-41 Frederick Street, Hillsborough		
Pollution Date	21/03/07	Comment	Watercare line broken, sewage discharging to harbour

The general catchment file and site visit file for the catchment (7-60 and 7-60-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

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financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Auckland Council
Te Kaunihera o Tāmaki Makaurau

23 September 2011

Tonkin & Taylor Limited
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Rachel Pickett

Dear Rachel

Site Contamination Enquiry – 86R Kiwi Esplanade, Mangere Bridge

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (7-43 and 7-43-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

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In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: Ground Floor, Kotuku House, 4 Osterley Way, Manukau Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101.

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp Heard

Michael Parsonson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Auckland Council
Te Kaunihera o Tāmaki Makaurau

1 June 2012

Tonkin & Taylor
PO Box 5271
Wellesley Street
Auckland 1141

Attention: Laura Mills / Lean Phuah

Dear Laura

Site Contamination Enquiry – 66 Wellesley Street, 70, 84R & 86R Kiwi Esplanade, Mangere Bridge (Ambury Park)

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

The tables below outline the reference for the site files and pollution incident files available for the subject site:

File Reference	A224-06		
File Name	Catchment file		
Site location	Ambury Park		
Pollution Date	03/04/10	Comment	Incident no. 10/1548. Burning (cooking fire with untreated wood).

File Reference	M096-43		
File Name	Catchment file		
Pollution Date	04/02/09	Comment	Ambury Farm. Incident no. 09/0509. Possible sewage overflow.
Pollution Date	13/06/11	Comment	Incident no. 11/1753. Large discharge of oil into Manukau Harbour outside 70 Kiwi Esplanade.
Pollution Date	30/04/11	Comment	Incident no. 11/2144. 20L containers of oil found floating in Manukau Harbour outside Kiwi Esplanade.

File Reference	7-54		
File Name	Catchment file		
Site location	Ambury Farm		
Pollution Date	03/02/95	Comment	Incident no. 05/0072. Suspected bird poisoning.

The general catchment file and site visit file for the catchment (7-43 and 7-43-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have

occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: Ground Floor, Kotuku House, 4 Osterley Way, Manukau Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

David Hampson
Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	4589
ACTIVITY STATUS:	Drilled
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	Auckland Regional Council
CONSENT NUMBER:	13231
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	19950929
FILE REFERENCE:	C512-12-1398
GRANTED DATE:	19940929
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for stock and domestic supply
REVIEW DATE:	Null
SITE DESCRIPTION:	Ambury Regional Park, Ambury Road, Mangere
SITE NAME:	ARC
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 40m depth and installation of steel casing to approx. 18m.

ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	4885
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited
CONSENT NUMBER:	14081
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	19960816
FILE REFERENCE:	C512-12-1611
GRANTED DATE:	19950816
LOC TYPE:	Point
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SITE DESCRIPTION:	Ambury Park Farm, Mangere
SITE NAME:	Null
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 20m depth. Installation of PVC casing to approx 18m and PVC screen from approx. 18m to 20m if required.

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited

CONSENT NUMBER:	23011
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20001101
LOC TYPE:	Point
PROCESSING OFFICER:	Robyn Floyd
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly and using Bac
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	By tractor boom and/or helicopter and/or other manual methods.

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	26417
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20021212
LOC TYPE:	Point
PROCESSING OFFICER:	Stuart Chapman
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly and using
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited

CONSENT NUMBER:	26522
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20020315
LOC TYPE:	Point
PROCESSING OFFICER:	_Stuart Chapman
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30325
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20041224
LOC TYPE:	Point
PROCESSING OFFICER:	_Kylie Falconer
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	30695

CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20050801
LOC TYPE:	Point
PROCESSING OFFICER:	Kylie Falconer
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).□Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	32307
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20060314
LOC TYPE:	Point
PROCESSING OFFICER:	Angela Mayson
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Quantity:□Malathion: (a) The maximum weekly discharge volume shall not exceed 8000 litres, and(b) That the maximum weekly discharge volume shall not exceed 1000 litres subsequent to the breach of the Pond 4 seawall.Bti: That the maximum weekly discharge

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5).□Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring

ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	32910
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20060906
LOC TYPE:	Point
PROCESSING OFFICER:	Angela Mayson
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	20070331
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	33770
CONSENT STATUS:	Replaced
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20080601
FILE REFERENCE:	8547
GRANTED DATE:	20070830
LOC TYPE:	Point
PROCESSING OFFICER:	Glenn Starr
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus thu
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other

CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	35210
CONSENT STATUS:	Superseded
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20181231
FILE REFERENCE:	8547
GRANTED DATE:	20080905
LOC TYPE:	Point
PROCESSING OFFICER:	Heidi Lynch
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus
REVIEW DATE:	20091231
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	37254
CONSENT STATUS:	Issued
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20181231
FILE REFERENCE:	8547
GRANTED DATE:	20100115
LOC TYPE:	Point
PROCESSING OFFICER:	Kevin Bews
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the change of conditions for consent 35210 to increase the methoprene discharge limit to 20 mg/m3 for midge control.
REVIEW DATE:	20101231
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	8994
CONSENT STATUS:	Replaced
DATE CREATE:	28/05/2012 7:24:11 p.m.

EXPIRY DATE:	19991231
FILE REFERENCE:	CR928547
GRANTED DATE:	19921022
LOC TYPE:	Point
PROCESSING OFFICER:	_Rinaldo Azzara
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	TO SPRAY MALDISON "50" TO A WATER COURSE TO CONTROL MIDGE FLY AT THE MANUKAU WASTEWATER TREATMENT PLANT.
REVIEW DATE:	Null
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY:	Discharge Other
ACTIVITY DESCRIPTION:	Change discharge limit amount of methoprene (condition 21(5). Orig-Treatment of water with methoprene for the control of midges
ACTIVITY ID:	3345
ACTIVITY STATUS:	Occurring
APPLICANT:	Watercare Services Limited
APPLICATION:	37029
APPLICATION STATUS:	Withdrawn
EASTING:	1756500
FILE REFERENCE:	8547
LOC TYPE:	Point
LODGED DATE:	20090616
NORTHING:	5909400
PROCESSING OFFICER:	Kevin Bews
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise in accordance with Section 15 (1) of the Resource Management Act 1991, the discharge of insecticides within the site boundaries using Maldison (Malathion 50EC) spray into water bodies and pond banks for the control of midge fly, Bacillus
SITE DESCRIPTION:	Treatment of water with methoprene for the control of midges
SITE NAME:	Watercare Services Limited - D
WORKS DESCRIPTION:	Null

ACTIVITY DESCRIPTION:	Remediation of site previously used for disposal of construction waste.
ACTIVITY ID:	20020
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	22984
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20031231
FILE REFERENCE:	14274
GRANTED DATE:	20000120
LOC TYPE:	Area
PROCESSING OFFICER:	_Ray Scoble

PROPERTY ADDRESS:	Island Road/Wellesley Road Mangere Auckland City
PURPOSE:	To authorise the discharge of contaminants into ground and ground water from a bioremediation facility and a closed waste landfill at Mangere in accordance with Section 15(b) of the Resource Management Act 1991.
REVIEW DATE:	Null
SITE DESCRIPTION:	Old landfill site on boundary between WSL and ARC Ambury Park
SITE NAME:	Project Manukau / Ambury Park Boundary
WORKS DESCRIPTION:	Construction and operation of a landfarm bioremediation facility, re-deposition of treated soils, and installation of three (3) ground water monitoring wells.

ACTIVITY DESCRIPTION:	To authorise the construction of two bores for Environmental monitoring.
ACTIVITY ID:	23118
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Bore
CONSENT HOLDER:	URS New Zealand Limited
CONSENT NUMBER:	35548
CONSENT STATUS:	Expired
DATE CREATE:	28/05/2012 7:24:11 p.m.
EXPIRY DATE:	20090304
FILE REFERENCE:	C512-12-4197*
GRANTED DATE:	20080305
LOC TYPE:	Point
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To authorise the construction of two bores for Environmental monitoring.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	URS New Zealand
WORKS DESCRIPTION:	The construction of two 50mm diameter bores to an approximate depth of between 6 and 10m. Installation of Grade D PVC casing material to an approximate depth of between 6 and 10m.

ACTIVITY:	Bore
ACTIVITY DESCRIPTION:	To constuct up to six bores for geotechnical, geological and ground water quality investigations.
ACTIVITY ID:	23548
ACTIVITY STATUS:	Proposed
CONSENT STATUS:	Assessment Completed
EASTING:	1757864.4
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4576*
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5908492.4
PERMITTED:	Bore
PERMITTED ACTIVITY TYPE :	52357
PROCESSING OFFICER:	Reginald Samuel

PROPERTY ADDRESS:	500 Island Road Mangere Bridge Manukau City
PURPOSE:	To constuct up to six bores for geotechnical, geological and ground water quality investigations.
REVIEW DATE:	Null
SITE DESCR:	Various sites Mangere WTP, Belfast Reserve, Road reserves - 35 Hoskins Ave. Hillsborough, 2 Haycock Ave. Lynfield, 56 Margate Road Blockhouse Bay, Miranda Reserve.
SITE NAME:	Watercare Services Ltd
WORKS DESCRIPTION:	To constuct up to six 100mm diameter bores to depths between 40-70m.

Auckland Council
Te Kaunihera o Tāmaki Makaurau

17 February 2012

Tonkin & Taylor
PO Box 5271
Wellesley Street
AUCKLAND

Attention: Courtney Fagan

Dear Courtney

Site Contamination Enquiry – 2-4 Haycock Avenue, Mt Roskill

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-46 and 5-46-SV respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. No consents were identified.

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

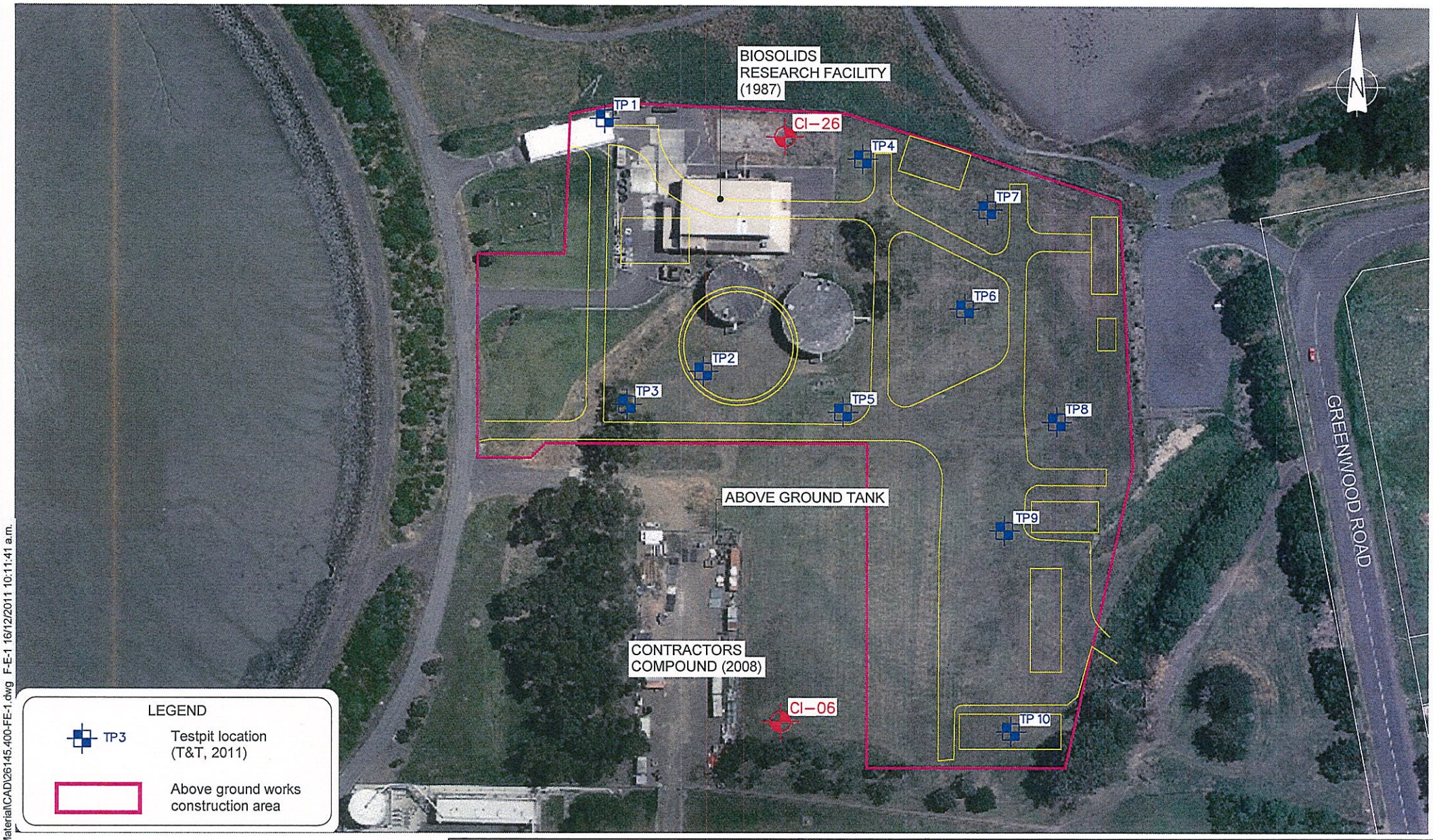
I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101.

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 0.5-1.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

David Hampson
Acting Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Appendix E: Mangere Waste Water Treatment Plant Site Investigation Information



Aerial photo sourced from Terralink International
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Property boundaries sourced from Land Information New Zealand data as at 8-Aug-2011 (Crown Copyright Reserved).

L:\26145\26145.400\WorkingMaterial\CAD\26145.400-FE-1.dwg F-E-1 16/12/2011 10:11:41 a.m.

Tonkin & Taylor
Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

DRAWN	RBS	Dec. 11
DRAFTING CHECKED		
APPROVED		
CADFILE : 26 145.400–FE– 1.dwg		
SCALES (AT A4 SIZE) 1: 1500		
PROJECT No. 26 145.400		

waterCare services limited

CENTRAL INTERCEPTOR

Mangere WWTP – Testpit Location Plan

FIG. No. Figure E– 1

REV. 0

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP1
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL: SILT, with gravels, dark brown, moist	M			TOPSOIL	
							HARDFILL: Greywacke gravels in a dark brown silt matrix, greenish blue, loose		L		FILL	
				0.5			Clayey SILT, dark brown, with inclusions of white and blue clay throughout, contains gravels and brick fragments, stained green in places, firm, moist, strong organics odour		F			
			PID 18.6ppm	1.0								
				1.5								
			20.8ppm	2.0			GRAVELS, in an orange brown silt matrix, loose, wet	W	L			
							END OF TEST PIT AT 2.4m.					
				2.5								
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP2
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL: SILT, dark brown, with gravels and plastic remnants, soft, moist	M	S		TOPSOIL	
				0.5			SILT, dark brown with lenses of grey/blue clay, contains gravels and inclusions of clay, firm, moist				FILL	
			PID 0ppm	1.0			SAND, orange brown, loose, wet	W	L			
				1.5								
			0ppm	2.0								
				2.0			SILT, with trace sand, dark brown mottled blue, soft, wet		S		ESTUARINE MUDS	
				2.5			**END OF TEST PIT AT 2.5m.** Maximum digger reach.					
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP3
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			SILT, with gravels, dark brown, loose, moist	M	L		FILL	
				0.5			SILT, yellow brown, soft, moist		S			
							SILT, dark reddish brown with lenses of grey/blue clay throughout, firm, moist, no obvious odour		F			
			PID 0ppm	1.0								
				1.5			Clayey SILT, dark purplish grey, with peat inclusions, contains lenses of white clay and greenish blue silt throughout, abundance of organic material, firm, moist					
			10ppm	2.0								
				2.5			Clayey SILT, greenish grey (Estuarine Muds), firm, wet, friable	W			ESTUARINE MUDS	
			5ppm	3.0			**END OF TEST PIT AT 3m.**					
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP4
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.5			SILT, dark brown, with gravels and large boulders of greywacke throughout, loose, moist, with plastic	M	L		FILL	
							Clayey SILT, orange brown, with lenses of greenish grey silt and white clay throughout, firm, moist		F			
			PID 0ppm	1.0			SILT, creamy grey, with inclusions of grey and purplish brown clayey silt throughout, firm, moist					
							SILT, dark brown mottled red, with inclusions of whitish grey and green grey silt, firm, moist					
			0ppm	1.5								
				2.0								
				2.5			**END OF TEST PIT AT 2.2m.**					
				3.0								
				3.5								

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EXCAVATION LOG

EXCAVATION No: TP5
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS		R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
								TOPSOIL				TOPSOIL	
								SILT, with gravels and organics, dark brown, loose, moist	M	L		FILL	
								SILT, reddish brown with lenses of grey and orange CLAY as above					
					0.5								
			PID 0ppm		1.0								
								CLAY, orange brown mottled grey with lenses of reddish brown silt and dark brwon silt, stiff, moist		St			
					1.5								
			0ppm		2.0			1.9 (approx.)-2.2m (approx.): SILT, yellow brown, firm, wet					
								2.2-2.9m (approx.): SILT, orange brown/reddish brown, with inclusions of white clay, soft, wet	W	S			
					2.5								
			0ppm		3.0			SILT, greenish grey mottled blue, with trace sand, soft, wet				ESTUARINE MUDS	
								END OF TEST PIT AT 3.2m.					
					3.5			Hole filled with water from approx. 1.2m - made logging extremely difficult and depths are approximates.					

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP6
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL, abundant organics, soft, moist	M	S		TOPSOIL	
							SILT, dark brown, with plastic and gravels, soft, moist	W			FILL	
				0.5								
							SILT, dark brown mottled reddish orange, contains inclusions and lenses of light brown and greyish white and grey clay throughout, contains medium to large sized gravels of greywacke, firm, moist [FILL]					
			PID 29ppm	x2 1.0								
				1.5								
			19ppm	2.0								
		▶		2.5			SILT, medium yellow brown, with trace sand, with gravels, soft, wet, water in - hole collapsing from 2.5m					
			35ppm	3.0								
							END OF TEST PIT AT 3.1m.					
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP7
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL: SILT, with fine gravels, dark brown, soft, moist	M	S		TOPSOIL	
				0.5			SILT, dark brown, with plastic and gravels, soft, moist				FILL	
			PID 7.5ppm	1.0								
				1.5			SILT, dark brown mottled reddish orange, contains inclusions and lenses of light brown and greyish white and grey clay throughout, contains medium to large sized gravels of greywacke, firm, moist		F			
				2.0								
				2.5								
				3.0			SILT, greenish grey mottled blue, with trace sand, soft, wet [NATURAL]	W	S		ESTUARINE MUDS	
				3.5			**END OF TEST PIT AT 3.2m.**					

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP8
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL, abundant organics, soft, moist	M	S		TOPSOIL	
							SILT, with organics and gravels throughout, medium brown, contains inclusions and lenses of whitish grey clay and reddish brown silt, soft, moist				FILL	
			PID 12ppm	0.5								
				1.0								
				1.5								
			4ppm	2.0			Sandy SILT, brownish grey, with inclusions of hard whitish grey silt, soft, wet - hole collapsing from 2.3m, contains limonite staining [NATURAL?]	W			ESTUARINE MUDS	
				2.5								
							END OF TEST PIT AT 2.6m.					
				3.0								
				3.5								

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP9
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL: SILT, dark brown, with gravels, loose, dry 0.2m: Geotextile	D	L		TOPSOIL	
							SILT, medium brown, with gravel inclusions and lenses of peat?, white silt, grey clay and organic materials, firm, moist	M	F		FILL	
				0.5								
			PID 0ppm	1.0								
				1.5			CLAY, orange brown mottled reddish brown, with light grey lenses throughout, stiff, moist		St			
			7ppm	2.0			SILT, greenish grey, fine shelly, partially cemented, wet Waterin around 2.2m	W			ESTUARINE MUDS	
			0ppm	2.5			**END OF TEST PIT AT 2.5m.**					
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP10
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.0			TOPSOIL: SILT, dark brown, with gravels, loose, dry 0.2m: Geotextile	D	L		TOPSOIL	
				0.5			SILT, with organics and gravels throughout, medium brown, contains inclusions and lenses of whitish grey clay and reddish brown silt, soft, moist	M	S		FILL	
		▼	PID 0ppm	1.0			SILT, grey, with timber, concrete, plastic, gravels etc, soft, wet Pit filled with water to 0.9m	W				
				1.5			CLAY, grey mottled reddish brown and medium brown, stiff, wet [REWORKED NATURAL?]		St			
			0ppm	2.0			SILT, greenish grey, fine shelly, partially cemented, wet Waterin around 2.2m				ESTUARINE MUDS	
			0ppm	3.0			**END OF TEST PIT AT 3m.**					
				3.5								

T+T DATATEMPLATE.GDT cf

Table 1: Mangere Waste Water Treatment Plant - Metals

Test Description	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP1 0m	TP1 0.25m	TP2 0.25m	TP2 1m	TP2 2.3m	TP3 0m	TP3 0.5m	TP4 0m	TP4 0.5m	TP5 0.25m	TP5 0.5m
					21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11
					Topsoil	Fill	Topsoil	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill
Arsenic	5.82	70	100	mg/kg	*8.4*	2.8	*14*	*27*	1.8	4.8	4.6	4.2	5	5.2	5.6
Cadmium	0.63	1,300	7.5	mg/kg	*1.3*	<0.9	*3.2*	<0.9	<0.9	<0.9	<0.9	*1.6*	*1.6*	<0.9	<0.91
Chromium	105	NL	400	mg/kg	*250*	*140*	*440*	48	44	87	55	*310*	*310*	67	*140*
Copper	39.1	NL	325	mg/kg	*130*	*100*	*220*	4.6	29	*43*	34	*140*	*170*	36	*70*
Lead	21.9	3,300	250	mg/kg	*110*	*46*	*230*	5.9	5	*36*	18	*160*	*140*	*38*	*82*
Mercury	0.12	4,200	0.75	mg/kg	*0.99*	*0.47*	*1.4*	<0.45	<0.45	<0.45	<0.45	*1.1*	*1.1*	<0.45	*0.49*
Nickel	168	3,000[4]	168[3]	mg/kg	120	*240*	140	*190*	89	81	76	120	140	62	76
Zinc	549	35,500[4]	549[3]	mg/kg	170	<67	*840*	<68	99	130	70	*470*	*440*	96	200

Test Description	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP6 0m	TP6 0.5m	TP7 0.25m	TP7 1m	TP8 0m	TP8 0.5m	TP9 0m	TP9 0.25m	TP10 0m	TP10 0.5m
					25-Oct-11	25-Oct-11	21-Oct-11	21-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
					Topsoil	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil	Fill
Arsenic	5.82	70	100	mg/kg	4.4	*11*	*9.7*	*14*	<1.8	<1.8	2.8	3.2	2.3	2.5
Cadmium	0.63	1,300	7.5	mg/kg	*1.2*	*3.1*	*2.8*	*9.7*	<0.91	<0.92	<0.89	<0.89	<0.9	<0.89
Chromium	105	NL	400	mg/kg	*230*	*610*	*550*	*1400*	83	76	53	28	42	54
Copper	39.1	NL	325	mg/kg	*100*	*290*	*220*	*500*	34	39	39	12	20	25
Lead	21.9	3,300	250	mg/kg	*150*	*300*	*260*	*660*	6.2	4.8	*41*	13	13	13
Mercury	0.12	4,200	0.75	mg/kg	*0.9*	*2.1*	*1.7*	*4*	<0.45	<0.46	<0.44	<0.45	<0.45	<0.45
Nickel	168	3,000[4]	168[3]	mg/kg	110	120	100	*190*	140	*180*	120	55	57	61
Zinc	549	35,500[4]	549[3]	mg/kg	67	280	*580*	*2100*	<68	<69	<67	<67	<68	<67

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

All results in mg/kg

1 - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Mt Mangere, Site 112.

4 - NEPC, 1999. Guideline on the Investigation Levels for Soil and Groundwater (Recreational).

Table 2: Mangere Waste Water Treatment Plant - PAH and SVOC

	Background Concentrations[5]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP1 0.25m	TP2 0.25m	TP2 1m	TP2 2.3m	TP3 0m	TP3 0.5m	TP4 0m	TP4 0.5m	TP5 0.5m	TP6 0m	TP6 0.5m	TP7 0.25m	TP7 1m	TP8 0m
					21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	25-Oct-11	25-Oct-11	21-Oct-11	21-Oct-11	25-Oct-11
					Fill	Topsoil	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil
PAH																		
Acenaphthylene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	*0.16*	<0.001	<0.01	<0.01	<0.01
Acenaphthene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01
Anthracene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	*0.18*	<0.001	<0.01	<0.01	<0.01
Benzo(a)anthracene	<LD	-	-	mg/kg	<0.01	*0.04*	*0.006*	<0.01	*0.02*	<0.01	<0.01	*0.004*	<0.01	*0.82*	*0.004*	<0.01	<0.01	<0.01
Benzo(a)pyrene	<LD	-	-	mg/kg	<0.01	*0.07*	*0.005*	<0.01	*0.02*	<0.01	<0.01	*0.003*	<0.01	*1.14*	*0.002*	<0.01	<0.01	<0.01
Benzo(b)fluoroanthene	<LD	-	-	mg/kg	<0.01	*0.1*	*0.005*	<0.01	*0.06*	<0.01	*0.06*	*0.005*	<0.01	*0.54*	*0.003*	*0.11*	*0.11*	<0.01
Benzo(ghi)perylene	<LD	-	-	mg/kg	*0.06*	<0.01	<0.01	<0.01	*0.02*	<0.01	*0.02*	<0.001	<0.01	*0.66*	<0.001	*0.06*	<0.01	<0.01
Benzo(k)fluoranthene	<LD	-	-	mg/kg	<0.01	*0.05*	*0.004*	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	*0.85*	*0.004*	*0.05*	*0.05*	<0.01
Chrysene	<LD	-	-	mg/kg	<0.01	<0.01	*0.012*	<0.01	<0.01	<0.01	<0.01	*0.006*	<0.01	*0.8*	<0.001	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	*0.26*	<0.001	<0.01	<0.01	<0.01
Fluoranthene	<LD	-	-	mg/kg	0.07	*0.09*	*0.032*	<0.01	<0.01	<0.01	<0.01	*0.016*	<0.01	*1.33*	*0.008*	*0.07*	*0.1*	<0.01
Fluorene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01
Indeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	0.04	*0.05*	*0.006*	<0.01	*0.01*	<0.01	<0.01	*0.006*	<0.01	*0.63*	*0.003*	<0.01	<0.01	<0.01
Naphthalene	<LD	230[3]	0.047[4]	mg/kg	**0.21**	**0.56**	-	<0.01	<0.01	<0.01	**0.07**	-	<0.01	**0.17**	-	<0.01	<0.01	<0.01
Phenanthrene	<LD	-	-	mg/kg	<0.01	*0.1*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	*0.44*	<0.001	*0.12*	*0.14*	<0.01
Pyrene	<LD	NA[3]	1.3[4]	mg/kg	*0.09*	*0.15*	*0.02*	<0.01	<0.01	<0.01	*0.05*	*0.011*	*0.02*	*1.39*	*0.004*	*0.14*	*0.18*	<0.01
Benzo(a)pyrene equivalent	<LD	35	2.15	mg/kg	*0.03*	*0.10*	*0.01*	NC	*0.04*	NC	*0.03*	0.01	NC	*1.69*	*0.00*	*0.04*	*0.04*	NC
SVOC																		
Aldrin	<LD		-	mg/kg	-	-	<0.001	-	-	-	-	<0.001	-	-	<0.001	-	-	-
alpha-Chlordane	<LD		-	mg/kg	-	-	<0.001	-	-	-	-	*0.0148*	-	-	<0.001	-	-	-
gamma-Chlordane	<LD	-	-	mg/kg	-	-	<0.001	-	-	-	-	*0.0164*	-	-	<0.001	-	-	-
4,4'-DDD	<LD	-	-	mg/kg	-	-	*0.0136*	-	-	-	-	*0.0138*	-	-	<0.001	-	-	-
4,4'-DDE	<LD	-	-	mg/kg	-	-	<0.001	-	-	-	-	*0.0104*	-	-	<0.001	-	-	-
4,4'-DDT	<LD	-	-	mg/kg	-	-	*0.0196*	-	-	-	-	<0.001	-	-	<0.001	-	-	-
Sum DDT	<LD	1000	0.7	mg/kg	-	-	*0.0332*	-	-	-	-	*0.0242*	-	-	NC	-	-	-
Dieldrin	<LD	160	190[4]	mg/kg	-	-	<0.001	-	-	-	-	*0.0223*	-	-	<0.001	-	-	-
cis-Permethrin	<LD	-	-	mg/kg	-	-	<0.01	-	-	-	-	*0.0226*	-	-	<0.01	-	-	-
Diethyl phthalate	<LD	-	-	mg/kg	-	-	*0.1*	-	-	-	-	<0.1	-	-	<0.1	-	-	-
Isophorone	<LD	-	-	mg/kg	-	-	*0.3*	-	-	-	-	<0.1	-	-	<0.1	-	-	-

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

Italicised values exceed the background concentrations

NC - not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - Protection of groundwater quality (GW 2 m).

5 - MfE 2006. Identifying, Investigating and Managing Risks Associated with Former Sheep Dip Sites.

Table 2: Mangere Waste Water Treatment Plant - PAH and SVOC

	Background Concentrations[5]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP8 0.5m	TP9 0m	TP9 0.25m	TP10 0m	TP10 0.5m
					25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
					Fill	Topsoil	Fill	Topsoil	Fill
PAH									
Acenaphthylene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Acenaphthene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Anthracene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Benzo(a)anthracene	<LD	-	-	mg/kg	<0.01	<0.01	*0.01*	*0.03*	<0.001
Benzo(a)pyrene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Benzo(b)fluoroanthene	<LD	-	-	mg/kg	<0.01	<0.01	*0.06*	*0.06*	<0.001
Benzo(ghi)perylene	<LD	-	-	mg/kg	<0.01	*0.02*	<0.01	<0.01	<0.001
Benzo(k)fluoranthene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Chrysene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Fluoranthene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Fluorene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Indeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Naphthalene	<LD	230[1]	0.047[4]	mg/kg	<0.01	<0.01	<0.01	<0.01	-
Phenanthrene	<LD	-	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.001
Pyrene	<LD	NA[3]	1.3[4]	mg/kg	<0.01	<0.01	*0.03*	*0.04*	<0.001
Benzo(a)pyrene equivalent	<LD	35	2.15	mg/kg	NC	*0.02*	*0.03*	*0.03*	NC
SVOC									
Aldrin	<LD		-	mg/kg	-	-	-	-	<0.001
alpha-Chlordane	<LD		-	mg/kg	-	-	-	-	<0.001
gamma-Chlordane	<LD	-	-	mg/kg	-	-	-	-	<0.001 .
4,4'-DDD	<LD	-	-	mg/kg	-	-	-	-	<0.001
4,4'-DDE	<LD	-	-	mg/kg	-	-	-	-	<0.001
4,4'-DDT	<LD	-	-	mg/kg	-	-	-	-	<0.001
Sum DDT	<LD	1000	0.7	mg/kg	-	-	-	-	NC
Dieldrin	<LD	160	190[4]	mg/kg	-	-	-	-	<0.001
cis-Permethrin	<LD	-	-	mg/kg	-	-	-	-	<0.01
Diethyl phthalate	<LD	-	-	mg/kg	-	-	-	-	<0.1
Isophorone	<LD	-	-	mg/kg	-	-	-	-	<0.1

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

Italicised values exceed the background concentrations

NC - not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - Protection of groundwater quality (GW 2 m).

5 - MfE 2006. Identifying, Investigating and Managing Risks Associated with Former Sheep-Dip Sites.

Table 3: Mangere Waste Water Treatment Plant - Soil Disposal - Metals

Test Description	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria (Non-Volcanic)[2]	Example Managed Fill Criteria[3]	Unit	TP1 0m	TP1 0.25m	TP2 0.25m	TP2 1m	TP2 2.3m	TP3 0m	TP3 0.5m	TP4 0m	TP4 0.5m	TP5 0.25m	TP5 0.5m
					21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11
					Topsoil	Fill	Topsoil	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill
Arsenic	5.82	12	30	mg/kg	*8.4*	2.8	*11*	*27*	1.8	4.8	4.6	4.2	5	5.2	5.6
Cadmium	0.63	0.65	20	mg/kg	*1.9*	<0.9	*1.7*	<0.9	<0.9	<0.9	<0.9	2.6	2.5	<0.9	<0.91
Chromium	105	55	400	mg/kg	*250*	*140*	*440*	48	44	**87**	**55**	*340*	*310*	**67**	*140*
Copper	39.1	45	325	mg/kg	*130*	*100*	*220*	4.6	29	*43*	34	*140*	*170*	36	*70*
Lead	21.9	65	250	mg/kg	*210*	*46*	*280*	5.9	5	*36*	18	*150*	*240*	*38*	*82*
Mercury	0.12	0.45	-	mg/kg	*0.99*	*0.47*	*1.1*	<0.45	<0.45	<0.45	<0.45	*1.1*	*1.1*	<0.45	*0.49*
Nickel	168	35	250	mg/kg	*120*	*240*	*140*	*190*	**89**	**81**	**76**	*120*	*140*	**62**	**76**
Zinc	549	180	1160	mg/kg	170	<67	*840*	68	99	130	70	*470*	*490*	96	*200*

Test Description	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP6 0m	TP6 0.5m	TP7 0.25m	TP7 1m	TP8 0m	TP8 0.5m	TP9 0m	TP9 0.25m	TP10 0m	TP10 0.5m
					25-Oct-11	25-Oct-11	21-Oct-11	21-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
					Topsoil	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil	Fill
Arsenic	5.82	12	30	mg/kg	4.4	*11*	9.7	*24*	<1.8	<1.8	2.8	3.2	2.3	2.5
Cadmium	0.63	0.65	20	mg/kg	*1.7*	*1.1*	*2.8*	*9.7*	<0.91	<0.92	<0.89	<0.89	<0.9	<0.89
Chromium	105	55	400	mg/kg	*230*	*610*	*560*	*1400*	**83**	**76**	53	28	42	54
Copper	39.1	45	325	mg/kg	*300*	*290*	*220*	*500*	34	39	39	12	20	25
Lead	21.9	65	250	mg/kg	*150*	*300*	*260*	*560*	6.2	4.8	*41*	13	13	13
Mercury	0.12	0.45	-	mg/kg	*0.9*	*2.1*	*1.7*	*4*	<0.45	<0.46	<0.44	<0.45	<0.45	<0.45
Nickel	168	35	250	mg/kg	*110*	*120*	*100*	*190*	**140**	**180**	**120**	**55**	**57**	**61**
Zinc	549	180	1160	mg/kg	<67	*280*	*580*	*2100*	<68	<69	<67	<67	<68	<67

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed the background concentrations for volcanic soils

1 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Mt Mangere - Site 112.
2 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Maximum Non-Volcanic background concentrations.
3 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: Mangere Waste Water Treatment Plant - Soil Disposal - PAH and SVOC

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP1 0.25m	TP2 0.25m	TP2 1m	TP2 2.3m	TP3 0m	TP3 0.5m	TP4 0m	TP4 0.5m	TP5 0.5m	TP6 0m	TP6 0.5m	TP7 0.25m	TP7 1m
				21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	21-Oct-11	25-Oct-11	25-Oct-11	21-Oct-11	21-Oct-11
				Fill	Topsoil	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Topsoil	Fill	Topsoil	Fill
PAH																
Acenaphthylene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	0.16	<0.001	<0.01	<0.01
Acenaphthene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.001	<0.01	<0.01
Anthracene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	0.18	<0.001	<0.01	<0.01
Benzo(a)anthracene	<LD	-	mg/kg	<0.01	0.04	0.006	<0.01	0.02	<0.01	<0.01	0.004	<0.01	0.82	0.004	<0.01	<0.01
Benzo(a)pyrene	<LD	-	mg/kg	<0.01	0.07	0.005	<0.01	0.02	<0.01	<0.01	0.003	<0.01	1.14	0.002	<0.01	<0.01
Benzo(b)fluoroanthene	<LD	-	mg/kg	<0.01	0.1	0.005	<0.01	0.06	<0.01	0.06	0.005	<0.01	0.54	0.003	0.11	0.11
Benzo(ghi)perylene	<LD	-	mg/kg	0.06	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.001	<0.01	0.56	<0.001	0.06	<0.01
Benzo(k)fluoranthene	<LD	-	mg/kg	<0.01	0.05	0.004	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	0.35	0.004	0.05	0.05
Chrysene	<LD	-	mg/kg	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	0.006	<0.01	0.8	<0.001	<0.01	<0.01
Dibenzo(ah)anthracene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	0.26	<0.001	<0.01	<0.01
Fluoranthene	<LD	-	mg/kg	0.07	0.09	0.032	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	1.33	0.008	0.07	0.1
Fluorene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.001	<0.01	<0.01
Indeno(1,2,3,c,d)pyrene	<LD	-	mg/kg	0.04	0.05	0.006	<0.01	0.01	<0.01	<0.01	0.006	<0.01	0.63	0.004	<0.01	<0.01
Naphthalene	<LD	-	mg/kg	2.61	0.58	-	<0.01	<0.01	<0.01	0.07	-	<0.01	0.13	-	<0.01	<0.01
Phenanthrene	<LD	-	mg/kg	<0.01	0.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	0.44	<0.001	0.12	0.14
Pyrene	<LD	-	mg/kg	0.09	0.15	0.07	<0.01	<0.01	<0.01	0.05	0.011	0.02	1.39	0.004	0.14	0.18
Benzo(a)pyrene equivalent	<LD	25	mg/kg	0.03	0.10	0.01	NC	0.04	NC	0.03	0.01	NC	1.69	0.004	0.04	0.04
SVOC																
Aldrin	<LD	-	mg/kg	-	-	<0.001	-	-	-	-	<0.001	-	-	<0.001	-	-
alpha-Chlordane	<LD	-	mg/kg	-	-	<0.001	-	-	-	-	0.0148	-	-	<0.001	-	-
gamma-Chlordane	<LD	-	mg/kg	-	-	<0.001	-	-	-	-	0.0164	-	-	<0.001	-	-
4,4'-DDD	<LD	-	mg/kg	-	-	0.0136	-	-	-	-	0.0198	-	-	<0.001	-	-
4,4'-DDE	<LD	-	mg/kg	-	-	<0.001	-	-	-	-	0.0104	-	-	<0.001	-	-
4,4'-DDT	<LD	-	mg/kg	-	-	0.0196	-	-	-	-	<0.001	-	-	<0.001	-	-
Sum DDT	<LD	12	mg/kg	-	-	0.0332	-	-	-	-	0.0242	-	-	NC	-	-
Dieldrin	<LD	-	mg/kg	-	-	<0.001	-	-	-	-	0.0223	-	-	<0.001	-	-
cis-Permethrin	<LD	-	mg/kg	-	-	<0.01	-	-	-	-	0.0226	-	-	<0.01	-	-
Diethyl phthalate	<LD	-	mg/kg	-	-	0.1	-	-	-	-	<0.1	-	-	<0.1	-	-
Isophorone	<LD	-	mg/kg	-	-	0.3	-	-	-	-	<0.1	-	-	<0.1	-	-

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed the background concentrations for volcanic soils
<LD - cleanfill criteria is taken as being below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: Mangere Waste Water Treatment Plant - Soil Disposal - PAH and SVOC

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP8 0m	TP8 0.5m	TP9 0m	TP9 0.25m	TP10 0m	TP10 0.5m
				25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
				Topsoil	Fill	Topsoil	Fill	Topsoil	Fill
PAH									
Acenaphthylene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Acenaphthene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Anthracene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Benzo(a)anthracene	<LD	-	mg/kg	<0.01	<0.01	<0.01	*0.01*	*0.03*	<0.001
Benzo(a)pyrene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Benzo(b)fluoroanthene	<LD	-	mg/kg	<0.01	<0.01	<0.01	*0.06*	*0.06*	<0.001
Benzo(ghi)perylene	<LD	-	mg/kg	<0.01	<0.01	*0.02*	<0.01	<0.01	<0.001
Benzo(k)fluoranthene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Chrysene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Dibenzo(ah)anthracene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Fluoranthene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Fluorene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Indeno(1,2,3,c,d)pyrene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Naphthalene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	-
Phenanthrene	<LD	-	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Pyrene	<LD	-	mg/kg	<0.01	<0.01	<0.01	*0.03*	*0.04*	<0.001
Benzo(a)pyrene equivalent	<LD	25	mg/kg	NC	NC	*0.02*	*0.03*	*0.03*	0.002
SVOC									
Aldrin	<LD	-	mg/kg	-	-	-	-	-	<0.001
alpha-Chlordane	<LD	-	mg/kg	-	-	-	-	-	<0.001
gamma-Chlordane	<LD	-	mg/kg	-	-	-	-	-	<0.001
4,4'-DDD	<LD	-	mg/kg	-	-	-	-	-	<0.001
4,4'-DDE	<LD	-	mg/kg	-	-	-	-	-	<0.001
4,4'-DDT	<LD	-	mg/kg	-	-	-	-	-	<0.001
Sum DDT	<LD	12	mg/kg	-	-	-	-	-	NC
Dieldrin	<LD	-	mg/kg	-	-	-	-	-	<0.001
cis-Permethrin	<LD	-	mg/kg	-	-	-	-	-	<0.01
Diethyl phthalate	<LD	-	mg/kg	-	-	-	-	-	<0.1
Isophorone	<LD	-	mg/kg	-	-	-	-	-	<0.1

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed the background concentrations for volcanic soils
<LD - cleanfill criteria is taken as being below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

water Care
Laboratory Services

Certificate of Analysis

TONKIN & TAYLOR NZ LTD
105 CARLTON GORE ROAD
NEWMARKET
AUCKLAND

Copy To 1: Rachel Pickett
2: Leon Pemberton
3: Courtney Fagan

Attention: Rachel Pickett

Job Description: 11/26145.400 Tonkin & Taylor 10-Day TAT R Pickett
Batch Number: 11/38933

Sample Descriptions

Sample No.	Date Sampled	Sample Description
01	21/10/2011	TP1 0m
02	21/10/2011	TP1 0.25m
03	21/10/2011	TP2 0.25m
04	21/10/2011	TP2 1m
05	21/10/2011	TP2 2.3m
06	21/10/2011	TP3 0m
07	21/10/2011	TP3 0.5m
08	21/10/2011	TP4 0m
09	21/10/2011	TP4 0.5m
10	21/10/2011	TP5 0.25m
11	21/10/2011	TP5 0.5m
12	21/10/2011	TP7 0.25m
13	21/10/2011	TP7 1m

Results

Test Description	Units	Sample Number/Result					
		01	02	03	04	05	06
Aldrin (as dry wt basis)	ug/kg				< 1.0000		
BHC alpha (as dry wt basis)	ug/kg				< 1.0000		
BHC beta (as dry wt basis)	ug/kg				< 1.0000		
BHC delta (as dry wt basis)	ug/kg				< 1.0000		
alpha-Chlordane (as dry wt basis)	ug/kg				< 1.00000		
gamma-Chlordane (as dry wt basis)	ug/kg				< 1.00000		
4,4'-DDD (as dry wt basis)	ug/kg				13.60000		
4,4'-DDE (as dry wt basis)	ug/kg				< 1.00000		
4,4'-DDT (as dry wt basis)	ug/kg				19.60000		
Dieldrin (as dry wt basis)	ug/kg				< 1.00000		
Endosulfan I (as dry wt basis)	ug/kg				< 1.0000		
Endosulfan II (as dry wt basis)	ug/kg				< 1.0000		
Endosulfan sulfate (as dry wt basis)	ug/kg				< 2.0000		
Endrin (as dry wt basis)	ug/kg				< 2.0000		
Endrin aldehyde (as dry wt basis)	ug/kg				< 4.0000		
Heptachlor (as dry wt basis)	ug/kg				< 1.0000		
Heptachlor epoxide (as dry wt basis)	ug/kg				< 4.0000		
Lindane (BHC gamma as dry wt basis)	ug/kg				< 1.0000		
Methoxychlor (as dry wt basis)	ug/kg				< 1.0000		
cis-Permethrin (as dry wt	ug/kg				< 10.0000		

Test Description	Units	Sample Number/Result				
basis)						
trans-Permethrin (as dry wt basis)	ug/kg			< 10.0000		
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	0.0400	0.0060	< 0.0100	0.0200
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0700	0.0050	< 0.0100	0.0200
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100	0.1000	0.0050	< 0.0100	0.0600
Benzo(ghi)perylene (as dry wt basis)	mg/kg	0.0600	< 0.0100	< 0.0010	< 0.0100	0.0200
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	0.0500	0.0040	< 0.0100	< 0.0100
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0120	< 0.0100	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	0.0700	0.0900	0.0320	< 0.0100	< 0.0100
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	0.0400	0.0500	0.0060	< 0.0100	0.0100
Naphthalene (as dry wt basis)	mg/kg	2.1100	0.5900		< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	0.1000	< 0.0010	< 0.0100	< 0.0100
Pyrene (as dry wt basis)	mg/kg	0.0900	0.1500	0.0200	< 0.0100	< 0.0100
bis(2-Ethylhexyl)phthalate (as dry wt basis)	mg/kg			< 0.100		
Butylbenzyl phthalate (as dry wt basis)	mg/kg			< 0.100		
bis(2-Ethylhexyl)adipate (as dry wt basis)	mg/kg			< 0.100		
Diethyl phthalate (as dry wt basis)	mg/kg			0.100		
Dimethyl phthalate (as dry wt basis)	mg/kg			< 0.100		
Di-n-butyl phthalate (as dry wt basis)	mg/kg			< 0.100		
Di-n-octyl phthalate (as dry wt basis)	mg/kg			< 0.100		
4-Chloro-3-methylphenol (as dry wt basis)	mg/kg			< 0.100		
2-Chlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,4-Dichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,6-Dichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,4-Dimethylphenol (as dry wt basis)	mg/kg			< 0.100		
2-Methyl 4,6-dinitrophenol (as dry wt basis)	mg/kg			< 0.100		
2-Methylphenol (as dry wt basis)	mg/kg			< 0.100		
4-Methylphenol (as dry wt basis)	mg/kg			< 0.100		
Pentachlorophenol (as dry wt	mg/kg			< 0.100		

Test Description	Units	Sample Number/Result					
basis)							
Phenol (as dry wt basis)	mg/kg				< 0.100		
2,4,5-Trichlorophenol (as dry wt basis)	mg/kg				< 0.100		
2,4,6-Trichlorophenol (as dry wt basis)	mg/kg				< 0.100		
2,3,4,6-Tetrachlorophenol (as dry wt basis)	mg/kg				< 0.100		
bis(2-Chloroethoxy)methane (as dry wt basis)	mg/kg				< 0.1000		
bis(2-Chloroethyl)ether (as dry wt basis)	mg/kg				< 0.1000		
bis(2-Chlorisopropyl)ether (as dry wt basis)	mg/kg				< 0.1000		
4-Bromophenylphenylether (as dry wt basis)	mg/kg				< 0.1000		
carbazole	mg/kg				< 0.1000		
2-Chloronaphthalene (as dry wt basis)	mg/kg				< 0.1000		
4-Chlorophenylphenyl ether (as dry wt basis)	mg/kg				< 0.1000		
Dibenzofuran (as dry wt basis)	mg/kg				< 0.1000		
1,3-Dichlorobenzene (as dry wt basis)	mg/kg				< 0.1000		
1,4-Dichlorobenzene (as dry wt basis)	mg/kg				< 0.1000		
1,2-Dichlorobenzene (as dry wt basis)	mg/kg				< 0.1000		
2,4-Dinitrotoluene (as dry wt basis)	mg/kg				< 0.1000		
2,6-Dinitrotoluene (as dry wt basis)	mg/kg				< 0.1000		
Diphenylhydrazine (as dry wt basis)	mg/kg				< 0.1000		
Hexachlorobenzene (as dry wt basis)	mg/kg				< 0.1000		
Hexachlorobutadiene (as dry wt basis)	mg/kg				< 0.1000		
Hexachlorocyclopentadiene (as dry wt basis)	mg/kg				< 0.1000		
Hexachloroethane (as dry wt basis)	mg/kg				< 0.1000		
Isophorone (as dry wt basis)	mg/kg				0.3000		
2-Methylnaphthalene (as dry wt basis)	mg/kg				< 0.1000		
Nitrobenzene (as dry wt basis)	mg/kg				< 0.1000		
n-Nitrosodi-n-propylamine (as dry wt basis)	mg/kg				< 0.1000		
n-Nitrosodiphenylamine (as dry wt basis)	mg/kg				< 0.1000		
1,2,4-Trichlorobenzene (as dry wt basis)	mg/kg				< 0.1000		
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	8.4	2.8	14.	27.	< 1.8	4.8
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	1.3	< 0.9	3.2	< 0.9	< 0.9	< 0.9
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	250.	140.	440.	48.	44.	87.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	130.	100.	220.	4.6	29.	43.

Test Description	Units	Sample Number/Result					
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Dry wt % Sludge	%w/w		93.8	67.8	85.7	68.4	77.9
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.99	0.47	1.4	< 0.45	< 0.45	< 0.45
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	120.	240.	140.	190.	89.	81.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	110.	46.	230.	5.9	5.	36.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	170.	< 67.	840.	< 68.	99.	130.
		07	**08**	**09**	**10**	**11**	**12**
Aldrin (as dry wt basis)	ug/kg			< 1.0000			
BHC alpha (as dry wt basis)	ug/kg			< 1.0000			
BHC beta (as dry wt basis)	ug/kg			< 1.0000			
BHC delta (as dry wt basis)	ug/kg			< 1.0000			
alpha-Chlordane (as dry wt basis)	ug/kg			14.80000			
gamma-Chlordane (as dry wt basis)	ug/kg			16.40000			
4,4'-DDD (as dry wt basis)	ug/kg			13.80000			
4,4'-DDE (as dry wt basis)	ug/kg			10.40000			
4,4'-DDT (as dry wt basis)	ug/kg			< 1.00000			
Dieldrin (as dry wt basis)	ug/kg			22.30000			
Endosulfan I (as dry wt basis)	ug/kg			< 1.0000			
Endosulfan II (as dry wt basis)	ug/kg			< 1.0000			
Endosulfan sulfate (as dry wt basis)	ug/kg			< 2.0000			
Endrin (as dry wt basis)	ug/kg			< 2.0000			
Endrin aldehyde (as dry wt basis)	ug/kg			< 4.0000			
Heptachlor (as dry wt basis)	ug/kg			< 1.0000			
Heptachlor epoxide (as dry wt basis)	ug/kg			< 4.0000			
Lindane (BHC gamma as dry wt basis)	ug/kg			< 1.0000			
Methoxychlor (as dry wt basis)	ug/kg			< 1.0000			
cis-Permethrin (as dry wt basis)	ug/kg			22.6000			
trans-Permethrin (as dry wt basis)	ug/kg			< 10.0000			
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010		< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010		< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010		< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0040		< 0.0100	< 0.0100
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0030		< 0.0100	< 0.0100
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100	0.0600	0.0050		< 0.0100	0.1100
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	0.0200	< 0.0010		< 0.0100	0.0600
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010		< 0.0100	0.0500
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0060		< 0.0100	< 0.0100

Test Description	Units	Sample Number/Result				
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0160	< 0.0100	0.0700
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0100	0.0060	< 0.0100	< 0.0100
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	0.0700		< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0010	< 0.0100	0.1200
Pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0500	0.0110	0.0200	0.1400
bis(2-Ethylhexyl)phthalate (as dry wt basis)	mg/kg			0.500		
Butylbenzyl phthalate (as dry wt basis)	mg/kg			< 0.100		
bis(2-Ethylhexyl)adipate (as dry wt basis)	mg/kg			< 0.100		
Diethyl phthalate (as dry wt basis)	mg/kg			< 0.100		
Dimethyl phthalate (as dry wt basis)	mg/kg			< 0.100		
Di-n-butyl phthalate (as dry wt basis)	mg/kg			< 0.100		
Di-n-octyl phthalate (as dry wt basis)	mg/kg			< 0.100		
4-Chloro-3-methylphenol (as dry wt basis)	mg/kg			< 0.100		
2-Chlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,4-Dichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,6-Dichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,4-Dimethylphenol (as dry wt basis)	mg/kg			< 0.100		
2-Methyl 4,6-dinitrophenol (as dry wt basis)	mg/kg			< 0.100		
2-Methylphenol (as dry wt basis)	mg/kg			< 0.100		
4-Methylphenol (as dry wt basis)	mg/kg			< 0.100		
Pentachlorophenol (as dry wt basis)	mg/kg			< 0.100		
Phenol (as dry wt basis)	mg/kg			< 0.100		
2,4,5-Trichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,4,6-Trichlorophenol (as dry wt basis)	mg/kg			< 0.100		
2,3,4,6-Tetrachlorophenol (as dry wt basis)	mg/kg			< 0.100		
bis(2-Chloroethoxy)methane (as dry wt basis)	mg/kg			< 0.1000		
bis(2-Chloroethyl)ether (as dry wt basis)	mg/kg			< 0.1000		
bis(2-Chlorisopropyl)ether (as dry wt basis)	mg/kg			< 0.1000		
4-Bromophenylphenylether (as dry wt basis)	mg/kg			< 0.1000		
carbazole	mg/kg			< 0.1000		
2-Chloronaphthalene (as dry wt basis)	mg/kg			< 0.1000		

Test Description	Units	Sample Number/Result					
4-Chlorophenylphenyl ether (as dry wt basis)	mg/kg			< 0.1000			
Dibenzofuran (as dry wt basis)	mg/kg			< 0.1000			
1,3-Dichlorobenzene (as dry wt basis)	mg/kg			< 0.1000			
1,4-Dichlorobenzene (as dry wt basis)	mg/kg			< 0.1000			
1,2-Dichlorobenzene (as dry wt basis)	mg/kg			< 0.1000			
2,4-Dinitrotoluene (as dry wt basis)	mg/kg			< 0.1000			
2,6-Dinitrotoluene (as dry wt basis)	mg/kg			< 0.1000			
Diphenylhydrazine (as dry wt basis)	mg/kg			< 0.1000			
Hexachlorobenzene (as dry wt basis)	mg/kg			< 0.1000			
Hexachlorobutadiene (as dry wt basis)	mg/kg			< 0.1000			
Hexachlorocyclopentadiene (as dry wt basis)	mg/kg			< 0.1000			
Hexachloroethane (as dry wt basis)	mg/kg			< 0.1000			
Isophorone (as dry wt basis)	mg/kg			< 0.1000			
2-Methylnaphthalene (as dry wt basis)	mg/kg			< 0.1000			
Nitrobenzene (as dry wt basis)	mg/kg			< 0.1000			
n-Nitrosodi-n-propylamine (as dry wt basis)	mg/kg			< 0.1000			
n-Nitrosodiphenylamine (as dry wt basis)	mg/kg			< 0.1000			
1,2,4-Trichlorobenzene (as dry wt basis)	mg/kg			< 0.1000			
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.6	4.2	5.	5.2	5.6	9.7
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.9	1.6	1.6	< 0.9	< 0.91	2.8
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	55.	310.	310.	67.	140.	560.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	34.	140.	170.	36.	70.	220.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Dry wt % Sludge	%w/w	72.0	60.1	75.6		75.8	64.9
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.45	1.1	1.1	< 0.45	0.49	1.7
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	76.	120.	140.	62.	76.	100.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	18.	160.	140.	38.	82.	260.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	70.	470.	440.	96.	200.	580.
		13					
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100					
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100					

Test Description	Units	Sample Number/Result				
Anthracene (as dry wt basis)	mg/kg	< 0.0100				
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100				
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100				
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.1100				
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100				
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	0.0500				
Chrysene (as dry wt basis)	mg/kg	< 0.0100				
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100				
Fluoranthene (as dry wt basis)	mg/kg	0.1000				
Fluorene (as dry wt basis)	mg/kg	< 0.0100				
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100				
Naphthalene (as dry wt basis)	mg/kg	< 0.0100				
Phenanthrene (as dry wt basis)	mg/kg	0.1400				
Pyrene (as dry wt basis)	mg/kg	0.1800				
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	14.				
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	9.7				
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	1400.				
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	500.				
Acid Digestion: Recoverable Metals in Solids		1				
Dry wt % Sludge	%w/w	48.8				
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.				
Preparation of solid samples for digestion		Yes				
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	190.				
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	660.				
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	2100.				

Test Descriptions

Test Description	Method	Accredited
1,2,4-Trichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,2-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,3-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,4-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
2,3,4,6-Tetrachlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4,5-Trichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4,6-Trichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4-Dichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4-Dimethylphenol (as dry wt basis)	USEPA 8270	IANZ
2,4-Dinitrotoluene (as dry wt basis)	USEPA 8270	IANZ
2,6-Dichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,6-Dinitrotoluene (as dry wt basis)	USEPA 8270	IANZ
2-Chloronaphthalene (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
2-Chlorophenol (as dry wt basis)	USEPA 8270	IANZ
2-Methyl 4,6-dinitrophenol (as dry wt basis)	USEPA 8270	IANZ
2-Methylnaphthalene (as dry wt basis)	USEPA 8270	IANZ
2-Methylphenol (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDD (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDE (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDT (as dry wt basis)	USEPA 8270	IANZ
4-Bromophenylphenylether (as dry wt basis)	USEPA 8270	IANZ
4-Chloro-3-methylphenol (as dry wt basis)	USEPA 8270	IANZ
4-Chlorophenylphenyl ether (as dry wt basis)	USEPA 8270	IANZ
4-Methylphenol (as dry wt basis)	USEPA 8270	IANZ
Acenaphthene (as dry wt basis)	USEPA 8270	IANZ
Acenaphthylene (as dry wt basis)	USEPA 8270	IANZ
Acid Digestion: Recoverable Metals in Solids	USEPA 200.8	
Aldrin (as dry wt basis)	USEPA 8270	IANZ
alpha-Chlordane (as dry wt basis)	USEPA 8270	IANZ
Anthracene (as dry wt basis)	USEPA 8270	IANZ
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Benzo(a)anthracene (as dry wt basis)	USEPA 8270	IANZ
Benzo(a)pyrene (as dry wt basis)	USEPA 8270	IANZ
Benzo(b)fluoroanthene (as dry wt basis)	USEPA 8270	IANZ
Benzo(ghi)perylene (as dry wt basis)	USEPA 8270	IANZ
Benzo(k)fluoranthene (as dry wt basis)	USEPA 8270	IANZ
BHC alpha (as dry wt basis)	USEPA 8270	IANZ
BHC beta (as dry wt basis)	USEPA 8270	IANZ
BHC delta (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chlorisopropyl)ether (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chloroethoxy)methane (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chloroethyl)ether (as dry wt basis)	USEPA 8270	IANZ
bis(2-Ethylhexyl)adipate (as dry wt basis)	USEPA 8270	IANZ
bis(2-Ethylhexyl)phthalate (as dry wt basis)	USEPA 8270	IANZ
Butylbenzyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
carbazole	USEPA 8270	IANZ
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chrysene (as dry wt basis)	USEPA 8270	IANZ
cis-Permethrin (as dry wt basis)	USEPA 8270	IANZ
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Di-n-butyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Di-n-octyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Dibenzo(ah)anthracene (as dry wt basis)	USEPA 8270	IANZ
Dibenzofuran (as dry wt basis)	USEPA 8270	IANZ
Dieldrin (as dry wt basis)	USEPA 8270	IANZ
Diethyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Dimethyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Diphenylhydrazine (as dry wt basis)	USEPA 8270	IANZ
Dry wt % Sludge	APHA (2005) 2540 G	IANZ
Endosulfan I (as dry wt basis)	USEPA 8270	IANZ
Endosulfan II (as dry wt basis)	USEPA 8270	IANZ
Endosulfan sulfate (as dry wt basis)	USEPA 8270	IANZ
Endrin (as dry wt basis)	USEPA 8270	IANZ
Endrin aldehyde (as dry wt basis)	USEPA 8270	IANZ
Fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Fluorene (as dry wt basis)	USEPA 8270	IANZ
gamma-Chlordane (as dry wt basis)	USEPA 8270	IANZ
Heptachlor (as dry wt basis)	USEPA 8270	IANZ
Heptachlor epoxide (as dry wt basis)	USEPA 8270	IANZ
Hexachlorobenzene (as dry wt basis)	USEPA 8270	IANZ
Hexachlorobutadiene (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
Hexachlorocyclopentadiene (as dry wt basis)	USEPA 8270	IANZ
Hexachloroethane (as dry wt basis)	USEPA 8270	IANZ
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	USEPA 8270	IANZ
Isophorone (as dry wt basis)	USEPA 8270	IANZ
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Lindane (BHC gamma as dry wt basis)	USEPA 8270	IANZ
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Methoxychlor (as dry wt basis)	USEPA 8270	IANZ
n-Nitrosodi-n-propylamine (as dry wt basis)	USEPA 8270	IANZ
n-Nitrosodiphenylamine (as dry wt basis)	USEPA 8270	IANZ
Naphthalene (as dry wt basis)	USEPA 8270	IANZ
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Nitrobenzene (as dry wt basis)	USEPA 8270	IANZ
Pentachlorophenol (as dry wt basis)	USEPA 8270	IANZ
Phenanthrene (as dry wt basis)	USEPA 8270	IANZ
Phenol (as dry wt basis)	USEPA 8270	IANZ
Preparation of solid samples for digestion	USEPA 200.8, modified	
Pyrene (as dry wt basis)	USEPA 8270	IANZ
trans-Permethrin (as dry wt basis)	USEPA 8270	IANZ
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ

Comments: This report replaces 11/38933-2.

Results are reported on an as received basis.

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

Dr You-Sing Yong
Operations Manager
22 November 2011
yyong@water.co.nz

water Care Laboratory Services

Certificate of Analysis

TONKIN & TAYLOR NZ LTD
105 CARLTON GORE ROAD
NEWMARKET
AUCKLAND

Copy To 1: Rachel Pickett
2: Leon Pemberton
3: Courtney Fagan

Attention: Rachel Pickett

Job Description: 11/26145.400 Tonkin & Taylor 10-Day TAT R Pickett
Batch Number: 11/38930

Sample Descriptions

Sample No.	Date Sampled	Sample Description
01	25/10/2011	TP6 0m
02	25/10/2011	TP6 0.5m
03	25/10/2011	TP8 0m
04	25/10/2011	TP8 0.5m
05	25/10/2011	TP9 0m
06	25/10/2011	TP9 0.25m
07	25/10/2011	TP10 0m
08	25/10/2011	TP10 0.5m

Results

Test Description	Units	Sample Number/Result					
		01	02	03	04	05	06
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.4	11.	< 1.8	< 1.8	2.8	3.2
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	1.2	3.1	< 0.91	< 0.92	< 0.89	< 0.89
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	230.	610.	83.	76.	53.	28.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	100.	290.	34.	39.	39.	12.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.9	2.1	< 0.45	< 0.46	< 0.44	< 0.45
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	110.	120.	140.	180.	120.	55.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	150.	300.	6.2	4.8	41.	13.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 67.	280.	< 68.	< 69.	< 67.	< 67.
Aldrin (as dry wt basis)	ug/kg		< 1.0000				
BHC alpha (as dry wt basis)	ug/kg		< 1.0000				
BHC beta (as dry wt basis)	ug/kg		< 1.0000				
BHC delta (as dry wt basis)	ug/kg		< 1.0000				
alpha-Chlordane (as dry wt basis)	ug/kg		< 1.00000				
gamma-Chlordane (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDD (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDE (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDT (as dry wt basis)	ug/kg		< 1.00000				
Dieldrin (as dry wt basis)	ug/kg		< 1.00000				

Test Description	Units	Sample Number/Result				
Endosulfan I (as dry wt basis)	ug/kg		< 1.0000			
Endosulfan II (as dry wt basis)	ug/kg		< 1.0000			
Endosulfan sulfate (as dry wt basis)	ug/kg		< 2.0000			
Endrin (as dry wt basis)	ug/kg		< 2.0000			
Endrin aldehyde (as dry wt basis)	ug/kg		< 4.0000			
Heptachlor (as dry wt basis)	ug/kg		< 1.0000			
Heptachlor epoxide (as dry wt basis)	ug/kg		< 4.0000			
Lindane (BHC gamma as dry wt basis)	ug/kg		< 1.0000			
Methoxychlor (as dry wt basis)	ug/kg		< 1.0000			
cis-Permethrin (as dry wt basis)	ug/kg		< 10.0000			
trans-Permethrin (as dry wt basis)	ug/kg		< 10.0000			
Acenaphthylene (as dry wt basis)	mg/kg	0.1600	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	0.1800	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	0.8200	0.0040	< 0.0100	< 0.0100	< 0.0100	0.0100
Benzo(a)pyrene (as dry wt basis)	mg/kg	1.1400	0.0020	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.5400	0.0030	< 0.0100	< 0.0100	< 0.0100	0.0600
Benzo(ghi)perylene (as dry wt basis)	mg/kg	0.6600	< 0.0010	< 0.0100	< 0.0100	0.0200	< 0.0100
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	0.8500	0.0040	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Chrysene (as dry wt basis)	mg/kg	0.8000	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	0.2600	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	1.3300	0.0080	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	0.6300	0.0030	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene (as dry wt basis)	mg/kg	0.1300		< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	0.4400	< 0.0010	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Pyrene (as dry wt basis)	mg/kg	1.3900	0.0040	< 0.0100	< 0.0100	< 0.0100	0.0300
bis(2-Ethylhexyl)phthalate (as dry wt basis)	mg/kg		< 0.100			
Butylbenzyl phthalate (as dry wt basis)	mg/kg		< 0.100			
bis(2-Ethylhexyl)adipate (as dry wt basis)	mg/kg		< 0.100			
Diethyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Dimethyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Di-n-butyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Di-n-octyl phthalate (as dry wt basis)	mg/kg		< 0.100			
4-Chloro-3-methylphenol (as dry wt basis)	mg/kg		< 0.100			
2-Chlorophenol (as dry wt	mg/kg		< 0.100			

Test Description	Units	Sample Number/Result			
basis)					
2,4-Dichlorophenol (as dry wt basis)	mg/kg	< 0.100			
2,6-Dichlorophenol (as dry wt basis)	mg/kg	< 0.100			
2,4-Dimethylphenol (as dry wt basis)	mg/kg	< 0.100			
2-Methyl 4,6-dinitrophenol (as dry wt basis)	mg/kg	< 0.100			
2-Methylphenol (as dry wt basis)	mg/kg	< 0.100			
4-Methylphenol (as dry wt basis)	mg/kg	< 0.100			
Pentachlorophenol (as dry wt basis)	mg/kg	< 0.100			
Phenol (as dry wt basis)	mg/kg	< 0.100			
2,4,5-Trichlorophenol (as dry wt basis)	mg/kg	< 0.100			
2,4,6-Trichlorophenol (as dry wt basis)	mg/kg	< 0.100			
2,3,4,6-Tetrachlorophenol (as dry wt basis)	mg/kg	< 0.100			
bis(2-Chloroethoxy)methane (as dry wt basis)	mg/kg	< 0.1000			
bis(2-Chloroethyl)ether (as dry wt basis)	mg/kg	< 0.1000			
bis(2-Chlorisopropyl)ether (as dry wt basis)	mg/kg	< 0.1000			
4-Bromophenylphenylether (as dry wt basis)	mg/kg	< 0.1000			
carbazole	mg/kg	< 0.1000			
2-Chloronaphthalene (as dry wt basis)	mg/kg	< 0.1000			
4-Chlorophenylphenyl ether (as dry wt basis)	mg/kg	< 0.1000			
Dibenzofuran (as dry wt basis)	mg/kg	< 0.1000			
1,3-Dichlorobenzene (as dry wt basis)	mg/kg	< 0.1000			
1,4-Dichlorobenzene (as dry wt basis)	mg/kg	< 0.1000			
1,2-Dichlorobenzene (as dry wt basis)	mg/kg	< 0.1000			
2,4-Dinitrotoluene (as dry wt basis)	mg/kg	< 0.1000			
2,6-Dinitrotoluene (as dry wt basis)	mg/kg	< 0.1000			
Diphenylhydrazine (as dry wt basis)	mg/kg	< 0.1000			
Hexachlorobenzene (as dry wt basis)	mg/kg	< 0.1000			
Hexachlorobutadiene (as dry wt basis)	mg/kg	< 0.1000			
Hexachlorocyclopentadiene (as dry wt basis)	mg/kg	< 0.1000			
Hexachloroethane (as dry wt basis)	mg/kg	< 0.1000			
Isophorone (as dry wt basis)	mg/kg	< 0.1000			
2-Methylnaphthalene (as dry wt basis)	mg/kg	< 0.1000			
Nitrobenzene (as dry wt basis)	mg/kg	< 0.1000			

Test Description	Units	Sample Number/Result					
n-Nitrosodi-n-propylamine (as dry wt basis)	mg/kg		< 0.1000				
n-Nitrosodiphenylamine (as dry wt basis)	mg/kg		< 0.1000				
1,2,4-Trichlorobenzene (as dry wt basis)	mg/kg		< 0.1000				
Dry wt % Sludge	%w/w	63.2	68.8	71.1	67.2	65.5	75.9
		07	08				
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	2.3	2.5				
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.9	< 0.89				
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	42.	54.				
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	20.	25.				
Acid Digestion: Recoverable Metals in Solids		1	1				
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.45	< 0.45				
Preparation of solid samples for digestion		Yes	Yes				
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	57.	61.				
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	13.	13.				
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 68.	< 67.				
Aldrin (as dry wt basis)	ug/kg		< 1.0000				
BHC alpha (as dry wt basis)	ug/kg		< 1.0000				
BHC beta (as dry wt basis)	ug/kg		< 1.0000				
BHC delta (as dry wt basis)	ug/kg		< 1.0000				
alpha-Chlordane (as dry wt basis)	ug/kg		< 1.00000				
gamma-Chlordane (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDD (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDE (as dry wt basis)	ug/kg		< 1.00000				
4,4'-DDT (as dry wt basis)	ug/kg		< 1.00000				
Dieldrin (as dry wt basis)	ug/kg		< 1.00000				
Endosulfan I (as dry wt basis)	ug/kg		< 1.0000				
Endosulfan II (as dry wt basis)	ug/kg		< 1.0000				
Endosulfan sulfate (as dry wt basis)	ug/kg		< 2.0000				
Endrin (as dry wt basis)	ug/kg		< 2.0000				
Endrin aldehyde (as dry wt basis)	ug/kg		< 4.0000				
Heptachlor (as dry wt basis)	ug/kg		< 1.0000				
Heptachlor epoxide (as dry wt basis)	ug/kg		< 4.0000				
Lindane (BHC gamma as dry wt basis)	ug/kg		< 1.0000				
Methoxychlor (as dry wt basis)	ug/kg		< 1.0000				
cis-Permethrin (as dry wt basis)	ug/kg		< 10.0000				
trans-Permethrin (as dry wt basis)	ug/kg		< 10.0000				
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010				

Test Description	Units	Sample Number/Result				
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Benzo(a)anthracene (as dry wt basis)	mg/kg	0.0300	< 0.0010			
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.0600	< 0.0010			
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Naphthalene (as dry wt basis)	mg/kg	< 0.0100				
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0010			
Pyrene (as dry wt basis)	mg/kg	0.0400	< 0.0010			
bis(2-Ethylhexyl)phthalate (as dry wt basis)	mg/kg		< 0.100			
Butylbenzyl phthalate (as dry wt basis)	mg/kg		< 0.100			
bis(2-Ethylhexyl)adipate (as dry wt basis)	mg/kg		< 0.100			
Diethyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Dimethyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Di-n-butyl phthalate (as dry wt basis)	mg/kg		< 0.100			
Di-n-octyl phthalate (as dry wt basis)	mg/kg		< 0.100			
4-Chloro-3-methylphenol (as dry wt basis)	mg/kg		< 0.100			
2-Chlorophenol (as dry wt basis)	mg/kg		< 0.100			
2,4-Dichlorophenol (as dry wt basis)	mg/kg		< 0.100			
2,6-Dichlorophenol (as dry wt basis)	mg/kg		< 0.100			
2,4-Dimethylphenol (as dry wt basis)	mg/kg		< 0.100			
2-Methyl 4,6-dinitrophenol (as dry wt basis)	mg/kg		< 0.100			
2-Methylphenol (as dry wt basis)	mg/kg		< 0.100			
4-Methylphenol (as dry wt basis)	mg/kg		< 0.100			
Pentachlorophenol (as dry wt basis)	mg/kg		< 0.100			
Phenol (as dry wt basis)	mg/kg		< 0.100			
2,4,5-Trichlorophenol (as dry wt basis)	mg/kg		< 0.100			
2,4,6-Trichlorophenol (as dry	mg/kg		< 0.100			

Test Description	Units	Sample Number/Result				
wt basis)						
2,3,4,6-Tetrachlorophenol (as dry wt basis)	mg/kg		< 0.100			
bis(2-Chloroethoxy)methane (as dry wt basis)	mg/kg		< 0.1000			
bis(2-Chloroethyl)ether (as dry wt basis)	mg/kg		< 0.1000			
bis(2-Chlorisopropyl)ether (as dry wt basis)	mg/kg		< 0.1000			
4-Bromophenylphenylether (as dry wt basis)	mg/kg		< 0.1000			
carbazole	mg/kg		< 0.1000			
2-Chloronaphthalene (as dry wt basis)	mg/kg		< 0.1000			
4-Chlorophenylphenyl ether (as dry wt basis)	mg/kg		< 0.1000			
Dibenzofuran (as dry wt basis)	mg/kg		< 0.1000			
1,3-Dichlorobenzene (as dry wt basis)	mg/kg		< 0.1000			
1,4-Dichlorobenzene (as dry wt basis)	mg/kg		< 0.1000			
1,2-Dichlorobenzene (as dry wt basis)	mg/kg		< 0.1000			
2,4-Dinitrotoluene (as dry wt basis)	mg/kg		< 0.1000			
2,6-Dinitrotoluene (as dry wt basis)	mg/kg		< 0.1000			
Diphenylhydrazine (as dry wt basis)	mg/kg		< 0.1000			
Hexachlorobenzene (as dry wt basis)	mg/kg		< 0.1000			
Hexachlorobutadiene (as dry wt basis)	mg/kg		< 0.1000			
Hexachlorocyclopentadiene (as dry wt basis)	mg/kg		< 0.1000			
Hexachloroethane (as dry wt basis)	mg/kg		< 0.1000			
Isophorone (as dry wt basis)	mg/kg		< 0.1000			
2-Methylnaphthalene (as dry wt basis)	mg/kg		< 0.1000			
Nitrobenzene (as dry wt basis)	mg/kg		< 0.1000			
n-Nitrosodi-n-propylamine (as dry wt basis)	mg/kg		< 0.1000			
n-Nitrosodiphenylamine (as dry wt basis)	mg/kg		< 0.1000			
1,2,4-Trichlorobenzene (as dry wt basis)	mg/kg		< 0.1000			
Dry wt % Sludge	%w/w	73.7	76.2			

Test Descriptions

Test Description	Method	Accredited
1,2,4-Trichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,2-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,3-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
1,4-Dichlorobenzene (as dry wt basis)	USEPA 8270	IANZ
2,3,4,6-Tetrachlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4,5-Trichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4,6-Trichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,4-Dichlorophenol (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
2,4-Dimethylphenol (as dry wt basis)	USEPA 8270	IANZ
2,4-Dinitrotoluene (as dry wt basis)	USEPA 8270	IANZ
2,6-Dichlorophenol (as dry wt basis)	USEPA 8270	IANZ
2,6-Dinitrotoluene (as dry wt basis)	USEPA 8270	IANZ
2-Chloronaphthalene (as dry wt basis)	USEPA 8270	IANZ
2-Chlorophenol (as dry wt basis)	USEPA 8270	IANZ
2-Methyl 4,6-dinitrophenol (as dry wt basis)	USEPA 8270	IANZ
2-Methylnaphthalene (as dry wt basis)	USEPA 8270	IANZ
2-Methylphenol (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDD (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDE (as dry wt basis)	USEPA 8270	IANZ
4,4'-DDT (as dry wt basis)	USEPA 8270	IANZ
4-Bromophenylphenylether (as dry wt basis)	USEPA 8270	IANZ
4-Chloro-3-methylphenol (as dry wt basis)	USEPA 8270	IANZ
4-Chlorophenylphenyl ether (as dry wt basis)	USEPA 8270	IANZ
4-Methylphenol (as dry wt basis)	USEPA 8270	IANZ
Acenaphthene (as dry wt basis)	USEPA 8270	IANZ
Acenaphthylene (as dry wt basis)	USEPA 8270	IANZ
Acid Digestion: Recoverable Metals in Solids	USEPA 200.8	
Aldrin (as dry wt basis)	USEPA 8270	IANZ
alpha-Chlordane (as dry wt basis)	USEPA 8270	IANZ
Anthracene (as dry wt basis)	USEPA 8270	IANZ
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Benzo(a)anthracene (as dry wt basis)	USEPA 8270	IANZ
Benzo(a)pyrene (as dry wt basis)	USEPA 8270	IANZ
Benzo(b)fluoroanthene (as dry wt basis)	USEPA 8270	IANZ
Benzo(ghi)perylene (as dry wt basis)	USEPA 8270	IANZ
Benzo(k)fluoranthene (as dry wt basis)	USEPA 8270	IANZ
BHC alpha (as dry wt basis)	USEPA 8270	IANZ
BHC beta (as dry wt basis)	USEPA 8270	IANZ
BHC delta (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chlorisopropyl)ether (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chloroethoxy)methane (as dry wt basis)	USEPA 8270	IANZ
bis(2-Chloroethyl)ether (as dry wt basis)	USEPA 8270	IANZ
bis(2-Ethylhexyl)adipate (as dry wt basis)	USEPA 8270	IANZ
bis(2-Ethylhexyl)phthalate (as dry wt basis)	USEPA 8270	IANZ
Butylbenzyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
carbazole	USEPA 8270	IANZ
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chrysene (as dry wt basis)	USEPA 8270	IANZ
cis-Permethrin (as dry wt basis)	USEPA 8270	IANZ
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Di-n-butyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Di-n-octyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Dibenzo(ah)anthracene (as dry wt basis)	USEPA 8270	IANZ
Dibenzofuran (as dry wt basis)	USEPA 8270	IANZ
Dieldrin (as dry wt basis)	USEPA 8270	IANZ
Diethyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Dimethyl phthalate (as dry wt basis)	USEPA 8270	IANZ
Diphenylhydrazine (as dry wt basis)	USEPA 8270	IANZ
Dry wt % Sludge	APHA (2005) 2540 G	IANZ
Endosulfan I (as dry wt basis)	USEPA 8270	IANZ
Endosulfan II (as dry wt basis)	USEPA 8270	IANZ
Endosulfan sulfate (as dry wt basis)	USEPA 8270	IANZ
Endrin (as dry wt basis)	USEPA 8270	IANZ
Endrin aldehyde (as dry wt basis)	USEPA 8270	IANZ
Fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Fluorene (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
gamma-Chlordane (as dry wt basis)	USEPA 8270	IANZ
Heptachlor (as dry wt basis)	USEPA 8270	IANZ
Heptachlor epoxide (as dry wt basis)	USEPA 8270	IANZ
Hexachlorobenzene (as dry wt basis)	USEPA 8270	IANZ
Hexachlorobutadiene (as dry wt basis)	USEPA 8270	IANZ
Hexachlorocyclopentadiene (as dry wt basis)	USEPA 8270	IANZ
Hexachloroethane (as dry wt basis)	USEPA 8270	IANZ
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	USEPA 8270	IANZ
Isophorone (as dry wt basis)	USEPA 8270	IANZ
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Lindane (BHC gamma as dry wt basis)	USEPA 8270	IANZ
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Methoxychlor (as dry wt basis)	USEPA 8270	IANZ
n-Nitrosodi-n-propylamine (as dry wt basis)	USEPA 8270	IANZ
n-Nitrosodiphenylamine (as dry wt basis)	USEPA 8270	IANZ
Naphthalene (as dry wt basis)	USEPA 8270	IANZ
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Nitrobenzene (as dry wt basis)	USEPA 8270	IANZ
Pentachlorophenol (as dry wt basis)	USEPA 8270	IANZ
Phenanthrene (as dry wt basis)	USEPA 8270	IANZ
Phenol (as dry wt basis)	USEPA 8270	IANZ
Preparation of solid samples for digestion	USEPA 200.8, modified	
Pyrene (as dry wt basis)	USEPA 8270	IANZ
trans-Permethrin (as dry wt basis)	USEPA 8270	IANZ
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ

Comments: This report replaces 11/38930-3.

Results are reported on an as received basis.

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

Dr You-Sing Yong
Operations Manager
22 November 2011
yyong@water.co.nz

Appendix F: May Road Site Investigation Information

SCALE 1: 2000

0 20 40 60 80 100 (m)

L:\26145\26145.400\WorkingMaterial\CAD\26145.400-FF-1.dwg MayRd 16/12/2011 2:33:05 p.m.

Tonkin & Taylor
Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

DRAWN	RBS	Dec.11
DRAFTING CHECKED		
APPROVED		
CADFILE : 26 145.400–FF– 1.dwg		
SCALES (AT A4 SIZE) 1: 2000		
PROJECT No. 26 145.400		

waterCare services limited

CENTRAL INTERCEPTOR

May Road – Testpit Location Plan

FIG. No. Figure F–1

REV. 0

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP1
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION					GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							TOPSOIL: Clayey SILT, brown, dry to moist				TOPSOIL	
							Clayey SILT, with some/minor gravels, orange brown to brown, wood and metal				FILL	
				0.5			Clayey SILT to silty CLAY, dark brown, moist to wet				NATURAL	
				1.0								
				1.5								
				2.0			**END OF TEST PIT AT 2m.**					
				2.5								
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP2
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							TOPSOIL: Clayey SILT, brown, dry to moist				TOPSOIL	
							Clayey SILT, with some/minor gravels, orange brown to brown, wood and metal				FILL	
				0.5			Clayey SILT to silty CLAY, dark brown, moist to wet				NATURAL	
				1.0								
				1.5			**END OF TEST PIT AT 1.5m.**					
				2.0								
				2.5								
				3.0								
				3.5								

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP3
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION					GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
							Clayey SILT, with sand, yellow to orange brown, dry to moist				FILL	
				0.5			Clayey SILT, yellow brown to dark brown, firm to stiff, dry to moist, Basalt boulder possible fill from 0.2m in side of pit.				NATURAL	
				1.0								
				1.5								
				2.0			**END OF TEST PIT AT 2m.**					
				2.5								
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP4
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0			TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
							Becoming clayey SILT with GRAVEL, minor sand, brown clay with grey basalt gravel-boulders, dry to 0.5m becoming moist at 1.6m				NATURAL	
				0.5								
				1.0								
				1.5								
							END OF TEST PIT AT 1.6m.					
				2.0								
				2.5								
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP5
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION					GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
							Becoming clayey SILT, with gravel, brown to orange brown, gravel-boulders of basalt, minor vesicles, dry				NATURAL	
				0.5			**END OF TEST PIT AT 0.5m.**					
				1.0								
				1.5								
				2.0								
				2.5								
				3.0								
				3.5								

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP6
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 20 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
				0.5			Clayey SILT, with gravel-boulders of basalt, moist to wet by 0.5m				NATURAL	
							END OF TEST PIT AT 0.7m.					
				1.0								
				1.5								
				2.0								
				2.5								
				3.0								
				3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP7
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
								Silty CLAY, with organics, minor sand, moist to wet, plastic, saturated by 1.5m				NATURAL	
					0.5								
					1.0			Becomes dark grey to dark brown by ~1m					
					1.5								
					2.0			**END OF TEST PIT AT 2m.**					
					2.5								
					3.0								
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP8
Location:

SHEET 1 OF 1

PROJECT: May Road	LOCATION: Mount Roskill	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE: Test Pit	EXCAV. STARTED: 26/10/11
	EQUIPMENT: 5 Tonne Digger	EXCAV FINISHED: 26/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CH
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0			TOPSOIL: Clayey SILT, minor sand and gravel, dark brown, moist				TOPSOIL	
							Silty CLAY, with organics, minor sand, moist to to approx. 0.2m then wet (not as wet as TP7), plastic				NATURAL	
				0.5								
				1.0			Becomes dark grey/brown from ~1.0m					
				1.5								
				2.0			**END OF TEST PIT AT 2m.**					
				2.5								
				3.0								
				3.5								

Table 1: May Road Soil Test Results - Metals

Test Description	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges	Unit	TP1 - 0	TP1 - 0.25	TP1 - 0.5	TP1 - 1.5	TP2 - 0	TP2 - 0.25	TP2 - 0.5	TP2 - 1.5	TP3 - 0	TP3 -0A (Duplicate)	Relative Percentage Difference
					Topsoil	Fill	Natural	Natural	Topsoil	Fill	Natural	Natural	Topsoil	Topsoil	-
Arsenic	1.08	70	100	mg/kg	< 1.8	*1.9*	< 1.8	*2.4*	< 1.8	< 1.8	< 1.8	< 1.8	*3.9*	*3*	6.5
Cadmium	0.28	1,300	7.5	mg/kg	< 0.89	< 0.9	< 0.9	< 0.89	< 0.9	< 0.9	< 0.89	< 0.89	*0.29*	0.16	14.4
Chromium	101	NL	400	mg/kg	17	22	20	34	31	31	18	13	20	18	2.6
Copper	53.1	NL	325	mg/kg	16	13	9.6	21	*160*	*250*	< 4.5	< 4.5	*87*	46	15.4
Lead	13.1	3,300	250	mg/kg	*130*	*26*	*24*	*30*	*42*	*110*	6.2	7.4	*53*	*25*	17.9
Mercury	0.125	4,200	0.75	mg/kg	< 0.44	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	0.064	<0.05	NC
Nickel	251	3,000[4]	251[3]	mg/kg	14	28	26	24	37	68	9.1	6.7	28	16	13.6
Zinc	280	35,500[4]	400	mg/kg	< 67	< 67	< 68	< 67	120	150	< 67	< 67	100	80	5.6

Test Description	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges	Unit	TP3 - 0.25	TP3 - 0.5	TP3 - 1.5	TP4 - 0	TP4 - 0.5	TP4 - 1.5	TP5 - 0	TP5 - 0.25	TP6 - 0	TP6 - 0.5
					Fill	Fill	Natural	Topsoil	Natural	Natural	Topsoil	Natural	Topsoil	Natural
Arsenic	1.08	70	100	mg/kg	*3.3*	*3.1*	< 1.8	*3.6*	< 1.8	< 1.8	*5.2*	< 1.8	*2*	< 1.8
Cadmium	0.28	1,300	7.5	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.89	< 0.9	< 0.9	< 0.9
Chromium	101	NL	400	mg/kg	15	13	19	17	71	*200*	62	92	62	46
Copper	53.1	NL	325	mg/kg	16	15	5.3	*54*	35	14	57	4.6	19	< 4.5
Lead	13.1	3,300	250	mg/kg	13	8.7	12	*22*	*42*	9.6	*150*	10	*46*	8.1
Mercury	0.125	4,200	0.75	mg/kg	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Nickel	251	3,000[4]	251[3]	mg/kg	9.3	4.5	16	11	54	53	46	35	33	15
Zinc	280	35,500[4]	400	mg/kg	< 67	< 67	< 67	< 68	94	< 68	150	< 67	< 68	< 68

Test Description	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges	Unit	TP7 - 0	TP7 - 0A	Relative Percentage Difference	TP7 - 0.25	TP7 - 1.6	TP8 - 0.25	TP8 - 1.5	HA01 - 0.25m	HA02 - 0-0.1m	HA03 - 0-0.1m
					Topsoil	Topsoil	-	Natural	Natural	Natural	Natural	Fill	Topsoil	Topsoil
Arsenic	1.08	70	100	mg/kg	<1.8	<1.8	NC	< 1.8	*2*	0.25	< 1.8	*1.4*	*6.3*	*8.2*
Cadmium	0.28	1,300	7.5	mg/kg	<0.089	<0.89	NC	< 0.89	< 0.9	< 0.1	< 0.9	< 0.099	*0.89*	*0.5*
Chromium	101	NL	400	mg/kg	17	19	3.00	14	37	73	26	15	45	34
Copper	53.1	NL	325	mg/kg	6.1	7.2	4.10	< 4.5	24	2.2	20	20	*210*	*97*
Lead	13.1	3,300	250	mg/kg	13	*15*	3.60	*16*	5.2	4.6	5.2	*16*	*190*	*140*
Mercury	0.125	4,200	0.75	mg/kg	<0.45	<0.45	NC	< 0.45	< 0.45	0.067	< 0.45	0.082	0.096	0.08
Nickel	251	3,000[4]	251[3]	mg/kg	7.1	7.8	2.30	6.4	69	3.2	32	10	70	51
Zinc	280	35,500[4]	400	mg/kg	<67	<67	NC	< 67	< 67	7.8	< 68	36	170	180

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

All results in mg/kg

1 - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region, Mt Mangere, Site 112.

4 - NEPC, 1999. Guideline on the Investigation Levels for Soil and Groundwater (Recreational).

Table 2: May Road Soil Test Results - TPH and PAH

	Background Concentrations[4]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP1 - 0	TP1 - 0.25	TP1 - 1.0	TP1 - 1.5	TP2 - 0	TP2 - 0.25	TP2 - 0.5	TP2 - 1.5	TP3 - 0
					Topsoil	Fill	Natural	Natural	Topsoil	Fill	Natural	Natural	Topsoil
PAH													
Acenaphthylene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene	<LD	-	-	mg/kg	*0.0500*	*0.0800*	*0.0800*	< 0.0100	< 0.0100	*0.0300*	*0.0500*	*0.7800*	*0.0700*
Benzo(b)fluoroanthene	<LD	-	-	mg/kg	*0.0700*	*0.1000*	*0.1000*	< 0.0100	*0.0600*	0.0700	< 0.0100	< 0.0100	*0.1000*
Benzo(ghi)perylene	<LD	-	-	mg/kg	< 0.0100	*0.0500*	*0.0500*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene	<LD	-	-	mg/kg	*0.0300*	*0.0500*	*0.0600*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	*0.0600*
Chrysene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene	<LD	-	-	mg/kg	*0.0400*	*0.0800*	*0.0700*	< 0.0100	< 0.0100	*0.0300*	< 0.0100	< 0.0100	*0.0900*
Fluorene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	< 0.0100	*0.0500*	*0.0400*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene	<LD	230[3]	230[3]	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	-	mg/kg	*0.0400*	*0.0500*	*0.0500*	*0.0200*	< 0.0100	*0.0400*	< 0.0100	< 0.0100	< 0.0100
Pyrene	<LD	NA[3]	NA[3]	mg/kg	*0.0800*	*0.1200*	*0.1200*	*0.0300*	*0.0300*	*0.0800*	< 0.0100	< 0.0100	*0.1500*
Benzo(a)pyrene equivalent	<LD	35	2.15	mg/kg	*0.07*	*0.11*	*0.11*	*0.01*	*0.02*	*0.04*	*0.05*	*0.79*	*0.09*
TPH													
TPH Band C7-C9	<LD	8800[3]	8800[3]	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C10-C14	<LD	1900[3]	1900[3]	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C15-C36	<LD	NA[3]	NA[3]	mg/kg	-	-	-	-	-	-	-	-	-

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

Italicised values exceed background concentrations

NA - Indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - <LD background concentrations are below the laboratory limit of detection.

Table 2: May Road Soil Test Results - TPH and PAH

	Background Concentrations[4]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP3 -0A	TP3 - 0.25	TP3 - 0.5	TP3 - 1.5	TP4 - 0.5	TP5 - 0	TP6 - 0	TP6 - 0.5	TP7 - 0A
					Topsoil	Fill	Fill	Natural	Natural	Topsoil	Natural	Natural	Topsoil
PAH													
Acenaphthylene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene	<LD	-	-	mg/kg	0.0600	< 0.0100	< 0.0100	< 0.0100	*0.0100*	< 0.0100	< 0.0100	*0.0400*	< 0.0100
Benzo(b)fluoroanthene	<LD	-	-	mg/kg	0.0900	< 0.0100	< 0.0100	< 0.0100	*0.0700*	*0.0500*	*0.0500*	< 0.0100	*0.0600*
Benzo(ghi)perylene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene	<LD	-	-	mg/kg	0.0500	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Chrysene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene	<LD	-	-	mg/kg	0.0400	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluorene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene	<LD	230[3]	230[3]	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Pyrene	<LD	NA[3]	NA[3]	mg/kg	*0.1000*	*0.0500*	*0.0100*	*0.0200*	*0.0500*	< 0.0100	*0.0200*	< 0.0100	*0.0500*
Benzo(a)pyrene equivalent	<LD	35	2.15	mg/kg	*0.08*	NC	*0.01*	*NC*	*0.02*	*0.02*	*0.02*	*0.05*	*0.02*
TPH													
TPH Band C7-C9	<LD	8800[3]	8800[3]	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C10-C14	<LD	1900[3]	1900[3]	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C15-C36	<LD	NA[3]	NA[3]	mg/kg	-	-	-	-	-	-	-	-	-

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

Italicised values exceed background concentrations

NA - Indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - <LD background concentrations are below the laboratory limit of detection.

Table 2: May Road Soil Test Results - TPH and PAH

	Background Concentrations[4]	NES Soil Contaminant Standards (Commercial/ Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP7 - 1.6	TP8 - 0.25	HA01 0.25m	HA02 0-0.1m	HA03 0-0.1m
					Natural	Natural	Fill	Topsoil	Topsoil
PAH									
Acenaphthylene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.09*	*0.23*
Benzo(a)pyrene	<LD	-	-	mg/kg	*0.2100*	< 0.0100	< 0.0100	*0.11*	*0.33*
Benzo(b)fluoroanthene	<LD	-	-	mg/kg	*0.0800*	< 0.0100	< 0.0100	*0.14*	*0.3*
Benzo(ghi)perylene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.08*	*0.22*
Benzo(k)fluoranthene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.11*	*0.24*
Chrysene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	*0.07*
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.03*	*0.07*
Fluoranthene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.12*	*0.24*
Fluorene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.05*	*0.17*
Naphthalene	<LD	230[3]	230[3]	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	-	mg/kg	*0.0400*	< 0.0100	< 0.0100	*0.06*	*0.1*
Pyrene	<LD	NA[3]	NA[3]	mg/kg	*0.0400*	< 0.0100	*0.03*	*0.19*	*0.33*
Benzo(a)pyrene equivalent	<LD	35	2.15	mg/kg	*0.22*	NC	NC	*0.18*	*0.49*
TPH									
TPH Band C7-C9	<LD	8800[3]	8800[3]	mg/kg	-	-	-	< 20.00	-
TPH Band C10-C14	<LD	1900[3]	1900[3]	mg/kg	-	-	-	< 20.00	-
TPH Band C15-C36	<LD	NA[3]	NA[3]	mg/kg	-	-	-	*140.00*	-

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

Italicised values exceed background concentrations

NA - Indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999, Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - <LD background concentrations are below the laboratory limit of detection.

Table 3: May Road - Soil Disposal - Metals

Test Description	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria (Non-Volcanic)[2]	Example Managed Fill Criteria[3]	Unit	TP1 - 0	TP1 - 0.25	TP1 - 0.5	TP1 - 1.5	TP2 - 0	TP2 - 0.25	TP2 - 0.5	TP2 - 1.5	TP3 - 0	TP3 -0A
					Topsoil	Fill	Natural	Natural	Topsoil	Fill	Natural	Natural	Topsoil	Topsoil
Arsenic	1.08	12	30	mg/kg	< 1.8	*1.9*	< 1.8	*2.4*	< 1.8	< 1.8	< 1.8	< 1.8	*3.9*	*3*
Cadmium	0.28	0.65	20	mg/kg	< 0.89	< 0.9	< 0.9	< 0.80	< 0.9	< 0.9	< 0.89	< 0.89	*0.29*	0.16
Chromium	101	55	400	mg/kg	17	22	20	34	31	31	18	13	20	18
Copper	53.1	45	325	mg/kg	16	13	9.6	21	160	750	< 4.5	< 4.5	87	46
Lead	13.1	65	250	mg/kg	720	*26*	*24*	*30*	*42*	110	6.2	7.4	*53*	*25*
Mercury	0.125	0.45	-	mg/kg	< 0.44	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	0.064	< 0.05
Nickel	251	35	250	mg/kg	14	28	26	24	37	58	9.1	6.7	28	16
Zinc	280	180	1160	mg/kg	< 67	< 67	< 68	< 67	120	150	< 67	< 67	100	80

Test Description	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria (Non-Volcanic)[2]	Example Managed Fill Criteria[3]	Unit	TP3 - 0.25	TP3 - 0.5	TP3 - 1.5	TP4 - 0	TP4 - 0.5	TP4 - 1.5	TP5 - 0	TP5 - 0.25	TP6 - 0	TP6 - 0.5
					Fill	Fill	Natural	Topsoil	Natural	Natural	Topsoil	Natural	Topsoil	Natural
Arsenic	1.08	12	30	mg/kg	*3.3*	*3.1*	< 1.8	*3.6*	< 1.8	< 1.8	*5.2*	< 1.8	*2*	< 1.8
Cadmium	0.28	0.65	20	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.89	< 0.9	< 0.9	< 0.9
Chromium	101	55	400	mg/kg	15	13	19	17	71	200	62	92	62	46
Copper	53.1	45	325	mg/kg	16	15	5.3	54	35	14	57	4.6	19	< 4.5
Lead	13.1	65	250	mg/kg	13	8.7	12	*22*	*42*	9.6	350	10	*46*	8.1
Mercury	0.125	0.45	-	mg/kg	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Nickel	251	35	250	mg/kg	9.3	4.5	16	11	53	53	46	35	33	15
Zinc	280	180	1160	mg/kg	< 67	< 67	< 67	< 68	94	< 68	150	< 67	< 68	< 68

Test Description	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria (Non-Volcanic)[2]	Example Managed Fill Criteria[3]	Unit	TP7 - 0	TP7 - 0A	TP7 - 0.25	TP7 - 1.6	TP8 - 0.25	TP8 - 1.5	HA01 - 0.25m	HA02 - 0-0.1m	HA03 - 0-0.1m
					Topsoil	Topsoil	Natural	Natural	Natural	Natural	Fill	Topsoil	Topsoil
Arsenic	1.08	12	30	mg/kg	< 1.8	< 1.8	< 1.8	*2*	0.25	< 1.8	*1.4*	*6.3*	*8.2*
Cadmium	0.28	0.65	20	mg/kg	< 0.89	< 0.89	< 0.89	< 0.9	< 0.1	< 0.9	< 0.099	0.85	*0.5*
Chromium	101	55	400	mg/kg	17	19	14	37	73	26	15	45	34
Copper	53.1	45	325	mg/kg	6.1	7.2	< 4.5	24	2.2	20	20	210	97
Lead	13.1	65	250	mg/kg	13	*15*	*16*	5.2	4.6	5.2	*16*	190	140
Mercury	0.125	0.45	-	mg/kg	< 0.45	< 0.45	< 0.45	< 0.45	0.067	< 0.45	0.082	0.096	0.08
Nickel	251	35	250	mg/kg	7.1	7.8	6.4	59	3.2	32	10	70	51
Zinc	280	180	1160	mg/kg	< 67	< 67	< 67	< 67	7.8	< 68	36	170	130

Notes:

Shaded values exceed the cleanfill criteria

Bold values exceed the example managed fill criteria

Italicised values exceed background concentrations for volcanic soils

1 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Mt Roskill (Site 106).

2 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Maximum Non-Volcanic background concentrations.

3 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: May Road - Soil Disposal - TPH and PAH

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP1 - 0	TP1 - 0.25	TP1 - 1.0	TP1 - 1.5	TP2 - 0	TP2 - 0.25	TP2 - 0.5	TP2 - 1.5	TP3 - 0
				Topsoil	Fill	Natural	Natural	Topsoil	Fill	Natural	Natural	Topsoil
PAH												
Acenaphthylene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene	<LD	-	mg/kg	*0.0500*	*0.0800*	*0.0800*	< 0.0100	< 0.0100	*0.0300*	*0.0500*	*0.7800*	*0.0700*
Benzo(b)fluoroanthene	<LD	-	mg/kg	*0.0700*	*0.1000*	*0.1000*	< 0.0100	*0.0600*	*0.0700*	< 0.0100	< 0.0100	*0.1000*
Benzo(ghi)perylene	<LD	-	mg/kg	< 0.0100	*0.0500*	*0.0500*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene	<LD	-	mg/kg	*0.0300*	*0.0500*	*0.0500*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	*0.0500*
Chrysene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene	<LD	-	mg/kg	*0.0400*	*0.0800*	*0.0700*	< 0.0100	< 0.0100	*0.0300*	< 0.0100	< 0.0100	*0.0900*
Fluorene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	mg/kg	< 0.0100	*0.0500*	*0.0400*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	mg/kg	*0.0400*	*0.0500*	*0.0500*	*0.0200*	< 0.0100	*0.0400*	< 0.0100	< 0.0100	< 0.0100
Pyrene	<LD	-	mg/kg	*0.0800*	*0.1200*	*0.1200*	*0.0300*	*0.0300*	*0.0500*	< 0.0100	< 0.0100	*0.1500*
Benzo(a)pyrene equivalent	<LD	25	mg/kg	*0.07*	*0.11*	*0.11*	*0.01*	*0.02*	*0.04*	*0.06*	*0.79*	*0.09*
TPH Band C7-C9	<LD	120	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C10-C14	<LD	500	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C15-C36	<LD	10000	mg/kg	-	-	-	-	-	-	-	-	-

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed background concentrations
NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: May Road - Soil Disposal - TPH and PAH

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP3 -0A	TP3 - 0.25	TP3 - 0.5	TP3 - 1.5	TP4 - 0.5	TP5 - 0	TP6 - 0	TP6 - 0.5	TP7 - 0A
				Topsoil	Fill	Fill	Natural	Natural	Topsoil	Natural	Natural	Topsoil
PAH												
Acenaphthylene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene	<LD	-	mg/kg	*0.0600*	< 0.0100	< 0.0100	< 0.0100	0.0100	< 0.0100	< 0.0100	*0.0400*	< 0.0100
Benzo(b)fluoroanthene	<LD	-	mg/kg	*0.0300*	< 0.0100	< 0.0100	< 0.0100	*0.0700*	*0.0500*	*0.0500*	< 0.0100	*0.0500*
Benzo(ghi)perylene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene	<LD	-	mg/kg	*0.0500*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Chrysene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene	<LD	-	mg/kg	*0.0400*	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluorene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Pyrene	<LD	-	mg/kg	*0.1000*	*0.0500*	*0.0100*	*0.0700*	*0.0500*	< 0.0100	*0.0200*	< 0.0100	*0.0500*
Benzo(a)pyrene equivalent	<LD	25	mg/kg	*0.05*	*0.01*	*0.01*	*0.01*	*0.02*	*0.02*	*0.02*	*0.05*	*0.02*
TPH Band C7-C9	<LD	120	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C10-C14	<LD	500	mg/kg	-	-	-	-	-	-	-	-	-
TPH Band C15-C36	<LD	10000	mg/kg	-	-	-	-	-	-	-	-	-

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed background concentrations
NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: May Road - Soil Disposal - TPH and PAH

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP7 - 1.6	TP8 - 0.25	HA01 0.25m	HA02 0-0.1m	HA03 0-0.1m
				Natural	Natural	Fill	Topsoil	Topsoil
PAH								
Acenaphthylene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.63*	*0.23*
Benzo(a)pyrene	<LD	-	mg/kg	*0.2100*	< 0.0100	< 0.0100	*0.11*	*0.33*
Benzo(b)fluoroanthene	<LD	-	mg/kg	*0.0800*	< 0.0100	< 0.0100	*0.14*	*0.3*
Benzo(ghi)perylene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.03*	*0.22*
Benzo(k)fluoranthene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.11*	*0.24*
Chrysene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	*0.07*
Dibenzo(ah)anthracene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.03*	*0.07*
Fluoranthene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.12*	*0.24*
Fluorene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	*0.05*	*0.17*
Naphthalene	<LD	-	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	mg/kg	*0.0900*	< 0.0100	< 0.0100	*0.06*	*0.2*
Pyrene	<LD	-	mg/kg	*0.0400*	< 0.0100	*0.03*	*0.13*	*0.33*
Benzo(a)pyrene equivalent	<LD	25	mg/kg	*0.22*	NC	*0.01*	*0.18*	*0.49*

TPH Band C7-C9	<LD	120	mg/kg	-	-	-	< 20.00	-
TPH Band C10-C14	<LD	500	mg/kg	-	-	-	< 20.00	-
TPH Band C15-C36	<LD	10000	mg/kg	-	-	-	*140.00*	-

Notes:
Shaded values exceed the cleanfill criteria
Bold values exceed the example managed fill criteria
Italicised values exceed background concentrations
NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

water Care
Laboratory Services

Certificate of Analysis

TONKIN & TAYLOR NZ LTD
105 CARLTON GORE ROAD
NEWMARKET
AUCKLAND

Copy To 1: Leon Pemberton
2: Courtney Fagan

Attention: Rachel Pickett

Job Description: 11/26145.400 Tonkin & Taylor 10-Day TAT R Pickett
Batch Number: 11/39235

Sample Descriptions

Sample No.	Date Sampled	Sample Description
01	26/10/2011	TP1/0
02	26/10/2011	TP1/0.25
03	26/10/2011	TP1/0.5
04	26/10/2011	TP1/1.5
05	26/10/2011	TP2/0
06	26/10/2011	TP2/0.25
07	26/10/2011	TP2/0.5
08	26/10/2011	TP2/1.5
09	26/10/2011	TP3/0
10	26/10/2011	TP3/0A
11	26/10/2011	TP3/0.25
12	26/10/2011	TP3/0.5
13	26/10/2011	TP3/1.5
14	26/10/2011	TP4/0
15	26/10/2011	TP4/0.5
16	26/10/2011	TP4/1.5
17	26/10/2011	TP5/0
18	26/10/2011	TP5/0.25
19	26/10/2011	TP6/0
20	26/10/2011	TP6/0.5
21	26/10/2011	TP7/0
22	26/10/2011	TP7/0A
23	26/10/2011	TP7/0.25
24	26/10/2011	TP7/1.6
25	26/10/2011	TP8/0.25
26	26/10/2011	TP8/1.5

Results

Test Description	Units	Sample Number/Result					
		01	02	03	04	05	06
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 1.8	1.9	< 1.8	2.4	< 1.8	< 1.8
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.89	< 0.9	< 0.9	< 0.89	< 0.9	< 0.9
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	17.	22.	20.	34.	31.	31.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	16.	13.	9.6	21.	160.	250.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.44	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Preparation of solid samples		Yes	Yes	Yes	Yes	Yes	Yes

Test Description	Units	Sample Number/Result					
for digestion							
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	14.	28.	26.	24.	37.	68.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	130.	26.	24.	30.	42.	110.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 67.	< 67.	< 68.	< 67.	120.	150.
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene (as dry wt basis)	mg/kg	0.0500	0.0800	0.0800	< 0.0100	< 0.0100	0.0300
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.0700	0.1000	0.1000	< 0.0100	0.0600	0.0700
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	0.0500	0.0500	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	0.0300	0.0500	0.0600	< 0.0100	< 0.0100	< 0.0100
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	0.0400	0.0800	0.0700	< 0.0100	< 0.0100	0.0300
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0500	0.0400	< 0.0100	< 0.0100	< 0.0100
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	0.0400	0.0500	0.0500	0.0200	< 0.0100	0.0400
Pyrene (as dry wt basis)	mg/kg	0.0800	0.1200	0.1200	0.0300	0.0300	0.0800
Dry wt % Sludge	%w/w	63.9	74.1	75.2	69.9	69.1	67.8
		07	**08**	**09**	**10**	**11**	**12**
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 1.8	< 1.8	3.9	3.	3.3	3.1
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.89	< 0.89	0.29	0.16	< 0.9	< 0.9
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	18.	13.	20.	18.	15.	13.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 4.5	< 4.5	87.	46.	16.	15.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.45	< 0.45	0.064	< 0.05	< 0.45	< 0.45
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	9.1	6.7	28.	16.	9.3	4.5
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	6.2	7.4	53.	25.	13.	8.7
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 67.	< 67.	100.	80.	< 67.	< 67.
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100

Test Description	Units	Sample Number/Result					
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)pyrene (as dry wt basis)	mg/kg	0.0500	0.7800	0.0700	0.0600	< 0.0100	< 0.0100
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.1000	0.0900	< 0.0100	< 0.0100
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0600	0.0500	< 0.0100	< 0.0100
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0900	0.0400	< 0.0100	< 0.0100
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.1500	0.1000	0.0500	0.0100
Dry wt % Sludge	%w/w	72.5	71.7	67.6	50.1	76.5	76.6
		13	**14**	**15**	**16**	**17**	**18**
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 1.8	3.6	< 1.8	< 1.8	5.2	< 1.8
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.89	< 0.9
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	19.	17.	71.	200.	62.	92.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	5.3	54.	35.	14.	57.	4.6
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	16.	11.	54.	53.	46.	35.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	12.	22.	42.	9.6	150.	10.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 67.	< 68.	94.	< 68.	150.	< 67.
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Anthracene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100		0.0100		< 0.0100	
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100		0.0700		0.0500	
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	

Test Description	Units	Sample Number/Result					
Chrysene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Fluorene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Naphthalene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100		< 0.0100		< 0.0100	
Pyrene (as dry wt basis)	mg/kg	0.0200		0.0500		< 0.0100	
Dry wt % Sludge	%w/w	71.5	73.3	72.0	64.8	65.0	73.4
		19	20	21	22	23	24
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	2.	< 1.8	< 1.8	< 1.8	< 1.8	2.
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.9	< 0.9	< 0.89	< 0.89	< 0.89	< 0.9
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	62.	46.	17.	19.	14.	37.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	19.	< 4.5	6.1	7.2	< 4.5	24.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	33.	15.	7.1	7.8	6.4	69.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	46.	8.1	13.	15.	16.	5.2
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 68.	< 68.	< 67.	< 67.	< 67.	< 67.
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0400		< 0.0100		0.2100
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.0500	< 0.0100		0.0600		0.0800
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100		< 0.0100		0.0400
Pyrene (as dry wt basis)	mg/kg	0.0200	< 0.0100		0.0500		0.0400

Test Description	Units	Sample Number/Result					
Dry wt % Sludge	%w/w	59.9	70.8	69.1	59.3	69.9	70.2
		25	26				
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.25	< 1.8				
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.1	< 0.9				
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	7.3	26.				
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	2.2	20.				
Acid Digestion: Recoverable Metals in Solids		1	1				
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.067	< 0.45				
Preparation of solid samples for digestion		Yes	Yes				
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	3.2	32.				
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.6	5.2				
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	7.8	< 68.				
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100					
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100					
Anthracene (as dry wt basis)	mg/kg	< 0.0100					
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100					
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100					
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100					
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100					
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100					
Chrysene (as dry wt basis)	mg/kg	< 0.0100					
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100					
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100					
Fluorene (as dry wt basis)	mg/kg	< 0.0100					
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100					
Naphthalene (as dry wt basis)	mg/kg	< 0.0100					
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100					
Pyrene (as dry wt basis)	mg/kg	< 0.0100					
Dry wt % Sludge	%w/w	76.9	73.7				

Test Descriptions

Test Description	Method	Accredited
Acenaphthene (as dry wt basis)	USEPA 8270	IANZ
Acenaphthylene (as dry wt basis)	USEPA 8270	IANZ
Acid Digestion: Recoverable Metals in Solids	USEPA 200.8	
Anthracene (as dry wt basis)	USEPA 8270	IANZ
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Benzo(a)anthracene (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
Benzo(a)pyrene (as dry wt basis)	USEPA 8270	IANZ
Benzo(b)fluoroanthene (as dry wt basis)	USEPA 8270	IANZ
Benzo(ghi)perylene (as dry wt basis)	USEPA 8270	IANZ
Benzo(k)fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chrysene (as dry wt basis)	USEPA 8270	IANZ
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Dibenzo(ah)anthracene (as dry wt basis)	USEPA 8270	IANZ
Dry wt % Sludge	APHA (2005) 2540 G	IANZ
Fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Fluorene (as dry wt basis)	USEPA 8270	IANZ
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	USEPA 8270	IANZ
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Naphthalene (as dry wt basis)	USEPA 8270	IANZ
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Phenanthrene (as dry wt basis)	USEPA 8270	IANZ
Preparation of solid samples for digestion	USEPA 200.8, modified	
Pyrene (as dry wt basis)	USEPA 8270	IANZ
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ

Comments: This report replaces 11/39235-1.

Results are reported on an as received basis.

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

:

Dr You-Sing Yong
Operations Manager
10 November 2011
yyong@water.co.nz

water Care
Laboratory Services

Certificate of Analysis

TONKIN & TAYLOR NZ LTD
105 CARLTON GORE ROAD
NEWMARKET
AUCKLAND

Copy To 1: Rachel Pickett
2: Leon Pemberton
3: Courtney Fagan

Attention: Rachel Pickett

Job Description: 11/26145.400 Tonkin & Taylor 10-Day TAT R Pickett
Batch Number: 11/41976

Sample Descriptions

Sample No.	Date Sampled	Sample Description
01	11/11/2011	HA01 (0.25m)
02	11/11/2011	HA02 (0-0.1m)
03	11/11/2011	HA03 (0-0.1m)

Results

Test Description	Units	Sample Number/Result		
		01	02	03
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	1.4	6.3	8.2
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.099	0.89	0.5
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	15.	45.	34.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	20.	210.	97.
Acid Digestion: Recoverable Metals in Solids		1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.082	0.096	0.08
Preparation of solid samples for digestion		Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	10.	70.	51.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	16.	190.	140.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	36.	170.	180.
TPH Band C10-C14 as dry wt basis	mg/kg		< 20.00	
TPH Band C15-C36 (as dry wt basis)	mg/kg		140.00	
TPH Band C7-C9 (as dry wt basis)	mg/kg		< 20.00	
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	0.0900	0.2300
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.1100	0.3300
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100	0.1400	0.3000

Test Description	Units	Sample Number/Result					
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	0.0800	0.2200			
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	0.1100	0.2400			
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	0.0700			
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	0.0300	0.0700			
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	0.1200	0.2400			
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100			
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0500	0.1700			
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100			
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	0.0600	0.1000			
Pyrene (as dry wt basis)	mg/kg	0.0300	0.1900	0.3300			
Total petroleum hydrocarbons profile (C7-C36 as drywt basis)	mg/kg		140.00				
Dry wt % Sludge	%w/w	74.2	74.5	68.8			

Test Descriptions

Test Description	Method	Accredited
Acenaphthene (as dry wt basis)	USEPA 8270	IANZ
Acenaphthylene (as dry wt basis)	USEPA 8270	IANZ
Acid Digestion: Recoverable Metals in Solids	USEPA 200.8	
Anthracene (as dry wt basis)	USEPA 8270	IANZ
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Benzo(a)anthracene (as dry wt basis)	USEPA 8270	IANZ
Benzo(a)pyrene (as dry wt basis)	USEPA 8270	IANZ
Benzo(b)fluoroanthene (as dry wt basis)	USEPA 8270	IANZ
Benzo(ghi)perylene (as dry wt basis)	USEPA 8270	IANZ
Benzo(k)fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chrysene (as dry wt basis)	USEPA 8270	IANZ
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Dibenzo(ah)anthracene (as dry wt basis)	USEPA 8270	IANZ
Dry wt % Sludge	APHA (2005) 2540 G	IANZ
Fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Fluorene (as dry wt basis)	USEPA 8270	IANZ
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	USEPA 8270	IANZ
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Naphthalene (as dry wt basis)	USEPA 8270	IANZ
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Phenanthrene (as dry wt basis)	USEPA 8270	IANZ
Preparation of solid samples for digestion	USEPA 200.8, modified	
Pyrene (as dry wt basis)	USEPA 8270	IANZ
Total petroleum hydrocarbons profile (C7-C36 as drywt basis)	Extraction GC-FID	IANZ
TPH Band C10-C14 as dry wt basis	Extraction DCM, GC-FID	IANZ
TPH Band C15-C36 (as dry wt basis)	Extraction DCM, GC-FID	IANZ
TPH Band C7-C9 (as dry wt basis)	Extraction DCM, GC-FID	IANZ
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ

Comments: This report replaces 11/41976-1.

Results are reported on an as received basis.

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

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Dr You-Sing Yong
Operations Manager
28 November 2011
yyong@water.co.nz

DOWDELL & ASSOCIATES LTD

OCCUPATIONAL HEALTH ANALYSTS & CONSULTANTS

4 Cain Rd, Penrose, PO Box 112-017 Auckland 1642, Phone (09) 5260-246. Fax (09) 5795-389.

29th October 2011

Tonkin & Taylor Ltd
PO Box 5271
Newmarket
Auckland

Attn Courtney Fagan

Dear Courtney,

Re: Bulk Fibre Analysis -

Sampled by	: Client
Date Samples Received	: 28th October 2011
Laboratory No.	: 26162
Location/Description	: 26145.400, 4x soil samples for asbestos ID
Method	: AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.

The following samples were examined using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques.
The following results apply to the samples as received.

Reg No: 90690 **Description:** Soil TP1/0m
Sample Size: 114.11 wet weight / 70.22g dry
Result: Asbestos **NOT** detected

Reg No: 90691 **Description:** Soil TP1/0.25m
Sample Size: 109.97g wet weight / 81.15g dry
Result: Asbestos **NOT** detected

Reg No: 90692 **Description:** Soil TP2/0.25m
Sample Size: 122.76g wet weight / 88.72g dry
Result: **Chrysotile *(White Asbestos)*** detected
0.00187g in >2mm sieve faction. Loose fibre groups
0.00006g in <2mm sieve faction. Loose fibre groups

Reg No: 90693 **Description:** Soil TP3/0m
Sample Size: 108.58g wet weight / 68.75g dry
Result: **Chrysotile & Amosite (White & Brown Asbestos)** detected
0.00140g in >2mm sieve faction. Loose fibre groups
0.00014g in <2mm sieve faction. Loose fibre groups

Yours Faithfully
DOWDELL & ASSOCIATES LTD

Michael Sullivan
Analyst/Consultant

I.B. Murgatroyd BSc.
Consultant

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NOTES:

- This report must not be altered, or reproduced except in full.

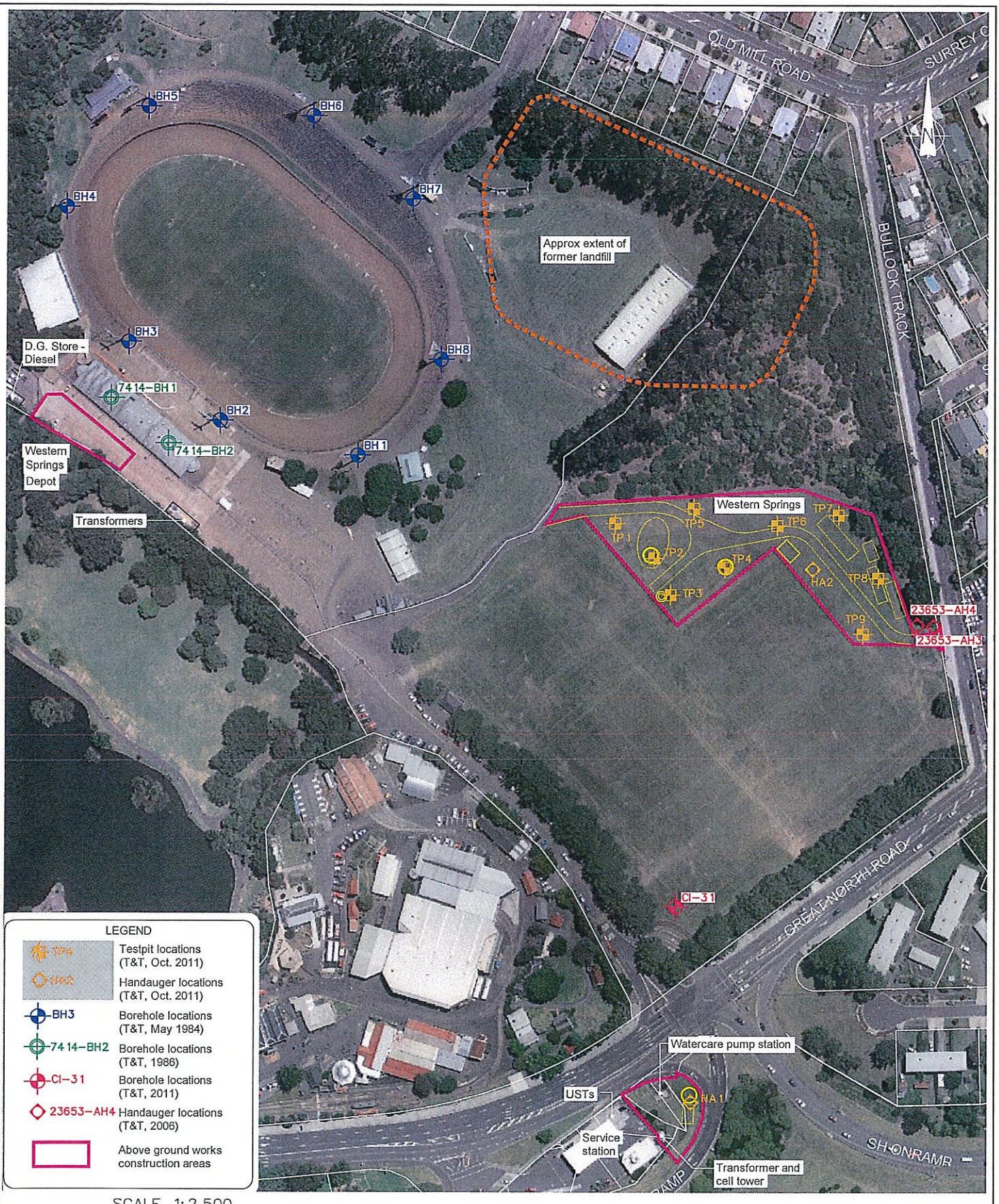
- Sample weights are defined as;

a) (Wet Weight) – Weight of Sample that has been Analysed. NOTE: Samples were sub-sampled. As received weights were 200g+

b) (Dry Basis) - The combusted dry weight of the Analysed Sample.

- New Zealand has no specific guidelines with regard to asbestos content in soils. However, we recommend that the Australian Government's enHealth Council's Document 'Management of Asbestos in the Non-Occupational Environment' – 2005 and the (DOH) WA's 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia – May 2009 be consulted.

Appendix G: Western Springs Outer Fields Site Investigation Information



L:\26 145\26 145.400\WorkingMaterial\CAD\26 145.400–FG–1.dwg F–WS 16/12/2011 2:33:20 p.m.

Aerial photo sourced from Terralink International Copyright 2002-2005 Terralink International Limited and its licensors).
Property boundaries sourced from Land Information New Zealand data as at 8-Aug-2011 (Crown Copyright Reserved).
Extent of former landfill source from drawing "Location of All Known Refuse Landfills in Auckland City", produced by Tonkin & Taylor, January 1993.

DRAWN	RBS	Dec. 11
DRAFTING CHECKED		
APPROVED		
CADFILE : 26 145.400–FG– 1.dwg		
SCALES (AT A4 SIZE) 1: 2500		
PROJECT No. 26 145.400		

Tonkin & Taylor
Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

waterCare services limited

CENTRAL INTERCEPTOR

Western Springs Outer Field – Testpit Location Plan

FIG. No. Figure G–1

REV. 0

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: HA1
Hole Location:

SHEET 1 OF 1

PROJECT: Western Springs | LOCATION: Auckland | JOB No: 26145.400

CO-ORDINATES | DRILL TYPE: Handauger | HOLE STARTED: 10/11/11

HOLE FINISHED: 10/11/11

R.L. m | DRILL METHOD: 50mm diameter Auger | DRILLED BY: City Parks

DATUM | DRILL FLUID: | LOGGED BY: CF | CHECKED: LP

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION / ROCK DESCRIPTION
TOPSOIL				Hand Auger		PID=1.8											TOPSOIL: SILT, with gravels, dark brown, reddish brown inclusions of SILT and abundant organics
FILL									0.5			M	F				Clayey SILT, dark brown mottled orange brown and light grey in places, firm, moist, contains peat inclusions [REWORKED FILL] 0.5
						PID=1.3			1.0								**END OF BOREHOLE AT 0.8m.** Hit brick - abandoned hole. 1.0
									1.5								1.5
									2								

Soil type, minor components, plasticity or particle size, colour.

Substance: Rock type, particle size, colour, minor components.

Defects: Type, inclination, thickness, roughness, filling.

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: HA2
Hole Location:

SHEET 1 OF 1

PROJECT: Western Springs | LOCATION: Auckland | JOB No: 26145.400

CO-ORDINATES | DRILL TYPE: Handauger | HOLE STARTED: 10/11/11

HOLE FINISHED: 10/11/11

R.L. m | DRILL METHOD: 50mm diameter Auger | DRILLED BY: City Parks

DATUM | DRILL FLUID: | LOGGED BY: CF | CHECKED: LP

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa) 10 25 50 100 200	COMPRESSIVE STRENGTH (MPa) 5 20 50 100 250	DEFECT SPACING (mm) 60 200 600 2000	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
TOPSOIL																	TOPSOIL: SILT, with gravels, dark brown, reddish brown inclusions of SILT and abundant organics
NATURAL						21ppm			0.5								SILT, orange brown
																	Sandy SILT, light purplish grey
						31ppm			1.0								END OF BOREHOLE AT 1m.
									1.5								
									2								

T+T DATATEMPLATE.GDT cf

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EXCAVATION LOG

EXCAVATION No: TP1
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			TOPSOIL: SILT, with gravels, dark brown, moist	M			TOPSOIL	
								HARDFILL: Greywacke gravels in a dark brown silt matrix, greenish blue, loose		L		FILL	
					0.5			Clayey SILT, dark brown, with inclusions of white and blue clay throughout, contains gravels and brick fragments, stained green in places, firm, moist, strong organics odour		F			
			PID 18.6ppm		1.0								
					1.5								
			20.8ppm		2.0			GRAVELS, in an orange brown silt matrix, loose, wet	W	L			
								END OF TEST PIT AT 2.4m.					
					2.5								
					3.0								
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP2
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			TOPSOIL: SILT, dark brown, with gravels and plastic remnants, soft, moist	M	S		TOPSOIL	
					0.5			SILT, dark brown with lenses of grey/blue clay, contains gravels and inclusions of clay, firm, moist				FILL	
			PID 0ppm		1.0			SAND, orange brown, loose, wet	W	L			
			0ppm		2.0			SILT, with trace sand, dark brown mottled blue, soft, wet		S		ESTUARINE MUDS	
					2.5			**END OF TEST PIT AT 2.5m.** Maximum digger reach.					
					3.0								
					3.5								

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EXCAVATION LOG

EXCAVATION No: TP3
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			SILT, with gravels, dark brown, loose, moist	M	L		FILL	
					0.5			SILT, yellow brown, soft, moist		S			
								SILT, dark reddish brown with lenses of grey/blue clay throughout, firm, moist, no obvious odour		F			
			PID 0ppm		1.0								
					1.5			Clayey SILT, dark purplish grey, with peat inclusions, contains lenses of white clay and greenish blue silt throughout, abundance of organic material, firm, moist					
			10ppm		2.0								
					2.5			Clayey SILT, greenish grey (Estuarine Muds), firm, wet, friable	W			ESTUARINE MUDS	
			5ppm		3.0			**END OF TEST PIT AT 3m.**					
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP4
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 50 100 200		ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
				0.5			SILT, dark brown, with gravels and large boulders of greywacke throughout, loose, moist, with plastic	M	L			FILL	
							Clayey SILT, orange brown, with lenses of greenish grey silt and white clay throughout, firm, moist		F				
			PID 0ppm	1.0			SILT, creamy grey, with inclusions of grey and purplish brown clayey silt throughout, firm, moist						
							SILT, dark brown mottled red, with inclusions of whitish grey and green grey silt, firm, moist						
			0ppm	1.5									
				2.0									
							END OF TEST PIT AT 2.2m.						
				2.5									
				3.0									
				3.5									

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP5
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED:21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
								TOPSOIL				TOPSOIL	
								SILT, with gravels and organics, dark brown, loose, moist	M	L		FILL	
								SILT, reddish brown with lenses of grey and orange CLAY as above					
					0.5								
			PID 0ppm		1.0								
								CLAY, orange brown mottled grey with lenses of reddish brown silt and dark brwon silt, stiff, moist		St			
					1.5								
								1.9 (approx.)-2.2m (approx.): SILT, yellow brown, firm, wet					
			0ppm		2.0								
								2.2-2.9m (approx.): SILT, orange brown/reddish brown, with inclusions of white clay, soft, wet	W	S			
					2.5								
								SILT, greenish grey mottled blue, with trace sand, soft, wet				ESTUARINE MUDS	
			0ppm		3.0								
								END OF TEST PIT AT 3.2m.					
								Hole filled with water from approx. 1.2m - made logging extremely difficult and depths are approximates.					
					3.5								

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP6
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant | LOCATION: | JOB No: 26145.400

CO-ORDINATES: | EXPOSURE TYPE: | EXCAV. STARTED: 21/10/11

EQUIPMENT: 5 1/2 Tonne Digger | EXCAV FINISHED: 21/10/11

R.L. m | OPERATOR: City Parks | LOGGED BY: CF

DATUM | DIMENSIONS: | CHECKED BY: LP

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			TOPSOIL, abundant organics, soft, moist	M	S		TOPSOIL	
								SILT, dark brown, with plastic and gravels, soft, moist	W			FILL	
					0.5								
			PID 29ppm	x2	1.0			SILT, dark brown mottled reddish orange, contains inclusions and lenses of light brown and greyish white and grey clay throughout, contains medium to large sized gravels of greywacke, firm, moist [FILL]					
					1.5								
			19ppm		2.0								
		▼			2.5			SILT, medium yellow brown, with trace sand, with gravels, soft, wet, water in - hole collapsing from 2.5m					
			35ppm		3.0								
								END OF TEST PIT AT 3.1m.					
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP7
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
								TOPSOIL: SILT, with fine gravels, dark brown, soft, moist	M	S		TOPSOIL	
					0.5			SILT, dark brown, with plastic and gravels, soft, moist				FILL	
			PID 7.5ppm		1.0			SILT, dark brown mottled reddish orange, contains inclusions and lenses of light brown and greyish white and grey clay throughout, contains medium to large sized gravels of greywacke, firm, moist		F			
					1.5								
					2.0								
					2.5								
								SILT, greenish grey mottled blue, with trace sand, soft, wet [NATURAL]	W	S		ESTUARINE MUDS	
					3.0								
								END OF TEST PIT AT 3.2m.					
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP8
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 12 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0			TOPSOIL, abundant organics, soft, moist	M	S		TOPSOIL	
					0.5			SILT, with organics and gravels throughout, medium brown, contains inclusions and lenses of whitish grey clay and reddish brown silt, soft, moist				FILL	
			PID 12ppm		1.0								
					1.5								
			4ppm		2.0			Sandy SILT, brownish grey, with inclusions of hard whitish grey silt, soft, wet - hole collapsing from 2.3m, contains limonite staining [NATURAL?]	W			ESTUARINE MUDS	
					2.5								
								END OF TEST PIT AT 2.6m.					
					3.0								
					3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP9
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED: 21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS					ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
								TOPSOIL: SILT, dark brown, with gravels, loose, dry 0.2m: Geotextile	D	L		TOPSOIL	
								SILT, medium brown, with gravel inclusions and lenses of peat?, white silt, grey clay and organic materials, firm, moist	M	F		FILL	
			PID 0ppm		0.5 1.0 1.5								
								CLAY, orange brown mottled reddish brown, with light grey lenses throughout, stiff, moist		St			
			7ppm		2.0								
								SILT, greenish grey, fine shelly, partially cemented, wet Waterin around 2.2m	W			ESTUARINE MUDS	
			0ppm		2.5								
								END OF TEST PIT AT 2.5m.					
					3.0 3.5								

T+T DATATEMPLATE.GDT cf

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP10
Location: Refer site plan.

SHEET 1 OF 1

PROJECT: Watercare Wastewater Treatment Plant	LOCATION:	JOB No: 26145.400
CO-ORDINATES:	EXPOSURE TYPE:	EXCAV. STARTED:21/10/11
	EQUIPMENT: 5 1/2 Tonne Digger	EXCAV FINISHED: 21/10/11
R.L. m	OPERATOR: City Parks	LOGGED BY: CF
DATUM	DIMENSIONS:	CHECKED BY: LP

EXCAVATION TESTS				ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa) 10 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
								TOPSOIL: SILT, dark brown, with gravels, loose, dry 0.2m: Geotextile	D	L		TOPSOIL	
					0.5			SILT, with organics and gravels throughout, medium brown, contains inclusions and lenses of whitish grey clay and reddish brown silt, soft, moist	M	S		FILL	
		▼	PID 0ppm		1.0			SILT, grey, with timber, concrete, plastic, gravels etc, soft, wet Pit filled with water to 0.9m	W				
					1.5								
			0ppm		2.0			CLAY, grey mottled reddish brown and medium brown, stiff, wet [REWORKED NATURAL?]		St			
								SILT, greenish grey, fine shelly, partially cemented, wet Waterin around 2.2m				ESTUARINE MUDS	
					2.5								
			0ppm		3.0			END OF TEST PIT AT 3m.					
					3.5								

T+T DATATEMPLATE.GDT cf

Table 1: Western Springs Reserve Soil Test Results - Metals

Test Description	NES Soil Contaminant Standards (Recreational)[1]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges	Unit	TP1 - 0	TP2 - 2	TP3 - 1	TP4 - 0	TP4 - 2	TP5 - 0.25
					Topsoil	Natural	Fill	Topsoil	Natural	Natural
Arsenic	80	70	100	mg/kg	4.2	0.87	2.5	6.7	0.96	2
Cadmium	400	1,300	7.5	mg/kg	0.17	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	NL	NL	400	mg/kg	14	2.6	14	4.9	9.2	9.2
Copper	NL	NL	325	mg/kg	19	5.5	6.9	4.5	7.5	7.1
Lead	880	3,300	250	mg/kg	40	3.9	10	11	4.5	6.7
Mercury	3,300	4,200	0.75	mg/kg	0.071	< 0.05	0.07	< 0.051	< 0.051	< 0.05
Nickel	600[4]	3,000[4]	105	mg/kg	13	2.1	5.3	3.4	2.4	10
Zinc	14,000[4]	35,500[4]	400	mg/kg	74	23	11	16	9.9	30

Test Description	NES Soil Contaminant Standards (Recreational)[1]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges	Unit	TP6 - 0.5	TP7 - 0	TP8 - 0.5	TP9 - 0.25	HA1 - 0.5	HA2 - 0
					Fill	Topsoil	Fill	Topsoil	Fill	Topsoil
Arsenic	80	70	100	mg/kg	2.6	19	2.9	5.6	3.9	15
Cadmium	400	1,300	7.5	mg/kg	< 0.1	0.14	< 0.1	< 0.1	< 0.099	0.11
Chromium	NL	NL	400	mg/kg	11	18	12	11	8.8	19
Copper	NL	NL	325	mg/kg	10	20	13	9.2	9	17
Lead	880	3,300	250	mg/kg	9	51	3.2	35	21	64
Mercury	3,300	4,200	0.75	mg/kg	0.051	0.072	< 0.051	0.094	0.087	0.15
Nickel	600[4]	3,000[4]	105	mg/kg	6.7	27	2.2	4.8	12	10
Zinc	14,000[4]	35,500[4]	400	mg/kg	26	69	13	23	39	55

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational/commercial use

1 - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria - discharges (unless otherwise stated).

3 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region.

4 - NEPC, 1999. Guideline on the Investigation Levels for Soil and Groundwater (Recreational/Commercial).

Table 2: Western Springs Reserve Soil Test Results - PAH

	NES Soil Contaminant Standards (Recreational)[2]	NES Soil Contaminant Standards (Commercial/Industrial)[1]	PARP:ALW Permitted Activity Soil Criteria	TP1 - 0	TP2 - 2	TP3 - 1	TP4 - 0	TP4 - 2	TP5 - 0.25	TP6 - 0.5	TP7 - 0	TP8 - 0.5	TP9 - 0.25	HA1 - 0.5	HA2 - 0
				Topsoil	Natural	Fill	Topsoil	Natural	Natural	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil
PAH															
Acenaphthylene	-	-	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.15	< 0.0100
Acenaphthene	-	-	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	-	-	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.26	< 0.0100
Benzo(a)anthracene	-	-	-	0.22	< 0.0100	0.03	0.14	< 0.0100	0.02	< 0.0100	0.07	< 0.0100	0.14	1.73	0.06
Benzo(a)pyrene	-	-	-	0.24	0.07	0.04	0.15	0.01	0.03	< 0.0100	0.05	< 0.0100	0.14	1.09	0.08
Benzo(b)fluoroanthene	-	-	-	0.22	< 0.0100	< 0.0100	0.12	< 0.0100	< 0.0100	< 0.0100	0.1	< 0.0100	0.14	0.98	0.09
Benzo(ghi)perylene	-	-	-	0.11	< 0.0100	0.03	0.07	< 0.0100	0.02	< 0.0100	0.06	< 0.0100	0.07	0.5	0.05
Benzo(k)fluoranthene	-	-	-	0.28	< 0.0100	0.07	0.14	< 0.0100	0.02	< 0.0100	0.07	< 0.0100	0.2	1.16	0.06
Chrysene	-	-	-	0.06	< 0.0100	< 0.0100	0.04	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.05	0.88	< 0.0100
Dibenzo(ah)anthracene	-	-	-	< 0.0100	< 0.0100	< 0.0100	0.02	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.02	1.94	0.02
Fluoranthene	-	-	-	0.28	< 0.0100	0.06	0.24	< 0.0100	0.04	< 0.0100	0.1	< 0.0100	0.25	3.03	0.12
Fluorene	-	-	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	-	-	-	0.1	< 0.0100	0.02	0.05	< 0.0100	< 0.0100	< 0.0100	0.03	< 0.0100	0.05	0.37	0.03
Naphthalene	230[3]	230[3]	230[3]	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	-	-	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.82	< 0.0100
Pyrene	NA[3]	NA[3]	NA[3]	0.4	0.01	0.11	0.32	< 0.0100	0.08	0.01	0.16	< 0.0100	0.32	2.96	0.17
Benzo(a)pyrene equivalent	40	35	2.15	0.33	0.08	0.06	0.22	0.02	0.04	0.01	0.08	0.01	0.21	3.46	0.12
TPH															
C7-C9	8800[3]	8800[3]	8800[3]	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	-	< 20.00	< 20.00	< 20.00
C10-C14	1900[3]	1900[3]	1900[3]	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	-	< 20.00	< 20.00	< 20.00
C15-C36	NA[3]	NA[3]	NA[3]	173	< 20.00	< 20.00	79	< 20.00	< 20.00	< 20.00	387	< 20.00	34	39	342

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for Recreational/Commercial use

NA - indicates contaminant not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.

1 - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay, All Pathways, Commercial/Industrial use.

Table 3: Western Springs Reserve Soil Disposal - Metals

Test Description	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP1 - 0	TP2 - 2	TP3 - 1	TP4 - 0	TP4 - 2	TP5 - 0.25
				Topsoil	Natural	Fill	Topsoil	Natural	Natural
Arsenic	12	30	mg/kg	4.2	0.87	2.5	6.7	0.96	2
Cadmium	0.65	20	mg/kg	0.17	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	55	400	mg/kg	14	2.6	14	4.9	9.2	9.2
Copper	45	325	mg/kg	19	5.5	6.9	4.5	7.5	7.1
Lead	65	250	mg/kg	40	3.9	10	11	4.5	6.7
Mercury	0.45	-	mg/kg	0.071	< 0.05	0.07	< 0.051	< 0.051	< 0.05
Nickel	35	250	mg/kg	13	2.1	5.3	3.4	2.4	10
Zinc	180	1160	mg/kg	74	23	11	16	9.9	30

Test Description	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	Unit	TP6 - 0.5	TP7 - 0	TP8 - 0.5	TP9 - 0.25	HA1 - 0.5	HA2 - 0
				Fill	Topsoil	Fill	Topsoil	Fill	Topsoil
Arsenic	12	30	mg/kg	2.6	**19**	2.9	5.6	3.9	**15**
Cadmium	0.65	20	mg/kg	< 0.1	0.14	< 0.1	< 0.1	< 0.099	0.11
Chromium	55	400	mg/kg	11	18	12	11	8.8	19
Copper	45	325	mg/kg	10	20	13	9.2	9	17
Lead	65	250	mg/kg	9	51	3.2	35	21	64
Mercury	0.45	-	mg/kg	0.051	0.072	< 0.051	0.094	0.087	0.15
Nickel	35	250	mg/kg	6.7	27	2.2	4.8	12	10
Zinc	180	1160	mg/kg	26	69	13	23	39	55

Notes:

Shaded values exceed the cleanfill criteria

Bold values exceed the example managed fill criteria

1 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: Western Springs Reserve Soil Disposal - PAH

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	TP1 - 0	TP2 - 2	TP3 - 1	TP4 - 0	TP4 - 2	TP5 - 0.25	TP6 - 0.5	TP7 - 0	TP8 - 0.5	TP9 - 0.25	HA1 - 0.5	HA2 - 0
			Topsoil	Natural	Fill	Topsoil	Natural	Natural	Fill	Topsoil	Fill	Topsoil	Fill	Topsoil
PAH														
Acenaphthylene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.15	< 0.0100
Acenaphthene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.26	< 0.0100
Benzo(a)anthracene	<LD	-	0.22	< 0.0100	0.03	0.14	< 0.0100	0.02	< 0.0100	0.07	< 0.0100	0.14	1.73	0.06
Benzo(a)pyrene	<LD	-	0.24	0.07	0.04	0.15	0.01	0.03	< 0.0100	0.05	< 0.0100	0.14	1.09	0.08
Benzo(b)fluoroanthene	<LD	-	0.22	< 0.0100	< 0.0100	0.12	< 0.0100	< 0.0100	< 0.0100	0.1	< 0.0100	0.14	0.98	0.09
Benzo(ghi)perylene	<LD	-	0.11	< 0.0100	0.03	0.07	< 0.0100	0.02	< 0.0100	0.06	< 0.0100	0.07	0.5	0.05
Benzo(k)fluoranthene	<LD	-	0.28	< 0.0100	0.07	0.14	< 0.0100	0.02	< 0.0100	0.07	< 0.0100	0.2	1.16	0.06
Chrysene	<LD	-	0.06	< 0.0100	< 0.0100	0.04	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.05	0.88	< 0.0100
Dibenzo(ah)anthracene	<LD	-	< 0.0100	< 0.0100	< 0.0100	0.02	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.02	1.94	0.02
Fluoranthene	<LD	-	0.28	< 0.0100	0.06	0.24	< 0.0100	0.04	< 0.0100	0.1	< 0.0100	0.25	3.03	0.12
Fluorene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene	<LD	-	0.1	< 0.0100	0.02	0.05	< 0.0100	< 0.0100	< 0.0100	0.03	< 0.0100	0.05	0.37	0.03
Naphthalene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene	<LD	-	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.82	< 0.0100
Pyrene	<LD	-	0.4	0.01	0.11	0.32	< 0.0100	0.08	0.01	0.16	< 0.0100	0.32	2.96	0.17
Benzo(a)pyrene equivalent	<LD	25	0.33	0.08	0.06	0.22	0.02	0.04	0.01	0.08	NC	0.21	3.46	0.12
TPH														
C7-C9	<LD	120	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	-	< 20.00	< 20.00	< 20.00
C10-C14	<LD	500	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	-	< 20.00	< 20.00	< 20.00
C15-C36	<LD	10,000	173	< 20.00	< 20.00	79	< 20.00	< 20.00	< 20.00	387	< 20.00	84	39	342

Notes:

Shaded values exceed the cleanfill criteria

Bold values exceed the example managed fill criteria

<LD - cleanfill criteria is taken as being below the laboratory limit of detection

1 - Greenmount Fill Acceptance Criteria - Managed Fill

water Care Laboratory Services

Certificate of Analysis

TONKIN & TAYLOR NZ LTD
105 CARLTON GORE ROAD
NEWMARKET
AUCKLAND

Copy To 1: Rachel Pickett
2: Leon Pemberton
3: Courtney Fagan

Attention: Rachel Pickett

Job Description: 11/26145.400 Tonkin & Taylor 10-Day TAT R Pickett
Batch Number: 11/41650

Sample Descriptions

Sample No.	Date Sampled	Sample Description
01	10/11/2011	TP1 0m
02	10/11/2011	TP2 2m
03	10/11/2011	TP3 1m
04	10/11/2011	TP4 0m
05	10/11/2011	TP4 2m
06	10/11/2011	TP5 0.25m
07	10/11/2011	TP6 0.5m
08	10/11/2011	TP7 0m
09	02/11/2011	TP8 0.5m
10	10/11/2011	TP9 0.25m
11	11/11/2011	HA1 0.5m
12	11/11/2011	HA2 0m
13	11/11/2011	Dup 2

Results

Test Description	Units	Sample Number/Result					
		01	02	03	04	05	06
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.2	0.87	2.5	6.7	0.96	2.
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.17	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	14.	2.6	14.	4.9	9.2	9.2
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	19.	5.5	6.9	4.5	7.5	7.1
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.071	< 0.05	0.07	< 0.051	< 0.051	< 0.05
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	13.	2.1	5.3	3.4	2.4	10.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	40.	3.9	10.	11.	4.5	6.7
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	74.	23.	11.	16.	9.9	30.
TPH Band C10-C14 as dry wt basis	mg/kg	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00
TPH Band C15-C36 (as dry wt basis)	mg/kg	173.00	< 20.00	< 20.00	79.00	< 20.00	< 20.00
TPH Band C7-C9 (as dry wt basis)	mg/kg	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00
Acenaphthylene (as dry wt	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100

Test Description	Units	Sample Number/Result					
basis)							
Acenaphthene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	0.2200	< 0.0100	0.0300	0.1400	< 0.0100	0.0200
Benzo(a)pyrene (as dry wt basis)	mg/kg	0.2400	0.0700	0.0400	0.1500	0.0100	0.0300
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	0.2200	< 0.0100	< 0.0100	0.1200	< 0.0100	< 0.0100
Benzo(ghi)perylene (as dry wt basis)	mg/kg	0.1100	< 0.0100	0.0300	0.0700	< 0.0100	0.0200
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	0.2800	< 0.0100	0.0700	0.1400	< 0.0100	0.0200
Chrysene (as dry wt basis)	mg/kg	0.0600	< 0.0100	< 0.0100	0.0400	< 0.0100	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	0.0200	< 0.0100	< 0.0100
Fluoranthene (as dry wt basis)	mg/kg	0.2800	< 0.0100	0.0600	0.2400	< 0.0100	0.0400
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	0.1000	< 0.0100	0.0200	0.0500	< 0.0100	< 0.0100
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Pyrene (as dry wt basis)	mg/kg	0.4000	0.0100	0.1100	0.3200	< 0.0100	0.0800
Total petroleum hydrocarbons profile (C7-C36 as drywt basis)	mg/kg	173.00	< 30.00	< 30.00	79.00	< 30.00	< 30.00
Dry wt % Sludge	%w/w	60.3	79.7	73.9	70.8	71.2	74.1
		07	**08**	**09**	**10**	**11**	**12**
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	2.6	19.	2.9	5.6	3.9	15.
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.1	0.14	< 0.1	< 0.1	< 0.099	0.11
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	11.	18.	12.	11.	8.8	19.
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	10.	20.	13.	9.2	9.	17.
Acid Digestion: Recoverable Metals in Solids		1	1	1	1	1	1
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	0.051	0.072	< 0.051	0.094	0.087	0.15
Preparation of solid samples for digestion		Yes	Yes	Yes	Yes	Yes	Yes
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	6.7	27.	2.2	4.8	12.	10.
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	9.	51.	3.2	35.	21.	64.
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	26.	69.	13.	23.	39.	55.
TPH Band C10-C14 as dry wt basis	mg/kg	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00
TPH Band C15-C36 (as dry wt basis)	mg/kg	< 20.00	387.00	< 20.00	34.00	39.00	342.00
TPH Band C7-C9 (as dry wt basis)	mg/kg	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00	< 20.00
Acenaphthylene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.1500	< 0.0100
Acenaphthene (as dry wt	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100

Test Description	Units	Sample Number/Result					
basis)							
Anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.2600	< 0.0100
Benzo(a)anthracene (as dry wt basis)	mg/kg	< 0.0100	0.0700	< 0.0100	0.1400	1.7300	0.0600
Benzo(a)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0500	< 0.0100	0.1400	1.0900	0.0800
Benzo(b)fluoroanthene (as dry wt basis)	mg/kg	< 0.0100	0.1000	< 0.0100	0.1400	0.9800	0.0900
Benzo(ghi)perylene (as dry wt basis)	mg/kg	< 0.0100	0.0600	< 0.0100	0.0700	0.5000	0.0500
Benzo(k)fluoranthene (as dry wt basis)	mg/kg	< 0.0100	0.0700	< 0.0100	0.2000	1.1600	0.0600
Chrysene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	0.0500	0.8800	< 0.0100
Dibenzo(ah)anthracene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	0.0200	1.9400	0.0200
Fluoranthene (as dry wt basis)	mg/kg	< 0.0100	0.1000	< 0.0100	0.2500	3.0300	0.1200
Fluorene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	mg/kg	< 0.0100	0.0300	< 0.0100	0.0500	0.3700	0.0300
Naphthalene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
Phenanthrene (as dry wt basis)	mg/kg	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.8200	< 0.0100
Pyrene (as dry wt basis)	mg/kg	0.0100	0.1600	< 0.0100	0.3200	2.9600	0.1700
Total petroleum hydrocarbons profile (C7-C36 as drywt basis)	mg/kg	< 30.00	387.00	< 30.00	34.00	< 20.00	342.00
Dry wt % Sludge	%w/w	71.7	46.6	73.9	76.5	73.2	45.9
		13					
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	7.7					
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.099					
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	5.2					
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.7					
Acid Digestion: Recoverable Metals in Solids		1					
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	< 0.049					
Preparation of solid samples for digestion		Yes					
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	4.9					
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	9.2					
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	mg/kg	18.					

Test Descriptions

Test Description	Method	Accredited
Acenaphthene (as dry wt basis)	USEPA 8270	IANZ
Acenaphthylene (as dry wt basis)	USEPA 8270	IANZ
Acid Digestion: Recoverable Metals in Solids	USEPA 200.8	
Anthracene (as dry wt basis)	USEPA 8270	IANZ
Arsenic: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Benzo(a)anthracene (as dry wt basis)	USEPA 8270	IANZ
Benzo(a)pyrene (as dry wt basis)	USEPA 8270	IANZ

Test Description	Method	Accredited
Benzo(b)fluoroanthene (as dry wt basis)	USEPA 8270	IANZ
Benzo(ghi)perylene (as dry wt basis)	USEPA 8270	IANZ
Benzo(k)fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Cadmium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chromium: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Chrysene (as dry wt basis)	USEPA 8270	IANZ
Copper: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Dibenzo(ah)anthracene (as dry wt basis)	USEPA 8270	IANZ
Dry wt % Sludge	APHA (2005) 2540 G	IANZ
Fluoranthene (as dry wt basis)	USEPA 8270	IANZ
Fluorene (as dry wt basis)	USEPA 8270	IANZ
Indeno(1,2,3,c,d)pyrene (as dry wt basis)	USEPA 8270	IANZ
Lead: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Mercury: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Naphthalene (as dry wt basis)	USEPA 8270	IANZ
Nickel: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ
Phenanthrene (as dry wt basis)	USEPA 8270	IANZ
Preparation of solid samples for digestion	USEPA 200.8, modified	
Pyrene (as dry wt basis)	USEPA 8270	IANZ
Total petroleum hydrocarbons profile (C7-C36 as drywt basis)	Extraction GC-FID	IANZ
TPH Band C10-C14 as dry wt basis	Extraction DCM, GC-FID	IANZ
TPH Band C15-C36 (as dry wt basis)	Extraction DCM, GC-FID	IANZ
TPH Band C7-C9 (as dry wt basis)	Extraction DCM, GC-FID	IANZ
Zinc: Recoverable (dry wt. basis) by ICPMS-Screen	USEPA 200.8, modified	IANZ

Comments: This report replaces 11/41650-1.

Results are reported on an as received basis.

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

Dr You-Sing Yong
Operations Manager
28 November 2011
yyong@water.co.nz

DOWDELL & ASSOCIATES LTD

OCCUPATIONAL HEALTH ANALYSTS & CONSULTANTS

4 Cain Rd, Penrose, PO Box 112-017 Auckland 1642, Phone (09) 5260-246, Fax (09) 5795-389.

Western Springs

16th November 2011

Tonkin & Taylor Ltd
PO Box 5271
Newmarket
Auckland

Attn Courtney Fagan

Dear Courtney,

Re: Bulk Fibre Analysis -

Sampled by	: Client
Date Samples Received	: 14th November 2011
Laboratory No.	: 26287.1
Location/Description	: 2 x soil samples for asbestos ID (Job 26415.400)
Method	: AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.

The following samples were examined using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques.
The following results apply to the samples as received.

Reg No: 91035 **Description:** Soil TP3 0.5
Sample Size: 104.34 wet weight / 78.11
Result: **Chrysotile** ***(White Asbestos)*** detected*
** 1x loose fibre group detected in >2mm sieve faction weighing 0.00001g*

Reg No: 91036 **Description:** Soil TP 8 0.25
Sample Size: 100.70 wet weight / 80.62g dry
Result: Asbestos **NOT** detected

Yours Faithfully
DOWDELL & ASSOCIATES LTD

I.B. Murgatroyd BSc.
Consultant

R.Nicholson
Analyst/Consultant

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NOTES:

- This report must not be altered, or reproduced except in full.

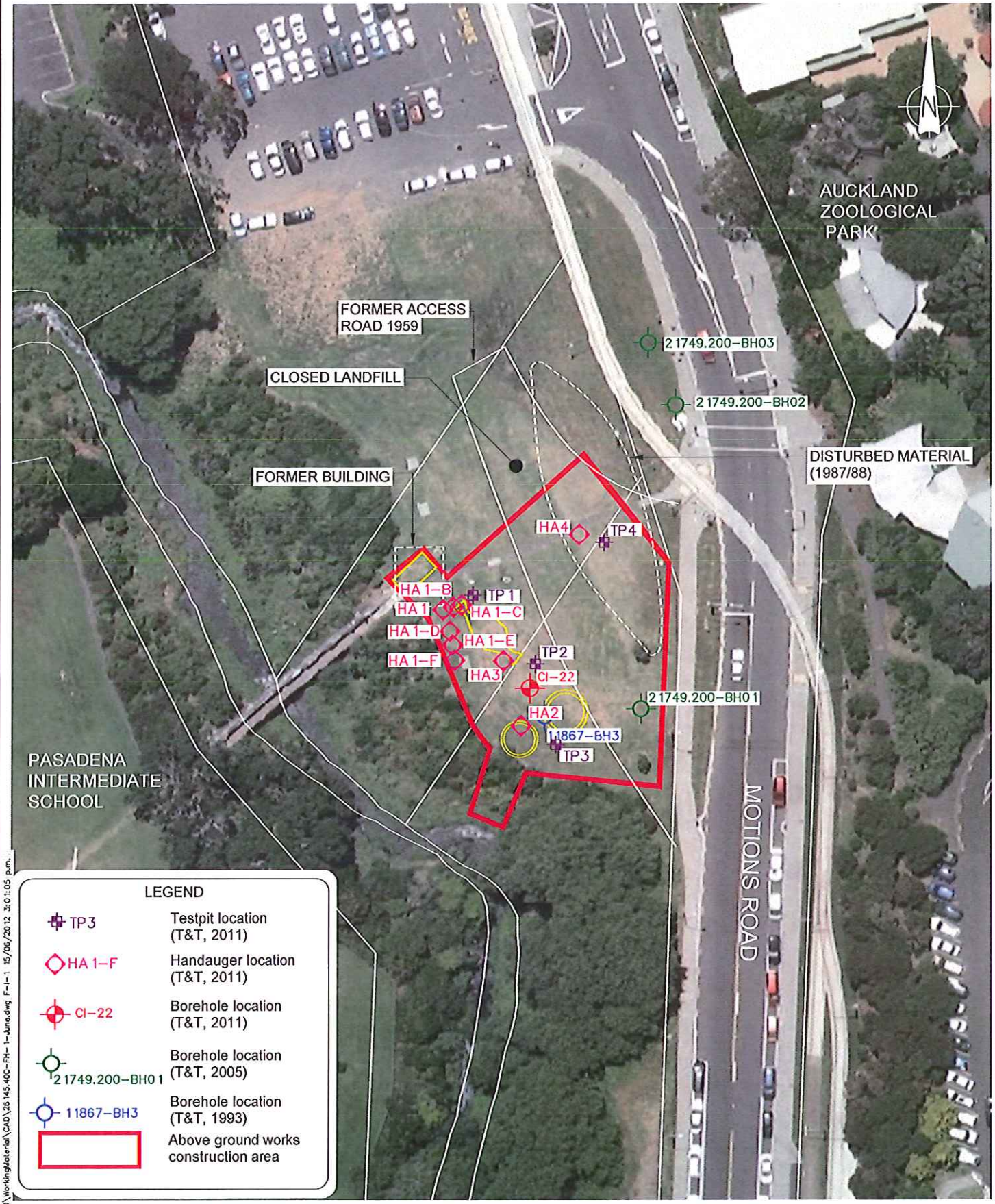
- Sample weights are defined as;

a) (Wet Weight) – Weight of Sample that has been Analysed. NOTE: Samples were sub-sampled. As received weights were 200g+

b) (Dry Basis) - The combusted dry weight of the Analysed Sample.

- New Zealand has no specific guidelines with regard to asbestos content in soils. However, we recommend that the Australian Government's enHealth Council's Document 'Management of Asbestos in the Non-Occupational Environment' – 2005 and the (DOH) WA's 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia – May 2009 be consulted.

Appendix H: Motions Road Reserve Site Investigation Information



L:\26 145\26 145.400\WorkingMaterial\CAD\26 145.400–FH– 1–June.dwg F–I–1 15/06/2012 3:01:05 p.m.

Tonkin & Taylor
Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

DRAWN	RBS	Jun. 12
DRAFTING CHECKED		
APPROVED		
CADFILE : 26 145.400–FH– 1–June.dwg		
SCALES (AT A4 SIZE) 1: 750		
PROJECT No. 26 145.400		

waterCare services limited

CENTRAL INTERCEPTOR

Motions Road Reserve – Testpit Location Plan

FIG. No. Figure H– 1

REV. 0

Test pit Logs

Location: Motions Road Reserve
T&T Job Number: 26145.400
Date Investigated: 01/12/11
Logged By: Rachel Pickett

TP 1

Depth	Sample	Unit	Description
0-0.2	0.1	Topsoil	SILT gravelly, brown, with glass fragments and basalt gravels, dry, no odour.
0.2-0.5	0.25	Fill	SILT sandy, with large basalt boulders, dry, no odour.
0.5-0.8	0.5 0.75	Natural	SILT clayey, orange brown, moist, no odour.
0.8			EOP Basalt obstruction

TP 2

Depth	Sample	Unit	Description
0-0.2	0 Dup 2	Topsoil	SILT, brown, some yellow silty clay patches, with glass fragments, bricks, fibre board (ACM) and gravels, dry, no odour.
0.2-0.5	0.3 0.5	Fill	BOULDERS basalt, and SILT, brown, with brick fragments, dry, no odour.
0.5			EOP Basalt obstruction within black silt matrix

TP 3

Depth	Sample	Unit	Description
0-0.3	0 0.25	Topsoil	SILT gravelly, brown, with glass fragments, crockery and chert gravels, dry, no odour.
0.3-0.5	0.4	Fill	SILT, blackish brown, with charcoal, dry, no odour.
0.5-0.85	-	Natural	SILT clayey, within basalt boulders, orange brown, moist, no odour.
0.85			EOP Basalt obstruction

TP 4

Depth	Sample	Unit	Description
0-0.2	0 0.25	Topsoil	SILT, brown, with few gravels, dry, no odour.
0.2-0.31	0.4	Fill	GRAVEL, mixed aggregate with basalt, up to 60mm in diameter, no matrix, dry, no odour.
0.31-0.4	-	Natural	BOULDERS basalt, within black gravelly matrix, damp, no odour.
0.4			EOP Basalt obstruction

Hand Auger Logs

Location: Motions Road Reserve
T&T Job Number: 26145.400
Date Investigated: 23/11/11
Logged By: Rachel Pickett

HA1

Depth	Sample	Unit	Description
0-0.2	0	Topsoil	SILT, brown, with some basalt gravels and nails, dry, no odour.
0.2		Obstruction	Solid creamy brown concrete

HA1 - B

Depth	Sample	Unit	Description
0-0.3	0.25	Topsoil	SILT, brown, with gravels, glass fragments and plastic, dry, no odour.
0.3		Obstruction	Solid creamy brown concrete

HA1 - C

Depth	Sample	Unit	Description
0-0.2	0	Topsoil	SILT, brown, with some basalt gravels, dry, no odour.
0.2		Obstruction	Basalt Boulder

HA1 - D

Depth	Sample	Unit	Description
0-0.1	-	Topsoil	SILT, brown, with some basalt gravels, dry, no odour.
0.1		Obstruction	Solid creamy brown concrete

HA1 - E

Depth	Sample	Unit	Description
0-0.1	-	Topsoil	SILT, brown, with some basalt gravels, dry, no odour.
0.1		Obstruction	Solid creamy brown concrete

HA1 - F

Depth	Sample	Unit	Description
0-0.2	0	Topsoil	SILT, brown, with basalt gravels, safety glass fragments, concrete fragments and fibre board (ACM), dry, no odour.
0.2-0.3	-	Fill	SILT and CLAY, brown and yellow, with gravels, moist, no odour.
0.2		Obstruction	Basalt Boulder

HA2

Depth	Sample	Unit	Description
0-0.4	0 0.2 0.4	Topsoil	SILT, brown, with basalt gravels, asphalt fragments, metal pieces, terracotta and fibre board (ACM), dry, no odour. Black glassy gravels mixed with yellow clay from 0.2m.
0.4-0.45		Fill	GRAVELS, fine, black, dry, no odour
0.45		Obstruction	Basalt Boulder

HA3

Depth	Sample	Unit	Description
0-0.08	0	Topsoil	SILT, brown, with basalt gravels, dry, no odour.
0.08-0.25	0.25	Fill	CLAY silty, light orange and brown, stiff, with gravels, crockery, glass fragments, and terracotta, slightly moist, no odour.
0.25		Obstruction	Solid ? Boulder

HA4

Depth	Sample	Unit	Description
0-0.11	0	Topsoil	SILT, brown, with basalt gravels, dry, no odour.
0.11		Obstruction	Solid ? Basalt Boulder

Table 1: Motions Road Reserve Soil Test Results - Metals

	Background Concentrations (Volcanic)[3]	NES Soil Contaminant Standards (Recreational)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25	TP3 - 0.7	TP4 - 0.0
					1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11
					Topsoil	Topsoil	Topsoil	Topsoil	Natural	Topsoil
Metals										
Recoverable Arsenic	2.15	80	100	mg/kg	*28*	*10*	*8.6*	*4.9*	*5.2*	*2.9*
Recoverable Cadmium	0.31	1,300	7.5	mg/kg	0.27	<0.1	0.28	0.18	<0.1	<0.1
Recoverable Chromium	98.8	NL	400	mg/kg	38	71	29	31	64	25
Recoverable Copper	79.9	2,000[4]	325	mg/kg	21	37	51	50	29	8.6
Recoverable Lead	34.1	1,800	250	mg/kg	*44*	25	*140*	*80*	13	11
Recoverable Mercury	0.235	600[4]	0.75	mg/kg	*0.35*	*0.29*	*0.27*	0.16	*0.4*	0.18
Recoverable Nickel	223	880	223[3]	mg/kg	25	130	49	100	39	6.8
Recoverable Zinc	1038	14,000[4]	1038[3]	mg/kg	100	96	220	110	37	18

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

NC - Not calculated because all constituents that contribute to the calculation are below the laboratory detection limit

All results in mg/kg

1 - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Mt Mangere, Site 112.

4 - NEPC, 1999. Guideline on the Investigation Levels for Soil and Groundwater (Recreational).

Table 2: Motions Road Reserve Soil Test Results - PAH and TPH

	Bakcground Concentrations[4]	NES Soil Contaminant Standards (Recreational)[1]	PARP:ALW Permitted Activity Soil Criteria (Discharges)[2]	Unit	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25	TP4 - 0.0
					1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11
					Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
PAH									
acenaphthylene	<LD	-	-	mg/kg	<0.01	*0.48*	*0.18*	<0.01	<0.01
Acenaphthene	<LD	-	-	mg/kg	<0.01	*0.34*	<0.01	<0.01	<0.01
Anthracene	<LD	-	-	mg/kg	<0.01	*3.5*	*0.53*	*0.38*	<0.01
Benzo(a)anthracene	<LD	-	-	mg/kg	*0.13*	*11*	*1.9*	*1.1*	*0.04*
Benzo(a)pyrene	<LD	-	-	mg/kg	*0.23*	*5.4*	*1.4*	*0.78*	*0.08*
benzo(b)fluoroanthene	<LD	-	-	mg/kg	*0.19*	*5.3*	*1.1*	*0.51*	*0.09*
Benzo(ghi)perylene	<LD	-	-	mg/kg	*0.08*	*2.9*	*0.68*	*0.4*	*0.04*
Benzo(k)fluoranthene	<LD	-	-	mg/kg	*0.15*	*5.6*	*1.3*	*0.69*	*0.05*
Chrysene	<LD	-	-	mg/kg	*0.05*	*4.3*	*0.97*	*0.61*	<0.01
Dibenzo(ah)anthracene	<LD	-	-	mg/kg	*0.04*	*0.92*	*0.23*	*0.13*	*0.01*
Fluoroanthene	<LD	-	-	mg/kg	*0.32*	*17*	*1.9*	*2.1*	*0.07*
Fluorene	<LD	-	-	mg/kg	<0.01	*0.33*	*0.05*	<0.01	<0.01
Iindeno(1,2,3,c,d)pyrene	<LD	-	-	mg/kg	*0.07*	*2.6*	*0.58*	*0.35*	*0.03*
Naphthalene	<LD	230[3]	210[3]	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	<LD	-	-	mg/kg	*0.1*	*7.3*	*1.2*	*0.73*	*0.04*
Pyrene	<LD	NA[3]	NA[3]	mg/kg	*0.39*	*17*	*2.6*	*2.3*	*0.13*
Benzo(a)pyrene Equivalent	<LD	40	2.15	mg/kg	*0.32*	*8.31*	*2.13*	*1.18*	*0.11*
TPH									
C7-C9	<LD	8800[3]	500[3]	mg/kg	-	-	-	<20	-
C10-C14	<LD	1900[3]	1700[3]	mg/kg	-	-	-	<20	-
C15-C36	<LD	NA[3]	NA[3]	mg/kg	-	-	-	*570*	-
TPH-Total	<LD	-	-	mg/kg	-	-	-	*570*	-

Notes:

Shaded values exceed the PARP:ALW Permitted Activity Soil Criteria (Discharges)

Bold values exceed the NES Soil Contaminant Standards for recreational use

all results are in mg/kg

1 - MfE, June 2011. NES - Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (unless otherwise stated).

2 - PARP:ALW Permitted Activity Soil Criteria- discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Managing and Assessing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Silty Clay - commercial/industrial use.

4 - <LD backrgound concentrations are below the laboratory limit of detection.

Table 3: Motions Road Reserve Soil Disposal - Metals

	Background Concentrations (Volcanic)[1]	Auckland Council Generic Cleanfill Criteria[2]	Example Managed Fill Criteria[3]	Unit	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25	TP3 - 0.7	TP4 - 0.0
					1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11
					Topsoil	Topsoil	Topsoil	Topsoil	Natural	Topsoil
Recoverable Arsenic	2.15	12	30	mg/kg	***28***	*10*	*8.6*	*4.9*	*5.2*	*2.9*
Recoverable Cadmium	0.31	0.65	20	mg/kg	0.27	<0.1	0.28	0.18	<0.1	<0.1
Recoverable Chromium	98.8	55	400	mg/kg	38	**71**	29	31	**64**	25
Recoverable Copper	79.9	45	325	mg/kg	21	37	**51**	**50**	29	8.6
Recoverable Lead	34.1	65	250	mg/kg	*44*	25	***140***	***80***	13	11
Recoverable Mercury	0.235	0.45	-	mg/kg	*0.35*	*0.29*	*0.27*	0.16	*0.4*	0.18
Recoverable Nickel	223	35	250	mg/kg	25	**130**	**49**	**100**	**39**	6.8
Recoverable Zinc	1038	180	1160	mg/kg	100	96	**220**	110	37	18

Notes:

Shaded values exceed the cleanfill criteria

Bold values exceed the example managed fill criteria

Italicised values exceed bakcground concentrations for volcanic soils

1 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Mt Eden, Site 108.

2 - ARC, October 2001. TP153 - Background Concentrations of Inorganic Elements in Soils from the Auckland Region. Maximum Non-Volcanic background concentrations.

3 - Greenmount Fill Acceptance Criteria - Managed Fill

Table 4: Motions Road Reserve Soil Disposal - PAH and TPH

	Auckland Council Generic Cleanfill Criteria	Example Managed Fill Criteria[1]	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25	TP4 - 0.0
			1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11	1-Dec-11
			Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
PAH							
acenaphthylene	<LD	-	<0.01	0.48	0.18	<0.01	<0.01
Acenaphthene	<LD	-	<0.01	0.34	<0.01	<0.01	<0.01
Anthracene	<LD	-	<0.01	3.5	0.53	0.38	<0.01
Benzo(a)anthracene	<LD	-	0.13	11	1.9	1.1	0.04
Benzo(a)pyrene	<LD	-	0.23	5.4	1.4	0.78	0.08
benzo(b)fluoroanthene	<LD	-	0.19	5.3	1.1	0.51	0.09
Benzo(ghi)perylene	<LD	-	0.08	2.9	0.68	0.4	0.04
Benzo(k)fluoranthene	<LD	-	0.15	5.6	1.3	0.69	0.05
Chrysene	<LD	-	0.05	4.3	0.97	0.61	<0.01
Dibenzo(ah)anthracene	<LD	-	0.04	0.92	0.23	0.13	0.01
Fluoroanthene	<LD	-	0.32	17	1.9	2.1	0.07
Fluorene	<LD	-	<0.01	0.33	0.05	<0.01	<0.01
lindeno(1,2,3,c,d)pyrene	<LD	-	0.07	2.6	0.58	0.35	0.03
Naphthalene	<LD	-	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	<LD	-	0.1	7.3	1.2	0.73	0.04
Pyrene	<LD	-	0.39	17	2.6	2.3	0.13
Benzo(a)pyrene Equivalent	<LD	25	0.32	8.81	2.13	1.18	0.11
TPH							
C7-C9	<LD	120	-	-	-	<20	-
C10-C14	<LD	500	-	-	-	<20	-
C15-C36	<LD	10000	-	-	-	570	-
TPH-Total	<LD	-	-	-	-	570	-

Notes:

Shaded values exceed the cleanfill criteria

Bold values exceed the example managed fill criteria

<LD - cleanfill criteria taken as being below the laboratory detection limit

1 - Greenmount Fill Acceptance Criteria - Managed Fill

water Care
Laboratory Services

Watercare Services Ltd
52 Aintree Ave
Mangere
Auckland
2022
New Zealand

Tel: (09) 539 7600
Fax: (09) 539 7620

Certificate of Analysis
Laboratory Reference:111202-089
Final Report

Attention:
Client: TONKIN & TAYLOR LTD
Address: PO Box 5271
WELLESLEY STREET
1141

Report Issue Date: 12-Dec-2011
Sampled Date: 01-Dec-2011
Received Date: 02-Dec-2011

Report Number: 542-0

Client Reference: 11/26145.400 Tonkin & Taylor - R Pickett

Chemistry

			Lab Sample ID:	65702	65703	65704	65705
			Client Sample ID:				
			Sample Date:	1/12/2011	1/12/2011	1/12/2011	1/12/2011
			Sampling Point:	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25
Analysis:	Component:	Units:					
Recoverable Metals by ICP-MS—Screen	Arsenic (Recoverable Dry Wt.)	mg/kg		28	10	8.6	4.9
	Cadmium (Recoverable Dry Wt.)	mg/kg		0.27	<0.1	0.28	0.18
	Chromium (Recoverable Dry Wt.)	mg/kg		38	71	29	31
	Copper (Recoverable Dry Wt.)	mg/kg		21	37	51	50
	Lead (Recoverable Dry Wt.)	mg/kg		44	25	140	80
	Mercury (Recoverable Dry Wt.)	mg/kg		0.35	0.29 *	0.27	0.16 *
	Nickel (Recoverable Dry Wt.)	mg/kg		25	130	49	100
	Zinc (Recoverable Dry Wt.)	mg/kg		100	96 *	220	110
Semi Volatile Organic Contaminants (Dry Weight Basis) by Gas Chromatography-Mass Spectrometry(Screen level)	Acenaphthene: Dry Weight Basis, Screen level	mg/kg		<0.01	0.34 *	<0.01 *	<0.01
	acenaphthylene: Dry Weight Basis, Screen level	mg/kg		<0.01	0.48 *	0.18 *	<0.01
	Anthracene: Dry Weight Basis, Screen level	mg/kg		<0.01	3.5 *	0.53 *	0.38
	Benzo(a)anthracene: Dry Weight Basis, Screen level	mg/kg		0.13	11 *	1.9 *	1.1
	Benzo(a)pyrene: Dry Weight Basis, Screen level	mg/kg		0.23	5.4 *	1.4 *	0.78
	benzo(b)fluoroanthene: Dry Weight Basis, Screen level	mg/kg		0.19	5.3 *	1.1 *	0.51
	Benzo(ghi)perylene: Dry Weight Basis, Screen level	mg/kg		0.08	2.9 *	0.68 *	0.40
	Benzo(k)fluoranthene: Dry Weight Basis, Screen level	mg/kg		0.15	5.6 *	1.3 *	0.69
	Chrysene: Dry Weight Basis, Screen level	mg/kg		0.05	4.3 *	0.97 *	0.61
	Dibenzo(ah)anthracene: Dry Weight Basis, Screen level	mg/kg		0.04	0.92 *	0.23 *	0.13
	Fluorene: Dry Weight Basis, Screen level	mg/kg		<0.01	0.33 *	0.05 *	<0.01
	Fluoroanthene: Dry Weight Basis, Screen level	mg/kg		0.32	17 *	1.9 *	2.1
	Indeno(1,2,3,c,d)pyrene: Dry Weight Basis, Screen level	mg/kg		0.07	2.6 *	0.58 *	0.35

Samples tested as received. A blank space indicates no test performed.

			65702	65703	65704	65705
			1/12/2011 TP1 - 0.1	1/12/2011 TP2 - 0.15	1/12/2011 TP3 - 0.0	1/12/2011 TP3 - 0.25
Semi Volatile Organic Contaminants (Dry Weight Basis) by Gas Chromatography-Mass Spectrometry(Screen level)	Naphthalene: Dry Weight Basis, Screen level	mg/kg	<0.01	<0.01 *	<0.01 *	<0.01
	Phenanthrene: Dry Weight Basis, Screen level	mg/kg	0.10	7.3 *	1.2 *	0.73
	Pyrene: Dry Weight Basis, Screen level	mg/kg	0.39	17 *	2.6 *	2.3
TPH	C10-C14 (Total: Dry Weight Basis)	mg/kg				<20
	C15-C36 (Total: Dry Weight Basis)	mg/kg				570
	C7-C9 (Total: Dry Weight Basis)	mg/kg				<20
	TPH-Total (Total: Dry Weight Basis)	mg/kg				570

			Lab Sample ID:	65706	65707
			Client Sample ID:		
			Sample Date:	1/12/2011	1/12/2011
			Sampling Point:	TP3 - 0.7	TP4 - 0.0
Analysis:	Component:	Units:			
Recoverable Metals by ICP-MS—Screen	Arsenic (Recoverable Dry Wt.)	mg/kg		5.2	2.9
	Cadmium (Recoverable Dry Wt.)	mg/kg		<0.1 *	<0.1
	Chromium (Recoverable Dry Wt.)	mg/kg		64	25
	Copper (Recoverable Dry Wt.)	mg/kg		29	8.6
	Lead (Recoverable Dry Wt.)	mg/kg		13	11
	Mercury (Recoverable Dry Wt.)	mg/kg		0.40 *	0.18
	Nickel (Recoverable Dry Wt.)	mg/kg		39	6.8
	Zinc (Recoverable Dry Wt.)	mg/kg		37 *	18
Semi Volatile Organic Contaminants (Dry Weight Basis) by Gas Chromatography-Mass Spectrometry(Screen level)	Acenaphthene: Dry Weight Basis, Screen level	mg/kg			<0.01
	acenaphthylene: Dry Weight Basis, Screen level	mg/kg			<0.01
	Anthracene: Dry Weight Basis, Screen level	mg/kg			<0.01
	Benzo(a)anthracene: Dry Weight Basis, Screen level	mg/kg			0.04
	Benzo(a)pyrene: Dry Weight Basis, Screen level	mg/kg			0.08
	benzo(b)fluoroanthene: Dry Weight Basis, Screen level	mg/kg			0.09
	Benzo(ghi)perylene: Dry Weight Basis, Screen level	mg/kg			0.04
	Benzo(k)fluoranthene: Dry Weight Basis, Screen level	mg/kg			0.05

			65706	65707
			1/12/2011	1/12/2011
			TP3 - 0.7	TP4 - 0.0
Semi Volatile Organic Contaminants (Dry Weight Basis) by Gas Chromatography-Mass Spectrometry(Screen level)	Chrysene: Dry Weight Basis, Screen level	mg/kg		<0.01
	Dibenzo(ah)anthracene: Dry Weight Basis, Screen level	mg/kg		0.01
	Fluorene: Dry Weight Basis, Screen level	mg/kg		<0.01
	Fluoroanthene: Dry Weight Basis, Screen level	mg/kg		0.07
	Indeno(1,2,3,c,d)pyrene: Dry Weight Basis, Screen level	mg/kg		0.03
	Naphthalene: Dry Weight Basis, Screen level	mg/kg		<0.01
	Phenanthrene: Dry Weight Basis, Screen level	mg/kg		0.04
	Pyrene: Dry Weight Basis, Screen level	mg/kg		0.13

		Lab Sample ID:	65702	65703	65704	65705
		Client Sample ID:				
		Sample Date:	1/12/2011	1/12/2011	1/12/2011	1/12/2011
		Sampling Point:	TP1 - 0.1	TP2 - 0.15	TP3 - 0.0	TP3 - 0.25
Analysis:		Units:				
Accelerated Solvent Extraction (ASE)			Completed *	Completed *	Completed *	Completed *
Accelerated Solvent Extraction (ASE)						Completed *
Drying and Milling			Completed *	Completed *	Completed *	Completed *
Digest for Recoverable Metals in Solids			Completed *	Completed *	Completed *	Completed *
Total Solids		%	77.3	77.3	78.2	92.5

		Lab Sample ID:	65706	65707
		Client Sample ID:		
		Sample Date:	1/12/2011	1/12/2011
		Sampling Point:	TP3 - 0.7	TP4 - 0.0
Analysis:		Units:		
Accelerated Solvent Extraction (ASE)				Completed *
Drying and Milling			Completed *	Completed *
Digest for Recoverable Metals in Solids			Completed *	Completed *
Total Solids		%		85.6

** Results marked with a * are not accredited to International Accreditation New Zealand*

Samples tested as received. A blank space indicates no test performed.

Results are reported on an as received basis.
Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

Dr You-Sing Yong
Operations Manager
12/12/2011
yyong@water.co.nz

Reference Methods:

The sample(s) referred to in this report were analysed by the following method(s):

Analyte	Method Reference	MDL	Samples
Chemistry			
Recoverable Metals by ICP-MS—Screen	US EPA 200.8 (Modified)		
Arsenic (Recoverable Dry Wt.)		0.2 mg/kg	All
Cadmium (Recoverable Dry Wt.)		0.1 mg/kg	All
Chromium (Recoverable Dry Wt.)		0.2 mg/kg	All
Copper (Recoverable Dry Wt.)		0.5 mg/kg	All
Lead (Recoverable Dry Wt.)		0.04 mg/kg	All
Mercury (Recoverable Dry Wt.)		0.05 mg/kg	All
Nickel (Recoverable Dry Wt.)		0.3 mg/kg	All
Zinc (Recoverable Dry Wt.)		7.5 mg/kg	All
Prep. for Metals Digest: Dry and Mill	US EPA 200.8 (modified—Dry at 60°C, mill to < 2 mm)		All
Acid Digest for Recoverable Metals in Solids	US EPA 200.8 (modified, 1:1 Nitric:Hydrochloric Acid))		All
Accelerated Solvent Extraction (ASE)	USEPA 8270		65702, 65703, 65704, 65705, 65707
Accelerated Solvent Extraction (ASE)	Extraction DCM,Gc-FID		65705
Total Solids by Gravimetry	APHA (2005) 2540 G		65702, 65703, 65704, 65705, 65707
Semi Volatile Organic Contaminants (Dry Weight Basis) by Gas Chromatography-Mass Spectrometry(Screen level)	USEPA 8270		
Acenaphthene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
acenaphthylene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Anthracene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Benzo(a)anthracene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Benzo(a)pyrene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
benzo(b)fluoroanthene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Benzo(ghi)perylene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Benzo(k)fluoranthene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Chrysene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Dibenzo(ah)anthracene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Fluorene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Fluoroanthene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Iindeno(1,2,3,c,d)pyrene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
Naphthalene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707

	Phenanthrene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
	Pyrene: Dry Weight Basis, Screen level		0.010 mg/kg	65702, 65703, 65704, 65705, 65707
TPH		Extraction DCM,Gc-FID		
	C10-C14 (Total: Dry Weight Basis)		20 mg/kg	65705
	C15-C36 (Total: Dry Weight Basis)		20 mg/kg	65705
	C7-C9 (Total: Dry Weight Basis)		20 mg/kg	65705
	TPH-Total (Total: Dry Weight Basis)		30 mg/kg	65705

The detection limit listed is the limit attainable in a relatively clean matrix. If dilutions are required for analysis the detection limit may be higher. For more information please contact the Operations Manager

DOWDELL & ASSOCIATES LTD

OCCUPATIONAL HEALTH ANALYSTS & CONSULTANTS

4 Cain Rd, Penrose, PO Box 112-017 Auckland 1642, Phone (09) 5260-246. Fax (09) 5795-389.

28th November 2011

Tonkin & Taylor Ltd
PO Box 5271
Newmarket
Auckland

Attn Rachel Pickett

Dear Rachel,

Re: Bulk Fibre Analysis -

Sampled by	: Client
Date Samples Received	: 28th November 2011
Laboratory No.	: 26393
Location/Description	: 4 x samples for asbestos ID (Job 26145.400)
Method	: AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.

The following samples were examined using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques.
The following results apply to the samples as received.

Reg No: 91314 **Description:** Soil HA1 - 0
Sample Size: 96.58 wet weight / 62.27
Result: Asbestos **NOT** detected

Reg No: 91315 **Description:** Fibre cement – HA1F – 0.1-0.3
Sample Size: ≈5x4cm
Result: **Chrysotile (White) & Amosite (Brown)** asbestos detected

Reg No: 91316 **Description:** Fibre cement – HA2 – 0.25
Sample Size: ≈6x5cm
Result: **Chrysotile (White) & Amosite (Brown)** asbestos detected

Reg No: 91317 **Description:** Soil HA3 - 0.25
Sample Size: 101.19 wet weight / 78.01
Result: Asbestos **NOT** detected

Yours Faithfully
DOWDELL & ASSOCIATES LTD

R.Nicholson
Analyst/Consultant

I.B. Murgatroyd BSc.
Consultant

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NOTES:

- This report must not be altered, or reproduced except in full.

- Sample weights are defined as;

a) (Wet Weight) – Weight of Sample that has been Analysed.
b) (Dry Basis) - The combusted dry weight of the Analysed Sample.

- New Zealand has no specific guidelines with regard to asbestos content in soils. However, we recommend that the Australian Government's enHealth Council's Document 'Management of Asbestos in the Non-Occupational Environment' – 2005 and the (DOH) WA's 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia – May 2009 be consulted.

Appendix I: ProUCL Worksheets

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Benzo(a)Pyrene Equ.

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0121	Minimum of Log Data	-4.419
Maximum	3.719	Maximum of Log Data	1.313
Mean	0.76	Mean of log Data	-0.944
Median	0.554	SD of log Data	1.429
SD	1.017		
Coefficient of Variation	1.339		
Skewness	2.897		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.599	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.316	95% H-UCL	6.239
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.799
95% Adjusted-CLT UCL	1.551	97.5% Chebyshev (MVUE) UCL	3.61
95% Modified-t UCL	1.36	99% Chebyshev (MVUE) UCL	5.201
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.698	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.088		
MLE of Mean	0.76		
MLE of Standard Deviation	0.909		
nu star	15.36		
Approximate Chi Square Value (.05)	7.516	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	1.264
Adjusted Chi Square Value	6.64	95% Jackknife UCL	1.316
		95% Standard Bootstrap UCL	1.246
Anderson-Darling Test Statistic	0.576	95% Bootstrap-t UCL	2.297
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	3.311
Kolmogorov-Smirnov Test Statistic	0.249	95% Percentile Bootstrap UCL	1.339
Kolmogorov-Smirnov 5% Critical Value	0.264	95% BCA Bootstrap UCL	1.593
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.097
		97.5% Chebyshev(Mean, Sd) UCL	2.676
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.812
95% Approximate Gamma UCL	1.553		
95% Adjusted Gamma UCL	1.758		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1.553

Appendix J: Draft Site Management Plan

REPORT

Watercare Services Ltd

Central Interceptor
Site Management Plan

Report prepared for:

WATERCARE SERVICES LTD

Report prepared by:

Tonkin & Taylor Ltd

Distribution:

WATERCARE SERVICES LTD	**1 copy**
Tonkin & Taylor Ltd (FILE)	**2 copies**

July 2012

T&T Ref: 26145.400

Table of contents

1 Introduction

Tonkin and Taylor (T&T) Limited has prepared this site management plan (SMP) to assist in managing the excavation, handling and disposal of any contaminated material encountered as part of the Central Interceptor Project. This work was conducted in accordance with our proposal dated 16 September 2011.

1.1 Background

The Central Interceptor Project involves the construction of a 13 km long main tunnel, 3 – 5 m diameter, with an invert depth of between 32 m and 110 m below ground surface. The tunnel will extend from Western Springs Park to the Mangere Wastewater Treatment Plant and will connect to the existing Watercare network at key connection points. Eight combined sewer overflow (CSO) collector sewers have been designed to extend out from the Central Interceptor tunnel into the local network. These collector sewers make connections with the local networks in parts of the Pt Chevalier, Waterview, Avondale, New Windsor, and Mt Albert suburbs. A range of pipe dimensions will be involved in these works, depending on location and the capacity needed to address overflow mitigation requirements.

A number of construction sites are required to facilitate completion of the project. Three major construction sites are proposed and will be located at Western Springs, May Road and Mangere (WS1 to WS3). These sites will be used for delivering construction materials and removing tunnel spoil for the main tunnel, including construction of permanent facilities. Smaller construction sites are proposed at a number of locations along the main tunnel route and the CSO collector sewer sites. Activities include shaft sinking launching or retrieving the microtunnel boring machine and construction of surface facilities. Activities at all construction sites will include possible removal of vegetation, earthworks, relocation of services, establishment of site access, construction yards and lay down areas and site reinstatement. Figure 1 in **Appendix A** shows the approximate location of the construction sites.

At the time of writing, the project has been developed to a concept design stage. It is likely that some design details or the concept proposed will change as the project moves through the detailed design process. All figures and dimensions referred to in this report are approximate.

For the purposes of this report, the following definitions are used to refer to the various relevant areas.

Construction site	Area of land that Watercare proposes to occupy during construction. The extents of the construction sites are shown in drawings provided in the Drawing Set which accompanies the Assessment of Effects on the Environment (AEE) Reports (or the AEE Drawing Set).
Property	Area of land covered by the legal description in which the construction site is proposed to be located. For example, the property for the Western Springs Depot construction site is land covered by Lot 10 DP 168863 and is 8.72 hectare in area. For a number of construction sites, e.g. Lyon Ave and Whitney Street, the property extends across land covered by more than one legal description.

1.2 Objectives and scope

An assessment on the potential for ground contamination has been completed for the project. The assessment indicates that contaminated soils are generally unlikely to pose a human health risk to workers undertaking the works and the general public. However, they could contain contaminant concentrations that will require the works to be managed to minimise the potential and actual effects on the environment.

The objective of this SMP is to provide procedures for the excavation, handling and disposal of any contaminated or potentially contaminated soil that may be encountered during construction of the Central Interceptor project works.

The scope of this report is to provide procedures for:

- Identifying the presence of contaminants;
- Undertaking excavations in areas potentially containing contaminated soils;
- Managing and containing contaminated soils encountered during the development of the site;
- Controlling potential effects during the works such as odour, dust and tracked soil;
- Managing health and safety during the works; and
- Validating/monitoring the works, as necessary, to ensure appropriate disposal of surplus soil.

2 Plan and management control

2.1 Roles and responsibilities

Implementation of this SMP shall be the responsibility of Watercare. Watercare will appoint a suitably qualified contractor to undertake the required works (the contractor). Watercare will also appoint a suitable qualified Environmental Consultant to address specific contamination issues outlined in this report.

The contractor shall train all earthwork staff to ensure they are aware and understand ways in which contamination can be identified on site (refer Section 8).

Watercare will ensure that a health and safety plan is produced and addresses, as a minimum, the issues outlined in this plan.

2.2 Distribution

At least one (master) copy of the SMP shall be held by Watercare. An up-to-date register of Plan Holders shall be maintained by the person responsible for the management and implementation of the document.

A copy of the SMP shall be kept onsite at all times. It is the responsibility of Watercare to distribute the SMP to site contractors carrying out the construction works.

2.3 Review and update

The SMP shall be reviewed prior to work commencing and as necessary to cater for changes in ground conditions and operation procedures.

Any substantive variations to the SMP shall be provided to Watercare and Auckland Council for approval prior to implementation.

It is the responsibility of Watercare to distribute updated versions of the SMP and to ensure the correct copy of the report is onsite at all times.

2.4 Implementation

Responsibility for the implementation of the SMP lies with Watercare and the contractors undertaking the works.

3 Ground contamination

3.1 Actual and potential ground contamination

Ground contamination assessments have been completed and are documented in the following reports:

- T&T, July 2012, Desk study and ground contamination assessment – Main works Central Interceptor Project; and
- T&T, July 2012, Desk study and ground contamination assessment – Combined sewer overflows (CSO) points Central Interceptor Project.

The ground contamination assessments were targeted to the construction sites that need to be established for the project because construction activities will disturb near-surface soils which could have been contaminated by current and/or historic HAIL activities.

The assessment indicates that no known potentially contaminating activities have occurred at the following construction sites:

Main Works

- Norgrove Ave (L2S2 & CC3A1 – MH1)
- Whitney Street (L3S3)
- Dundale Ave (L3S4)
- Haycock Ave (L3S5)
- Kiwi Esplanade (AS7 Option A)

CSO works

- Moa Reserve (CC1A2-MH2)
- Waterview Reserve (CC1B4-MH1)
- Howlett and Waterview Walkway (CC1B5-MH2)
- Seaside Reserve (CC1B-MH11)
- Alan Wood Reserve (CC5- MH3 and CC5-MH4)

Hence, works at those sites will be subject to the Watercare standard earthwork procedures.

However, potentially contaminating activities are known to have occurred at the other construction sites. Potential contaminants generally include metals, petroleum hydrocarbons and asbestos containing material.

Intrusive investigations were carried out on four of the potentially contaminated construction sites (Mangere WWTP, May Road, Western Springs and Motions Road). Investigation results and development implications for the four investigated sites are provided in **Table 3.1**.

Table 3.1: Summary of analytical results and development implications

Site name	Soil concentrations			Soil disposal location	
	Above ALW Plan Permitted Activity criteria	Above published background	Above NES SCS [1]	Fill	Natural
Mangere WTP	Yes	Yes	No	Managed fill (Average depth across site of fill requiring disposal = 2.5 m)	Volcanic cleanfill, otherwise managed fill

[1] MfE, April 2011, National Environmental Standards (NES) Users Guide for Assessing and Managing Contaminants to protect human health - Soil Contaminant Standards (SCS)

Site name	Soil concentrations			Soil disposal location	
	Above ALW Plan Permitted Activity criteria	Above published background	Above NES SCS [1]	Fill	Natural
May Road	No	Yes	No	Managed fill but presence of ACM may require all fill to be disposed to licensed landfill (Average depth across site of fill requiring disposal = 1 m)	Volcanic cleanfill, otherwise managed fill
Western Springs Main site	No	Yes	No	Managed fill (Average depth across site of fill requiring disposal = 0.8 m)	Cleanfill, subject to further testing, otherwise managed fill
Western Springs Secondary site	Yes	Yes	No	Managed fill (Likely depth across site of fill requiring disposal = 1 m)	Not able to be tested
Motions Road	Yes	Yes	No	Managed fill but presence of ACM may require all fill to be disposed to licensed landfill (Average depth across site of fill requiring disposal = 0.5 m)	Volcanic cleanfill, otherwise managed fill

Intrusive investigations have not been carried out at the other remaining potentially contaminated construction sites (Rawalpindi Reserve, Mt Albert War Memorial Reserve, Lyons Ave, Haverstock Road, Walmsley Park, PS25, Keith Hay Park, PS23, Ambury Park, Western Springs Depot, Miranda Reserve and Wingate Reserve). However, the desk study assessment shows that contaminant levels at these sites are unlikely to be at concentrations that would exceed human health criteria for recreational and/or commercial/industrial land use. Hence, the potential for risk to construction workers and general public is likely to be low. However, for some sites, contaminant concentrations could be above published background concentrations and/or the permitted activity acceptance criteria for the Auckland Regional Plan: Air Land and Water. Sampling and testing of soils will be required at these sites before work commences (refer Section 3.2) to establish contaminant levels and correct procedures for the sites.

The potential for contamination from the tunnelling works is extremely low because soils at the proposed tunnelling depths are likely to comprise natural ground. There is a low potential for works within the road corridors to encounter contaminated ground and/or groundwater (eg migration from neighbouring industrial or service station sites onto the adjacent road corridors). Confirmatory testing and management procedures if contaminated materials are encountered are provided in this SMP for those works (Sections 4.0 to 9.0)

3.2 Confirmation of ground contamination

As discussed above, further sampling is required to fully characterise ground contamination across the areas of ground disturbance for the 12 potentially contaminated construction sites. Additional soil sampling and testing is proposed to be undertaken either prior to excavation or during the construction process by sampling and testing open excavations or spoil stockpiles.

Confirmatory soil sampling and testing may also be required on sites that have not been identified to be potentially contaminated including works within the road corridor if contaminated soil is suspected during the course of works (refer Section 3.1).

These confirmatory sampling works will establish the appropriate handling procedures and disposal locations.

Results of any soil testing will not be available for at least five working days. If soil testing is undertaken during the construction process, the excavated soil shall be treated as potentially contaminated while awaiting laboratory confirmatory results and the procedures set out in Section 4.0 shall be implemented. A waste manifest is required to be obtained from Landfill Operator before surplus soils can be disposed of. Discussions with the landfill operator could take several days. Further testing (for leachability) may also be required if soil contaminant levels exceed their screening criteria. Disposal facilities typically require one sample per 500 m^3 of soil.

The advantages of establishing contamination levels and obtaining a waste manifest prior to any excavation starting on site are that the material can be directly loaded onto trucks and transported offsite. This minimises the need for additional environmental controls (e.g. to prevent dust generation from stockpiled material), frees up more area for construction purposes, and minimises associated effects on programme.

3.2.1 Sampling procedure

All sampling works to confirm if contamination is present shall be directed and undertaken by a qualified Environmental Consultant in accordance with the Ministry for the Environment Contaminated Land Guidelines. The soil sampling strategy (including depth, sampling method, analytes) for the areas of excavation shall be based on the findings of the desk-based ground contamination assessment[1 & 2].

3.2.2 Classification of soils

Laboratory results should be assessed against the following:

- The National Environmental Standards (NES) Soil Contamination Criteria[3] for commercial/industrial outdoor workers to determine if soils pose a health risk to site workers (Section 6);
- The National Environmental Standards (NES) Soil Contamination Criteria[3] for recreational or commercial/industrial land use to determine if soils can be re-used on site; and
- Auckland cleanfill criteria to determine appropriate disposal locations.

These are listed in **Table 3.2.**

[2] Desk Study and Ground Contamination Assessment – Combined Sewer Overflows (CSO) – Central Interceptor Project, Tonkin and Taylor, July 2012

[3] MfE, April 2012. Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

Table 3.2: Soil Contaminant Concentrations (mg/kg)

Contaminant	NES SCS for commercial/industrial outdoor workers (unpaved) [1]	NES SCS for recreational land use[1]	Auckland Cleanfill Criteria [2]
Arsenic	70	80	12
Cadmium	1,300	400	0.65
Chromium	>10,000	>10,000	55 or published background for the site
Copper	>10,000	>10,000	45 or published background for the site
Lead	3,300	880	65 or published background for the site
Nickel	3,000 [3]	600 [3]	35 or published background for the site
Zinc	35,500 [3]	14,000 [3]	180 or published background for the site
B(a)P. Equivalent	35	40	<LOR
C7-C9	500 [4]	500 [4]	<LOR
C10-C14	670 [4]	510 [4]	<LOR
C15-36	> 20,000 [4]	> 20,000 [4]	<LOR
Total Hydrocarbons	-	-	<LOR

Notes:

<LOR = Less than Laboratory Limit of Reporting

1 - NES for Assessing and Managing Contaminants in Soil to Protect human Health, Ministry for the Environment, 2011

2 - Refer TP153 Background Concentrations of Inorganic Elements within Auckland Soils, Auckland Regional Council, 2001

3 - NEPC, 1999. Guideline on the Investigation Levels for Soil and Groundwater

4- MfE, 1999 (Revised 2011), *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand*, conservative scenario of sandy silt soil with contamination at 1-4m depth, used for comparison Site Management Practices

The soil testing results shall determine the management procedures that the contractor shall follow during works. These are shown on **Table 3.3**.

Table 3.3: Soil handling management protocols

Soil contaminant concentrations (refer Table3.2)	Management procedures
Below Auckland Cleanfill Criteria	Watercare standard earthworks procedures and no additional environmental controls or precautions shall be required for the soil
Above Auckland Cleanfill Criteria but below NES SCS for Commercial/Industrial Outdoor Workers (unpaved)	Follow management procedures in Sections 4 and 5
Above NES SCS for Commercial/Industrial Outdoor Workers (unpaved)	Follow management procedures in Sections 4 - 9

4 Site Management Procedures

Site management procedures are outlined to ensure proper handling of contaminated materials and potentially contaminated materials throughout the project works area.

4.1 Earthwork procedures

The following general handling procedures should be followed where contamination is identified, is suspected, or has not been able to be confirmed (refer Section 3.2):

- Material excavated shall be reused on site where practicable, if soil contaminant concentrations are below the NES SCS for the site final land use. If the soil is not able to be reused on the site, it shall be loaded by the contractor directly onto trucks for offsite disposal, or temporarily stockpiled immediately adjacent to the excavation to prevent contamination of other areas. Stockpiling should be in accordance with Section 4.2.
- Trucks shall be loaded within the site where runoff and possible spills during loading can be controlled and contained.
- Trucks shall have their wheels either swept down or washed before they leave site. Each truck will have a tracking document signed onsite and collected at the receiving facility to track each load of material.
- Trucks shall have their loads covered by tarpaulins during transport of material to licensed landfill. These shall be affixed before leaving site.
- A permit/manifest shall be obtained by the contractor from the landfill destination prior to transportation. The contractor is responsible for obtaining this approval.
- All contaminated material removed from site shall be disposed of as per the procedures set out in Section 5.

4.2 Stockpiling of contaminated or potentially contaminated soil

If stockpiling of contaminated soil on site is required, it shall be managed by the contractor as follows:

- Sediment control measures shall encircle the stockpile, this may include:
  - earth bunds with a minimum height of 0.3m;

  - hay bales;
  - silt fences; and
  - proprietary products such as filter socks etc;
- If the stockpile is to remain for more than 1-2 days, the stockpile shall be covered with clean soil, geotextile or a polythene cover to prevent rainfall induced erosion and dust; and
- The stockpile shall be fenced or otherwise secured so that the general public cannot access the stockpile.

4.3 Imported material procedure

If any material is to be imported to the site for the purposes of filling, the material shall be sampled by the Environmental Consultant at a rate of 1 sample for every 100m^3 and analysed for contaminants including metals, total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH). It is preferable that the fill is tested at its source prior to its disposal at the site. However, if not, then the contractor shall stockpile the fill on site until test results are available.

Basecourse/hardfill does not require testing, provided it is sourced directly from a quarry. The contractor shall require all compounds in imported fill, other than fill directly from a quarry, to meet the cleanfill criteria provided in **Table 3.2.**

4.4 Procedure for removing and reporting on unforeseen structures

It is possible that subsurface structures with potential to cause ground contamination may be encountered during the works. Structures of concern are those associated with the storage, transfer or disposal of fuels, chemicals or wastes. These may include underground storage tanks (USTs), pipelines, waste tanks or sumps. If unforeseen structures of this type are encountered, the Environmental Consultant shall inspect the structures and advise on handling, disposal, and site validation procedures. Any abandoned drainage lines shall be capped off with concrete and inspected by the Environmental Consultant prior to reinstatement.

The contractor shall keep a record (location and description) of all identified structures of this type. These records shall be provided to the Environmental Consultant on request.

4.5 Dust control

From an environmental and human health perspective, dust generated during earthworks on a contaminated site has the potential to contain contaminants and, during windy conditions, may discharge offsite.

In order to control the generation of contaminated dust, the contractor shall:

- Limit the amount of contaminated soil to be excavated as much as practicable;
- Limit vehicle access onto contaminated areas;
- Utilise a water truck or portable water sprays in trafficked areas to dampen dust during dry and windy conditions;
- Cover stockpiled material awaiting laboratory testing and removal with geotextile to prevent dust generation;
- Visually monitor dust emissions in the vicinity of the excavation until exposed contaminated material has been covered by clean material; and
- Avoid work during windy conditions.

When utilising water to control dust, the contractor shall ensure that:

- The volume of water used for dust suppression does not exceed soil field capacity of the wetted areas;
- The application does not cause surface runoff that would discharge into natural water bodies; and
- The application of water does not induce soil erosion and soil pugging.

4.6 Stormwater and sediment control measures

During earthworks on contaminated sites, rainwater has the potential to come into contact with contaminated material and become contaminated itself. Contaminated sediment may also become entrained in the stormwater.

The contractor shall liaise with the Environmental Consultant and ensure that the stormwater and sediment control procedures specific to and appropriate for the potential contaminants in each area, are put in place prior to any groundbreaking works commencing. The procedures shall include as a minimum:

- Limiting the duration of exposure of contaminated ground as much as possible;
- Containment of any runoff during rainfall events within the excavation;
- Bund stockpiles as set out in Section 4.2;
- Implement sediment and erosion control measures as set out in the Erosion and Sediment Control Plan; and
- Controlled site exit points and dry brushing equipment shall be put in place to prevent soils being tracking offsite by vehicles.

4.7 Dewatering

The quality of any dewatering discharges on confirmed contaminated sites shall be tested prior to the disposal of the water to stormwater. In the absence of confirmatory testing, the waste water shall be disposed to trade waste/sewer.

In addition, the Environmental Consultant shall be notified if any unusual/unexpected ground and groundwater conditions are encountered during the project works. The Environmental Consultant shall assess the need to test or treat the water, and advise on appropriate disposal methods.

4.8 Odour control

Odorous material is not expected to be encountered, however, if odorous material is uncovered during excavation works the following odour control measures shall be implemented to prevent a nuisance to neighbouring houses and to ensure the health of workers:

- All work in the immediate vicinity of odorous material shall cease and the exposed material shall be covered, for example with tarpaulin, polyethylene sheeting or a layer of clean soil to prevent further discharge of odour. The contractor shall then seek advice from the Environmental Consultant. The Environmental Consultant shall assess the potential for volatile compounds and advise on health and safety requirements. Assessment of volatility may include use of a Photoionisation Detector (PID) and soil sampling and testing;
- Wind conditions shall be assessed and if necessary work shall cease until conditions are more favourable for minimising discharge of odour;

- A ventilation or other mitigation system, for example odour suppression sprays, shall be established if natural dispersion is not adequate; and
- Health & safety procedures as set out in Section 6 shall be employed.

5 Soil Disposal

The contractor shall remove all contaminated soil to a managed disposal facility, such as Puketutu Managed Fill or a licensed landfill such as Redvale Landfill. The confirmation of contamination concentrations present in the soil, as determined by Section 3.2, shall determine the suitable disposal location. Acceptance must be confirmed by the landfill prior to disposal.

In general, material for managed fill disposal must be free of anthropogenic waste material such as metal, rubber and plastic, although concrete is allowed if it contains no more than minimal reinforcing steel. Up to 5% organic material is allowed, including tree roots, branches and leafy vegetation. Material that does not meet managed fill acceptance criteria must be disposed of at a licensed landfill.

The contractor shall be required to keep records of the material disposed (weighbridge dockets, etc) and this information shall be provided to the Environmental Consultant on request.

6 Health and Safety Procedures

Watercare shall prepare and implement a Health and Safety Plan (HSP) in compliance with the Health and Safety in Employment Act, 1992, its amendments, and associated regulations, and other applicable legislation, regulations, codes and guidelines. The Health and Safety Plan shall address all potential hazards associated with the proposed works. General protocols related to the presence of potentially contaminated material are described in this section and shall be included in the HSP.

6.1 Site establishment

The following shall be put in place by Watercare prior to ground works commencing:

- The site will be fenced to restrict entry to authorised workers and prevent access by the general public. Appropriate warning signs (e.g. "*Restricted entry*", "*Danger open excavations*") shall be erected around the fenced site;
- Health and safety inductions shall be completed; and
- Health and safety facilities as required by the hazard management procedures, such as wash facilities, personal protection equipment stores and first aid points shall be provided.

6.2 General safety requirements

Watercare shall, as a minimum, implement the following measures:

- While the excavations remain open, entry to the site shall be restricted to authorised workers only;
- A health and safety officer (HSO) shall be appointed for the works. The role of the HSO shall be to ensure workers are wearing the correct protective equipment and respond to new hazards as they arise;
- All workers shall be inducted prior to carrying out works at the sites. The inductions shall describe the PPE requirements and outline the potential hazards of the contamination that is likely to be encountered at the construction sites;

- Contact with contaminated soil by workers is expected to be minimal because the potential for contamination has been identified as low in most of the sites and earthworks are proposed to be undertaken by mechanical methods. However, as a precautionary measure, any worker that is required to manually handle contaminated or potentially contaminated soil shall be required to wear disposable gloves. The resistance of the gloves to the contaminants encountered on site shall be confirmed prior to use;
- Dust masks shall be made available at the project area at all times. Workers shall use these if visible dust clouds are present within the project area;
- Additional requirements such as safety glass, disposable or splash/water proof overalls, and/or half mask respirators with organic filters may be required depending on the nature of the contamination present on site and the scale and location of the works. the conditions under which the need for additional requirements will be triggered shall be identified in the HSP; and

Hand to mouth contact (including eating, drinking and smoking) within the project area shall not be permitted except within a designated support zone(s).

6.3 Emergency procedures

It is the responsibility of the HSO to ascertain the availability of appropriate emergency services and equipment prior to the start of works. These will include:

- The location of the nearest telephone;
- Location of the nearest first aid kit; and
- Appropriate local medical emergency numbers.

The HSO shall be immediately notified of any injury or accident occurring at the site. If serious harm occurs, Occupational Safety and Health (OSH) must be notified immediately.

The following is a list of emergency numbers:

Emergency	111
Auckland Hospital	09 367 0000
Auckland Fire Department	09 302 5142
Auckland Police	09 302 6400
OSH Inspectors	0800 20 90 20
Consultant:	To be determined
Contractor:	To be determined

7 Monitoring Programme

The following sets out the monitoring programme to be carried out during earthworks.

7.1 Earthworks Control

Monitoring shall be undertaken by Watercare or its contractor and shall involve regular inspections of earthworks areas for:

- Sediment control and compliance with plan;
- Water accumulation; and

- Dust generation.

Watercare or its contractor shall also visually inspect excavations for significant odours or discoloration and notify the Environmental Consultant if any are observed.

7.2 Validation Testing

As full remediation is not being carried out, validation sampling and testing of excavated areas is not proposed.

As discussed in Section 4.3, validation testing of imported fill is required.

In addition, should unexpected contamination conditions be encountered the appointed Environmental Consultant shall inspect the material and provide additional advice regarding its safe handling and disposal and the requirement for the collection of any validation samples.

If undertaken, validation sampling shall be undertaken by a suitably qualified Environmental Consultant and collected according to the "Ministry for the Environment *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils* or other equivalent standards approved in writing by the Auckland Council.

8 Staff Training

Environmental training for all earthwork staff working on the project shall be undertaken as part of the site induction programme. All workers shall be made aware of the potential for contamination and understand ways in which contamination can be identified on site (refer Section 2.1). This is particularly important if sampling and testing of the material cannot be undertaken prior to excavations on the potentially contaminated sites or if contamination is encountered during the course of works on sites where potentially contaminating activities have not been identified, including works within the road corridor.

If any of the following are noted in the excavation, or the excavated soils, it is an indication that contamination may be present:

- A solvent or hydrocarbon odour (petrol, diesel, kerosene type odour, etc)
- Other abnormal odours not normally associated with soil
- Discoloured soil (i.e. areas of soil with dark staining, abnormal or unnatural colouring)
- Soil with waste material or building debris (i.e. plastics, metal, bricks, timber etc) indicating the ground has been filled
- An oily substance or sheen on the surface of soil, or on the surface of water in the excavation

If any of the above indications of contamination are identified, work in the immediate vicinity of the contamination shall cease. The contractor shall notify the Project Environmental Consultant who will visually inspect the material, take samples for confirmatory testing (Section 3.2), if required, and provide additional advice regarding its safe handling and disposal.

9 Validation Reporting

Validation is the process of confirming that the objectives and goals of this SMP have been achieved. A Site Validation Report (SVR) shall be prepared by the Environmental Consultant on completion of the earthworks and upon receipt of all necessary documentation. The report shall document:

- Variations from the strategies outlined in this plan and the reasons why variations were necessary;
- Provide results of validation testing of any imported soils to confirm they meet the acceptance criteria set out in **Table 3.2**;
- Confirm the excavation soil disposal volume and destination;
- Results of soil validation samples (if any);
- Evidence that groundwater and surface water was disposed in an appropriate manner; and
- Requirements for further work, if any.

The validation report shall comply with the Ministry for the Environment *Guidelines for Reporting on Contaminated Sites in New Zealand* (June 2001).

Information is required from the Contractor for inclusion in the SVR. The information requirements are:

- Copies of weigh bridge summaries for the disposal destination for contaminated soil;
- Documentation (for example copies of weigh bridge summaries or invoices) confirming the source of the material and location of placement of any materials imported to the site;
- Records of visits by council representatives;
- Details of any complaints related to contamination and how they were resolved; and
- Details of any health and safety incident related to the contamination and how they were resolved.

10 Applicability

This report has been prepared for the benefit of Watercare Services Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
.....	.....
Lauren Sunde	Gerard Bird
Environmental Geologist	Environmental Group Manager

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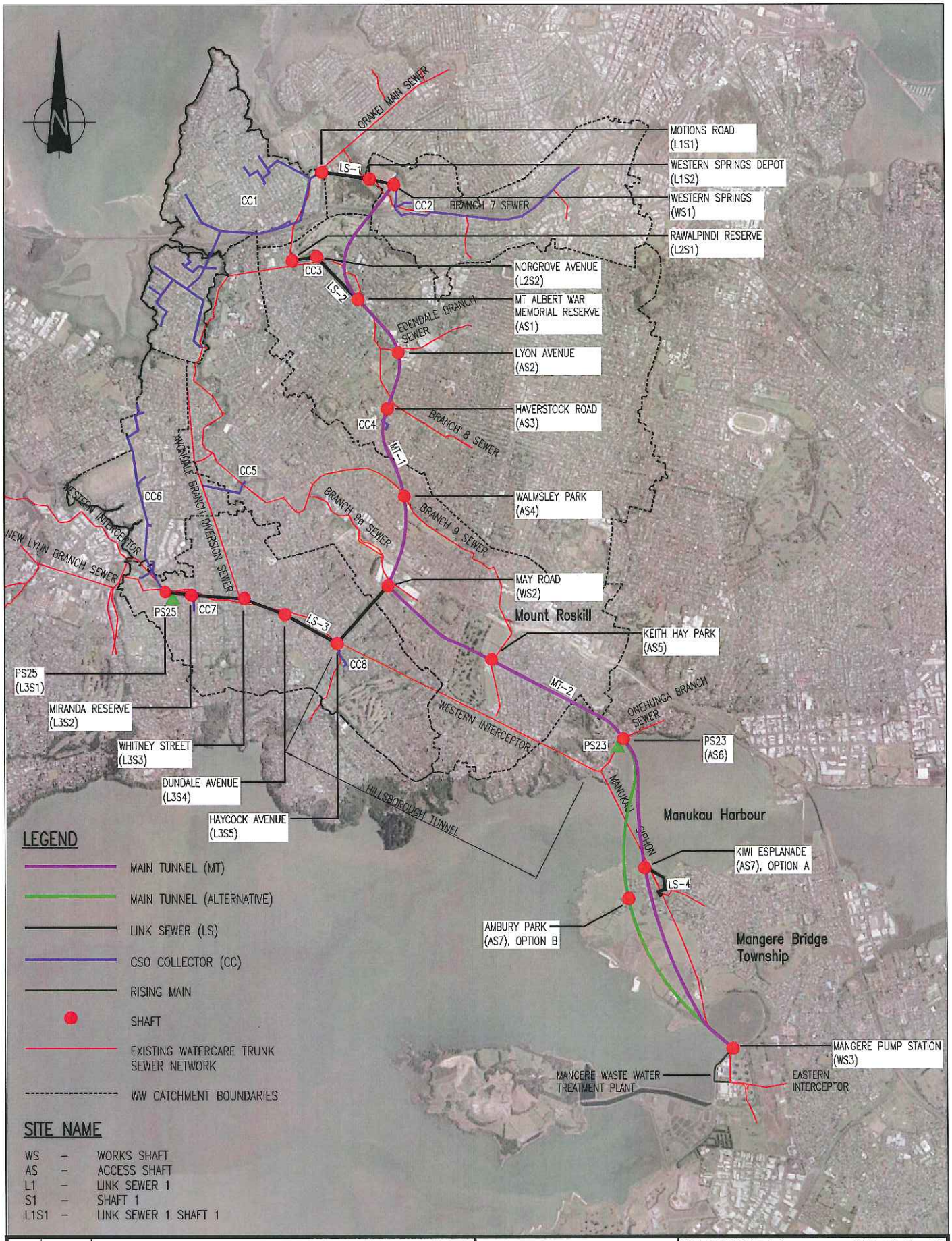
Appendix A: Figure



ISSUE	DATE
5	
4	30/05/12
3	16/03/12
2	17/02/12
1	22/12/11

CENTRAL INTERCEPTOR
GENERAL
OVERALL SITE LAYOUT

DRAFT

AEE MARCH 2012

watercare services limited

CAD FILE FIGURE 1.1 | DATE 30-May-12

ORIGINAL SCALE A4 1:62500 A4 | CONTRACT No. 0538

DRAWING No. FIGURE 1.1 | ISSUE 5