Appendix C – Bore logs and test pits

GENERAL NOTES

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The report contains the results of a geotechnical investigation or study conducted for a specific purpose and client. The results may not be used or relied on by other parties, or used for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically required to do so by the client.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the report are excluded unless they are expressly stated to apply in the report.

TEST HOLE LOGGING

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information. Moreover, the location of test holes should be considered approximate, unless noted otherwise (refer report). Reference should also be made to the relevant standard sheets for the explanation of logging procedures (Soil and Rock Descriptions, Core Log Sheet Notes etc.).

GROUNDWATER

Unless otherwise indicated, the water depths presented on the test hole logs are the depths of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater depth may differ from this recorded depth depending on material permeabilities (i.e. depending on response time of the measuring instrument). Further, variations of this depth could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities such as a change is ground surface level. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate surveys, instrumentation techniques and monitoring programmes.

INTERPRETATION OF RESULTS

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data, often with only approximate locations (e.g. GPS). Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

CHANGE IN CONDITIONS

Local variations or anomalies in ground conditions do occur in the natural environment, particularly between discrete test hole locations or available observation sites. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural processes.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to GHD for appropriate assessment and comment.

GEOTECHNICAL VERIFICATION

Verification of the geotechnical assumptions and/or model is an integral part of the design process - investigation, construction verification, and performance monitoring. Variability is a feature of the natural environment and, in many instances, verification of soil or rock quality, or foundation levels, is required. There may be a requirement to extend foundation depths, to modify a foundation system and/or to conduct monitoring as a result of this natural variability. Allowance for verification by appropriate geotechnical personnel must be recognised and programmed for construction.

FOUNDATIONS

Where referred to in the report, the soil or rock quality, or the recommended depth of any foundation (piles, caissons, footings etc.) is an engineering estimate. The estimate is influenced, and perhaps limited, by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The material quality and/or foundation depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications should provide for variations in the final depth, depending upon the ground conditions at each point of support, and allow for geotechnical verification.

REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions must include at least all of the relevant test hole and test data, together with the appropriate Standard Description sheets and remarks made in the written report of a factual or descriptive nature.

Ref: DS5.5.1 Issue 0 Date: 05/10/2018

SOIL DESCRIPTION AND CLASSIFICATION

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Soil is described in general accordance with Australian Standard AS 1726-2017 (Geotechnical Site Investigations) in terms of visual and tactile properties, with potential refinement by laboratory testing. AS 1726 defines soil as particulate materials that occur in the ground and can be disaggregated or remoulded by hand in air or water without prior soaking. Classification of the soil is undertaken following description.

SOIL DESCRIPTION

The soil description includes a) Composition, b) Condition, c) Structure, d) Origin and e) Additional observations. 'FILL', 'TOPSOIL' or a 'MIXTURE OF SOIL AND COBBLES / BOULDERS' (with dominant fraction first) is denoted at the start of a soil description where applicable.

a) Soil Composition (soil name, colour, plasticity or particle characteristics, secondary and then minor components)

Soil Name: A soil is termed a *coarse grained soil* where the dry mass of sand and gravel particles exceeds 65% of the total. Soils with more than 35% fines (silt or clay particles) are termed *fine grained soils*. The soil name is made up of the primary soil component (in BLOCK letters), prefixed by applicable secondary component qualifiers. Minor components are applied as a qualifiers to the soil name (using the words 'with' or 'trace').

Particles are differentiated on the basis of size. 'Boulders' and 'cobbles' are outside the soil particle range, though their presence (and proportions) is noted. While individual particles may be designated as silt or clay based on grain size, fine grained soils are characterised as silt or clay based on tactile behaviour or Atterberg Limits, and not the relative composition of silt or clay sized particles.

Colour: The prominent colour is noted, followed by (spotted, mottled, streaked etc.) then secondary colours as applicable. Roughly equally proportioned colours are prefixed by (spotted, mottled, streaked etc.). Colour is described in its moist condition, though both wet and dry colours may also be provided if appropriate.

Plasticity: Fine grained soils are designated within standard ranges of plasticity based on tactile assessment or laboratory assessment of the Liquid Limit.

Particle Characteristics: The particle shape, particle distribution and particle size range within a coarse grained soil is described using standard terms. Particle composition may be described using rock or mineral names, with specific terms for carbonate soils.

Secondary and Minor Components: The primary soil is described and modified by secondary and minor components, with assessed ranges as tabulated.

Carbonate Soils: Carbonate content can be assessed by use of dilute '10%' HCl solution. Resulting clear sustained effervescence is interpreted as a *Carbonate soil* (approximately >50% carbonate), while weak or sporadic effervescence indicates *Calcareous soil* (< 50% carbonate). No effervescence is interpreted as a non-calcareous soil.

Organic and Peat Soils: Where identified, organic content is noted. *Organic soil* (2% to 25% organic matter) is usually identified by colour (usually dark grey/black) and odour (i.e. 'mouldy' or hydrogen sulphide odour). *Peat* (>25% organic matter) is identified by a spongy feel and fibrous texture. Peat soils' decomposition may be described as '*fibrous*' (little / no decomposition), '*pseudo-fibrous*' (moderate decomposition) or '*amorphous*' (full decomposition).

Fraction	Components		Particle Size (mm)
Oversize	BOULDERS		> 200
	COBBLES		63 - 200
Coarse grained soil particles	GRAVEL	Coarse	19 - 63
		Medium	6.7 -19
		Fine	2.36 - 6.7
	SAND	Coarse	0.6 - 2.36
		Medium	0.21 - 0.6
		Fine	0.075 - 0.21
Fine grained soil particles	SILT		0.002 - 0.075
	CLAY		< 0.002

Plasticity Terms (Fine Grained Soils)		Laboratory Liquid Limit Range
Silt	**Clay**	
N/A	N/A	(Non Plastic)
Low Plasticity	*Low Plasticity*	≤ 35%
	Medium Plasticity	> 35% and ≤ 50%
High Plasticity	*High Plasticity*	> 50%

Particle Distribution Terms (Coarse Grained Soils)	
Well graded	good representation of all particle sizes
Poorly graded	one or more intermediate sizes poorly represented
Gap graded	one or more intermediate sizes absent
Uniform	essentially of one size

Particle Shape Terms (Coarse Grained Soils)		
Rounded	*Sub-angular*	*Flaky or Platy*
Sub-rounded	*Angular*	*Elongated*

Secondary and Minor Components for Coarse Grained Soils			
Fines (%)	**Modifier** (as applicable)	**Accessory coarse (%)**	**Modifier** (as applicable)
≤ 5	*'trace silt / clay'*	≤ 15	*'trace sand / gravel'*
> 5, ≤ 12	*'with clay / silt'*	> 15, ≤ 30	*'with sand / gravel'*
> 12	*prefix 'silty / clayey'*	> 30	*prefix 'gravelly / sandy'*

Secondary and Minor Components for Fine Grained Soils	
% Coarse	**Modifier** (as applicable)
≤ 15	add *"trace sand / gravel"*
> 15, ≤ 30	add *"with sand / gravel"*
> 30	prefix soil *"sandy / gravelly"*

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b) Soil Condition (moisture, relative density or consistency)

Moisture: Fine grained soils are described relative to plastic or liquid limits, while coarse grained soils are assessed based on appearance and feel. The observation of seepage or free water is noted on the test hole logs.

Moisture - Coarse Grained Soils

Term		Tactile Properties
Dry	*('D')*	Non-cohesive, free running
Moist	*('M')*	Feels cool, darkened colour, tends to stick together
Wet	*('W')*	Feels cool, darkened colour, tends to stick together, free water forms when handling

Moisture - Fine Grained Soils

Term		Tactile Properties
Moist, dry of plastic limit	*('w < PL')*	Hard and friable or powdery
Moist, near plastic limit	*('w ≈ PL')*	Can be moulded
Moist, wet of plastic limit	*('w > PL')*	Weakened, free water forms on hands with handling
Wet, near liquid limit	*('w ≈ LL')*	Highly weakened, tends to flow when tapped
Wet, wet of liquid limit	*('w > LL')*	Liquid consistency, soil flows

Relative Density (Non Cohesive Soils): The Density Index is inherently difficult to assess by visual or tactile means, and is normally assessed by penetration testing (e.g. SPT, DCP, PSP or CPT) with published correlations. Assessment may be affected by moisture and *in situ* stress conditions. Density Index assessment may be refined by combination of *in situ* density testing and laboratory reference maximum and minimum density ranges.

Consistency (Cohesive Soils): May be assessed by direct measurement (shear vane, CPT etc.), or approximate tactile correlations. Cohesive soils include fine grained soils, and coarse grained soils with sufficient fine grained components to induce cohesive behaviour. A 'design shear strength' must consider the mode of testing, the *in situ* moisture content and potential for variations of moisture which may affect the shear strength.

Relative Density (Non-Cohesive Soils)

Term and (Symbol)		Density Index (%)
Very Loose	*(VL)*	≤ 15
Loose	*(L)*	> 15 and ≤ 35
Medium Dense	*(MD)*	> 35 and ≤ 65
Dense	*(D)*	> 65 and ≤ 85
Very Dense	*(VD)*	> 85

Consistency assessment can be influenced by moisture variation.

Consistency (Cohesive Soils)

Term and (Symbol)		Tactile Properties	Undrained Shear Strength
Very Soft	*(VS)*	Extrudes between fingers when squeezed	< 12 kPa
Soft	*(S)*	Can be moulded by light finger pressure	12 - 25 kPa
Firm	*(F)*	Can be moulded by strong finger pressure	25 - 50 kPa
Stiff	*(St)*	Cannot be moulded by fingers	50 - 100 kPa
Very Stiff	*(VSt)*	Can be indented by thumb nail	100 - 200 kPa
Hard	*(H)*	Can be indented with difficulty by thumb nail	> 200 kPa
Friable	*(Fr)*	Easily crumbled or broken into small pieces by hand	-

c) Structure (zoning, defects, cementing)

Zoning: The *in situ* zoning is described using the terms below. *'Intermixed'* may be used for an irregular arrangement.

'layer' (a continuous zone across the exposed sample)

'lens' (a discontinuous layer with lenticular shape)

'pocket' (an irregular inclusion of different material).

'interbedded' or *"interlaminated"* (alternating soil types)

Defects: Described using terms below, with dimension orientation and spacing described where practical.

'parting' (an open or closed surface or crack sub parallel to layering with little / no tensile strength - open or closed)

'fissure' (as per a parting, though not parallel or sub parallel to layering – may include desiccation cracks)

'sheared seam' (zone of sub parallel near planar closely spaced intersecting smooth or slickensided fissures dividing the mass into lenticular or wedge shaped blocks)

'sheared surface' (a near planar, curved or undulating smooth, polished or slickensided surface, indicative of displacement)

'softened zone' (in clayey soils, usually adjacent to a defect with associated higher moisture content)

'tube' (tubular cavity, singly or one of a large number, often formed from root holes, animal burrows or tunnel erosion)

'tube cast' (an infilled tube – infill may vary from uncemented through to cemented or have rock properties)

'infilled seam' (sheet like soil body cutting through the soil mass, formed by infilling of open defects)

Cementation: Soils may be cemented by various substances (e.g. iron oxides and hydroxides, silica, calcium carbonate, gypsum), and the cementing agent shall be identified if practical. Cemented soils are described as:

'weakly cemented'	easily disaggregated by hand in air or water
'moderately cemented'	effort required to disaggregate the soil by hand in air or water

Materials extending beyond '*moderately cemented*' are encompassed within the rock strength range. Where consistent cementation throughout a soil mass is identified as a duricrust, it is described in accordance with duricrust rock descriptors. Where alternate descriptors of cementation development are applied for consistency with regional practices or geology, or client requirements, these are outlined separately.

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d) Origin

An interpretation is provided based on observations of landform, geology and fabric, and may further include assignment of a stratigraphic unit. The use of terms 'possibly' or 'probably' indicates a higher degree of uncertainty regarding the assessed origin or stratigraphic unit. Typical origin descriptors include:

Residual	Formed directly from in situ weathering with no visible structure or fabric of the parent soil or rock.
Extremely weathered	Formed directly from in situ weathering, with remnant and/or fabric from the parent rock.
Alluvial	Deposited by streams and rivers (may be applied more generically as transported by water).
Estuarine	Deposited in coastal estuaries, including sediments from inflowing rivers, streams, and tidal currents.
Marine	Deposited in a marine environment.
Lacustrine	Deposited in freshwater lakes.
Aeolian	Transported by wind.
Colluvial and Slopewash	Soil and rock debris transported down slopes by gravity (with or without assistance of water). Colluvium is typically applied to thicker / localised deposits, and slopewash for thinner / widespread deposits.
TOPSOIL	Surficial soil, typically with high levels of organic material. Topsoils buried by other transported soils are termed *'remnant topsoil'*. Tree roots within otherwise unaltered soil does not characterise topsoil.
FILL	Any material which has been placed by anthropogenic processes (i.e. human activity).

e) Additional Observations

Additional observations may be included to supplement the soil description. Additional observations may consist of notations relating to soil characteristics (odour, contamination, colour changes with time), inferred geology (with delineation of soil horizons or geological time scale) or notes on sampling and testing application (including the reliability, recovery, representativeness, or condition of samples or test conditions and limitations). If the material is assessed to be not representative, terms such as 'poor recovery', 'non-intact', 'recovered as' or 'probably' are applied.

SOIL CLASSIFICATION

Classification allocates the material within distinct soil groups assigned a two character Group Symbol:

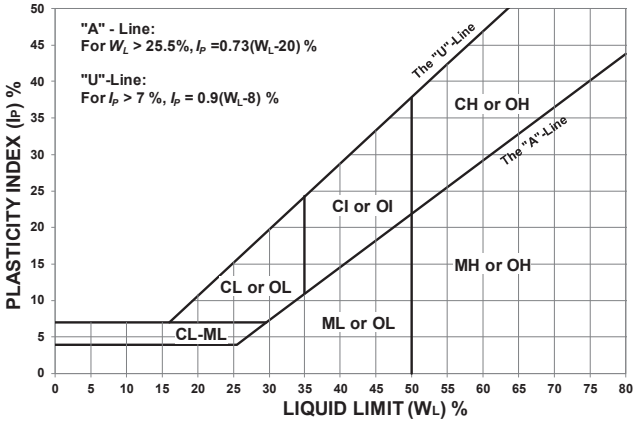
Coarse Grained Soils (sand and gravel: more than 65% of soil coarser than 0.075 mm)		
Major Division	**Group Symbol**	**Soil Group**
GRAVEL (more than half of the coarse fraction is > 2.36 mm)	GW	GRAVEL, well graded
	GP	GRAVEL, poorly graded
	GM	Silty GRAVEL
	GC	Clayey GRAVEL
SAND (more than half of the coarse fraction is < 2.36 mm)	SW	SAND, well graded
	SP	SAND, poorly graded
	SM	Silty SAND
	SC	Clayey SAND

Fine Grained Soils (silt and clay: more than 35% of soil finer than 0.075 mm)		
Major division	**Group Symbol**	**Soil Group**
SILT and CLAY (low to medium plasticity)	ML	SILT, low plasticity
	CL	CLAY, low plasticity
	CI	CLAY, medium plasticity
	OL	Organic SILT
SILT and CLAY (high plasticity)	MH	SILT, high plasticity
	CH	CLAY, high plasticity
	OH	Organic CLAY / SILT
Highly Organic	Pt	PEAT

Coarse grained soils with fines contents between 5% and 12% are provided a dual classification comprising the two group symbols separated by a dash, e.g. for a poorly graded gravel with between 5% and 12% silt fines (poorly graded 'GRAVEL with silt'), the classification is GP-GM.

For the purpose of classification, *poorly graded, uniform,* or *gap graded* soils are all designated as poorly graded. Soils that are dominated by boulders or cobbles are described separately and are not classified.

Classification is routinely undertaken based on tactile assessment with the soil description. Refinement of soil classification may be applied using laboratory assessment, including particle size distribution and Atterberg Limits. Atterberg Limits testing is applied to the sample portion finer than 0.425 mm. Fine grained soil components are assessed on the basis of regions defined within the Modified Casagrande Chart.



ROCK DESCRIPTION
(MATERIALS)

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The description and classification of rock is in general accordance with Australian Standard AS 1726-2017 (Geotechnical Site Investigations). Visual and tactile assessment is applied to rock materials and natural defects to facilitate an assessment of rock mass engineering behaviour. AS1726 defines rock as "any aggregate of minerals and/or organic materials that cannot be disaggregated by hand in air or water without prior soaking".

Rock Name: Simple rock names are used to provide a reasonable engineering description rather than a precise geological classification. The rock name is chosen on the basis of origin, with common types summarised below. Additional, non-exhaustive, terminology is included in AS1726. Rock names not described within AS1726 may be adopted, with geological characteristics typically noted within accompanying text.

Grain Size (mm)	Sedimentary					Metamorphic		Igneous			Duricrust
	Clastic or Detrital		Carbonate		Pyroclastic	Foliated	Non-Foliated	Felsic	↔	Mafic	(by cementing mineral)
			Low Porosity	Porous							
>2.0	CONGLOMERATE (rounded grains) BRECCIA (angular grains)		LIMESTONE ($CaCO_3$) or DOLOMITE ($CaMgCO_3$)	CALCIRUDITE	AGGLOMERATE (rounded grains) VOLCANIC BRECCIA (angular grains)	GNEISS	MARBLE (carbonate) QUARTZITE SERPENTIN-ITE HORNFELS	GRANITE	DIORITE	GABBRO	FERRICRETE (iron oxides / hydroxides) SILCRETE (Silica) CALCRETE ($CaCO_3$) GYPCRETE (gypsum)
2.0-0.06	SANDSTONE			CALCARENITE	TUFF	SCHIST		MICRO-GRANITE	MICRO-DIORITE	DOLERITE	
0.06-0.002	MUDSTONE (silt and clay)	SILTSTONE		CALCISILTITE	Fine grained TUFF	PHYLLITE or SLATE		RHYOLITE	ANDESITE	BASALT	
<0.002		CLAYSTONE		CALCILUTITE							

Grain size: For rocks with predominantly sand sized grains (or crystals) the dominant or average grain size is described as follows: Sedimentary rocks: *coarse grained:* mainly 0.6 to 2 mm; *medium grained:* mainly 0.2 to 0.6 mm; *fine grained:* mainly 0.06 (just visible) to 0.2 mm. Igneous and metamorphic rocks: *coarse grained:* > 2 mm; *medium grained:* 0.06 to 0.6 mm; *fine grained:* < 0.06 mm (just visible).

Colour assists in rock identification and interpolation. Rock colour is generally described in a "moist" condition, using simple terms (e.g. grey, brown, etc.) and modified as necessary by *"pale"*, *"dark"*, or *"mottled"*. Borderline colours may be described as a combination of these colours (e.g. red-brown).

Texture refers to the arrangement of, or the relationship between, the component grains or crystals (e.g. porphyritic, crystalline or amorphous).

Fabric refers to visible grain arrangement along a preferential orientation or a layering. Fabric may be noted as *"indistinct"* (little effect on strength) or *"distinct"* (rock breaks more easily parallel to the fabric). Common terms include *"massive"* or *"flow banding"* (igneous), *"foliation"* or *"cleavage"* (metamorphic). Sedimentary layering is described as *"bedding"* or (where thickness < 20 mm) *"lamination"*. The typical orientation, spacing or thickness of these structural features can be described directly in millimetres and metres. Further quantification of bedding thickness applied by GHD is as follows:

Thinly laminated	<6 mm	Very thinly bedded	20-60 mm	Medium bedded	0.2-0.6 m	Very thickly bedded	>2 m
Laminated	6-20 mm	Thinly bedded	60-200 mm	Thickly bedded	0.6-2 m		

Features, Inclusions and Minor Components are typically only described when those features could influence the engineering behaviour of the rock. Described features may include: gas bubbles in igneous rocks; veins of quartz, calcite or other minerals; pyrite crystals and nodules or bands of ironstone or carbonate; cross bedding in sandstone; clast or matrix support in conglomerates and breccia.

Moisture content may be described by the feel and appearance of the rock, as follows: *"dry"* (looks and feels dry), *"moist"* (feels cool, darkened in colour, but no water is visible on the surface), or *"wet"* (feels cool, darkened in colour, water film or droplets visible on the surface). The moisture content of rock cored with water may not represent in situ conditions.

Durability of rock samples is noted where there is an observed tendency of samples to crack, breakdown in water or otherwise deteriorate with exposure.

Weathering and Alteration: Weathering (changes from exposure near the surface) and alteration (changes caused by hot gases or liquids, with potential distribution unrelated to topography) assists identification, though are not scales of engineering behaviour. A subjective scale is applied as follows:

Weathering Term		Alteration Term		Description (where weathering or alteration processes are not delineated, weathering terms adopted)
Residual Soil *(RS)*				Material has weathered to such an extent that it has soil properties. Mass structure, material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered	*(XW)*	Extremely Altered	*(XA)*	Material has weathered / altered to such an extent that it has soil properties. Mass structure, material texture and fabric of original rock are still visible.
Highly Weathered	*(HW)*	Highly Altered	*(HA)*	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering / alteration. Some primary minerals have weathered / altered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products, or precipitation of secondary minerals, in pores.
Moderately Weathered	*(MW)*	Moderately Altered	*(MA)*	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered	*(SW)*	Slightly Altered	*(SA)*	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh (Fr)				Rock shows no sign of decomposition of individual minerals or colour changes.

Estimated Strength refers to the rock material and not the rock mass. The strength is defined in terms of uniaxial compressive strength (UCS), though is typically estimated by either tactile assessment or Point Load Strength Index $I_{S(50)}$ (measured perpendicular to planar anisotropy). A correlation between $I_{S(50)}$ and UCS is adopted for classification, though is not intended for design purposes without appropriate supporting assessment. A field guide follows:

Term		UCS (MPa)	$I_{S(50)}$ (MPa)	Field Guide
Very Low	*(VL)*	0.6 – 2	0.03 - 0.1	Material crumbles under firm blows with sharp end of geological pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm thick can be broken by finger pressure.
Low	*(L)*	2 - 6	0.1 - 0.3	Easily scored with knife; indentations 1 to 3 mm show in the specimen with firm blows of a geological pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	*(M)*	6 - 20	0.3 - 1.0	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
High	*(H)*	20 - 60	1 - 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a geological pick with a single firm blow; rock rings under hammer.
Very High	*(VH)*	60 - 200	3 -10	Hand specimen breaks with geological pick after more than one blow; rock rings under hammer.
Extremely High	*(EH)*	>200	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Material with strength less than "Very Low" is described using soil characteristics, with the presence of an original rock texture or fabric noted if relevant.

Stratigraphic units may be interpreted and reported. The terms *"possibly"* or *"probably"* indicate increased uncertainty in this interpretation.

Defects often control the overall engineering behaviour of a rock mass. AS 1726 defines a defect as "a discontinuity, fracture, break or void in the material or materials across which there is little or no tensile strength". Describing the type, character and distribution of natural defects is an essential part of the description of many rock masses.

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ROCK DESCRIPTION
(DEFECTS)

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Commonly described characteristics of defects within a rock mass include type, orientation, roughness and shape, coatings and composition of seams, aperture, persistence, spacing and block shape.

The degree of detail required for defect descriptions depends on project requirements. All defects judged of engineering significance for the site and project are described individually. Where appropriate, generalised descriptions for less significant, or multiple similar, defects can be provided for delineated parts of rock core or exposures. A general description of delineated defect sets is provided when sufficient orientation data is available.

Defect Type is described using the terms summarised below. On core logs, only natural defects across which the core is discontinuous are described (i.e. inferred artificial fractures such as drill breaks are excluded). Incipient defects are described using the relevant texture or fabric terms. Healed defects (those that have been re-cemented by minerals such as chlorite or calcite) are described using the prefix "healed" (e.g. healed joint).

Type	Code	Description
Parting	Pt	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (e.g. cleavage). May be open or closed.
Joint	Jt	A surface or crack with no apparent shear displacement and across which the rock has little or no tensile strength, but which is not parallel or subparallel to layering or to planar anisotropy in the rock material. May be open or closed.
Sheared Surface	SS	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.
Sheared Zone	SZ	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.
Sheared Seam	SSm	Seam of soil material with roughly parallel almost planar boundaries, composed of soil materials with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.
Crushed Seam	CSm	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.
Infilled Seam	ISm	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as a veneer or coating on a joint surface.
Extremely Weathered Seam	WSm	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.

Defect Orientation is recorded as the "dip" (maximum angle of the mean plane, measured from horizontal) and the "dip direction" (azimuth of the dip, measured clockwise from true north). Dip and dip direction is expressed in degrees, with two-digit and three-digit numbers respectively, separated by a slash (e.g. 45/090). For vertical boreholes, the defect dip is measured as the acute angle from horizontal. Rock core extracted from vertical boreholes is generally not oriented, so the dip direction cannot be directly measured. For non-oriented inclined boreholes, a defect "alpha" (α) angle is measured as the acute angle from the core axis. For vertical and non-oriented inclined boreholes, the dip direction can sometimes be estimated from the relationship of the defect to a well-defined site structure such as fabric. For oriented inclined boreholes, the measurement of the defect orientation is carried out and recorded in a form suited to the particular device being used and later processed to report true dip and dip direction.

Roughness and Shape of the defect surface combine to have significant influence on shear strength. Standard descriptions and abbreviations include:

Roughness	Code	Description
Very Rough	VR	Many large surface irregularities (amplitude generally more than 1 mm). Feels like, or coarser than very coarse sand paper.
Rough	Rf	Many small surface irregularities (amplitude generally less than 1 mm). Feels like fine to coarse sand paper.
Smooth	So	Smooth to touch. Few or no surface irregularities.
Polished	Pol	Shiny smooth surface.
Slickensided	Slk	Grooved or striated surface, usually polished.

Shape	Code	Description
Planar	Pln	The defect does not vary in orientation.
Curved	Cu	The defect has a gradual change in orientation.
Undulating	Un	The defect has a wavy surface.
Stepped	St	The defect has one or more well defined steps.
Irregular	Ir	The defect has many sharp changes of orientation.

Although the surface roughness of defects can be described at small (10-100 mm) scales of observation, the overall shape of the defect surface can usually be observed only at medium (0.1-1 m) and large (>1 m) scale.

Where it is necessary to assess the shear strength of a defect, observations are generally made at multiple scales. Surface roughness may also be characterised by using the joint roughness coefficient (JRC) profiles established by Barton and Choubey (1977). Where large-scale observations are possible, further measurement of defect "waviness" (angle of the asperities relative to the overall dip angle of the plane) is made.

Coatings and Composition of Seams: Many defects have surface coatings, which can affect their shear strength. Standard descriptions include:

Coating	Code	Description
Clean	Cn	No visible coating.
Stained	Sn	No visible coating but surfaces are discoloured.
Veneer	Ve	A visible coating of soil or mineral substance, but too thin to be measured may be patchy.
Coating	Co	A visible coating up to 1 mm thick. Soil material greater than 1 mm thick is described using defect terms (e.g. infilled seam). Rock material greater than 1 mm thick is described as a vein (Vn).

Common Minerals	Code
Clay	CLAY
Calcite	Ca
Carbonaceous	X
Chlorite	Kt
Iron Oxide	Fe
Micaceous	Mi
Manganese	Mn
Pyrite	Py
Quartz	Qz

The composition of seams are described using soil description terms as given on the SOIL DESCRIPTION Standard Sheet. Where possible the mineralogy of coatings is identified. Common mineral coatings include:

Aperture: Defects across which there is little or no tensile strength can be either *"open"* (*Op*) or *"closed"* (*Cl*). For rock core, the width of the "open" defect is measured whilst still in the core barrel splits. The descriptor *"tight"* (*Ti*) can only apply to healed or incipient defects (i.e. veins, foliation, etc.).

Persistence and Spacing of defects is described directly in millimetres and metres. If the measurement of defect persistence is limited by the extent of the exposure, the end conditions are noted (i.e. 0, 1 or 2 defect ends observed). Further quantification of defect spacing applied by GHD is as follows:

Extremely closely	6-20 mm	Closely	60-200 mm	Wide	0.6-2.0 m
Very closely	20-60 mm	Medium	0.2-0.6 m	Very wide	>2 m

The spacing between defects of similar orientation (i.e. within a specific defect set) is recorded when possible. The frequency of defects within rock core can be measured as either: the spacing between successive defects; or the "Fracture Index", which is the number of defects per metre of core.

Block Shape: Where it is considered significant, block shape can be described using the subjective terms as follows:

Block Shape	Description
Polyhedral	Irregular discontinuities without arrangement into distinct sets, and of small persistence.
Tabular	One dominant set of parallel discontinuities, for example bedding planes, with other non-continuous joints; thickness of blocks much less than length or width.
Prismatic	Two dominant sets of discontinuities, approximately orthogonal and parallel, with a third irregular set; thickness of blocks much less than length or width.
Equidimensional	Three dominant sets of discontinuities, approximately orthogonal, with occasional irregular joints, giving equidimensional blocks.
Rhomboidal	Three (or more) dominant, mutually oblique, sets of joints giving oblique-shaped, equidimensional blocks.
Columnar	Several, usually more than three sets of continuous, parallel joints usually crossed by irregular joints; lengths much greater than other dimensions.

Ref: DS6.5.2.2 Issue 2.0d Date: 20/06/2017

GLOSSARY OF SYMBOLS

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This standard sheet should be read in conjunction with all test hole log sheets and any idealised geological sections prepared for the investigation report.

GENERAL

Symbol	Description	Symbol	Description
D	Disturbed Sample	PZ	Piezometer Installation
U	Undisturbed Sampled (suffixed by sample size or tube diameter in mm if applicable)	R	Rising Head Permeability Test
		F	Falling Head Permeability Test
C	Core Sample (suffixed by diameter in mm)	PBT	Plate Bearing Test
SV	Shear Vane Test (suffixed by value in kPa)		Water Inflow (make)
SPT	Standard Penetration Test (with blows per 0.15m)		Water Outflow (loss)
N	SPT Value		Temporary Water Level
HB	SPT hammer bouncing		Final Water Level
PM	Pressuremeter Test		Point Load Test (axial)
PP	Pocket Penetrometer (suffixed by value in kPa)		Point Load Test (diametric)
PK	Packer Test	IMP	Impression Device Test

SOIL SYMBOLS

Main Components

SAND
CLAY
SILT
GRAVEL
FILL
TOPSOIL

Minor Components

sandy
clayey
silty
gravelly
vegetation, roots

Note: Natural soils are generally a combination of constituents, e.g. sandy CLAY

ROCK SYMBOLS

Sedimentary

SANDSTONE
SHALE
CLAYSTONE
CONGLOMERATE
SILTSTONE
COAL

Igneous

GRANITIC ROCK
IGNEOUS DYKE
BASALTIC ROCK

Note: Additional rock symbols may be allocated for a particular project.

NATURAL FRACTURES (Coding)

Fracture Type

JT	Joint
BP	Bedding Plane
Cb	Cross Bed
SS	Sheared Surface
SM	Seam
CS	Crushed Seam
FZ	Fragmented Zone
SZ	Shear Zone
VN	Vein

Orientation

For vertical non-oriented core ... “Dip” angle (eg. 5°) measured relative to horizontal
For inclined non-oriented core ... “Angle” measured relative to core axis.
For inclined oriented core ... “Dip” angle and “Dip Direction” angle (eg. 45°/225° mag.)

VT	Vertical
HZ or 0°	Horizontal
d	degrees

Infilling or Coating

CN	Clean
X	Carbonaceous
CLAY	Clay
KT	Chlorite
CA	Calcite
FE	Iron Oxide
MI	Micaceous
Mn	Manganese
Py	Pyrite
QZ	Quartz
VE	Veneer

Shape

PLN	Planar
CU	Curved
UN	Undulating
ST	Stepped
IR	Irregular

Roughness

POL	Polished
SLK	Slickensided
SO	Smooth
RF	Rough
VR	Very Rough

Others

DIS	Discontinuous
OP	Open
CL	Closed
TI	Tight

Ref: DS6.5.1 Issue 1.7 Date: 20/09/2010

CORE LOG SHEET NOTES

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The intention of Core log Sheets is to present factual information measured from the core or as recorded in the field. Some interpretative information is inevitable in the location of core loss, description of weathering and identification of drilling induced fractures. This should be noted in the use of Core Log Sheets and remembered in their utilisation.

DRILLING AND CASING

The types of drilling used to advance the drill hole are recorded for relevant intervals. The types of drilling may include: NMLC coring, NQTT (NQ triple tube wire line), HW, HX, NW and NX casing, wash boring (tri-cone roller bit, TC drag bit, TC blade bit), or auger drilling (V-bit, TC drag bit).

The relevant progress is shown by abbreviated dates in the column.

WATER

Water lost or water made during drilling is recorded and subsequent readings of water levels in the borehole or piezometers are recorded here with dates of observation.

DRILL DEPTH AND CORE LOSS

Drilling intervals are shown by depth increments and horizontal marker lines. Core loss is measured as a percentage of the drill run. If the location of the core loss is known or strongly suspected, it is shown in a region of the column bounded by dashed horizontal lines. If unknown, core loss is assigned to the bottom of a coring run.

SAMPLES AND FIELD TESTS

The location of samples taken for testing or the location of field tests are indicated by the appropriate symbol from the GLOSSARY OF SYMBOLS Standard Sheet (or as applicable for the project) and are shown at the relevant location or over the relevant depth interval.

DEPTH (RL)

Changes in rock types or the locations of piezometer tips, samples, test intervals or other depths are shown as appropriate in terms of depth from the hole collar or in terms of RL.

For inclined holes the depths shown on the log refer to the drilled length along the borehole. The RL, where used, is the only transformed reference to true vertical depth.

STRATA

Rock types are presented graphically using the symbols shown on the GLOSSARY OF SYMBOLS Standard Sheet or as assigned for the project.

DESCRIPTION

The rock type is described in accordance with the ROCK DESCRIPTION Standard Sheet.

WEATHERING

Weathering is described, by code letters, in accordance with the ROCK DESCRIPTION Standard Sheet. A weathering term or range of terms is usually assigned to various strata.

It is noted, however, that the assignment of a term of weathering is subjective and is normally used for identification and does not imply engineering behaviour (such behaviour being controlled principally by rock substances strength and defect frequency - collectively, rock mass strength). Consequently, boundaries are often not shown and weathering may even not be reported where potentially misleading.

ESTIMATED STRENGTH

The strength of the rock substance is estimated by a combination of Point Load testing and tactile appraisal in accordance with the ROCK DESCRIPTION Standard Sheet. The estimated strength is presented in a histogram form. Both axial and diametric point load test results can be presented using the symbols on the GLOSSARY OF SYMBOLS Standard Sheet and the variation between axial and diametric values is indicative of anisotropy or fissility of the rock unit.

NATURAL FRACTURES

The identification of natural fractures requires an endeavour to exclude drilling induced breaks in the core and, as such, can be somewhat subjective. Natural fractures exist prior to coring the rock, whereas artificial fractures occur either during coring, during placing core in the core boxes, or during examination or transportation, or core after being boxed.

The log of Natural Fractures is presented as a combination of Fracture Spacing, Visual and Description columns. Coding is presented on the GLOSSARY OF SYMBOLS Standard Sheet.

ROCK QUALITY DESIGNATION (RQD) INDEX OPTION

The Core Log Sheet has an optional field column to record the RQD index. For certain projects, such as tunnelling or underground mining investigations, rock mass ratings or classifications can be required as part of the design process. The Rock Quality Designation (RQD) Index forms a component of these rock mass ratings and provides a quantitative estimate of rock mass quality from rock core logs. The core must be a minimum of 54.7mm diameter (although NMLC-sized core is probably OK) for derivation of an RQD index.

The RQD index is expressed as a percentage of intact rock core (excludes extremely weathered rock/residual soil) greater than 100 mm in length over the total selected core length. The total selected core length should be based on identifiable engineering geological domain characteristics. Should this not be practicable, RQD can be measured on a per run basis.

Ref: DS6.2.1 Issue 1.5 Date: 04/06/2008

DYNAMIC CONE PENETROMETER (DCP) TESTING

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SCOPE

The Dynamic Cone Penetrometer (DCP) test comprises the measurement of the soil resistance to a steel rod driven into the ground by a dropped weight.

The DCP test is a simple manual test used in both sandy and clayey soils. The test is a measure of the shear strength of the soil at relatively shallow depth.

EQUIPMENT AND METHOD

A general description of the dynamic penetrometer apparatus used by our firm is presented in Australian Standard AS 1289.6.3.2. The equipment utilises a 9 kg sliding weight with a drop height of 510 mm. It is fitted with a conical tip. The equipment can be adjusted for a fall of 600 mm and use of a blunt tip in accordance with AS 1289.6.3.3.

The test data are generally recorded as the number of blows (n) per 50 mm of penetration. For specific applications (such as pavement investigations), the data may be collected in the reverse form, i.e. as mm per blow. The results are presented either in tabular or graphic form for reporting purposes.

INTERPRETATION

The interpretation of the DCP results is generally based on the assumption that the measured resistance is a function of soil strength. A profile of soil strength (cohesive soils) or density index (cohesionless soils) can thus be established. The test often can be used to qualitatively indicate the presence of soft or loose zones within a soil profile.

The energy of the system per unit area is similar to that of the larger Standard Penetration Test (SPT). Thus, the common relationships of SPT and other parameters can be used as a means of estimating soil properties, after appropriate site specific consideration. The interpretations from the test are approximate only, and this is particularly pertinent to sand profiles where the magnitude of confinement stress is important in the assessment of the results.

Interpretation of the DCP penetration rate at depth must be conducted with due regard to rod friction effects. In particular, care must be exercised with soft clay profiles where rod resistance may have an unconservative impact on the results. Care must also be exercised with soil profiles containing larger particles such as gravels and cobbles where penetration rate can be affected if the DCP tip strikes or glances off such particles.

In-situ California Bearing Ratio (CBR) values of clay soil subgrades are sometimes interpreted directly from DCP test results for use in road pavement design. In this case, the correlation between DCP and CBR based on that published in AUSTROADS Pavement Structural Design guide (AGPT02-17 Part 2) may be applied. This correlation should be verified by site specific laboratory testing, where appropriate. In addition, the effects of moisture content variations (in-situ versus design conditions) must be considered, as the DCP test only reflects the shear strength of the soil at the time of testing. Further information can be found in AUSTROADS Geotechnical Investigation and Design guide (AGRD07-08 Part 7).

Ref: DS5.4.3 Rev 0 Date: 05/10/2018

LABORATORY TESTING

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GENERAL

Samples extracted during the fieldwork stage of a site investigation may be “disturbed” or “undisturbed” (as generally indicated on the test hole logs) depending upon the nature and purpose of the sample as well as the method of extraction, transportation, extrusion and testing. This aspect should be taken into account when assessing test results, which must of necessity, reflect the effects of such disturbance.

All soil properties (as measured by laboratory testing) exhibit inherent variability and thus a certain statistical number of tests is required in order to predict an average property with any degree of confidence. The site variability of soil strata, future changes in moisture and other conditions and the discrete sampling positions must also be considered when assessing the representative nature of the laboratory programme.

Certain laboratory test results provide interpreted soil properties as derived by conventional mathematical procedures. The applicability of such properties to engineering design must be assessed with due regard to the site, sample condition, procedure and project in hand.

TESTING

Laboratory testing is normally carried out in accordance with Australian Standard AS 1289 as amended, or in NSW, Roads and Maritime Services (RMS) standards when specified. The routine Australian Standard tests are as follows:

Moisture Content	AS1289 2.1.1	
Liquid Limit	AS1289 3.1.1	collectively known as Atterberg Limits
Plastic Limit	AS1289 3.2.1	
Plasticity Index	AS1289 3.3.1	
Linear Shrinkage	AS1289 3.4.1	
Particle Density	AS1289 3.5.1	
Particle Size Distribution	AS1289 3.6.1, 3.6.2 and 3.6.3	
Emerson Class Number	AS1289 3.8.1	collectively, Dispersive Classification
Percent Dispersion	AS1289 3.8.2	
Pinhole Dispersion Classification	AS1289 3.8.3	
Hole Erosion (HE)	GHD Method	
No Erosion Filter (NEF)	GHD Method	
Organic Matter	AS1289 4.1.1	
Sulphate Content	AS1289 4.2.1	
pH Value	AS1289 4.3.1	
Resistivity	AS1289 4.4.1	
Standard Compaction	AS1289 5.1.1	
Modified Compaction	AS1289 5.2.1	
Dry Density Ratio	AS1289 5.4.1	
Minimum Density	AS1289 5.5.1	
Density Index	AS1289 5.6.1	
California Bearing Ratio	AS1289 6.1.1 and 6.1.2	
Shear Box	AS1289 6.2.2	
Undrained Triaxial Shear	AS1289 6.4.1 and 6.4.2	
One Dimensional Consolidation	AS1289 6.6.1	
Permeability Testing	AS1289 6.7.1, 6.7.2 and 6.7.3	

Where tests are used which are not covered by appropriate standard procedures, details are given in the report.

LABORATORIES

Our Australian laboratories are NATA accredited to AS ISO / IEC17025 for the listed tests.

The oedometer, triaxial and shear box equipment are fully automated for continuous operation using computer controlled data acquisition, processing and plotting systems.

Ref: DS5.5.2 Issue 0 Date: 05/10/2018

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH02

SHEET 1 OF 2

Position : 309191.0 E 6246197.6 N MGA94 56 **Surface RL:** 7.45m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
0	Solid Flight Auger (TC-bit)	Nil	▽	ES	0.50		-	SILT, brown, low plasticity, trace fine grained sand, with rootlets (fill).	M	-	At 0.3m, PID=0.5ppm
				SPT 6/7/5 N=12			-	CLAY, brown to dark brown, high plasticity, trace fine to medium grained sand, with rootlets (fill).	M	–	
1					1.50		CL-CI	CLAY, dark brown, low to medium plasticity, trace fine to medium grained sand, with rootlets (alluvium).	W	S	
				SPT 3/2/1 N=3							
2				U50				2.0m, trace fine grained sand, without rootlets.			
3				SPT 3/4/3 N=7				3.0m, brown-orange.	M	F	
4								4.5m, grey to orange brown.		VSt	
				SPT 8/10/11 N=21	5.00						
5											

Note: * indicates signatures on original issue of log or last revision of log

See standard sheets for details of abbreviations & basis of descriptions

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH02

SHEET 2 OF 2

Position : 309191.0 E 6246197.6 N MGA94 56 **Surface RL:** 7.45m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil		SPT 3/6/6 N=12	6.45		CL-CI	CLAY, as previous.	M	VSt	
								6.0m, grey spotted red brown, with fine to coarse grained sand		St	
								End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

Note: * indicates signatures on original issue of log or last revision of log

See standard sheets for details of abbreviations & basis of descriptions

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BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH03

SHEET 1 OF 2

Position : 309182.3 E 6246131.4 N MGA94 56 **Surface RL:** 7.10m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
							-	Silty SAND, dark grey, fine to medium grained, with fine to coarse sub-rounded gravel (fill).	D	-	
				ES							At 0.3m, PID=1.3ppm
					0.50		-	Sandy SILT, dark grey, low plasticity, fine to coarse grained sand (fill).	M	-	
				SPT 8/11/6 N=17							
1											
					1.50		CL	CLAY, brown, low plasticity, trace fine grained sand (alluvium).	M	S	1.5-1.95m, PP=25-30kPa
				SPT 1/1/2 N=3							
2											
	Solid Flight Auger (TC-bit)	Nil						2.5m, brown to pale brown.			
				U50							
3			▽							F	3.0-3.45m, PP=50-100kPa
				SPT 3/3/3 N=6							
4											
								4.5m, pale brown mottled orange brown		VSt	4.5-4.95m, PP=150-200kPa
				SPT 2/11/11 N=22							
5					5.00						

Note: * indicates signatures on original issue of log or last revision of log

See standard sheets for details of abbreviations & basis of descriptions

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH03

SHEET 2 OF 2

Position : 309182.3 E 6246131.4 N MGA94 56 **Surface RL:** 7.10m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil		SPT 7/8/10 N=18	6.45		CL	CLAY, as previous.	M	VSt	
								End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

Note: * indicates signatures on original issue of log or last revision of log

See standard sheets for details of abbreviations & basis of descriptions

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH04

SHEET 1 OF 2

Position : 309170.6 E 6246065.3 N MGA94 56 | **Surface RL:** 6.90m AHD | **Angle from Horiz. :** 90° | **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track | **Contractor :** Terratest | **Driller :** Fabian Ferreiro | **Checked :** BS
Date Started : 10/11/2018 | **Date Completed :** 10/11/2018 | **Logged by :** JK | **Date:** 19/12/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
1	Solid Flight Auger (TC-bit)	Nil	▽	ES			-	Silty SAND, black, fine to coarse grained, with fine to coarse sub-rounded gravel (fill).	D	-	At 0.3m, PID=1.7ppm
				SPT 5/8/4 N=12	1.50		CL-CI	CLAY, brown, low to medium plasticity, with fine to medium grained sand, with rootlets (alluvium).	W	VS	1.5-1.95m, SPT sank under hammer weight.
2				SPT 0/0/0 N=0							
3				SPT 0/0/0 N=0				3.0m, brown with grey mottles.			3.0-3.45m, SPT sank under hammer weight.
				U50							
4											3.95m, PP=10-30kPa
				SPT 2/2/2 N=4	4.50		CL-CI	Sandy CLAY, grey with minor brown, low to medium plasticity, fine to coarse grained sand (alluvium).	M	F	4.5-4.95m, PP=50-100kPa
5					5.00						

See standard sheets for details of abbreviations & basis of descriptions

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CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH04

SHEET 2 OF 2

Position : 309170.6 E 6246065.3 N MGA94 56 **Surface RL:** 6.90m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil					CL-CI	Sandy CLAY, as previous.	M	F	
				SPT 4/6/7 N=13	6.00		CL-CI	CLAY, brown and grey, low to medium plasticity, with fine to medium grained sand (alluvium).	M	St	
					6.45			End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

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BOREHOLE LOG SHEET

GEO_BOREHOLE_2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH05

SHEET 1 OF 2

Position : 309162.2 E 6246000.3 N MGA94 56 **Surface RL:** 7.39m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
0	Solid Flight Auger (TC-bit)	Nil	▽	ES			-	Silty SAND, dark grey to black, fine to coarse grained, with fine to coarse sub-rounded gravel (fill).	M	-	At 0.3m, PID=1.5ppm
					0.50		CL-CI	CLAY, brown with red brown mottles, low to medium plasticity, trace fine grained sand, with rootlets (alluvium).	M	F-St	0.5m, perched water table 0.5-0.8m, PP=100kPa
1				SPT 3/4/4 N=8							
				SPT 3/3/4 N=7					M		1.5-1.9m, PP=80-90kPa
2											
3				SPT 4/4/6 N=10						St-VSt	3.0-3.45m, PP=200-210kPa
								3.5m, grey.			
4											
				SPT 8/15/14 N=29				4.5m, brown and grey, with fine to medium grained sand.			4.5-4.9m, PP=150-200kPa
5					5.00						

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BOREHOLE LOG SHEET

GEO_BOREHOLE_2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH05

SHEET 2 OF 2

Position : 309162.2 E 6246000.3 N MGA94 56 **Surface RL:** 7.39m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 10/11/2018 **Date Completed :** 10/11/2018 **Logged by :** JK **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil					CL-CI	CLAY, as previous.	M	St-VSt	
								6.0m, grey with minor brown.		St	
				SPT 1/3/8 N=11	6.20		CL-CI	Sandy CLAY, grey with brown mottle, low to medium plasticity, fine to coarse grained sand (alluvium).	M	St	
					6.45			End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

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BOREHOLE LOG SHEET

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH06

SHEET 1 OF 2

Position : 309153.5 E 6245936.7 N MGA94 56	**Surface RL:** 8.02m AHD	**Angle from Horiz. :** 90°		**Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track	**Contractor :** Terratest	**Driller :** Fabian Ferreiro		**Checked :** BS
Date Started : 11/11/2018	**Date Completed :** 11/11/2018	**Logged by :** JS		**Date:** 19/12/2018

DRILLING					MATERIAL						Note: * indicates signatures on original issue of log or last revision of log
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
				D	0.15		-	Silty SAND, dark brown, fine to coarse grained trace gravel (ballast) at the surface, trace rootlets (fill).	M	-	
				ES			CL	CLAY, red-brown mottled pale grey, low plasticity, trace fine grained sand (alluvium).	M	St	At 0.2m, PID=0.6ppm
				SPT 3/4/5 N=9							0.5-0.95m, PP=150kPa
1											
				SPT 3/5/4 N=9							1.5-1.95m, PP=150kPa
2											
	Solid Flight Auger (TC-bit)	Nil			3.00		ML	Sandy SILT, mottled brown, orange brown and pale grey, fine grained sand (alluvium).	M	St	3.0-3.45m, PP=150-200kPa
3				SPT 3/4/9 N=13							
4								4.5m, pale grey.			
				SPT 4/5/7 N=12	5.00						
5											

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BOREHOLE LOG SHEET

GEO_BOREHOLE_2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH06

SHEET 2 OF 2

Position : 309153.5 E 6245936.7 N MGA94 56 **Surface RL:** 8.02m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil	▽	SPT 3/4/4 N=8	6.45		ML	Sandy SILT, as previous. 6.0m, pale grey mottled orange-brown with bands of brown, trace coarse grained sand.	M	St	
7								End of borehole at 6.45 metres. Target Depth			
8											
9											
10											

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BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH07

SHEET 1 OF 2

Position : 309146.0 E 6245900.0 N MGA94 56 **Surface RL:** 8.16m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
				D	0.15		-	Silty SAND, dark grey, fine to coarse grained, with fine to coarse sub-angular to angular gravel of ballast (fill).	D	-	
				ES	0.40		-	Gravelly CLAY, brown, low plasticity, fine to coarse sub-angular to angular gravel, with fine to coarse grained sand (fill).	M	-	At 0.2m, PID=0.9ppm
				SPT 3/10/12 N=22			CL-CI	CLAY, orange-brown, low to medium plasticity, with fine to medium grained sand, trace rootlets (probably alluvium)	M	VSt - H	0.5-0.95m, PP=400kPa
1					1.50		CL	Sandy CLAY, brown-pale brown spotted grey, low plasticity, fine to medium grained sand (alluvium).	M	VSt	
				SPT 6/10/11 N=21							
2	Solid Flight Auger (TC-bit)	Nil	Groundwater Not Encountered								
3								3.0m, brown-orange and grey.			
				SPT 5/11/12 N=23							
4											
								4.5m, pale brown to orange-brown and pale grey			4.5-4.95m, PP=250kPa
				SPT 6/9/10 N=19							
5					5.00						

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BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH07

SHEET 2 OF 2

Position : 309146.0 E 6245900.0 N MGA94 56 **Surface RL:** 8.16m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil	Groundwater Not Encountered	SPT 4/5/5 N=10	6.45		CL	Sandy CLAY, as previous. 6.0m, pale grey, sand is fine grained.	M	VSt	
								End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH08

SHEET 1 OF 2

Position : 309144.2 E 6245869.4 N MGA94 56 **Surface RL:** 8.27m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Note: * indicates signatures on original issue of log or last revision of log Comments/ Observations
0	Solid Flight Auger (TC-bit)	Nil			0.15		-	GRAVEL, grey, medium to coarse, sub-angular to angular, consisting of ballast (fill).	D	-	
				d ES	0.50		-	Sandy CLAY, brown, low to medium plasticity, fine to coarse grained sand, trace fine sub-angular gravel (fill)	M	-	At 0.3m, PID=0.9ppm
				SPT 2/4/6 N=10			CL-CI	CLAY, red-brown spotted grey, low to medium plasticity (alluvium).	M	VSt	0.5-0.95m, PP=200-250kPa
1											
				SPT 6/9/12 N=21							
2											
					3.00		CL	Sandy CLAY, pale grey mottled red-brown and pale brown, low plasticity, fine to medium grained sand (alluvium).	M	VSt	
				SPT 5/6/10 N=16							
3											
4								4.5m, pale brown to orange-brown and pale grey with minor dark brown.		St	4.5-4.95m, occasional dark brown organic inclusions up to 20mm wide.
				SPT 3/3/5 N=8							
5					5.00						

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE_2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH08

SHEET 2 OF 2

Position : 309144.2 E 6245869.4 N MGA94 56 **Surface RL:** 8.27m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil	▽				CL	Sandy CLAY, as previous.	M	St	
								5.5m, pale grey, sand is fine grained		VSt	
				SPT 3/13/12 N=25	6.20		SP	SAND, orange-brown, coarse grained, with clay (alluvium).	W	MD	
					6.45			End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

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Job No. 22-19800

BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH09

SHEET 1 OF 2

Position : 309132.5 E 6245798.6 N MGA94 56 | **Surface RL:** 8.18m AHD | **Angle from Horiz. :** 90° | **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track | **Contractor :** Terratest | **Driller :** Fabian Ferreiro | **Checked :** BS
Date Started : 11/11/2018 | **Date Completed :** 11/11/2018 | **Logged by :** JS | **Date:** 19/12/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
					0.00		-	Clayey SAND, dark brown, fine to coarse grained, trace fine sub-angular gravel (fill).	M	-	
					0.20		-	Gravelly CLAY, dark brown, low plasticity, fine to medium sub-angular to angular gravel, with fine to coarse grained sand (fill).	M	-	At 0.2m, PID=1.0ppm
				ES	0.70		CL-CI	CLAY, orange-brown mottled pale grey, low to medium plasticity (alluvium).	M	St	
1	Solid Flight Auger (TC-bit)	Nil		SPT 3/5/7 N=12	1.50		CL	Sandy CLAY, orange-brown, low plasticity, fine grained sand, trace rootlets and dark brown organics (alluvium).	M	St	
2				SPT 5/6/7 N=13							
3				SPT 4/6/8 N=14							
4								4.5m, without organic material.			
5				SPT 3/4/7 N=11	5.00						

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BOREHOLE LOG SHEET

GEO_BOREHOLE 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

Client : ARTC
Project : Cabramatta Rail Loop
Location : Cabramatta to Warwick Farm, NSW

HOLE No. GHD-BH09

SHEET 2 OF 2

Position : 309132.5 E 6245798.6 N MGA94 56 **Surface RL:** 8.18m AHD **Angle from Horiz. :** 90° **Processed :** HAL
Rig Type : Geoprobe 205 **Mounting:** Track **Contractor :** Terratest **Driller :** Fabian Ferreiro **Checked :** BS
Date Started : 11/11/2018 **Date Completed :** 11/11/2018 **Logged by :** JS **Date:** 19/12/2018

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
6	Solid Flight Auger (TC-bit)	Nil	▽				CL	Sandy CLAY, as previous.	M	St	
					6.00		CL-CI	CLAY, dark brown, low to medium plasticity, with organic inclusions (alluvium).	M	St	
				SPT 3/5/7 N=12	6.35						
					6.45		CL	Sandy CLAY, pale red mottled pale brown and grey, low plasticity, fine grained sand (alluvium).	M	St	
								End of borehole at 6.45 metres. Target Depth			
7											
8											
9											
10											

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Job No. 22-19800

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP02

SHEET 1 **OF** 1

Position:	309378.7 E 6247252.9 N MGA94 56	**Surface RL:**	11.86m AHD	**Processed:**	HAL
Method of Exploration:	Chrisite Pavement Rig	**Hole Size:**	0.25m Ø	**Checked:**	BS
Date:	12/11/18	**Logged by:**	JS	**Date:**	19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
		C			-	ASPHALTIC CONCRETE	-	-	Note: * indicates signatures on original issue of log or last revision of log
		ES	0.25		-	Sandy GRAVEL, dark grey, fine to coarse, sub-angular to angular, medium to coarse grained sand, trace with low plasticity clay (fill).	M	-	0.25 - 0.6m, appears poorly compacted
		D	0.60		CH	CLAY, red-brown mottled pale grey, high plasticity, trace fine grained sand (alluvium).	M	F	At 0.3m, PID = 1.0ppm
1	Groundwater Not Encountered	B						St	
			1.20					VSt	
					CL	CLAY, pale grey mottled pale brown, low plasticity, with fine grained sand (alluvium).	M	VSt	
		B							
			2.00					H	
2						End of test pit at 2 metres. Target Depth			
3									

See standard sheets for details of abbreviations & basis of descriptions

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP04

SHEET 1 **OF** 1

Position:	309349.0 E 6247054.2 N MGA94 56	**Surface RL:**	8.90m AHD	**Processed:**	HAL
Method of Exploration:	Chrisite Pavement Rig	**Hole Size:**	0.25m Ø	**Checked:**	BS
Date:	12/11/18	**Logged by:**	JS	**Date:**	19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
		C	0.15		-	ASPHALTIC CONCRETE	-	-	Note: * indicates signatures on original issue of log or last revision of log
		ES D	0.50		-	Gravelly CLAY, dark grey, low plasticity, fine to medium sub-angular to angular gravel, with medium to coarse grained sand (fill).	M	-	0.15 - 1.2m, appears moderately compacted At 0.2m, PID=1.0ppm
1	Groundwater Not Encountered	B	1.20		-	Sandy CLAY, dark brown to grey, low to medium plasticity, fine to medium grained sand (fill)	M	-	
		B	2.00		Cl	CLAY, red-brown to orange-brown, medium plasticity, with fine to medium sub-rounded to rounded ironstone gravel (alluvium),	M	St VSt-H	
2						End of test pit at 2 metres. Target Depth			
3									

See standard sheets for details of abbreviations & basis of descriptions

GHD GEOTECHNICS
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CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP06

SHEET 1 **OF** 1

Position:	309318.9 E 6246854.3 N MGA94 56	**Surface RL:**	6.74m AHD	**Processed:**	HAL
Method of Exploration:	Chrisite Pavement Rig	**Hole Size:**	0.25m Ø	**Checked:**	BS
Date:	12/11/18	**Logged by:**	JS	**Date:**	19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
			0.10		-	ASPHALTIC CONCRETE	-	-	Note: * indicates signatures on original issue of log or last revision of log
		C			-	Cement stabilised GRAVEL, dark grey to black, bound (fill)	-	-	
		ES	0.30		-	Sandy CLAY/ Clayey SAND, dark brown to dark grey, low plasticity, fine to coarse grained sand, with fine to coarse sub-angular to angular gravel (fill).	M	-	0.3 - 0.6m, appears poorly to moderately compacted At 0.3m, PID=0.6ppm
		D	0.60		Cl	CLAY, pale brown, orange brown and pale grey, medium plasticity, with fine grained sand (alluvium).	M	St	
		D							
1	Groundwater Not Encountered		1.00		SC	Clayey SAND, orange-brown, fine to coarse grained, with fine sub-rounded to rounded gravel (alluvium).	M	MD	
		B						D	
2			2.00			End of test pit at 2 metres. Target Depth			
3									

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP101

SHEET 1 **OF** 1

Position: 309255.1 E 6246459.0 N MGA94 56	**Surface RL:** 5.38m AHD	**Processed:** HAL
Method of Exploration: 2t Excavator	**Hole Size:** 2.0m x 0.3m	**Checked:** BS
Date: 13/11/18	**Logged by:** JS	**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
	Groundwater Not Encountered	ES	0.10		-	Sandy SILT, dark brown, low plasticity, fine grained, trace rootlets (topsoil/fill)	M	-	
		B			-	Gravelly SAND, red-brown, dark brown, brown and orange, fine to coarse grained, fine to coarse sub-angular to angular gravel, trace cobbles of brick, glass and other rubble (fill).	M	-	0.0 - 0.55m, appears well compacted.
		D	0.55 0.65		ML	Sandy SILT, orange-brown mottled brown, fine grained sand (alluvium).	M	St	
1						End of test pit at 0.65 metres. Terminated due to Aboriginial heritage termination criteria (i.e. no mechanical disturbance of natural soil profile)			
2									
3									

Note: * indicates signatures on original issue of log or last revision of log

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD

TITLE

ARTC
Cabramatta Rail Loop
Cabramatta to Warwick Farm NSW
Test Pit Photographs

DRAWN: H Warr	DATE: 09/01/2019
CHECKED: J Scognamiglio	DATE: 09/01/2019
SCALE: Not To Scale	A4
PROJECT No: 22-19800	FIGURE No: GHD-TP101 1/1

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP102

SHEET 1 **OF** 1

Position: 309241.4 E 6246366.9 N MGA94 56	**Surface RL:** 5.22m AHD	**Processed:** HAL
Method of Exploration: 2t Excavator	**Hole Size:** 2.0m x 0.3m	**Checked:** BS
Date: 13/11/18	**Logged by:** JS	**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
			0.10		-	Sandy SILT, dark brown, low plasticity, fine to medium grained sand, trace rootlets (fill).	M	-	0.0 - 0.6m, appears moderately to well compacted
		ES			-	Gravelly SAND, dark grey amd dark brown, fine to coarse grained, fine to coarse sub-angular to angular gravel, occasional cobbles, trace brick, glass and concrete rubble (fill).	M	-	
		B	0.60		CL	CLAY, brown and pale brown, low plasticity, with fine grained sand (alluvium).	M	VSt	0.6m, layer of non-woven geofabric material
		B							
1	Groundwater Not Encountered	B				1.0m, pale grey mottled orange-brown, trace sand and organics/rootlets			
			2.00			End of test pit at 2 metres. Target Depth			
2									
3									

Note: * indicates signatures on original issue of log or last revision of log

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

TITLE: ARTC Cabramatta Rail Loop Cabramatta to Warwick Farm NSW Test Pit Photographs	DRAWN: H Warr	DATE: 09/01/2019	
	CHECKED: J Scognamiglio	DATE: 09/01/2019	
	SCALE: Not To Scale		A4
	PROJECT No: 22-19800	FIGURE No: GHD-TP102 1/1	

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP103

SHEET 1 **OF** 1

Position: 309225.3 E 6246260.6 N MGA94 56	**Surface RL:** 5.67m AHD		**Processed:** HAL
Method of Exploration: 2t Excavator	**Hole Size:** 2.0m x 0.3m		**Checked:** BS
Date: 13/11/18	**Logged by:** JS		**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
					-	Sandy SILT, dark grey, fine to medium grained sand, trace rootlets (topsoil/fill).	M	-	0.0 - 0.5m, appears well compacted
		ES	0.10		-	GRAVEL, dark brown to dark grey, fine to coarse, sub-angular to angular, with cobbles and boulders up to 0.20-0.30m in width (fill).	M	-	0.1m, layer of non-woven geofabric material At 0.1m, PID=1.0ppm
			0.50		ML	Sandy SILT, brown to pale brown, fine grained sand (alluvium).	M	VSt	0.5m, layer of non-woven geofabric material
1	Groundwater Not Encountered	B							
		B				1.5m, pale grey mottled pale brown and orange brown.			
2			2.00			End of test pit at 2 metres. Target Depth			
3									

Note: * indicates signatures on original issue of log or last revision of log

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD	TITLE: ARTC Cabramatta Rail Loop Cabramatta to Warwick Farm NSW Test Pit Photographs	DRAWN: H Warr	DATE: 09/01/2019
		CHECKED: J Scognamiglio	DATE: 09/01/2019
		SCALE: Not To Scale	A4
		PROJECT No: 22-19800	FIGURE No: GHD-TP103 1/1

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP104

SHEET 1 **OF** 1

Position: 309206.4 E 6246162.0 N MGA94 56	**Surface RL:** 7.11m AHD	**Processed:** HAL
Method of Exploration: 5t Excavator	**Hole Size:** 0.3m Ø	**Checked:** BS
Date: 10/11/18	**Logged by:** JS	**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
					-	Gravelly SAND, dark grey to dark brown, fine to coarse grained, fine to medium sub-angular to angular gravel with silt (fill).	M	-	0.0 - 0.65m, appears well compacted
		ES	0.15		-	Gravelly SAND, pale brown, fine to coarse grained, fine to coarse sub-rounded to sub-angular gravel of ripped sandstone (fill).	M	-	At 0.15m, PID=0.7ppm
		B							
			0.65		-	GRAVEL, dark grey, dark brown and black, fine to coarse sub-angular to angular with fine to coarse grained sand and clay, occasional cobbles (fill).	M	-	0.65 - 2.0m, appears moderately compacted
		B							
1	Groundwater Not Encountered								
		D	1.50		-	Clayey SAND/Sandy CLAY, dark brown, dark grey and black, fine to coarse grained sand, low plasticity, with fine to coarse sub-angular to angular gravel, occasional cobbles (fill).	M	-	
		B	2.00						
2						End of test pit at 2 metres. Target Depth			
3									

Note: * indicates signatures on original issue of log or last revision of log

Comments Observations

See standard sheets for details of abbreviations & basis of descriptions

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD	TITLE ARTC Ca3ramatta Rail Loob Ca3ramatta to Warp icwFarm NSW Tekt Pit Psotograbsk	DRAWN H Warr	DATE 09/01/2019
		CHECKED J Scognamiglio	DATE 09/01/2019
		SCALE Not To Scale	A4
		PROJECT No 22-19800	FIGURE No GHD-TP104 1/2

GHDhGEOhLI_RARBYGL_ Gr.cT3I DG PHOTO TEST PIT PHOTO 1 PER PAGE 2 2219800hCA_RAf ATTA RAIL LOOPYGPJ MVDrapingFile<< 09/01/2019 12ϟ: 10ϟϟ000

GHD	TITLE ARTC Ca3ramatta Rail Loob Ca3ramatta to Warp icwFarm NSW Tekt Pit Psotograbsk	DRAWN H Warr	DATE 09/01/2019
		CHECKED J Scognamiglio	DATE 09/01/2019
		SCALE Not To Scale	A4
		PROJECT No 22-19800	FIGURE No GHD-TP104 2/2

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP105

SHEET 1 **OF** 1

Position: 309180.7 E 6245993.4 N MGA94 56	**Surface RL:** 7.45m AHD		**Processed:** HAL
Method of Exploration: 5t Excavator	**Hole Size:** 0.3m Ø		**Checked:** BS
Date: 10/11/18	**Logged by:** JS		**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
					-	Gravelly SAND, dark grey to dark brown, fine to coarse grained, fine to coarse sub-angular to angular gravel, with silt, trace rootlets (fill).	M	-	
			0.15		-	Gravelly SAND, pale brown, fine to coarse grained, fine to coarse sub-rounded to sub-angular gravel of ripped sandstone (fill).	M	-	0.15-0.85m, appears well compacted At 0.15m, PID=0.8ppm
		ES							
		B							
			0.65		-	GRAVEL, dark grey, fine to coarse, sub-angular, with fine to coarse grained sand (fill)	W	-	0.65m, layer of non-woven geofabric material
			0.85		CL	CLAY, brown to orange-brown, low plasticity, with fine grained sand (alluvium).	M	St-VSt	0.65 - 0.85m, perched water table
1									
		B							
2			2.00			End of test pit at 2 metres. Target Depth			
3									

Note: * indicates signatures on original issue of log or last revision of log

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Job No. 22-19800

GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD

TITLE

ARTC
Cabramatta Rail Loop
Cabramatta to Warwick Farm NSW
Test Pit Photographs

DRAWN: H Warr	DATE: 09/01/2019
CHECKED: J Scognamiglio	DATE: 09/01/2019
SCALE: Not To Scale	A4
PROJECT No: 22-19800	FIGURE No: GHD-TP105 1/2

GHD	TITLE: ARTC Cabramatta Rail Loop Cabramatta to Warwick Farm NSW Test Pit Photographs	DRAWN: H Warr	DATE: 09/01/2019
		CHECKED: J Scognamiglio	DATE: 09/01/2019
		SCALE: Not To Scale	A4
		PROJECT No: 22-19800	FIGURE No: GHD-TP105 2/2

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP106

SHEET 1 **OF** 1

Position: 309151.4 E 6245794.5 N MGA94 56	**Surface RL:** 7.91m AHD		**Processed:** HAL
Method of Exploration: 5t Excavator	**Hole Size:** 0.3m Ø		**Checked:** BS
Date: 10/11/18	**Logged by:** JS		**Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
		D	0.15		-	Gravelly SAND, dark grey to dark brown, fine to coarse grained, fine to medium sub-angular to angular gravel, with silt, trace rootlets (fill).	M	-	0.0 - 0.15m, appears moderately compacted
		ES			-	Gravelly SAND, pale brown, fine to coarse grained fine to coarse, sub-rounded to sub-angular gravel of ripped sandstone (fill).	M	-	0.15-0.65m, appears well compacted At 0.15m, PID=0.3ppm
		B	0.65		Cl	CLAY, pale brow to orange brown mottled pale grey, medium plasticity, trace fine grained sand (alluvium).	M	St	0.65m, layer of non-woven geofabric material
1	Groundwater Not Encountered	B	1.20		CL	CLAY, pale brown-orange brown, low plasticity, with fine grained sand (alluvium).	M	St VSt	
		B							
2		B	2.00			End of test pit at 2 metres. Target Depth			
3									

Note: * indicates signatures on original issue of log or last revision of log

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GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD

TITLE

ARTC
Cabramatta Rail Loop
Cabramatta to Warwick Farm NSW
Test Pit Photographs

DRAWN H Warr	DATE 09/01/2019
CHECKED J Scognamiglio	DATE 09/01/2019
SCALE Not To Scale	A4
PROJECT No 22-19800	FIGURE No GHD-TP106 1/2

GHD

TITLE

ARTC
Cabramatta Rail Loop
Cabramatta to Warwick Farm NSW
Test Pit Photographs

DRAWN: H Warr	DATE: 09/01/2019
CHECKED: J Scognamiglio	DATE: 09/01/2019
SCALE: Not To Scale	A4
PROJECT No: 22-19800	FIGURE No: GHD-TP106 2/2

TEST PIT LOG SHEET

Client: ARTC

Project: Cabramatta Rail Loop

Location: Cabramatta to Warwick Farm, NSW

HOLE No. GHD-TP107

SHEET 1 **OF** 1

Position: 309137.0 E 6245697.9 N MGA94 56 **Surface RL:** 8.33m AHD **Processed:** HAL

Method of Exploration: 5t Excavator **Hole Size:** 0.3m Ø **Checked:** BS

Date: 10/11/18 **Logged by:** JS **Date:** 19/12/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Material Description (SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength)	Moisture Condition	Consistency / Density Index	Comments Observations
					-	Gravelly SAND, dark grey to dark brown, fine to coarse grained, fine to coarse sub-angular to angular gravel, with silt, trace rootlets (fill).	M	-	0.0 - 0.65m, appears well compacted
		ES	0.15		-	Gravelly SAND, pale brown, fine to coarse grained, fine to coarse sub-rounded to sub-angular gravel of ripped sandstone (fill).	M	-	At 0.15m, PID=0.8ppm
		B							
			0.65		-	Clayey SAND, pale brown mottled grey, fine to coarse grained, with fine to coarse sub-rounded gravel, trace cobble-sized pockets of low plasticity sandy clay (fill).	M	-	0.65m, layer of non-woven geofabric material.
1	Groundwater Not Encountered	B							0.65 - 1.5m, appears moderately compacted
		B	1.50						
					Cl	CLAY, red to red-orange mottled pale grey, medium plasticity, trace fine grained sand (alluvium).	M	VSt	
		B	2.00						
2						End of test pit at 2 metres. Target Depth			
3									

Note: * indicates signatures on original issue of log or last revision of log

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GEO_TEST PIT 2219800_CABRAMATTA RAIL LOOP.GPJ GHD_GEO_TEMPLATE.GDT 10/1/19

GHD

TITLE

ARTC
Cabramatta Rail Loop
Cabramatta to Warwick Farm NSW
Test Pit Photographs

DRAWN: H Warr	DATE: 09/01/2019	
CHECKED: J Scognamiglio	DATE: 09/01/2019	
SCALE: Not To Scale		A4
PROJECT No: 22-19800	FIGURE No: GHD-TP107 1/2	

GHD	TITLE: ARTC Cabramatta Rail Loop Cabramatta to Warwick Farm NSW Test Pit Photographs	DRAWN: H Warr	DATE: 09/01/2019
		CHECKED: J Scognamiglio	DATE: 09/01/2019
		SCALE: Not To Scale	A4
		PROJECT No: 22-19800	FIGURE No: GHD-TP107 2/2

Appendix D – Laboratory reports

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**GHD Pty Ltd NSW**
Contact name:	Vaughan Wilton
Project name:	CABRAMATTA LOOP
Project ID:	2219800
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 12, 2018 6:37 PM
Eurofins | mgt reference:	**627276**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 17.4 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Vaughan Wilton - vaughan.wilton@ghd.com.

eurofins | mgt

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 2219800

Order No.:
Report #: 627276
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP104_0.2	Nov 10, 2018		Soil	S18-No14504	X	X	X	X
2	GHD_TP105_0.2	Nov 10, 2018		Soil	S18-No14505	X	X	X	X
3	GHD_TP106_0.2	Nov 10, 2018		Soil	S18-No14506	X	X	X	X
4	GHD_TP107_0.2	Nov 10, 2018		Soil	S18-No14507	X	X	X	X
5	GHD_BH02_0.3	Nov 10, 2018		Soil	S18-No14508	X	X	X	X
6	GHD_BH03_0.	Nov 10, 2018		Soil	S18-No14509	X	X	X	X

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 2219800

Order No.:
Report #: 627276
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	3								
7	GHD_BH04_0.3	Nov 10, 2018		Soil	S18-No14510	X	X	X	X
8	GHD_BH05_0.3	Nov 10, 2018		Soil	S18-No14511	X	X	X	X
9	GHD_TP104_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16130	X	X	X	X
10	GHD_TP105_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16131	X	X	X	X
Test Counts						10	10	10	10

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention:	Vaughan Wilton
Report	627276-AID
Project Name	CABRAMATTA LOOP
Project ID	2219800
Received Date	Nov 12, 2018
Date Reported	Nov 20, 2018

Methodology:

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

Project Name CABRAMATTA LOOP
Project ID 2219800
Date Sampled Nov 10, 2018
Report 627276-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
GHD_TP104_0.2	18-No14504	Nov 10, 2018	Approximate Sample 95g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP105_0.2	18-No14505	Nov 10, 2018	Approximate Sample 66g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP106_0.2	18-No14506	Nov 10, 2018	Approximate Sample 57g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP107_0.2	18-No14507	Nov 10, 2018	Approximate Sample 72g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH02_0.3	18-No14508	Nov 10, 2018	Approximate Sample 72g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH03_0.3	18-No14509	Nov 10, 2018	Approximate Sample 75g Sample consisted of: Dark brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH04_0.3	18-No14510	Nov 10, 2018	Approximate Sample 73g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH05_0.3	18-No14511	Nov 10, 2018	Approximate Sample 66g Sample consisted of: Dark brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
GHD_TP104_0.2 (DUP)	18-No16130	Nov 10, 2018	Approximate Sample 73g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP105_0.2 (DUP)	18-No16131	Nov 10, 2018	Approximate Sample 69g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 13, 2018	Indefinite

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Site # 23736

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NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 2219800

Order No.:
Report #: 627276
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP104_0.2	Nov 10, 2018		Soil	S18-No14504	X	X	X	X
2	GHD_TP105_0.2	Nov 10, 2018		Soil	S18-No14505	X	X	X	X
3	GHD_TP106_0.2	Nov 10, 2018		Soil	S18-No14506	X	X	X	X
4	GHD_TP107_0.2	Nov 10, 2018		Soil	S18-No14507	X	X	X	X
5	GHD_BH02_0.3	Nov 10, 2018		Soil	S18-No14508	X	X	X	X
6	GHD_BH03_0.	Nov 10, 2018		Soil	S18-No14509	X	X	X	X

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Site # 23736

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NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 2219800

Order No.:
Report #: 627276
Phone: 02 9239 7100
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Received: Nov 12, 2018 6:37 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	3								
7	GHD_BH04_0.3	Nov 10, 2018		Soil	S18-No14510	X	X	X	X
8	GHD_BH05_0.3	Nov 10, 2018		Soil	S18-No14511	X	X	X	X
9	GHD_TP104_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16130	X	X	X	X
10	GHD_TP105_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16131	X	X	X	X
Test Counts						10	10	10	10

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Karthik Surisetty	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

GHD Pty Ltd NSW
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Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Vaughan Wilton**

Report **627276-S**
Project name CABRAMATTA LOOP
Project ID 2219800
Received Date Nov 12, 2018

Client Sample ID			**GHD_TP104_0.2**	**GHD_TP105_0.2**	**GHD_TP106_0.2**	**GHD_TP107_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14504**	**S18-No14505**	**S18-No14506**	**S18-No14507**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	71	64	60	67
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			GHD_TP104_0.2	GHD_TP105_0.2	GHD_TP106_0.2	GHD_TP107_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14504	S18-No14505	S18-No14506	S18-No14507
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	90	91	90
p-Terphenyl-d14 (surr.)	1	%	125	122	138	126
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	92	87	75	72
Tetrachloro-m-xylene (surr.)	1	%	86	83	66	69
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			GHD_TP104_0.2	GHD_TP105_0.2	GHD_TP106_0.2	GHD_TP107_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14504	S18-No14505	S18-No14506	S18-No14507
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	146	149	118	131
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	94	95	111	102

Client Sample ID			GHD_TP104_0.2	GHD_TP105_0.2	GHD_TP106_0.2	GHD_TP107_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14504	S18-No14505	S18-No14506	S18-No14507
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	2.2	3.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	5.5	< 5	< 5	< 5
Copper	5	mg/kg	68	200	230	270
Lead	5	mg/kg	10	13	9.6	16
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	6.8	5.0	6.6
Zinc	5	mg/kg	22	64	56	87
% Moisture	1	%	20	14	24	12

Client Sample ID			GHD_BH02_0.3	GHD_BH03_0.3	GHD_BH04_0.3	GHD_BH05_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14508	S18-No14509	S18-No14510	S18-No14511
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	170	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	70	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	240	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	66	63	63	62
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	290	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	290	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	0.7	< 0.5	0.6
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			GHD_BH02_0.3	GHD_BH03_0.3	GHD_BH04_0.3	GHD_BH05_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14508	S18-No14509	S18-No14510	S18-No14511
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	0.7	< 0.5	0.6
2-Fluorobiphenyl (surr.)	1	%	84	83	91	91
p-Terphenyl-d14 (surr.)	1	%	102	92	99	104
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	1.6	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	2.7	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	0.07	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	4.3	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	4.37	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	106	int	78	159
Tetrachloro-m-xylene (surr.)	1	%	83	63	65	122
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			GHD_BH02_0.3	GHD_BH03_0.3	GHD_BH04_0.3	GHD_BH05_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14508	S18-No14509	S18-No14510	S18-No14511
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	53	62	68	66
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5

Client Sample ID			GHD_BH02_0.3	GHD_BH03_0.3	GHD_BH04_0.3	GHD_BH05_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14508	S18-No14509	S18-No14510	S18-No14511
Date Sampled			Nov 10, 2018	Nov 10, 2018	Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	76	65	66	70
Heavy Metals						
Arsenic	2	mg/kg	5.7	54	53	92
Cadmium	0.4	mg/kg	< 0.4	1.0	0.4	1.3
Chromium	5	mg/kg	13	18	12	12
Copper	5	mg/kg	43	290	160	350
Lead	5	mg/kg	19	89	43	88
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	18	34	12	14
Zinc	5	mg/kg	72	140	80	110
% Moisture	1	%	12	7.2	14	16

Client Sample ID			GHD_TP104_0.2 (DUP)	GHD_TP105_0.2 (DUP)
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S18-No16130	S18-No16131
Date Sampled			Nov 10, 2018	Nov 10, 2018
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	58	56
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100

Client Sample ID			GHD_TP104_0.2 (DUP)	GHD_TP105_0.2 (DUP)
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16130**	**S18-No16131**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	107	95
p-Terphenyl-d14 (surr.)	1	%	81	130
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	88	70
Tetrachloro-m-xylene (surr.)	1	%	74	70

Client Sample ID			GHD_TP104_0.2 (DUP)	GHD_TP105_0.2 (DUP)
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16130**	**S18-No16131**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit		
Organophosphorus Pesticides				
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	118	53
Phenols (Halogenated)				
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1

Client Sample ID			GHD_TP104_0.2 (DUP)	GHD_TP105_0.2 (DUP)
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16130**	**S18-No16131**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit		
Phenols (non-Halogenated)				
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20
Phenol-d6 (surr.)	1	%	86	97
Heavy Metals				
Arsenic	2	mg/kg	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	5.6	< 5
Copper	5	mg/kg	40	250
Lead	5	mg/kg	7.7	13
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	7.0
Zinc	5	mg/kg	19	61
% Moisture	1	%	19	13

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Nov 15, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Nov 15, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B14			
Organochlorine Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Melbourne	Nov 13, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 2219800

Order No.:
Report #: 627276
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP104_0.2	Nov 10, 2018		Soil	S18-No14504	X	X	X	X
2	GHD_TP105_0.2	Nov 10, 2018		Soil	S18-No14505	X	X	X	X
3	GHD_TP106_0.2	Nov 10, 2018		Soil	S18-No14506	X	X	X	X
4	GHD_TP107_0.2	Nov 10, 2018		Soil	S18-No14507	X	X	X	X
5	GHD_BH02_0.3	Nov 10, 2018		Soil	S18-No14508	X	X	X	X
6	GHD_BH03_0.	Nov 10, 2018		Soil	S18-No14509	X	X	X	X

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**		**Received:**	Nov 12, 2018 6:37 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627276	**Due:**	Nov 19, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Vaughan Wilton
Project Name:	CABRAMATTA LOOP				
Project ID:	2219800				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	3								
7	GHD_BH04_0.3	Nov 10, 2018		Soil	S18-No14510	X	X	X	X
8	GHD_BH05_0.3	Nov 10, 2018		Soil	S18-No14511	X	X	X	X
9	GHD_TP104_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16130	X	X	X	X
10	GHD_TP105_0.2 (DUP)	Nov 10, 2018		Soil	S18-No16131	X	X	X	X
Test Counts						10	10	10	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	83			70-130	Pass	
TRH C10-C14	%	101			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	86			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	77			70-130	Pass	
TRH >C10-C16	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	105			70-130	Pass	
Acenaphthylene	%	111			70-130	Pass	
Anthracene	%	122			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	77			70-130	Pass	
Benzo(b&j)fluoranthene	%	94			70-130	Pass	
Benzo(g.h.i)perylene	%	122			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a.h)anthracene	%	122			70-130	Pass	
Fluoranthene	%	122			70-130	Pass	
Fluorene	%	95			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	%	124			70-130	Pass	
Naphthalene	%	82			70-130	Pass	
Phenanthrene	%	91			70-130	Pass	
Pyrene	%	112			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	97			70-130	Pass	
4.4'-DDE	%	111			70-130	Pass	
4.4'-DDT	%	126			70-130	Pass	
a-BHC	%	95			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-BHC	%	94			70-130	Pass	
d-BHC	%	96			70-130	Pass	
Dieldrin	%	114			70-130	Pass	
Endosulfan I	%	111			70-130	Pass	
Endosulfan II	%	101			70-130	Pass	
Endosulfan sulphate	%	109			70-130	Pass	
Endrin	%	113			70-130	Pass	
Endrin aldehyde	%	109			70-130	Pass	
Endrin ketone	%	113			70-130	Pass	
g-BHC (Lindane)	%	96			70-130	Pass	
Heptachlor	%	113			70-130	Pass	
Heptachlor epoxide	%	106			70-130	Pass	
Hexachlorobenzene	%	89			70-130	Pass	
Methoxychlor	%	114			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	90			70-130	Pass	
Dimethoate	%	112			70-130	Pass	
Ethion	%	123			70-130	Pass	
Fenitrothion	%	95			70-130	Pass	
Methyl parathion	%	89			70-130	Pass	
Mevinphos	%	75			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	98			30-130	Pass	
2.4-Dichlorophenol	%	110			30-130	Pass	
2.4.5-Trichlorophenol	%	110			30-130	Pass	
2.4.6-Trichlorophenol	%	104			30-130	Pass	
2.6-Dichlorophenol	%	110			30-130	Pass	
4-Chloro-3-methylphenol	%	108			30-130	Pass	
Pentachlorophenol	%	54			30-130	Pass	
Tetrachlorophenols - Total	%	113			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	52			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	116			30-130	Pass	
2-Methylphenol (o-Cresol)	%	92			30-130	Pass	
2-Nitrophenol	%	102			30-130	Pass	
2.4-Dimethylphenol	%	102			30-130	Pass	
2.4-Dinitrophenol	%	33			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	90			30-130	Pass	
4-Nitrophenol	%	92			30-130	Pass	
Dinoseb	%	47			30-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenol			%	73			30-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	104			80-120	Pass	
Cadmium			%	103			80-120	Pass	
Chromium			%	114			80-120	Pass	
Copper			%	109			80-120	Pass	
Lead			%	114			80-120	Pass	
Mercury			%	100			75-125	Pass	
Nickel			%	107			80-120	Pass	
Zinc			%	107			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-No14912	NCP	%	78			70-130	Pass	
TRH C10-C14	S18-No16633	NCP	%	78			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-No14912	NCP	%	83			70-130	Pass	
Toluene	S18-No14912	NCP	%	83			70-130	Pass	
Ethylbenzene	S18-No14912	NCP	%	82			70-130	Pass	
m&p-Xylenes	S18-No14912	NCP	%	85			70-130	Pass	
o-Xylene	S18-No14912	NCP	%	87			70-130	Pass	
Xylenes - Total	S18-No14912	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-No14912	NCP	%	80			70-130	Pass	
TRH C6-C10	S18-No14912	NCP	%	74			70-130	Pass	
TRH >C10-C16	S18-No16633	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-No21101	NCP	%	100			70-130	Pass	
4.4'-DDE	M18-No21101	NCP	%	112			70-130	Pass	
4.4'-DDT	M18-No21101	NCP	%	129			70-130	Pass	
a-BHC	M18-No21101	NCP	%	98			70-130	Pass	
Aldrin	M18-No21101	NCP	%	113			70-130	Pass	
b-BHC	M18-No21101	NCP	%	96			70-130	Pass	
d-BHC	M18-No21101	NCP	%	97			70-130	Pass	
Dieldrin	M18-No21101	NCP	%	113			70-130	Pass	
Endosulfan I	M18-No21101	NCP	%	113			70-130	Pass	
Endosulfan II	M18-No21101	NCP	%	103			70-130	Pass	
Endosulfan sulphate	M18-No21101	NCP	%	108			70-130	Pass	
Endrin	M18-No21101	NCP	%	111			70-130	Pass	
Endrin aldehyde	M18-No21101	NCP	%	107			70-130	Pass	
Endrin ketone	M18-No21101	NCP	%	113			70-130	Pass	
g-BHC (Lindane)	M18-No21101	NCP	%	98			70-130	Pass	
Heptachlor	M18-No21101	NCP	%	115			70-130	Pass	
Heptachlor epoxide	M18-No21101	NCP	%	109			70-130	Pass	
Hexachlorobenzene	M18-No21101	NCP	%	93			70-130	Pass	
Methoxychlor	M18-No21101	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S18-No14513	NCP	%	108			70-130	Pass	
Dimethoate	S18-No14513	NCP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethion	S18-No14513	NCP	%	88			70-130	Pass	
Fenitrothion	S18-No14513	NCP	%	92			70-130	Pass	
Methyl parathion	S18-No14513	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-No17240	NCP	%	60			30-130	Pass	
2.4-Dinitrophenol	M18-No17240	NCP	%	87			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Copper	M18-No15377	NCP	%	101			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-No14507	CP	%	94			75-125	Pass	
Cadmium	S18-No14507	CP	%	96			75-125	Pass	
Chromium	S18-No14507	CP	%	94			75-125	Pass	
Lead	S18-No14507	CP	%	95			75-125	Pass	
Mercury	S18-No14507	CP	%	90			70-130	Pass	
Nickel	S18-No14507	CP	%	96			75-125	Pass	
Zinc	S18-No14507	CP	%	55			75-125	Fail	Q08
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-No14508	CP	%	124			70-130	Pass	
Acenaphthylene	S18-No14508	CP	%	85			70-130	Pass	
Anthracene	S18-No14508	CP	%	96			70-130	Pass	
Benz(a)anthracene	S18-No14508	CP	%	122			70-130	Pass	
Benzo(a)pyrene	S18-No14508	CP	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	S18-No14508	CP	%	109			70-130	Pass	
Benzo(g.h.i)perylene	S18-No14508	CP	%	82			70-130	Pass	
Benzo(k)fluoranthene	S18-No14508	CP	%	99			70-130	Pass	
Chrysene	S18-No14508	CP	%	105			70-130	Pass	
Dibenz(a.h)anthracene	S18-No14508	CP	%	97			70-130	Pass	
Fluoranthene	S18-No14508	CP	%	91			70-130	Pass	
Fluorene	S18-No14508	CP	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-No14508	CP	%	85			70-130	Pass	
Naphthalene	S18-No14508	CP	%	92			70-130	Pass	
Phenanthrene	S18-No14508	CP	%	106			70-130	Pass	
Pyrene	S18-No14508	CP	%	124			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S18-No14508	CP	%	112			30-130	Pass	
2.4-Dichlorophenol	S18-No14508	CP	%	122			30-130	Pass	
2.4.5-Trichlorophenol	S18-No14508	CP	%	122			30-130	Pass	
2.4.6-Trichlorophenol	S18-No14508	CP	%	105			30-130	Pass	
2.6-Dichlorophenol	S18-No14508	CP	%	122			30-130	Pass	
4-Chloro-3-methylphenol	S18-No14508	CP	%	119			30-130	Pass	
Pentachlorophenol	S18-No14508	CP	%	35			30-130	Pass	
Tetrachlorophenols - Total	S18-No14508	CP	%	108			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methylphenol (o-Cresol)	S18-No14508	CP	%	103			30-130	Pass	
2-Nitrophenol	S18-No14508	CP	%	115			30-130	Pass	
2.4-Dimethylphenol	S18-No14508	CP	%	120			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-No14508	CP	%	98			30-130	Pass	
4-Nitrophenol	S18-No14508	CP	%	81			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dinoseb	S18-No14508	CP	%	35			30-130	Pass	
Phenol	S18-No14508	CP	%	93			30-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Mevinphos	M18-No13530	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	M18-No16184	NCP	%	48			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-No14016	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-No18418	NCP	mg/kg	< 20	22	41	30%	Fail	Q15
TRH C15-C28	S18-No18418	NCP	mg/kg	190	200	1.0	30%	Pass	
TRH C29-C36	S18-No18418	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-No14016	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-No14016	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-No14016	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-No14016	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-No14016	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-No14016	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-No14016	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-No14016	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-No18418	NCP	mg/kg	< 50	53	16	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-No21099	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-No21099	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-No21099	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S18-No14507	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S18-No14507	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S18-No14507	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S18-No14507	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S18-No14507	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S18-No14507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S18-No14507	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S18-No14507	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-No14507	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S18-No14507	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S18-No14507	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S18-No14507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-No14507	CP	mg/kg	3.3	3.4	1.0	30%	Pass	
Cadmium	S18-No14507	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-No14507	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S18-No14507	CP	mg/kg	270	270	<1	30%	Pass	
Lead	S18-No14507	CP	mg/kg	16	16	1.0	30%	Pass	
Mercury	S18-No14507	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-No14507	CP	mg/kg	6.6	6.7	2.0	30%	Pass	
Zinc	S18-No14507	CP	mg/kg	87	88	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-No14510	CP	%	14	15	3.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins | mgt

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 221980047

Order No.:
Report #: 627278
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 20, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_BH06_0.2	Nov 11, 2018		Soil	S18-No14512	X	X	X	X
2	GHD_BH07_0.2	Nov 11, 2018		Soil	S18-No14513	X	X	X	X
3	GHD_BH08_0.3	Nov 11, 2018		Soil	S18-No14514	X	X	X	X
4	GHD_BH09_0.2	Nov 11, 2018		Soil	S18-No14515	X	X	X	X
5	GHD_TP02_0.25	Nov 11, 2018		Soil	S18-No14516	X	X	X	X
6	GHD_TP04_0.	Nov 12, 2018		Soil	S18-No14517	X	X	X	X

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NATA # 1261
Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**		**Received:**	Nov 12, 2018 6:37 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627278	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Vaughan Wilton
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	2								
7	GHD_TP06_0.3	Nov 12, 2018		Soil	S18-No14518	X	X	X	X
Test Counts						7	7	7	7

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention:	Vaughan Wilton
Report	627278-AID
Project Name	CABRAMATTA LOOP
Project ID	221980047
Received Date	Nov 12, 2018
Date Reported	Nov 20, 2018

Methodology:

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

Project Name CABRAMATTA LOOP
Project ID 221980047
Date Sampled Nov 11, 2018 to Nov 12, 2018
Report 627278-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
GHD_BH06_0.2	18-No14512	Nov 11, 2018	Approximate Sample 51g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH07_0.2	18-No14513	Nov 11, 2018	Approximate Sample 50g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH08_0.3	18-No14514	Nov 11, 2018	Approximate Sample 69g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_BH09_0.2	18-No14515	Nov 11, 2018	Approximate Sample 61g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP02_0.25	18-No14516	Nov 11, 2018	Approximate Sample 64g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP04_0.2	18-No14517	Nov 12, 2018	Approximate Sample 69g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP06_0.3	18-No14518	Nov 12, 2018	Approximate Sample 62g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 12, 2018	Indefinite

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 221980047

Order No.:
Report #: 627278
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 20, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_BH06_0.2	Nov 11, 2018		Soil	S18-No14512	X	X	X	X
2	GHD_BH07_0.2	Nov 11, 2018		Soil	S18-No14513	X	X	X	X
3	GHD_BH08_0.3	Nov 11, 2018		Soil	S18-No14514	X	X	X	X
4	GHD_BH09_0.2	Nov 11, 2018		Soil	S18-No14515	X	X	X	X
5	GHD_TP02_0.25	Nov 11, 2018		Soil	S18-No14516	X	X	X	X
6	GHD_TP04_0.	Nov 12, 2018		Soil	S18-No14517	X	X	X	X

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Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**		**Received:**	Nov 12, 2018 6:37 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627278	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Vaughan Wilton
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	2								
7	GHD_TP06_0.3	Nov 12, 2018		Soil	S18-No14518	X	X	X	X
Test Counts						7	7	7	7

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

GHD Pty Ltd NSW
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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Vaughan Wilton**

Report **627278-S**
Project name CABRAMATTA LOOP
Project ID 221980047
Received Date Nov 12, 2018

Client Sample ID			**GHD_BH06_0.2**	**GHD_BH07_0.2**	**GHD_BH08_0.3**	**GHD_BH09_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14512**	**S18-No14513**	**S18-No14514**	**S18-No14515**
Date Sampled			**Nov 11, 2018**	**Nov 11, 2018**	**Nov 11, 2018**	**Nov 11, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	73	76	71	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			GHD_BH06_0.2	GHD_BH07_0.2	GHD_BH08_0.3	GHD_BH09_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14512	S18-No14513	S18-No14514	S18-No14515
Date Sampled			Nov 11, 2018	Nov 11, 2018	Nov 11, 2018	Nov 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	61	60	90
p-Terphenyl-d14 (surr.)	1	%	89	85	87	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	80	95	79	92
Tetrachloro-m-xylene (surr.)	1	%	86	106	91	103
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			GHD_BH06_0.2	GHD_BH07_0.2	GHD_BH08_0.3	GHD_BH09_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14512	S18-No14513	S18-No14514	S18-No14515
Date Sampled			Nov 11, 2018	Nov 11, 2018	Nov 11, 2018	Nov 11, 2018
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	84	89	76	69
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	66	64	63	69

Client Sample ID			GHD_BH06_0.2	GHD_BH07_0.2	GHD_BH08_0.3	GHD_BH09_0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14512	S18-No14513	S18-No14514	S18-No14515
Date Sampled			Nov 11, 2018	Nov 11, 2018	Nov 11, 2018	Nov 11, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	8.0	7.4	6.8	43
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	17	20	20
Copper	5	mg/kg	17	24	15	84
Lead	5	mg/kg	13	16	15	34
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.3	9.5	9.9	12
Zinc	5	mg/kg	23	28	16	56
% Moisture	1	%	16	28	18	24

Client Sample ID			GHD_TP02_0.25	GHD_TP04_0.2	GHD_TP06_0.3
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No14516	S18-No14517	S18-No14518
Date Sampled			Nov 11, 2018	Nov 12, 2018	Nov 12, 2018
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	130	< 50	< 50
TRH C29-C36	50	mg/kg	560	90	110
TRH C10-36 (Total)	50	mg/kg	690	90	110
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	70	67	106
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	620	< 100	< 100
TRH >C34-C40	100	mg/kg	380	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	1000	< 100	120
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.8	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.1	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.4	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			GHD_TP02_0.25	GHD_TP04_0.2	GHD_TP06_0.3
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14516**	**S18-No14517**	**S18-No14518**
Date Sampled			**Nov 11, 2018**	**Nov 12, 2018**	**Nov 12, 2018**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene	0.5	mg/kg	0.7	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.8	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.4	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	4.4	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	88	51
p-Terphenyl-d14 (surr.)	1	%	82	91	75
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	int	101	103
Tetrachloro-m-xylene (surr.)	1	%	50	111	97
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2

Client Sample ID			GHD_TP02_0.25	GHD_TP04_0.2	GHD_TP06_0.3
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14516**	**S18-No14517**	**S18-No14518**
Date Sampled			**Nov 11, 2018**	**Nov 12, 2018**	**Nov 12, 2018**
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Coumaphos	2	mg/kg	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	83	68	86
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5

Client Sample ID			GHD_TP02_0.25	GHD_TP04_0.2	GHD_TP06_0.3
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14516**	**S18-No14517**	**S18-No14518**
Date Sampled			**Nov 11, 2018**	**Nov 12, 2018**	**Nov 12, 2018**
Test/Reference	LOR	Unit			
Phenols (non-Halogenated)					
Dinoseb	20	mg/kg	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	54	70	50
Heavy Metals					
Arsenic	2	mg/kg	6.1	16	6.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	29	36	14
Copper	5	mg/kg	47	24	11
Lead	5	mg/kg	20	30	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	41	10	13
Zinc	5	mg/kg	47	31	11
% Moisture	1	%	12	13	15

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Nov 15, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Nov 15, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B14			
Organochlorine Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Melbourne	Nov 12, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: CABRAMATTA LOOP
Project ID: 221980047

Order No.:
Report #: 627278
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 12, 2018 6:37 PM
Due: Nov 20, 2018
Priority: 5 Day
Contact Name: Vaughan Wilton

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_BH06_0.2	Nov 11, 2018		Soil	S18-No14512	X	X	X	X
2	GHD_BH07_0.2	Nov 11, 2018		Soil	S18-No14513	X	X	X	X
3	GHD_BH08_0.3	Nov 11, 2018		Soil	S18-No14514	X	X	X	X
4	GHD_BH09_0.2	Nov 11, 2018		Soil	S18-No14515	X	X	X	X
5	GHD_TP02_0.25	Nov 11, 2018		Soil	S18-No14516	X	X	X	X
6	GHD_TP04_0.	Nov 12, 2018		Soil	S18-No14517	X	X	X	X

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**		**Received:**	Nov 12, 2018 6:37 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627278	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Vaughan Wilton
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
	2								
7	GHD_TP06_0.3	Nov 12, 2018		Soil	S18-No14518	X	X	X	X
Test Counts						7	7	7	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	97			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	112			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
TRH >C10-C16	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	109			70-130	Pass	
Acenaphthylene	%	96			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	91			70-130	Pass	
Benzo(a)pyrene	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	
Benzo(g.h.i)perylene	%	103			70-130	Pass	
Benzo(k)fluoranthene	%	126			70-130	Pass	
Chrysene	%	116			70-130	Pass	
Dibenz(a.h)anthracene	%	128			70-130	Pass	
Fluoranthene	%	110			70-130	Pass	
Fluorene	%	124			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	%	116			70-130	Pass	
Naphthalene	%	102			70-130	Pass	
Phenanthrene	%	120			70-130	Pass	
Pyrene	%	101			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	79			70-130	Pass	
4.4'-DDE	%	90			70-130	Pass	
4.4'-DDT	%	78			70-130	Pass	
a-BHC	%	94			70-130	Pass	
Aldrin	%	111			70-130	Pass	
b-BHC	%	118			70-130	Pass	
d-BHC	%	74			70-130	Pass	
Dieldrin	%	118			70-130	Pass	
Endosulfan I	%	122			70-130	Pass	
Endosulfan II	%	115			70-130	Pass	
Endosulfan sulphate	%	103			70-130	Pass	
Endrin	%	101			70-130	Pass	
Endrin aldehyde	%	104			70-130	Pass	
Endrin ketone	%	111			70-130	Pass	
g-BHC (Lindane)	%	94			70-130	Pass	
Heptachlor	%	130			70-130	Pass	
Heptachlor epoxide	%	113			70-130	Pass	
Hexachlorobenzene	%	73			70-130	Pass	
Methoxychlor	%	72			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	90			70-130	Pass	
Dimethoate	%	112			70-130	Pass	
Ethion	%	123			70-130	Pass	
Fenitrothion	%	95			70-130	Pass	
Methyl parathion	%	89			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	128			30-130	Pass	
2.4-Dichlorophenol	%	110			30-130	Pass	
2.4.5-Trichlorophenol	%	108			30-130	Pass	
2.4.6-Trichlorophenol	%	129			30-130	Pass	
2.6-Dichlorophenol	%	110			30-130	Pass	
4-Chloro-3-methylphenol	%	105			30-130	Pass	
Pentachlorophenol	%	52			30-130	Pass	
Tetrachlorophenols - Total	%	116			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Methylphenol (o-Cresol)	%	119			30-130	Pass	
2-Nitrophenol	%	102			30-130	Pass	
2.4-Dimethylphenol	%	110			30-130	Pass	
2.4-Dinitrophenol	%	35			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	117			30-130	Pass	
4-Nitrophenol	%	70			30-130	Pass	
Dinoseb	%	72			30-130	Pass	
Phenol	%	103			30-130	Pass	
LCS - % Recovery							
Heavy Metals							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic			%	100			80-120	Pass	
Cadmium			%	103			80-120	Pass	
Chromium			%	109			80-120	Pass	
Copper			%	103			80-120	Pass	
Lead			%	105			80-120	Pass	
Mercury			%	119			75-125	Pass	
Nickel			%	108			80-120	Pass	
Zinc			%	106			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-No21421	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-No21421	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-No14521	NCP	%	84			70-130	Pass	
Acenaphthylene	S18-No14521	NCP	%	121			70-130	Pass	
Anthracene	S18-No14521	NCP	%	89			70-130	Pass	
Benz(a)anthracene	S18-No14521	NCP	%	120			70-130	Pass	
Benzo(a)pyrene	S18-No14521	NCP	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	S18-No14521	NCP	%	112			70-130	Pass	
Benzo(g.h.i)perylene	S18-No14521	NCP	%	84			70-130	Pass	
Benzo(k)fluoranthene	S18-No14521	NCP	%	102			70-130	Pass	
Chrysene	S18-No14521	NCP	%	104			70-130	Pass	
Dibenz(a.h)anthracene	S18-No14521	NCP	%	101			70-130	Pass	
Fluoranthene	S18-No14521	NCP	%	87			70-130	Pass	
Fluorene	S18-No14521	NCP	%	108			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-No14521	NCP	%	90			70-130	Pass	
Naphthalene	S18-No14521	NCP	%	89			70-130	Pass	
Phenanthrene	S18-No14521	NCP	%	101			70-130	Pass	
Pyrene	S18-No14521	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	P18-No19937	NCP	%	91			70-130	Pass	
4.4'-DDE	P18-No19937	NCP	%	91			70-130	Pass	
4.4'-DDT	P18-No19937	NCP	%	77			70-130	Pass	
a-BHC	P18-No19937	NCP	%	98			70-130	Pass	
Aldrin	S18-No16803	NCP	%	122			70-130	Pass	
b-BHC	P18-No19937	NCP	%	87			70-130	Pass	
d-BHC	P18-No19937	NCP	%	83			70-130	Pass	
Dieldrin	P18-No19937	NCP	%	126			70-130	Pass	
Endosulfan I	P18-No19937	NCP	%	123			70-130	Pass	
Endosulfan II	P18-No19937	NCP	%	117			70-130	Pass	
Endosulfan sulphate	P18-No19937	NCP	%	105			70-130	Pass	
Endrin	P18-No19937	NCP	%	104			70-130	Pass	
Endrin aldehyde	P18-No19937	NCP	%	113			70-130	Pass	
Endrin ketone	P18-No19937	NCP	%	118			70-130	Pass	
g-BHC (Lindane)	P18-No19937	NCP	%	98			70-130	Pass	
Heptachlor	P18-No19937	NCP	%	112			70-130	Pass	
Heptachlor epoxide	P18-No19937	NCP	%	114			70-130	Pass	
Hexachlorobenzene	P18-No19937	NCP	%	77			70-130	Pass	
Methoxychlor	P18-No19937	NCP	%	72			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S18-No14521	NCP	%	103			30-130	Pass	
2.4-Dichlorophenol	S18-No14521	NCP	%	114			30-130	Pass	
2.4.5-Trichlorophenol	S18-No14521	NCP	%	114			30-130	Pass	
2.4.6-Trichlorophenol	S18-No14521	NCP	%	105			30-130	Pass	
2.6-Dichlorophenol	S18-No14521	NCP	%	116			30-130	Pass	
4-Chloro-3-methylphenol	S18-No14521	NCP	%	113			30-130	Pass	
Pentachlorophenol	S18-No14508	NCP	%	35			30-130	Pass	
Tetrachlorophenols - Total	S18-No14521	NCP	%	95			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-No17240	NCP	%	60			30-130	Pass	
2-Methylphenol (o-Cresol)	S18-No14521	NCP	%	95			30-130	Pass	
2-Nitrophenol	S18-No14521	NCP	%	109			30-130	Pass	
2.4-Dimethylphenol	S18-No14521	NCP	%	111			30-130	Pass	
2.4-Dinitrophenol	M18-No17240	NCP	%	87			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-No14521	NCP	%	94			30-130	Pass	
4-Nitrophenol	S18-No14521	NCP	%	69			30-130	Pass	
Dinoseb	S18-No14521	NCP	%	33			30-130	Pass	
Phenol	S18-No14521	NCP	%	88			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-No15611	NCP	%	91			75-125	Pass	
Cadmium	M18-No15611	NCP	%	96			75-125	Pass	
Chromium	M18-No15540	NCP	%	108			75-125	Pass	
Copper	M18-No15611	NCP	%	102			75-125	Pass	
Lead	M18-No15611	NCP	%	143			75-125	Fail	Q08
Mercury	M18-No15611	NCP	%	87			70-130	Pass	
Nickel	M18-No15611	NCP	%	97			75-125	Pass	
Zinc	M18-No15540	NCP	%	109			75-125	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S18-No14513	CP	%	108			70-130	Pass	
Dimethoate	S18-No14513	CP	%	95			70-130	Pass	
Ethion	S18-No14513	CP	%	88			70-130	Pass	
Fenitrothion	S18-No14513	CP	%	92			70-130	Pass	
Methyl parathion	S18-No14513	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-No14518	CP	%	118			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-No14518	CP	%	90			70-130	Pass	
Toluene	S18-No14518	CP	%	87			70-130	Pass	
Ethylbenzene	S18-No14518	CP	%	85			70-130	Pass	
m&p-Xylenes	S18-No14518	CP	%	82			70-130	Pass	
o-Xylene	S18-No14518	CP	%	88			70-130	Pass	
Xylenes - Total	S18-No14518	CP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-No14518	CP	%	92			70-130	Pass	
TRH C6-C10	S18-No14518	CP	%	117			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-No13528	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-No13528	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-No13528	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-No13528	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-No13528	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-No13528	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-No13528	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-No13528	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-No13528	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-No16632	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Methoxychlor	S18-No16632	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S18-No16632	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S18-No16632	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S18-No16632	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S18-No16632	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S18-No16632	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S18-No16632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S18-No16632	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2.4-Dimethylphenol	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S18-No16632	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-No16632	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S18-No16632	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S18-No16632	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S18-No16632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-No15611	NCP	mg/kg	33	34	3.0	30%	Pass	
Cadmium	M18-No15611	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-No15611	NCP	mg/kg	63	67	5.0	30%	Pass	
Copper	M18-No15611	NCP	mg/kg	21	22	6.0	30%	Pass	
Lead	M18-No15611	NCP	mg/kg	95	97	2.0	30%	Pass	
Mercury	M18-No15611	NCP	mg/kg	0.2	0.2	<1	30%	Pass	
Nickel	M18-No15611	NCP	mg/kg	13	13	3.0	30%	Pass	
Zinc	M18-No15611	NCP	mg/kg	210	210	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-No14517	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-No14517	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-No14517	CP	mg/kg	90	160	56	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-No14517	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-No14517	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-No14517	CP	mg/kg	< 100	170	61	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-No14517	CP	%	13	12	4.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**GHD Pty Ltd NSW**
Contact name:	Emma Harrison
Project name:	CABRAMATTA LOOP
Project ID:	221980047
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 13, 2018 5:08 PM
Eurofins | mgt reference:	**627474**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 11.5 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Emma Harrison - emma.harrison@ghd.com.

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**	221980047	**Received:**	Nov 13, 2018 5:08 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627474	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Emma Harrison
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP101_0.15	Nov 13, 2018		Soil	S18-No16394	X	X	X	X
2	GHD_TP102_0.1	Nov 13, 2018		Soil	S18-No16395	X	X	X	X
3	GHD_TP103_0.1	Nov 13, 2018		Soil	S18-No16396	X	X	X	X
Test Counts						3	3	3	3

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention:	Emma Harrison
Report	627474-AID
Project Name	CABRAMATTA LOOP
Project ID	221980047
Received Date	Nov 13, 2018
Date Reported	Nov 20, 2018

Methodology:

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

Project Name CABRAMATTA LOOP
Project ID 221980047
Date Sampled Nov 13, 2018
Report 627474-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
GHD_TP101_0.15	18-No16394	Nov 13, 2018	Approximate Sample 77g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP102_0.1	18-No16395	Nov 13, 2018	Approximate Sample 75g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD_TP103_0.1	18-No16396	Nov 13, 2018	Approximate Sample 77g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 13, 2018	Indefinite

ABN – 50 005 085 521
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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**	221980047	**Received:**	Nov 13, 2018 5:08 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627474	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Emma Harrison
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP101_0.15	Nov 13, 2018		Soil	S18-No16394	X	X	X	X
2	GHD_TP102_0.1	Nov 13, 2018		Soil	S18-No16395	X	X	X	X
3	GHD_TP103_0.1	Nov 13, 2018		Soil	S18-No16396	X	X	X	X
Test Counts						3	3	3	3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Emma Harrison**

Report **627474-S**
Project name CABRAMATTA LOOP
Project ID 221980047
Received Date Nov 13, 2018

Client Sample ID			**GHD_TP101_0.15**	**GHD_TP102_0.1**	**GHD_TP103_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16394**	**S18-No16395**	**S18-No16396**
Date Sampled			**Nov 13, 2018**	**Nov 13, 2018**	**Nov 13, 2018**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	73	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			GHD_TP101_0.15	GHD_TP102_0.1	GHD_TP103_0.1
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No16394	S18-No16395	S18-No16396
Date Sampled			Nov 13, 2018	Nov 13, 2018	Nov 13, 2018
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	107	109	111
p-Terphenyl-d14 (surr.)	1	%	109	116	117
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	120	103	121
Tetrachloro-m-xylene (surr.)	1	%	103	90	106
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2

Client Sample ID			GHD_TP101_0.15	GHD_TP102_0.1	GHD_TP103_0.1
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16394**	**S18-No16395**	**S18-No16396**
Date Sampled			**Nov 13, 2018**	**Nov 13, 2018**	**Nov 13, 2018**
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	111	109	59
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	95	103	105

Client Sample ID			GHD_TP101_0.15	GHD_TP102_0.1	GHD_TP103_0.1
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No16394**	**S18-No16395**	**S18-No16396**
Date Sampled			**Nov 13, 2018**	**Nov 13, 2018**	**Nov 13, 2018**
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	2	mg/kg	6.4	3.7	2.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	15	11
Copper	5	mg/kg	23	12	12
Lead	5	mg/kg	21	11	9.8
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	9.9	5.8	< 5
Zinc	5	mg/kg	43	16	19
% Moisture	1	%	6.9	5.5	6.4

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 16, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Nov 16, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Nov 16, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Nov 16, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Nov 16, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Sydney	Nov 13, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 23736

Company Name:	GHD Pty Ltd NSW	**Order No.:**	221980047	**Received:**	Nov 13, 2018 5:08 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	627474	**Due:**	Nov 20, 2018
		Phone:	02 9239 7100	**Priority:**	5 Day
		Fax:	02 9239 7199	**Contact Name:**	Emma Harrison
Project Name:	CABRAMATTA LOOP				
Project ID:	221980047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Eurofins | mgt Suite B14	Moisture Set	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	GHD_TP101_0.15	Nov 13, 2018		Soil	S18-No16394	X	X	X	X
2	GHD_TP102_0.1	Nov 13, 2018		Soil	S18-No16395	X	X	X	X
3	GHD_TP103_0.1	Nov 13, 2018		Soil	S18-No16396	X	X	X	X
Test Counts						3	3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	96			70-130	Pass	
TRH C10-C14	%	106			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	90			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
o-Xylene	%	89			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	92			70-130	Pass	
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	
Acenaphthylene	%	108			70-130	Pass	
Anthracene	%	114			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	%	103			70-130	Pass	
Benzo(g.h.i)perylene	%	112			70-130	Pass	
Benzo(k)fluoranthene	%	110			70-130	Pass	
Chrysene	%	111			70-130	Pass	
Dibenz(a.h)anthracene	%	103			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluorene	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	104			70-130	Pass	
Naphthalene	%	111			70-130	Pass	
Phenanthrene	%	119			70-130	Pass	
Pyrene	%	117			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	122			70-130	Pass	
4.4'-DDE	%	120			70-130	Pass	
4.4'-DDT	%	119			70-130	Pass	
a-BHC	%	119			70-130	Pass	
Aldrin	%	128			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	118			70-130	Pass	
Dieldrin	%	122			70-130	Pass	
Endosulfan I	%	127			70-130	Pass	
Endosulfan II	%	125			70-130	Pass	
Endosulfan sulphate	%	120			70-130	Pass	
Endrin	%	126			70-130	Pass	
Endrin aldehyde	%	118			70-130	Pass	
Endrin ketone	%	122			70-130	Pass	
g-BHC (Lindane)	%	117			70-130	Pass	
Heptachlor	%	118			70-130	Pass	
Heptachlor epoxide	%	125			70-130	Pass	
Hexachlorobenzene	%	103			70-130	Pass	
Methoxychlor	%	128			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	114			70-130	Pass	
Dimethoate	%	104			70-130	Pass	
Ethion	%	98			70-130	Pass	
Fenitrothion	%	93			70-130	Pass	
Methyl parathion	%	123			70-130	Pass	
Mevinphos	%	107			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	104			30-130	Pass	
2.4-Dichlorophenol	%	105			30-130	Pass	
2.4.5-Trichlorophenol	%	100			30-130	Pass	
2.4.6-Trichlorophenol	%	104			30-130	Pass	
2.6-Dichlorophenol	%	108			30-130	Pass	
4-Chloro-3-methylphenol	%	109			30-130	Pass	
Pentachlorophenol	%	80			30-130	Pass	
Tetrachlorophenols - Total	%	104			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	119			30-130	Pass	
2-Methylphenol (o-Cresol)	%	106			30-130	Pass	
2-Nitrophenol	%	103			30-130	Pass	
2.4-Dimethylphenol	%	106			30-130	Pass	
2.4-Dinitrophenol	%	91			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	109			30-130	Pass	
4-Nitrophenol	%	97			30-130	Pass	
Dinoseb	%	74			30-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenol			%	111			30-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	93			70-130	Pass	
Cadmium			%	99			70-130	Pass	
Chromium			%	101			70-130	Pass	
Copper			%	104			70-130	Pass	
Lead			%	101			70-130	Pass	
Mercury			%	95			70-130	Pass	
Nickel			%	103			70-130	Pass	
Zinc			%	101			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-No19614	NCP	%	81			70-130	Pass	
TRH C10-C14	S18-No21227	NCP	%	98			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-No19614	NCP	%	93			70-130	Pass	
Toluene	S18-No19614	NCP	%	89			70-130	Pass	
Ethylbenzene	S18-No19614	NCP	%	86			70-130	Pass	
m&p-Xylenes	S18-No19614	NCP	%	90			70-130	Pass	
o-Xylene	S18-No19614	NCP	%	90			70-130	Pass	
Xylenes - Total	S18-No19614	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-No19614	NCP	%	78			70-130	Pass	
TRH C6-C10	S18-No19614	NCP	%	79			70-130	Pass	
TRH >C10-C16	S18-No21227	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-No20033	NCP	%	97			70-130	Pass	
Acenaphthylene	S18-No20033	NCP	%	110			70-130	Pass	
Anthracene	S18-No20033	NCP	%	112			70-130	Pass	
Benz(a)anthracene	S18-No20033	NCP	%	109			70-130	Pass	
Benzo(a)pyrene	S18-No20033	NCP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	S18-No20033	NCP	%	108			70-130	Pass	
Benzo(g.h.i)perylene	S18-No20033	NCP	%	108			70-130	Pass	
Benzo(k)fluoranthene	S18-No20033	NCP	%	110			70-130	Pass	
Chrysene	S18-No20033	NCP	%	108			70-130	Pass	
Dibenz(a.h)anthracene	S18-No20033	NCP	%	110			70-130	Pass	
Fluoranthene	S18-No20033	NCP	%	113			70-130	Pass	
Fluorene	S18-No20033	NCP	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-No20033	NCP	%	116			70-130	Pass	
Naphthalene	S18-No20033	NCP	%	101			70-130	Pass	
Phenanthrene	S18-No20033	NCP	%	114			70-130	Pass	
Pyrene	S18-No20033	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S18-No16366	NCP	%	122			70-130	Pass	
4.4'-DDE	S18-No16366	NCP	%	118			70-130	Pass	
4.4'-DDT	S18-No16366	NCP	%	109			70-130	Pass	
a-BHC	S18-No16366	NCP	%	117			70-130	Pass	
Aldrin	S18-No16366	NCP	%	120			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-BHC	S18-No16366	NCP	%	101			70-130	Pass	
d-BHC	S18-No16366	NCP	%	119			70-130	Pass	
Dieldrin	S18-No16366	NCP	%	119			70-130	Pass	
Endosulfan I	S18-No16366	NCP	%	120			70-130	Pass	
Endosulfan II	S18-No16366	NCP	%	122			70-130	Pass	
Endosulfan sulphate	S18-No16366	NCP	%	119			70-130	Pass	
Endrin	S18-No16366	NCP	%	117			70-130	Pass	
Endrin aldehyde	S18-No16366	NCP	%	107			70-130	Pass	
Endrin ketone	S18-No16366	NCP	%	129			70-130	Pass	
g-BHC (Lindane)	S18-No16366	NCP	%	116			70-130	Pass	
Heptachlor	S18-No16366	NCP	%	115			70-130	Pass	
Heptachlor epoxide	S18-No16366	NCP	%	123			70-130	Pass	
Hexachlorobenzene	S18-No16366	NCP	%	99			70-130	Pass	
Methoxychlor	S18-No16366	NCP	%	105			70-130	Pass	
Toxaphene	S18-No16366	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-No21143	NCP	%	98			70-130	Pass	
Cadmium	S18-No21143	NCP	%	98			70-130	Pass	
Chromium	S18-No21143	NCP	%	114			70-130	Pass	
Copper	S18-No21143	NCP	%	98			70-130	Pass	
Lead	S18-No21143	NCP	%	107			70-130	Pass	
Mercury	S18-No21143	NCP	%	102			70-130	Pass	
Nickel	S18-No21143	NCP	%	105			70-130	Pass	
Zinc	S18-No21143	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
Phenol	S18-No21684	NCP	%	86			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-No16394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-No21683	NCP	mg/kg	21	< 20	8.0	30%	Pass	
TRH C15-C28	S18-No21683	NCP	mg/kg	580	610	6.0	30%	Pass	
TRH C29-C36	S18-No21683	NCP	mg/kg	680	750	10	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-No16394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-No16394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-No16394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-No16394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-No16394	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-No16394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-No21683	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-No21683	NCP	mg/kg	1100	1200	8.0	30%	Pass	
TRH >C34-C40	S18-No21683	NCP	mg/kg	290	330	13	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-No16361	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-No16361	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S18-No16361	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S18-No16361	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S18-No16394	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Ethion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S18-No16394	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S18-No16394	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S18-No16394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S18-No16394	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S18-No16394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S18-No16394	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S18-No16394	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-No16394	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S18-No16394	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S18-No16394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S18-No16394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-No20051	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S18-No16358	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-No20051	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S18-No20051	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-No20051	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	S18-No16358	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-No20051	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-No20051	NCP	mg/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-No16394	CP	%	6.9	6.9	1.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**GHD Pty Ltd NSW**
Contact name:	Vaughan Wilton
Project name:	CABRAMATTA LOOP
Project ID:	221980047
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 12, 2018 6:37 PM
Eurofins | mgt reference:	**627278**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 17.4 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Vaughan Wilton - vaughan.wilton@ghd.com.

Appendix E – Results summary tables

Appendix F
Cabramatta Loop Project - Targeted Contamination Assessment
Soil Analyses - Ecological Criteria

	Asbestos	Heavy Metal								Inorganic	OCP																								Organic							
	Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content (%)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)
Comment		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	Absetos detected	2	0.4	5	5	5	0.1	5	5	1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.5	20	20	50	50	100	100	100
NEPM 2013 EIL-Commercial/Industrial																																										
0-2m		160		310	85	1800		55	110												640	640													370						
NEPM 2013 EIL-Urban Residential- Public Open Space																																										
0-2m		100		190	60	1100		30	70												180	180													170						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil																																										
0-2m																																					215			170	1700	3300	
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																																										
0-2m																																					180			120	300	2800	

Field_ID	Sample_Depth_Range	Sampled_Date_Time																																									
GHD_BH02_0.3	0.3-0.3	10/11/2018	No	5.7	<0.4	13	43	19	<0.1	18	72	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH03_0.3	0.3-0.3	10/11/2018	No	54	1	18	290	89	<0.1	34	140	7.2	4.37	<0.1	<0.05	<0.05	1.6	4.3	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	2.7	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	290	<100	290
GHD_BH04_0.3	0.3-0.3	10/11/2018	No	53	0.4	12	160	43	<0.1	12	80	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH05_0.3	0.3-0.3	10/11/2018	No	92	1.3	12	350	88	<0.1	14	110	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH06_0.2	0.2-0.2	11/11/2018	No	8	<0.4	17	17	13	<0.1	7.3	23	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH07_0.2	0.2-0.2	11/11/2018	No	7.4	<0.4	17	24	16	<0.1	9.5	28	28	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH08_0.3	0.3-0.3	11/11/2018	No	6.8	<0.4	20	15	15	<0.1	9.9	16	18	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_BH09_0.2	0.2-0.2	11/11/2018	No	43	<0.4	20	84	34	<0.1	12	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP02_0.25	0.25-0.25	11/11/2018	No	6.1	<0.4	29	47	20	<0.1	41	47	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	620	380	1000
GHD_TP04_0.2	0.2-0.2	12/11/2018	No	16	<0.4	36	24	30	<0.1	10	31	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP06_0.3	0.3-0.3	12/11/2018	No	6.5	<0.4	14	11	14	<0.1	13	11	15	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	120	120
GHD_TP101_0.15	0.15-0.15	13/11/2018	No	6.4	<0.4	12	23	21	<0.1	9.9	43	6.9	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP102_0.1	0.1-0.1	13/11/2018	No	3.7	<0.4	15	12	11	<0.1	5.8	16	5.5	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP103_0.1	0.1-0.1	13/11/2018	No	2.5	<0.4	11	12	9.8	<0.1	<5	19	6.4	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP104_0.2	0.2-0.2	10/11/2018	No	<2	<0.4	5.5	68	10	<0.1	<5	22	20	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP104_0.2 (DUP)		10/11/2018	No	<2	<0.4	5.6	40	7.7	<0.1	<5	19	19	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP105_0.2	0.2-0.2	10/11/2018	No	2.5	<0.4	<5	200	13	<0.1	6.8	64	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP105_0.2 (DUP)		10/11/2018	No	<2	<0.4	<5	250	13	<0.1	7	61	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP106_0.2	0.2-0.2	10/11/2018	No	2.2	<0.4	<5	230	9.6	<0.1	5	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100
GHD_TP107_0.2	0.2-0.2	10/11/2018	No	3.3	<0.4	<5	270	16	<0.1	6.6	87	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.5	<20	<20	<50	<50	<100	<100	<100

Appendix F
Cabramatta Loop Project - Targeted Contamination Assessment
Soil Analyses - Ecological Criteria

			PAH																				Volatile					
		C6-C9 Fraction	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Ca	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Cal	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		20	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.2	0.3
NEPM 2013 EIL-Commercial/Industrial																												
0-2m																370												
NEPM 2013 EIL-Urban Residential- Public Open Space																												
0-2m																**170**												
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil																												
0-2m							1.4																75	135	165			180
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																												
0-2m							0.7																50	85	70			105
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																										
GHD_BH02_0.3	0.3-0.3	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH03_0.3	0.3-0.3	10/11/2018	<20	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH04_0.3	0.3-0.3	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH05_0.3	0.3-0.3	10/11/2018	<20	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH06_0.2	0.2-0.2	11/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH07_0.2	0.2-0.2	11/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH08_0.3	0.3-0.3	11/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH09_0.2	0.2-0.2	11/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP02_0.25	0.25-0.25	11/11/2018	<20	<0.5	<0.5	<0.5	0.7	0.5	0.5	<0.5	0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	1.4	4.4	0.8	1.1	1.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP04_0.2	0.2-0.2	12/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP06_0.3	0.3-0.3	12/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP101_0.15	0.15-0.15	13/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP102_0.1	0.1-0.1	13/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP103_0.1	0.1-0.1	13/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2	0.2-0.2	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2 (DUP)		10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2	0.2-0.2	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2 (DUP)		10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP106_0.2	0.2-0.2	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP107_0.2	0.2-0.2	10/11/2018	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3

Appendix F
Cabramatta Loop Project - Targeted Contamination Assessment
Soil Analyses - Health Criteria

		Asbestos	Heavy Metal							Inorganic	OCP																															
		Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content (%)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfete	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Tolusthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S
		Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		Absetos detected	2	0.4	5	5	5	0.1	5	5	1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2
NEPM 2013 Table 1A(1) HIL D Comm/Ind			3000	900	3600	240000	1500	730	6000	400000							45		530				3600					100				50		80	2500	160					2000				
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																																												
0-1m																																												
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																																												
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																																										
GHD_BH02_0.3	0.3-0.3	10/11/2018	No	5.7	<0.4	13	43	19	<0.1	18	72	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH03_0.3	0.3-0.3	10/11/2018	No	54	1	18	290	89	<0.1	34	140	7.2	4.37	<0.1	<0.05	<0.05	1.6	4.3	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	2.7	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH04_0.3	0.3-0.3	10/11/2018	No	53	0.4	12	160	43	<0.1	12	80	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH05_0.3	0.3-0.3	10/11/2018	No	92	1.3	12	350	88	<0.1	14	110	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH06_0.2	0.2-0.2	11/11/2018	No	8	<0.4	17	17	13	<0.1	7.3	23	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH07_0.2	0.2-0.2	11/11/2018	No	7.4	<0.4	17	24	16	<0.1	9.5	28	28	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH08_0.3	0.3-0.3	11/11/2018	No	6.8	<0.4	20	15	15	<0.1	9.9	16	18	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_BH09_0.2	0.2-0.2	11/11/2018	No	43	<0.4	20	84	34	<0.1	12	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP02_0.25	0.25-0.25	11/11/2018	No	6.1	<0.4	29	47	20	<0.1	41	47	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP04_0.2	0.2-0.2	12/11/2018	No	16	<0.4	36	24	30	<0.1	10	31	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP06_0.3	0.3-0.3	12/11/2018	No	6.5	<0.4	14	11	14	<0.1	13	11	15	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP101_0.15	0.15-0.15	13/11/2018	No	6.4	<0.4	12	23	21	<0.1	9.9	43	6.9	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP102_0.1	0.1-0.1	13/11/2018	No	3.7	<0.4	15	12	11	<0.1	5.8	16	5.5	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP103_0.1	0.1-0.1	13/11/2018	No	2.5	<0.4	11	12	9.8	<0.1	<5	19	6.4	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP104_0.2	0.2-0.2	10/11/2018	No	<2	<0.4	5.5	68	10	<0.1	<5	22	20	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP104_0.2 (DUP)		10/11/2018	No	<2	<0.4	5.6	40	7.7	<0.1	<5	19	19	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP105_0.2	0.2-0.2	10/11/2018	No	2.5	<0.4	<5	200	13	<0.1	6.8	64	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP105_0.2 (DUP)		10/11/2018	No	<2	<0.4	<5	250	13	<0.1	7	61	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP106_0.2	0.2-0.2	10/11/2018	No	2.2	<0.4	<5	230	9.6	<0.1	5	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2
GHD_TP107_0.2	0.2-0.2	10/11/2018	No	3.3	<0.4	<5	270	16	<0.1	6.6	87	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2

Appendix F
Cabramatta Loop Project - Targeted Contamination Assessment
Soil Analyses - Health Criteria

	OPP																									Organic											PAH										
	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	20	20	50	50	100	100	100	20	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HIL D Comm/Ind																																														
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																																														
0-1m																										*999999*	*260*		*999999*																	
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																												700		1000	3500	10000														

Field_ID	Sample_Depth_Range	Sampled_Date_Time																																													
GHD_BH02_0.3	0.3-0.3	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH03_0.3	0.3-0.3	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	290	<100	290	<20	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH04_0.3	0.3-0.3	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH05_0.3	0.3-0.3	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH06_0.2	0.2-0.2	11/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH07_0.2	0.2-0.2	11/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH08_0.3	0.3-0.3	11/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH09_0.2	0.2-0.2	11/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP02_0.25	0.25-0.25	11/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	620	380	1000	<20	<0.5	<0.5	<0.5	<0.5	0.7	0.5	0.5	<0.5	0.5	<0.5	0.8
GHD_TP04_0.2	0.2-0.2	12/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP06_0.3	0.3-0.3	12/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	120	120	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP101_0.15	0.15-0.15	13/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP102_0.1	0.1-0.1	13/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP103_0.1	0.1-0.1	13/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP104_0.2	0.2-0.2	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP104_0.2 (DUP)		10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP105_0.2	0.2-0.2	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP105_0.2 (DUP)		10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP106_0.2	0.2-0.2	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_TP107_0.2	0.2-0.2	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Appendix F
Cabramatta Loop Project - Targeted Contamination Assessment
Soil Analyses - Health Criteria

											SVOC																			Volatile					
											Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Ca	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Cal	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	3,4-Methylphenol (m,p-cresol)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,4-dinitrophenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	Tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total
											mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL											0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	1	1	0.5	0.5	5	0.5	0.5	0.2	1	5	20	1	5	20	1	0.5	1	1	20	0.1	0.1	0.1	0.1	0.2	0.3
NEPM 2013 Table 1A(1) HIL D Comm/Ind																4000	40	40	40													660	240000											
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																																											
0-1m													*999999*																											*3*	*999999*	*999999*			*230*
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																																											
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																																									
GHD_BH02_0.3	0.3-0.3	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH03_0.3	0.3-0.3	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH04_0.3	0.3-0.3	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH05_0.3	0.3-0.3	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH06_0.2	0.2-0.2	11/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH07_0.2	0.2-0.2	11/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH08_0.3	0.3-0.3	11/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH09_0.2	0.2-0.2	11/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP02_0.25	0.25-0.25	11/11/2018	<0.5	<0.5	<0.5	<0.5	1.4	4.4	0.8	1.1	1.4	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP04_0.2	0.2-0.2	12/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP06_0.3	0.3-0.3	12/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP101_0.15	0.15-0.15	13/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP102_0.1	0.1-0.1	13/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP103_0.1	0.1-0.1	13/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2	0.2-0.2	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2 (DUP)		10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2	0.2-0.2	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2 (DUP)		10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP106_0.2	0.2-0.2	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP107_0.2	0.2-0.2	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3

Appendix F
Cabramatta Loop Project - DSI
Waste Classification Results

		Asbestos	Heavy Metal								Inorganic	OCP																												
		Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content (%)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor				
		Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				
EQL		Asbestos detected	2	0.4	5	5	5	0.1	5	5	1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05				
NSW EPA (2014) General Solid Waste CT1 (No Leaching)			100	20	100		100	4	40																														
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)			400	80	400		400	16	160																														
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Matrix_Description**																																				
GHD_BH02_0.3		0.3-0.3	10/11/2018			5.7	<0.4	13	43	19	<0.1	18	72	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH03_0.3		0.3-0.3	10/11/2018			54	1	18	290	89	<0.1	34	140	7.2	4.37	<0.1	<0.05	<0.05	1.6	4.3	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	2.7	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH04_0.3		0.3-0.3	10/11/2018			53	0.4	12	160	43	<0.1	12	80	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH05_0.3		0.3-0.3	10/11/2018			92	1.3	12	350	88	<0.1	14	110	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH06_0.2		0.2-0.2	11/11/2018			8	<0.4	17	17	13	<0.1	7.3	23	16	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH07_0.2		0.2-0.2	11/11/2018			7.4	<0.4	17	24	16	<0.1	9.5	28	28	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH08_0.3		0.3-0.3	11/11/2018			6.8	<0.4	20	15	15	<0.1	9.9	16	18	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_BH09_0.2		0.2-0.2	11/11/2018			43	<0.4	20	84	34	<0.1	12	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP02_0.25		0.25-0.25	11/11/2018			6.1	<0.4	29	47	20	<0.1	41	47	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP04_0.2		0.2-0.2	12/11/2018			16	<0.4	36	24	30	<0.1	10	31	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP06_0.3		0.3-0.3	12/11/2018			6.5	<0.4	14	11	14	<0.1	13	11	15	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP101_0.15		0.15-0.15	13/11/2018			6.4	<0.4	12	23	21	<0.1	9.9	43	6.9	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
GHD_TP102_0.1		0.1-0.1	13/11/2018			3.7	<0.4	15	12	11	<0.1	5.8	16	5.5	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
GHD_TP103_0.1		0.1-0.1	13/11/2018			2.5	<0.4	11	12	9.8	<0.1	<5	19	6.4	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
GHD_TP104_0.2		0.2-0.2	10/11/2018			<2	<0.4	5.5	68	10	<0.1	<5	22	20	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP104_0.2 (DUP)			10/11/2018			<2	<0.4	5.6	40	7.7	<0.1	<5	19	19	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP105_0.2		0.2-0.2	10/11/2018			2.5	<0.4	<5	200	13	<0.1	6.8	64	14	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP105_0.2 (DUP)			10/11/2018			<2	<0.4	<5	250	13	<0.1	7	61	13	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP106_0.2		0.2-0.2	10/11/2018			2.2	<0.4	<5	230	9.6	<0.1	5	56	24	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GHD_TP107_0.2		0.2-0.2	10/11/2018			3.3	<0.4	<5	270	16	<0.1	6.6	87	12	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

																		OPP																						
					Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Naphthalene (BTEXN)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					1	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
NSW EPA (2014) General Solid Waste CT1 (No Leaching)										4																													
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)										16																													
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Matrix_Description**																																			
GHD_BH02_0.3		0.3-0.3	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH03_0.3		0.3-0.3	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH04_0.3		0.3-0.3	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH05_0.3		0.3-0.3	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH06_0.2		0.2-0.2	11/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH07_0.2		0.2-0.2	11/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH08_0.3		0.3-0.3	11/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_BH09_0.2		0.2-0.2	11/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP02_0.25		0.25-0.25	11/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP04_0.2		0.2-0.2	12/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP06_0.3		0.3-0.3	12/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP101_0.15		0.15-0.15	13/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP102_0.1		0.1-0.1	13/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP103_0.1		0.1-0.1	13/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP104_0.2		0.2-0.2	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP104_0.2 (DUP)			10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP105_0.2		0.2-0.2	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP105_0.2 (DUP)			10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP106_0.2		0.2-0.2	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
GHD_TP107_0.2		0.2-0.2	10/11/2018		<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5

					Organic								PAH																											
					F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Cal	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	3,4-Methylphenol (m,p-cresol)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,4-dinitrophenol	2,6-dichlorophenol	2-chlorophenol
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					20	20	50	50	100	100	100	20	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	1	1	0.5	0.5	5	0.5	0.5
NSW EPA (2014) General Solid Waste CT1 (No Leaching)												650					0.8												200					8000	40					
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)												2600					3.2												800					32000	160					
Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Description																																				
GHD_BH02_0.3		0.3-0.3	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH03_0.3		0.3-0.3	10/11/2018		<20	<20	<50	<50	290	<100	290	<20	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH04_0.3		0.3-0.3	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH05_0.3		0.3-0.3	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH06_0.2		0.2-0.2	11/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH07_0.2		0.2-0.2	11/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH08_0.3		0.3-0.3	11/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_BH09_0.2		0.2-0.2	11/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP02_0.25		0.25-0.25	11/11/2018		<20	<20	<50	<50	620	380	1000	<20	<0.5	<0.5	<0.5	<0.5	0.7	0.5	0.5	<0.5	0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	1.4	4.4	0.8	1.1	1.4	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP04_0.2		0.2-0.2	12/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP06_0.3		0.3-0.3	12/11/2018		<20	<20	<50	<50	<100	120	120	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP101_0.15		0.15-0.15	13/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP102_0.1		0.1-0.1	13/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP103_0.1		0.1-0.1	13/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP104_0.2		0.2-0.2	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP104_0.2 (DUP)			10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP105_0.2		0.2-0.2	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP105_0.2 (DUP)			10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP106_0.2		0.2-0.2	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5
GHD_TP107_0.2		0.2-0.2	10/11/2018		<20	<20	<50	<50	<100	<100	<100	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.4	<1	<1	<0.5	<0.5	<5	<0.5	<0.5

Appendix F
Cabramatta Loop Project - DSI
Soil Analytical Results

						SVOC												TPH				Volatile					
						2-methylphenol	2-nitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.2	1	5	20	1	5	20	1	0.5	1	1	20	20	50	50	50	0.1	0.1	0.1	0.1	0.2	0.3
NSW EPA (2014) General Solid Waste CT1 (No Leaching)						4000											288				10000	10	288	600			1000
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)						16000											1152				40000	40	1152	2400			4000
Field_ID	**Location_Code**	**Sample_Depth_Range**	**Sampled_Date_Time**	**Matrix_Description**																							
GHD_BH02_0.3		0.3-0.3	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH03_0.3		0.3-0.3	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	170	70	240	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH04_0.3		0.3-0.3	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH05_0.3		0.3-0.3	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH06_0.2		0.2-0.2	11/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH07_0.2		0.2-0.2	11/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH08_0.3		0.3-0.3	11/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_BH09_0.2		0.2-0.2	11/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP02_0.25		0.25-0.25	11/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	130	560	690	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP04_0.2		0.2-0.2	12/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	90	90	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP06_0.3		0.3-0.3	12/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	110	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP101_0.15		0.15-0.15	13/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP102_0.1		0.1-0.1	13/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP103_0.1		0.1-0.1	13/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2		0.2-0.2	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP104_0.2 (DUP)			10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2		0.2-0.2	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP105_0.2 (DUP)			10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP106_0.2		0.2-0.2	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
GHD_TP107_0.2		0.2-0.2	10/11/2018			<0.2	<1	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3

		Location Code						
		Date	10/11/2018	10/11/2018		10/11/2018	10/11/2018	
		Field ID	GHD_TP104_0.2	GHD_TP104_0.2 (DUP)		GHD_TP105_0.2	GHD_TP105_0.2 (DUP)	
		Sample Type	Normal	Field_D		Normal	Field_D	
		Matrix Type	soil	soil	RPD	soil	soil	RPD
	Unit	EQL						
Inorganics								
Moisture Content (dried @ 103°C)	%	1	20	19	5	14	13	7
Asbestos								
ACM - Comment	Comment		1	1	0	1	1	0
Asbestos from ACM in Soil	%w/w		0.0000	0.0000		0.0000	0.0000	
Asbestos from FA & AF in Soil	%w/w		0.0000	0.0000		0.0000	0.0000	
Metals								
Arsenic	mg/kg	2	<2	<2	0	2.5	<2	22
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0
Chromium (III+VI)	mg/kg	5	5.5	5.6	2	<5	<5	0
Copper	mg/kg	5	68	40	52	200	250	22
Lead	mg/kg	5	10	7.7	26	13	13	0
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	5	<5	<5	0	6.8	7.0	3
Zinc	mg/kg	5	22	19	15	64	61	5
BTEXN								
Benzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Toluene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Xylene (o)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Xylene (m & p)	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Xylene Total	mg/kg	0.3	<0.3	<0.3	0	<0.3	<0.3	0
Naphthalene (BTEXN)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
TRH - NEPM 2013								
F1 (C6-C10 minus BTEX)	mg/kg	20	<20	<20	0	<20	<20	0
C6-C10 Fraction	mg/kg	20	<20	<20	0	<20	<20	0
F2 (>C10-C16 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0
>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0
F3 (>C16-C34 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0
F4 (>C34-C40 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0
>C10-C40 (Sum of Total)	mg/kg	100	<100	<100	0	<100	<100	0
TRH - NEPM 1999								
C6-C9 Fraction	mg/kg	20	<20	<20	0	<20	<20	0
C10-C14 Fraction	mg/kg	20	<20	<20	0	<20	<20	0
C15-C28 Fraction	mg/kg	50	<50	<50	0	<50	<50	0
C29-C36 Fraction	mg/kg	50	<50	<50	0	<50	<50	0
C10-C36 (Sum of Total)	mg/kg	50	<50	<50	0	<50	<50	0
PAHs								
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene-PAH	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
PAHs (Sum of total) - Lab calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0
Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0
Phenols								
3,4-Methylphenol (m,p-cresol)	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0
2,4,5-trichlorophenol	mg/kg	1	<1	<1	0	<1	<1	0
2,4,6-trichlorophenol	mg/kg	1	<1	<1	0	<1	<1	0
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
2,4-dinitrophenol	mg/kg	5	<5	<5	0	<5	<5	0
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
2-methylphenol	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
2-nitrophenol	mg/kg	1	<1	<1	0	<1	<1	0
4,6-Dinitro-2-methylphenol	mg/kg	5	<5	<5	0	<5	<5	0
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20	<20	<20	0	<20	<20	0
4-chloro-3-methylphenol	mg/kg	1	<1	<1	0	<1	<1	0
4-nitrophenol	mg/kg	5	<5	<5	0	<5	<5	0
Pentachlorophenol	mg/kg	1	<1	<1	0	<1	<1	0
Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
tetrachlorophenols	mg/kg	1	<1	<1	0	<1	<1	0
Phenols (Total Halogenated)	mg/kg	1	<1	<1	0	<1	<1	0
Phenols (Total Non Halogenated)	mg/kg	20	<20	<20	0	<20	<20	0
OC Pesticides								
Organochlorine pesticides EPAVic	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Other organochlorine pesticides EPAVic	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
4,4-DDE	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
a-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Aldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
b-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Chlordane	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
d-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
4,4 DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
4,4 DDT	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
DDT+DDE+DDD - Lab Calc	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endosulfan I (alpha)	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endosulfan II (beta)	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endosulfan Sulfate	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Heptachlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Methoxychlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Toxaphene	mg/kg	1	<1	<1	0	<1	<1	0
OP Pesticides								
Tokuthion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Azinphos methyl	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Bolstar (Sulprofos)	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Chlorfenvinphos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Chlorpyrifos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Chlorpyrifos-methyl	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Coumaphos	mg/kg	2	<2	<2	0	<2	<2	0
Demeton-O	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Demeton-S	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Diazinon	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Dichlorvos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Dimethoate	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Disulfoton	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
EPN	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Ethion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Ethoprop	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Fenitrothion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Fensulfothion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Fenthion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Malathion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Merphos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0

		Location Code						
		Date	10/11/2018	10/11/2018		10/11/2018	10/11/2018	
		Field ID	GHD_TP104_0.2	GHD_TP104_0.2 (DUP)		GHD_TP105_0.2	GHD_TP105_0.2 (DUP)	
		Sample Type	Normal	Field_D		Normal	Field_D	
		Matrix Type	soil	soil	RPD	soil	soil	RPD
	Unit	EQL						
Methyl parathion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Mevinphos (Phosdrin)	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Monocrotophos	mg/kg	2	<2	<2	0	<2	<2	0
Naled (Dibrom)	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Omethoate	mg/kg	2	<2	<2	0	<2	<2	0
Parathion	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Phorate	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Pirimiphos-methyl	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Pyrazophos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Ronnel	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Terbufos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Trichloronate	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Tetrachlorvinphos	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
Herbicides								
Dinoseb	mg/kg	20	<20	<20	0	<20	<20	0

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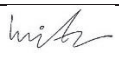
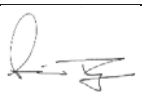
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	E Harrison	V Wilton		S Page		08/08/19

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