

Mr John Coles
Bury Hill Landscape Supplies Ltd
The Estate Office
Old Bury Hill
Westcott
Nr Dorking
Surrey, RH4 3JU

9<sup>th</sup> December 2022 Our Ref: TOHA/22/7685/8/SS

Your Ref: see below

# Soil Analysis Report: Bury Hill Horsham Yard - Lawn Rootzone (S)

We have completed the analysis of the sample recently submitted, referenced *Lawn Rootzone* (S) and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample specifically for use as a lawn rootzone for high-performance amenity grass areas with good compaction resistance and a higher drainage rate are required, and where automatic irrigation and on-going maintenance are provisioned.

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the soil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the soil has left the Bury Hill Landscape Supplies Ltd site.

### SAMPLE EXAMINATION

The sample was described as a pale yellow (Munsell Colour 10YR 6/3), dry, friable, non-calcareous SAND with a single grain structure. The sample was very slightly stony and contained a low proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.



Plate 1: Lawn Rootzone (S) Sample

### **ANALYTICAL SCHEDULE**

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition, drainage rate and fertility of the rootzone, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (clay, silt, '5 sands');
- stone content (2-20mm, 20-50mm, >50mm);
- saturated hydraulic conductivity;
- pH and electrical conductivity values;
- calcium carbonate;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

TOHA/22/7685/8/SS/Dec Page 2

#### **RESULTS OF ANALYSIS**

#### Particle Size Analysis and Stone Content

The sample fell into the *sand* texture class. Further detailed particle sized distribution found the sample to have a sufficiently narrow particle size distribution, and a predominance of *medium sand* (0.25-0.50mm), with a smaller proportion of *coarse sand* (0.50-1.0mm). This is acceptable for high-use grass areas as sufficient porosity levels should be maintained in a consolidated state and the risk of particle interpacking and surface smearing is minimised.

High sand content soils typically have good aeration, drainage and compaction-resistance properties, but can possess reduced water and nutrient retention capacities. As such, it will be important that the lawn be suitably maintained (seasonal fertiliser applications, irrigation, decompaction etc.) as part of an ongoing maintenance regime.

The sample was virtually stone-free and as such, stones will not restrict the use of the soil.

#### Saturated Hydraulic Conductivity

The saturated hydraulic conductivity rate (161 mm/hr) recorded under a degree of consolidation was high. This should be considered suitable for high-permeability lawns where a 'fast-draining' soil is required. The high drainage rate will however mean that provision for irrigation will be essential for the long term performance of the sward.

#### pH and Calcium Carbonate Values

The sample was strongly alkaline in reaction (pH 8.2) and non-calcareous (CaCO<sub>3</sub> <1%).

The main source of the 'alkalinity' is likely to be the potassium ions from the compost in the sample. As such, this pH value would be considered suitable for most grass cultivars.

### **Electrical Conductivity Values**

The electrical conductivity (salinity) values (water and CaSO<sub>4</sub> extract) were low, which indicates that soluble salts were not present at levels that would be harmful to plants.

# Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for landscape applications.

#### **Potential Contaminants**

In the absence of site-specific assessment criteria, the concentrations of potential contaminants that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4Uls for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels* (C4SLs) *for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

## Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded our maximum permissible levels.

TOHA/22/7685/8/SS/Dec Page 3

#### **CONCLUSION**

The purpose of the analysis was to determine the suitability of the sample for use as a *lawn rootzone* for high-performance amenity grass / lawn areas.

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, non-calcareous sand with a single grain structure and very low stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the soil represented by this sample would be considered suitable for high-use lawn areas that are supported by irrigation.

A suitable maintenance regime should also be implemented to support the establishment and continued growth of the grass sward (e.g. decompaction, aeration, fertiliser applications, etc.).

# Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid compaction during all phases of soil handling (e.g. stockpiling, respreading, cultivating, seeding or turfing). As a consequence, soil handling operations should be carried out when soil and the underlying ground is sufficiently dry and stable.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the ground has dried out. If the soil is compacted at any stage during the course of soiling or landscaping works, it should be decompacted appropriately.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully

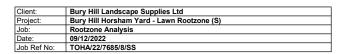
Harriet MacRae BSc MSc Graduate Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

Matthew Heins BSc (Hons) MISoilSci Senior Soil Scientist

TOHA/22/7685/8/SS/Dec Page 4







Sample Reference			Lawn Rootzone (S)
- Campio i totorono		Accreditation	Lawii Rooizoile (5)
Clay (<0.002mm)	%	UKAS	2
Silt (0.002-0.05mm)	%	UKAS	0
Very Fine Sand (0.05-0.15mm)	%	UKAS	2
Fine Sand (0.15-0.25mm)	%	UKAS	7
Medium Sand (0.25-0.50mm)	%	UKAS	66
Coarse Sand (0.50-1.0mm)	%	UKAS	20
Very Coarse Sand (1.0-2.0mm)	%	UKAS	3
otal Sand (0.05-2.0mm)	%	UKAS	98
exture Class (UK Classification)		UKAS	S
itones (2-20mm)	% DW	GLP	1
tones (20-50mm)	% DW	GLP	0
ones (>50mm)	% DW	GLP	0
turated Hydraulic Conductivity	mm/hr	A2LA	161
•			
H Value (1:2.5 water extract)	units	UKAS	8.2
alcium Carbonate	%	UKAS	< 1.0
ectrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	484
ectrical Conductivity (1:2:3 water extract)	uS/cm	UKAS	2652
	%	UKAS	4.1
xchangeable Sodium Percentage			
rganic Matter (LOI)	%	UKAS	2.5
otal Nitrogen (Dumas)	%	UKAS	0.10
: N Ratio	ratio	UKAS	15
xtractable Phosphorus	mg/l	UKAS	29
xtractable Potassium	mg/l	UKAS	479
xtractable Magnesium	mg/l	UKAS	61
otal Arsenic (As)	mg/kg	MCERTS	3
otal Cadmium (Cd)	mg/kg	MCERTS	< 0.2
otal Chromium (Cr)	mg/kg	MCERTS	2.8
exavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
otal Copper (Cu)	mg/kg	MCERTS	9.2
			9.2
otal Lead (Pb)	mg/kg	MCERTS	
otal Mercury (Hg)	mg/kg	MCERTS	< 0.3
otal Nickel (Ni)	mg/kg	MCERTS	< 1.0
otal Selenium (Se)	mg/kg	MCERTS	< 1.0
otal Zinc (Zn)	mg/kg	MCERTS	8
/ater Soluble Boron (B)	mg/kg	MCERTS	0.6
otal Cyanide (CN)	mg/kg	MCERTS	< 1.0
otal (mono) Phenols	mg/kg	MCERTS	< 1.0
anhthalana		MOEDTO	.0.05
	mg/kg	MCERTS	< 0.05
enaphthylene	mg/kg mg/kg	MCERTS	< 0.05
cenaphthylene		MCERTS MCERTS	< 0.05 < 0.05
cenaphthylene cenaphthene	mg/kg	MCERTS	< 0.05
enaphthylene enaphthene uorene	mg/kg mg/kg	MCERTS MCERTS	< 0.05 < 0.05
enaphthylene enaphthene Jorene lenanthrene	mg/kg mg/kg mg/kg mg/kg	MCERTS MCERTS MCERTS	< 0.05 < 0.05 < 0.05
cenaphthylene cenaphthylene cenaphthene cenaphthene cenaphthene cenaphthene cenaphthene cenaphthene	mg/kg mg/kg mg/kg mg/kg mg/kg	MCERTS MCERTS MCERTS MCERTS MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
enaphthylene enaphthene jorene enanthrene tithracene joranthene	mg/kg mg/kg mg/kg mg/kg mg/kg	MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthene uorene nenanthrene thracene uoranthene	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthene uorene tenanthrene thracene uoranthene rene	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
penaphthylene penaphthene puorene penanthrene nithracene puoranthene r/rene penzo(a)anthracene	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	MCERTS	< 0.05 < 0.05
cenaphthylene cenaphthene uorene nenanthrene thracene uoranthene rene anzo(a)anthracene nrysene enzo(b)fluoranthene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthene uorene henanthrene nthracene uoranthene yrene enzo(a)anthracene hrysene enzo(b)fluoranthene enzo(k)fluoranthene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene hrysene enzo(b)fluoranthene enzo(a)fluoranthene enzo(a)pyrene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene hnysene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)pyrene deno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthylene cenaphthene core cenaphthene core cenaphthene cene cenephthene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
enaphthylene enaphthylene enaphthene orene enanthrene thracene oranthene ene ene ene ene ene ene ene enzo(a)anthracene enzo(b)fluoranthene enzo(a)pyrene eno(1,2,3-cd)pyrene enozo(z,h)anthracene enzo(z,h)purperviene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
enaphthylene enaphthene iorene enanthrene thracene ioranthene rene enanthrene enanthrene enanthrene enancy (a) anthracene enzo (a) philoranthene enzo (a) philoranthene enzo (a) piyene eleno (1, 2, 3-cd) pyrene eleno (1, 2, 3-cd) pyrene eleno (2, 4, h) anthracene enzo (g, h, l) perylene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
penaphthylene enaphthylene enaphthene jorene penanthrene thtracene joranthene mene mene mene mene mene mene mene	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
enaphthylene enaphthene ororene enanthrene thracene thracene toranthene enanthrene thracene trene enzo(a)anthracene enzo(b)fluoranthene enzo(a)pyrene enzo(a)pyrene enen(1,2,3-cd)pyrene enenzo(a,fluoranthracene enzo(a,fluoranthracene enzo(a,fluoranthrac	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05
cenaphthylene cenaphthylene cenaphthene uorene nenanthrene nthracene uoranthene yrene enzo(a)nthracene enzo(s)filuoranthene enzo(s)filuoranthene enzo(a)pyrene denof1.2.3-cd)pyrene denof1.2.3-cd)pyrene benzo(a,h)anthracene enzo(g,h,i)perylene otal PAHs (sum USEPA16) iiphatic TPH > C5 - C6	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.08 < 0.08
cenaphthylene cenaphthylene cenaphthene uorene nenanthrene nthracene uoranthene yrene enzo(a)anthracene enzo(b)fluoranthene en	mg/kg	MCERTS	< 0.05
cenaphthylene cenaphthene uorene henanthrene nthracene uoranthene yrene enzo(a) anthracene hrysene enzo(b) fluoranthene enzo(c), h) pervlene btal PAHs (sum USEPA16) iiphatic TPH > C5 - C6 iiphatic TPH > C6 - C8 iiphatic TPH > C8 - C10	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	MCERTS	< 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.05     < 0.08     < 0.08     < 0.09     < 0.09     < 0.09     < 0.000     < 0.001     < 0.001     < 0.001     < 0.001
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a) anthracene henzo(b) fluoranthene enzo(b) fluoranthene enzo(b) fluoranthene enzo(b) fluoranthene enzo(b) fluoranthene enzo(c) pyrene ideno(1,2,3-cd)	mg/kg	MCERTS	< 0.05
cenaphthylene cenaphthene uorene henanthrene henanthrene henanthrene henanthrene uoranthene yrene enzo(a)anthracene henzo(a)filuoranthene enzo(b)filuoranthene enzo(b)filuoranthene enzo(b)filuoranthene enzo(b)filuoranthene enzo(c)filuoranthene enzo(a,h)anthracene enzo(a,h)anthracene enzo(a,h)iperylene btal PAHs (sum USEPA16) liphatic TPH >C5 - C6 liphatic TPH >C6 - C8 liphatic TPH >C8 - C10 liphatic TPH >C8 - C10 liphatic TPH >C10 - C12 liphatic TPH >C10 - C12 liphatic TPH >C10 - C12	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05
cenaphthylene cenaphthene uorene henanthrene nthracene uoranthene yrene enzo(a) anthracene hrysene enzo(b) fluoranthene enzo(c) fluoranthene enzo(a) pyrene deno(1,2,3-cd) pyrene ibienzo(a,1) anthracene enzo(g,h,i) perylene otal PAHs (sum USEPA16) iliphatic TPH >C5 - C6 iliphatic TPH >C6 - C8 iliphatic TPH >C8 - C10 iliphatic TPH >C10 - C12 iliphatic TPH >C12 - C16 iliphatic TPH >C12 - C16 iliphatic TPH >C16 - C21	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene henzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(c)fluoranthene enzo(a)aphanthracene enzo(a),h)anthracene enzo(a,h)anthracene enzo(a,h)anthracene enzo(a,h)anthracene liphatic TPH >C5 - C6 liphatic TPH >C6 - C8 liphatic TPH >C8 - C10 liphatic TPH >C10 - C12 liphatic TPH >C10 - C12 liphatic TPH >C12 - C16 liphatic TPH >C16 - C21	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene henzo(b)fluoranthene enzo(b)fluoranthene denzo(b)fluoranthene ibenzo(a,h)anthracene enzo(b)fluoranthene enzo(b)fluoranthene ibenzo(a,h)anthracene enzo(b)fluoranthene ibenzo(b)fluoranthene ibenzo(b)fluoranthene ibenzo(b)fluoranthene enzo(b)fluoranthene ibenzo(b)fluoranthene ibenzo(b)f	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.80 <0.80
cenaphthylene cenaphthylene tuorene henanthrene nthracene tuoranthene yrene enzo(a)anthracene hrysene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(c)fluoranthene enzo	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
cenaphthylene cenaphthylene cenaphthene uorene nenanthrene nthracene uoranthene yrene enzo(a)nthracene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(a)pyrene denof 1,2,3-cd)pyrene denof 1,2,3-cd)pyrene benzo(a,h)anthracene enzo(a,h)anthracene enzo(b,h)perylene otal PAHs (sum USEPA16) iphatic TPH >C5 - C6 iphatic TPH >C6 - C8 iphatic TPH >C8 - C10 iphatic TPH >C12 - C16 iphatic TPH >C16 - C21 iphatic TPH >C16 - C21 iphatic TPH >C21 - C35 iphatic TPH >C3 - C35 iphatic TPH >C5 - C7 romatic TPH >C7 - C8	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.80 <0.80
cenaphthylene cenaphthylene cenaphthene uorene nenanthrene nthracene uoranthene yrene enzo(a)nthracene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(a)pyrene denof 1,2,3-cd)pyrene denof 1,2,3-cd)pyrene benzo(a,h)anthracene enzo(a,h)anthracene enzo(b,h)perylene otal PAHs (sum USEPA16) iphatic TPH >C5 - C6 iphatic TPH >C6 - C8 iphatic TPH >C8 - C10 iphatic TPH >C12 - C16 iphatic TPH >C16 - C21 iphatic TPH >C16 - C21 iphatic TPH >C21 - C35 iphatic TPH >C3 - C35 iphatic TPH >C5 - C7 romatic TPH >C7 - C8	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
cenaphthylene cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene hnysene enzo(b)fluoranthene enzo(c) fluoranthene ibenzo(a,h)anthracene enzo(d,h)perylene otal PAHs (sum USEPA16)  liphatic TPH > C5 - C6 liphatic TPH > C6 - C8 liphatic TPH > C8 - C10 liphatic TPH > C10 - C12 liphatic TPH > C12 - C12 liphatic TPH > C12 - C13 liphatic TPH > C12 - C35 liphatic TPH > C3 - C35 liphatic TPH > C3 - C35 liphatic TPH > C5 - C7 romatic TPH > C7 - C8 romatic TPH > C7 - C8 romatic TPH > C7 - C8	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.00 <0.05 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene hrysene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(c)fluoranthene enzo(c	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
cenaphthylene cenaphthene luorene henanthrene nthracene luoranthene yrene enzo(a)anthracene hrysene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(b)fluoranthene enzo(a)panthracene enzo(a)prene ideno(1,2,3-cd)pyrene ideno(1,2,3-cd)pyrene ideno(1,2,3-cd)pyrene ideno(1,2,3-cd)pyrene ideno(b) ideno(b	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
ccenaphthylene ccenaphthylene ccenaphthene luorene Phenanthrene unthracene luoranthene Pyrene elenzo(a) fluoranthene elenzo(b) fluoranthene elenzo(b) fluoranthene elenzo(b) fluoranthene elenzo(a) pyrene deno(1,2,3-cd) pyrene blenzo(a),1) parlyracene elenzo(g, h,i) perylene otal PAHs (sum USEPA16)  Liiphatic TPH >C5 - C6 Liiphatic TPH >C6 - C8 Liiphatic TPH >C6 - C8 Liiphatic TPH >C6 - C8 Liiphatic TPH >C6 - C10 Liiphatic TPH >C10 - C12 Liiphatic TPH >C10 - C12 Liiphatic TPH >C10 - C35 Liiphatic TPH >C10 - C35 Liiphatic TPH >C10 - C35 Liiphatic TPH >C10 - C21 Liiphatic TPH >C10 - C21 Liiphatic TPH >C10 - C35 Liiphatic TPH >C3 - C7 Liiphatic TPH >C3 - C7 Liiphatic TPH >C3 - C7 Liiphatic TPH >C4 - C35 Liiphatic TPH >C4 - C35 Liiphatic TPH >C5 - C7 Liiphatic TPH >C5 - C5 Liiphatic TPH >C5 - C7 Liiphatic TPH >C5 - C7 Liiphatic TPH >C5 - C7 Liiphatic TPH >C5 - C6 Liiphatic TPH >C5 - C7 Lii	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
ccenaphthylene ccenaphthene luorene Phenanthrene ulturanthrene luoranthrene luoranthrene Pyrene lenzo(a) anthracene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(a) pyrene loitenzo(a, h) anthracene lenzo(b) liphatic TPH > C5 - C6 liphatic TPH > C6 - C8 liphatic TPH > C8 - C10 liphatic TPH > C10 - C12 liphatic TPH > C10 - C12 liphatic TPH > C10 - C12 liphatic TPH > C3 - C35 liphatic TPH > C3 - C35 liphatic TPH > C10 - C12 liphatic TPH > C3 - C35 liphatic TPH > C4 - C35 liphatic TPH > C5 - C7 vormatic TPH > C7 - C8 vormatic TPH > C10 - C12 vormatic TPH > C10 - C21 vormatic TPH > C21 - C35	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
ccenaphthylene ccenaphthene luorene Phenanthrene ulturanthrene luoranthrene luoranthrene Pyrene lenzo(a) anthracene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(b) fluoranthrene lenzo(a) pyrene loitenzo(a, h) anthracene lenzo(b) liphatic TPH > C5 - C6 liphatic TPH > C6 - C8 liphatic TPH > C8 - C10 liphatic TPH > C10 - C12 liphatic TPH > C10 - C12 liphatic TPH > C10 - C12 liphatic TPH > C3 - C35 liphatic TPH > C3 - C35 liphatic TPH > C10 - C12 liphatic TPH > C3 - C35 liphatic TPH > C4 - C35 liphatic TPH > C5 - C7 vormatic TPH > C7 - C8 vormatic TPH > C10 - C12 vormatic TPH > C10 - C21 vormatic TPH > C21 - C35	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
ucenaphthylene ucenaphthylene ucenaphthene lluorene Phenanthrene ulturanthrene ulturanthrene lluoranthene Pyrene elenzo(a) anthracene elenzo(b) fluoranthene elenzo(b) fluoranthene elenzo(a) pyrene elenzo(b) fluoranthene elenzo(a) pyrene elenzo(b) fluoranthene elenzo(a) pyrene elenzo(b) elenzonthene elenzo(a) pyrene elenzo(a) py	mg/kg	MCERTS	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.005 < 0.005 < 0.001 < 0.001 < 0.001 < 1.0 < 2.0 < 8.0 < 8.0 < 8.0 < 10 < 0.001 < 0.001 < 0.001 < 1.0 < 2.0 < 8.0 < 10 < 0.001 < 0.001 < 1.0 < 2.0 < 10 < 10 < 1.0 < 2.0 < 10 < 10 < 1.0 < 2.0 < 10 < 10 < 1.0 < 2.0 < 10 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0
Accenaphthylene Accenaphthylene Accenaphthene Illuorene Phenanthrene Anthracene Illuoranthene Pyrene Benzo(a) anthracene Benzo(b) fluoranthene Benzo(b) fluoranthene Benzo(b) fluoranthene Benzo(a) pyrene Dibenzo(a, h) anthracene Benzo(a), h) perylene Total PAHs (sum USEPA16) Aliphatic TPH > C5 - C6 Aliphatic TPH > C6 - C8 Aliphatic TPH > C10 - C12 Aliphatic TPH > C10 - C12 Aliphatic TPH > C10 - C21 Aliphatic TPH > C3 - C35 Aliphatic TPH > C4 - C35 Aliphatic TPH > C5 - C35 Aromatic TPH > C7 - C8 Aromatic TPH > C8 - C10 Aromatic TPH > C9 - C12 Aromatic TPH > C9 - C12 Aromatic TPH > C9 - C12 Aromatic TPH > C10 - C21 Aromatic TPH > C10 - C21 Aromatic TPH > C10 - C21 Aromatic TPH > C10 - C35 Aromatic TPH > C21 - C35 Aromatic TPH > C35 - C35	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001
Acenaphthylene Acenaphthene  Acenaphthene  Illuorene Phenanthrene Anthracene  Illuoranthene Pyrene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(a)hanthracene Benzo(a,h)anthracene Benzo(a,h)peryene Ilblenzo(a,h)anthracene Benzo(a,h)peryene Ilblenzo(a,h)anthracene Benzo(a,h)peryene Ilblenzo(a,h)anthracene Benzo(a,h)peryene Ilblenzo(a,h)peryene	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
Naphthalene           Acenaphthylene           Acenaphthylene           Acenaphthene           Fluorene           Phenanthrene           Anthracene           Fluoranthene           Pyrene           Benzo(a)anthracene           Chrysene           Benzo(k)fluoranthene           Benzo(k)fluoranthene           Benzo(k)fluoranthene           Benzo(a)pyrene           Dibenzo(a, h)anthracene           Benzo(a, h)lperylene           Total PAHs (sum USEPA16)           Aliphatic TPH >C5 - C6           Aliphatic TPH >C8 - C10           Aliphatic TPH >C8 - C10           Aliphatic TPH >C10 - C12           Aliphatic TPH >C10 - C12           Aliphatic TPH >C14 - C35           Aliphatic TPH >C21 - C35           Aliphatic TPH >C6 - C35           Aromatic TPH >C7 - C8           Aromatic TPH >C8 - C10           Aromatic TPH >C10 - C12           Aromatic TPH >C10 - C12           Aromatic TPH >C12 - C16           Aromatic TPH >C12 - C35           Aromatic TPH >C12 - C35           Aromatic TPH >C15 - C21           Aromatic TPH >C15 - C35           Aromatic TPH >C16 - C21           Aromatic TP	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
Acenaphthylene Acenaphthylene Acenaphthene Illuorene Phenanthrene Anthracene Illuoranthene Pyrene Benzo(a)nthracene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(a)pyrene Dibenzo(a,h)anthracene Benzo(a,h)perylene Fotal PAHs (sum USEPA16) Aliphatic TPH > C5 - C6 Aliphatic TPH > C6 - C8 Aliphatic TPH > C10 - C12 Aliphatic TPH > C10 - C12 Aliphatic TPH > C10 - C21 Aliphatic TPH > C3 - C6 Aliphatic TPH > C3 - C7 Aromatic TPH > C3 - C8 Aliphatic TPH > C10 - C12 Aliphatic TPH > C3 - C35 Aliphatic TPH > C3 - C35 Aromatic TPH > C5 - C8 Aromatic TPH > C5 - C7 Aromatic TPH > C6 - C35 Aromatic TPH > C10 - C12 Aromatic TPH > C10 - C21 Aromatic TPH > C10 - C35 Aromatic TPH > C21 - C35 Aromatic TPH > C35 Aromatic TPH > C35 Aromatic TPH > C35 Aromatic TPH > C36 Aromatic TPH > C37	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
Acenaphthylene Acenaphthylene Acenaphthene	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
ccenaphthylene cenaphthylene cenaphthene luorene thenanthrene nthracene lucranthene yrene tenzo(a)anthracene tenzo(a)anthracene tenzo(b)fluoranthene tenzo(b)fluoranthene tenzo(b)fluoranthene tenzo(b)fluoranthene tenzo(a)pyrene tibenzo(a,h)anthracene tenzo(a,h)anthracene tenzo(a,h)anthracene tenzo(a,h)perylene total PAHs (sum USEPA16)  diliphatic TPH > C5 - C6 liphatic TPH > C6 - C8 liphatic TPH > C8 - C10  diliphatic TPH > C10 - C12 liphatic TPH > C10 - C12 liphatic TPH > C10 - C21 diliphatic TPH > C3 - C35 liphatic TPH > C4 - C35 liphatic TPH > C5 - C7 uromatic TPH > C5 - C8 uromatic TPH > C10 - C12 uromatic TPH > C10 - C21 uromatic TPH > C35 uromatic T	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001
penaphthylene penaphthylene penaphthene penaphthene penanthrene mithracene penanthrene mithracene penacy (a) anthracene penacy (a) privene penacy (b) fluoranthene penacy (c)	mg/kg	MCERTS	<.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.05 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001 <.0.001
penaphthylene enaphthene Jorene enaphthene Jorene lenanthrene thtracene Joranthene rene enace Jorene	mg/kg	MCERTS	<0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.005 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001

S = SAND

# Visual Examination

The sample was described as a pale yellow (Munsell Colour 10YR 6/3), dry, friable, non-calcareous SAND with a single grain structure. The sample was very slightly stony and contained a low proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.

H.MacRae

Harriet MacRae BSc MSc Graduate Soil Scientist