

Appendix C 3rd Party Topsoil Compliance Testing



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Jonathan Cowley
Eurogreen Environmental Ltd
North Barn Farm
Titnore Lane
Worthing
West Sussex, BN12 6NZ

14th June 2024
Our Ref: TOHA/24/1399/SS
Your Ref: as below

Dear Sirs

Topsail Analysis Report: 10mm Topsoil – Batch No. 9

We have completed the analysis of the soil sample recently submitted, referenced *Batch No. 9*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil 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 topsoil has left the Eurogreen Environmental Ltd site.

SAMPLE EXAMINATION

The sample was described as a very dark brown (Munsell Colour 10YR 2/2), slightly moist, friable, moderately calcareous LOAMY SAND with a weakly developed, fine to medium granular structure*. The sample was virtually stone-free, and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

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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 and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

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

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

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The sample was virtually stone-free, and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.3). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO_4 extract was equal to the maximum specified value (3300 $\mu\text{S}/\text{cm}$) given in BS3882:2015 – Table 1.

Organic Matter and Fertility Status

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

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

Potential Contaminants

With reference to BS3882:2015 - Table 1: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with homegrown 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 the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, moderately calcareous, virtually stone-free *loamy sand* with an adequate structure. 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 topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided the physical condition of the soil is satisfactory and species with a wide pH tolerance or those known to prefer alkaline soils are selected.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

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 soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015*.

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



Ebony Gheorghe
BSc MSc
Soil Scientist



Tim White
BSc MSc M(SoilSci) CSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP

[illegible]Batch No. 9

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-1.0
-2.0
-1.0
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99

色

Ebony Okeagha
 MD, MSc
 Lead Scientist

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

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Appendix D Imported Subsoil Verification Record



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e: mail@soiltechnics.net
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Clive Hilton
Bellway Homes Limited, South London

Date: 2nd August 2023
Your Ref: Barrington Road,
Worthing
Our Ref: L-STV59595M-001

RE: Subsoil Verification Testing at Barrington Road, Goring-by-Sea, Worthing, BN12 4EA

Introduction

Further to our email correspondence of 28th June 2023, we are pleased to enclose our subsoil verification assessment.

We confirm our brief was to undertake sampling of subsoil stockpiles originating from the Bellway site at Billingshurst and a HGH site at Newick, both of which have been imported for use within the residential development at Barrington Road, Goring-by-Sea. The scope of the assessment is to determine the suitability of the soils for reuse on site, in terms of the risks to human health.

Site location and description

The residential development site is located on land south of the Durrington-on-Sea train station and North of Barrington Road, Goring-by-Sea, which provides access to the site.

The development is for the construction of approximately 139 residential plots, 4 blocks of flats and a care home with associated access, open space, parking, landscaping, infrastructure and other associated works. The development is controlled under the Worthing Borough Council planning regime, under the planning application number AWDM/0605/22.

Summary of findings

Aspect	Comments
Material tested	Billingshurst Material, Newick Material
Current placement	3x Billingshurst stockpiles (total of 2,600m ³), 1x Newick stockpile (total of 550m ³)
Approximate volume	~3,150m ³
Testing frequency	10x Billingshurst, 3x Newick. Equivalent to 1 sample per 250m ³ .
Physical suitability	No injurious, or over-sized artefacts identified.
Chemical suitability	Contaminants are within acceptable levels.
Overall comments	Chemically and physical suitable for use. No further testing required.
Recommendations	Organic matter content appears low, consider applying an organic based soil improver, or testing to BS:3882 standards to ensure suitability as a growing medium

Material origin

The subsoil materials are understood to be imported from two separate developments, a Bellway site at Billingshurst and a HGH site at Newick. On review of desk study and investigation reports provided, it was concluded that there is no evidence to indicate the site has been subject to activities which could produce a significant source of chemical contamination, and the materials are considered to be clean and naturally occurring.

Chemical testing has been carried out for reassurance purposes and to ensure no unexpected contamination is present or cross-contamination has occurred.

Fieldwork

The fieldwork was undertaken on 4th July 2023 and comprised the collection of soil samples from the recently formed stockpiles.

The dimensions of the stockpile have not been surveyed and the volume estimates provided below are based on visual observations at the time of the site visit.

Stockpile Origin	Stockpile Reference	Approximate Volume	Approximate Dimensions	Samples Obtained
Billingshurst	SL01	50m ³	4m x 6m x 2.5m	2
	SL02	800m ³	8m x 25m x 5m	4
	SL03	1,600m ³	10m x 40m x 5m	4
Newick	SL04 / SL05	500m ³	7m x 25m x 3.5m	3

The Billingshurst subsoil typically comprised of brown, slightly gravelly clay. With gravels of fine, subrounded flint. The material included infrequent inclusions of brick and concrete.

The Newick subsoil comprised of firm brown slightly sandy slightly gravelly clay. With gravels of fine to coarse, subrounded to subangular flint, brick and concrete.

Sampling was evenly distributed across the extent of the stockpiles. Generally sampling was undertaken following the principles of ISO 18400-104:2018 *Soil quality – Sampling - Part 104: Strategies*. Laboratory testing was undertaken on all samples collected for a general suite of organic and inorganic contaminants, as well as asbestos. Laboratory test results are presented within Appendix B. The stockpile location plan is shown below.



Fig 1 A Stockpile Location

The following photographs presented below shows one of the Billingshurst stockpiles and a stockpile of Newick soil.



Figure 1: Billingshurst soil stockpile SL01

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Figure 2: Billingshurst soil stockpile SL02



Figure 3: Billingshurst soil stockpile SL03

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Figure 4: Billingshurst soil stockpile SL04/05

Assessment for reuse

The soils were screened against published, widely accepted generic criteria for a residential end-use (with plant uptake).

No exceedances were detected within Billingshurst soil samples.

Exceedances from the Newick soil materials showed exceedances of Dibenz(a,h)anthracene, with a maximum concentration of 0.31 mg/kg, against the guideline value of 0.24mg/kg. As the exceedance is marginal, and all other PAH compounds fall below the guideline values, it is not considered to represent a significant risk to future residents, and can be discounted. Details of laboratory testing screening is presented within Appendix C.

Observations from the fieldworks, and screening of the laboratory analysis indicate that the imported soil materials are not impacted by contamination and are considered chemically suitable for re-use on site.

No injurious, undesirable, or over-sized materials were identified within the soil stockpile and is therefore considered broadly physically suitable for use.

Conclusions

Based on evidence obtained during our investigations, we are of the opinion that the subsoil deposits at the site are not affected by chemical contamination and can be reused within a residential development.

Should any of the soils be suspected to contain contamination or non-inert materials (by virtue of visual or olfactory evidence) upon excavation, then such soils should be stockpiled separately, and additional testing carried out as considered necessary.

Yours sincerely,

Prepared by

Richard Farrell BSc.

Geoenvironmental Consultant, Soiltechnics Limited

Supervised/reviewed by

Mark Hamill BSc, MSc, CEnv, MEnvSc.

Technical Director, Soiltechnics Limited

Encs.

Appendices	Principal coverage
A	Definitions of geo-environmental terms used in this report
B	Chemical laboratory test results
C	GQRA chemical screening assessments

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Appendix A

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Definition of geo-environmental terms used in this report

Conceptual model

Textual and/or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information obtained from the investigatory process.

Contamination

Presence of a substance which is in, on or under land, and which has the potential to cause harm or to cause pollution of controlled water.

Controlled water

Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three mile limit of territorial waters.

Harm

Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of humans, including property.

Pathway

Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.

Receptor

Persons, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).

Risk

Probability of the occurrence of, and magnitude of the consequences of, an unwanted adverse effect on a receptor.

Risk assessment

Process of establishing, to the extent possible, the existence, nature and significance of risk.

Definition of environmental risk/hazard terms used in this report

Based on CIRIA report C552 '*Contaminated land risk assessment – A guide to good practice*'.

Potential hazard severity definition

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

Probability of risk definition

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

Level of risk for potential hazard definition

Probability of risk	Potential severity			
	Severe	Medium	Mild	Minor
High likelihood	Very high	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low likelihood	Moderate	Low/Moderate	Low	Very low
Unlikely	Low/Moderate	Low	Very low	Very low

See below for definitions of 'very high' to 'very low'

Definition of environmental risk/hazard terms used in this report

Based on CIRIA report C552 '*Contaminated land risk assessment – A guide to good practice*'.

Risk classifications and likely action required:

Very high risk

High probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.

High risk

Harm is likely to arise to a designated receptor from an identified hazard. This risk, if realised, is likely to result in substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the long term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is likely that the harm would be relatively mild. Investigation is normally required to clarify risks and to determine potential liability. Some remedial works may be required in the long term.

Low risk

It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk

It is a low possibility that harm could arise to a designated receptor. On the event of such harm being realised it is not likely to be severe.

List of documents used in assessment of chemical contamination

No.	Title	Publication reference / publisher
1	Human health toxicological assessment of contaminants in soil	EA Science Report – SC050021/SR2
2	Updated technical background to the CLEA model	EA Science Report – SC050021/SR3
3	CLEA Software (Version 1.03 beta) Handbook	EA Science Report - SC050021/SR4
4	Guidance on comparing Soil Contamination Data with a Critical Concentration	CIEH
5	The LQM/CIEH S4ULs for Human Health Risk Assessment (2015)	LQM/CIEH
6	Assessment of Risks to Human Health from Land Contamination: An overview of the development of soil guideline values and related research	R&D Publication, Contaminated Land Report CLR 7
7	Contaminants of Soil: Collation of Toxicological Data and Intake Values for Humans	R&D Publication, Contaminated Land Report CLR 9
8	The Contaminated Land Exposure Assessment Model (CLEA): Technical Basis and Algorithms	R&D Publication, Contaminated Land Report CLR 10
9	Model Procedures for the Management of Land Contamination	R&D Publication, Contaminated Land Report CLR 11
10	Contaminants in Soil: Collection of Toxicological Data and Intake Values for Human Values	R&D Publications, Tox. 6
11	Soil Guideline Values for Contamination (2002)	R&D Publications, SGV 10
12	Soil Guideline Values (2009)	EA Science Reports – SC050021
13	Atkins ATRISK ^{SOIL} (2011)	http://www.atrisksoil.co.uk
14	Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination (September 2014)	CL:AIRE

CIEH	Chartered institute of Environmental Health
LQM	Land Quality Management
EA	Environment Agency
CL:AIRE	Contaminated Land: Applications in Real Environments

Testing suite summary

Table summarising testing suites		
Suite	Parameters	Medium
Suite 1	Arsenic, beryllium, boron, cadmium, chromium (total and VI), copper, lead, mercury, nickel, selenium, vanadium zinc, cyanide (free, total and complex), organic matter content, PAH (16 speciated), pH, phenol (total), TOC	Soil
Suite 2	Arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, PAH (16 speciated), pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Leachate
Suite 3	Arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, PAH (16 speciated), pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Water
Suite 4	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated), organic matter	Soil
Suite 5	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated)	Leachate
Suite 6	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated)	Water
Suite 7	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, TOC, organic matter	Soil
Suite 8	Sulphur (total), sulphate (water and acid soluble), pH	Soil
Suite 9	Sulphate, ammoniacal nitrogen, dissolved magnesium, pH	Water
Suite 10	VOC, SVOC, TOC, organic matter	Soil
Suite 11	VOC, SVOC	Leachate
Suite 12	VOC, SVOC	Water
Suite 13	Organotins dibutyltin/ tributyl-tin/tetrabutyltin/triphenyl-tin, tetraethyl-lead/tetramethyl-lead	Soil
Suite 14	Organotin	Leachate
Suite 15	Organotin	Water
Suite 16	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, VOC, SVOC	Soil, water, leachate
Suite 17	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, SVOC, VOC, arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Soil, water, leachate
Concrete BRE suite	pH, sulphate (water and acid soluble), magnesium (water soluble), ammonia (water soluble), chloride, nitrate	Soil

Appendix B

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Final Report

Report No.: 23-23395-1

Initial Date of Issue: 19-Jul-2023

Re-Issue Details:

Client Soiltechnics Limited

Client Address: 1st Floor Unit 9 Westpoint Enterprise
Park
Clarence Avenue
Trafford Park
Manchester
M17 1QS

Contact(s): Admin

Project STV5959 Barrington Road, Worthing

Quotation No.: **Date Received:** 11-Jul-2023

Order No.: POR015875 **Date Instructed:** 11-Jul-2023

No. of Samples: 13

Turnaround (Wkdays): 7 **Results Due:** 19-Jul-2023

Date Approved: 18-Jul-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: STV5959 Barrington Road, Worthing

Client: Soiltechnics Limited	Chemtest Job No.:				23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395
Quotation No.:	Chemtest Sample ID.:				1672171	1672172	1672173	1672174	1672175	1672176	1672177	1672178	1672179
Order No.: POR015875	Client Sample Ref.:				1	2	2	3	4	1	1	2	3
	Client Sample ID.:				SL010.201	SL011.502	SL020.102	SL020.203	SL020.304	SL020.601	SL030.101	SL030.202	SL030.303
	Sample Location:				SL01	SL01	SL02	SL02	SL02	SL02	SL03	SL03	SL03
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	1.50	0.10	0.20	0.30	0.60	0.10	0.20	0.30
	Date Sampled:				04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	21	19	15	14	13	16	5.4	12	11
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	50% Stones	45% Stones	Stones	Stones	50% Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Clay	Sand	Sand	Clay	Sand	Gravel	Sand	Sand
pH	M	2010		4.0	7.6	7.8	7.8	7.5	7.1	7.6	7.7	7.4	8.0
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	3.1	3.5	1.9	1.2	0.49	1.8	6.6	1.5	1.0
Cyanide (Complex)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	11	9.2	9.2	8.4	8.4	6.5	14	8.4	8.6
Beryllium	U	2455	mg/kg	0.5	0.8	0.7	0.6	0.7	0.7	< 0.5	0.9	0.6	0.7
Cadmium	M	2455	mg/kg	0.10	< 0.10	< 0.10	0.21	< 0.10	0.20	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	26	24	26	23	18	16	31	20	24
Copper	M	2455	mg/kg	0.50	52	21	20	18	15	25	31	16	23
Mercury	M	2455	mg/kg	0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Nickel	M	2455	mg/kg	0.50	16	18	15	15	11	11	13	13	17
Lead	M	2455	mg/kg	0.50	23	24	27	24	14	26	20	24	33
Selenium	M	2455	mg/kg	0.25	0.53	0.62	0.56	0.56	0.37	0.38	0.43	0.50	0.68
Vanadium	U	2455	mg/kg	0.5	34	32	29	30	22	23	38	28	33
Zinc	M	2455	mg/kg	0.50	65	57	59	50	36	46	46	49	64
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
LOI	M	2610	%	0.10	5.5	4.5	5.1	4.5	4.6	5.9	6.2	5.0	4.3
Organic Matter	M	2625	%	0.40	1.9	2.1	3.1	1.8	4.2	1.4	0.95	2.4	1.5
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C16-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C35	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	2.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C5-C35	N	2670	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	M	2800	mg/kg	0.10	0.62	0.64	1.2	0.55	1.1	0.65	0.74	0.83	0.90
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: STV5959 Barrington Road, Worthing

Client: Soiltechnics Limited	Chemtest Job No.:				23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395	23-23395
Quotation No.:	Chemtest Sample ID.:				1672171	1672172	1672173	1672174	1672175	1672176	1672177	1672178	1672179
Order No.: POR015875	Client Sample Ref.:				1	2	2	3	4	1	1	2	3
	Client Sample ID.:				SL010.201	SL011.502	SL020.102	SL020.203	SL020.304	SL020.601	SL030.101	SL030.202	SL030.303
	Sample Location:				SL01	SL01	SL02	SL02	SL02	SL02	SL03	SL03	SL03
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	1.50	0.10	0.20	0.30	0.60	0.10	0.20	0.30
	Date Sampled:				04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD									
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.14	0.18	0.14	< 0.10	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	0.14	0.47	< 0.10	< 0.10	0.42	< 0.10	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	< 0.10	0.12	0.52	< 0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	2.3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: STV5959 Barrington Road, Worthing

Client: Soiltechnics Limited	Chemtest Job No.:				23-23395	23-23395	23-23395	23-23395
Quotation No.:	Chemtest Sample ID.:				1672180	1672181	1672182	1672183
Order No.: POR015875	Client Sample Ref.:				4	1	1	2
	Client Sample ID.:				SL030.604	SL040.601	SL050.201	SL050.602
	Sample Location:				SL03	SL04	SL05	SL05
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.60	0.60	0.20	0.60
	Date Sampled:				04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023
	Asbestos Lab:				NEW-ASB	DURHAM	DURHAM	NEW-ASB
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	16	12	7.5	7.4
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand
pH	M	2010		4.0	7.6	6.6	9.7	9.9
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.50	0.48	1.4	1.3
Cyanide (Complex)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	9.9	10	10	6.8
Beryllium	U	2455	mg/kg	0.5	0.7	< 0.5	0.6	0.5
Cadmium	M	2455	mg/kg	0.10	0.12	< 0.10	0.31	0.21
Chromium	M	2455	mg/kg	0.5	23	17	19	14
Copper	M	2455	mg/kg	0.50	18	19	22	16
Mercury	M	2455	mg/kg	0.05	0.06	0.06	0.09	0.08
Nickel	M	2455	mg/kg	0.50	15	10	17	11
Lead	M	2455	mg/kg	0.50	41	30	77	74
Selenium	M	2455	mg/kg	0.25	0.59	0.56	0.54	0.36
Vanadium	U	2455	mg/kg	0.5	35	23	31	25
Zinc	M	2455	mg/kg	0.50	61	58	110	84
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
LOI	M	2610	%	0.10	4.5	3.0	4.1	4.0
Organic Matter	M	2625	%	0.40	2.4	1.3	1.6	1.4
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0	< 1.0	12	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	< 1.0	< 1.0	14	3.4
TPH >C16-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0	18	23
TPH >C21-C35	N	2670	mg/kg	1.0	< 1.0	< 1.0	57	170
Total TPH >C5-C35	N	2670	mg/kg	10	< 10	< 10	100	190
Naphthalene	M	2800	mg/kg	0.10	1.2	0.64	0.70	0.57
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	0.11	0.14

Results - Soil

Project: STV5959 Barrington Road, Worthing

Client: Soiltechnics Limited	Chemtest Job No.:				23-23395	23-23395	23-23395	23-23395
Quotation No.:	Chemtest Sample ID.:				1672180	1672181	1672182	1672183
Order No.: POR015875	Client Sample Ref.:				4	1	1	2
	Client Sample ID.:				SL030.604	SL040.601	SL050.201	SL050.602
	Sample Location:				SL03	SL04	SL05	SL05
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.60	0.60	0.20	0.60
	Date Sampled:				04-Jul-2023	04-Jul-2023	04-Jul-2023	04-Jul-2023
	Asbestos Lab:				NEW-ASB	DURHAM	DURHAM	NEW-ASB
Determinand	Accred.	SOP	Units	LOD				
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.35	0.23
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.22	0.19
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	2.5	2.1
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.61	0.58
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	4.2	4.3
Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	3.4	3.6
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	1.7	2.0
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10	1.9	2.3
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	2.5	2.5
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.95	1.0
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	1.8	2.1
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	1.4	1.4
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	0.28	0.31
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10	1.4	1.5
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	24	25
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix C

soiltechnics

QRA Screening

Assessments	Status	Date	Created by	Reviewed By
Acute human health risk - Soils	Not undertaken			
Chronic human health risk - Soils	Complete	26.08.23	RF	MOH
Chronic human health risk - Groundwater vapour	Not undertaken			
Controlled waters risk - Surface water	Not undertaken			
Controlled waters risk - Drinking water	Not undertaken			
Controlled waters - Free phase indicator	Not undertaken			
Phytotoxicity	Not undertaken			
Ecotoxicity	Not undertaken			

Key

Assessment	Abbr.	QRA Source (in order of preference)	Last Update
All	NGA	No guideline value available	-
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010

Chronic human health risk (soils)

Scenario																				
End user				Proposed site user																
Receptor				Residential with homegrown produce																
SOM				1.00%																
GAC Preference				C4SLs over S4ULs																
Unspecified TPH GAC				Worst-case aliphatic/aromatic																
Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location		SL01	SL01	SL02	SL02	SL02	SL02	SL03	SL03	SL03	SL03	SL04	SL05	SL05		
				Depth (m)		0.20	1.50	0.10	0.20	0.30	0.60	0.10	0.20	0.30	0.60	0.60	0.20	0.60		
				Date		04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	04/07/23	
Inorganics - Metals																				
Arsenic	C4SL	37	14			11	9.2	9.2	8.4	8.4	6.5	14	8.4	8.6	9.9	10	10	6.8		
Beryllium	S4UL	1.7	0.9			0.8	0.7	0.6	0.7	0.7	< 0.5	0.9	0.6	0.7	0.7	< 0.5	0.6	0.5		
Boron	S4UL	290	6.6			3.1	3.5	1.9	1.2	0.49	1.8	6.6	1.5	1	0.5	0.48	1.4	1.3		
Cadmium	C4SL	22	0.31			< 0.10	< 0.10	0.21	< 0.10	0.2	< 0.10	< 0.10	< 0.10	< 0.10	0.12	< 0.10	0.31	0.21		
Chromium (III)	S4UL	910	31			26	24	26	23	18	16	31	20	24	23	17	19	14		
Chromium (VI)	C4SL	21	<LoD			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Copper	S4UL	2400	52			52	21	20	18	15	25	31	16	23	18	19	22	16		
Cyanide - Free	ATK	34	<LoD			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Lead	C4SL	200	77			23	24	27	24	14	26	20	24	33	41	30	77	74		
Mercury	S4UL	40	0.09			< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.06	0.06	0.09	0.08			
Nickel	S4UL	130	18			16	18	15	15	11	11	13	13	17	15	10	17	11		
Selenium	S4UL	250	0.68			0.53	0.62	0.56	0.56	0.37	0.38	0.43	0.5	0.68	0.59	0.56	0.54	0.36		
Vanadium	S4UL	410	38			34	32	29	30	22	23	38	28	33	35	23	31	25		
Zinc	S4UL	3700	110			65	57	59	50	36	46	46	49	64	61	58	110	84		
Inorganics - Asbestos																				
Asbestos Type	N/A																			
Asbestos Screen	N/A																			
Inorganics - Soil Parameters																				
Organic matter	N/A																			
Organics - PAH & Phenol	N/A																			
Acenaphthene	S4UL	210	0.35			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.35	0.23		
Acenaphthylene	S4UL	170	0.14			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	0.14		
Anthracene	S4UL	2400	0.61			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.61	0.58		
Benzo(a)anthracene	S4UL	7.2	2			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.7	2		
Benzo(a)pyrene	C4SL	5	2.1			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.8	2.1		
Benzo(b)fluoranthene	S4UL	2.6	2.5			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.5	2.5		
Benzo(ghi)perylene	S4UL	320	1.5			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.4	1.5		
Benzo(k)fluoranthene	S4UL	77	1			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.95	1		
Chrysene	S4UL	15	2.3			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.9	2.3		
Dibenz(a,h)anthracene	S4UL	0.24	0.31			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.28	0.31		
Fluoranthene	S4UL	280	4.3			< 0.10	0.14	0.47	< 0.10	< 0.10	0.42	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	4.2	4.3		
Fluorene	S4UL	170	0.22			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.22	0.19		
Indeno(1,2,3-cd)pyrene	S4UL	27	1.4			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.4	1.4		
Naphthalene	S4UL	2.3	1.2			0.62	0.64	1.2	0.55	1.1	0.65	0.74	0.83	0.9	1.2	0.64	0.7	0.57		
Phenanthrene	S4UL	95	2.5			0.14	0.18	0.14	< 0.10	< 0.10	0.33	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.5	2.1		
Phenol	S4UL	120	<LoD			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Pyrene	S4UL	620	3.6			< 0.10	0.12	0.52	< 0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.4	3.6		
Organics - Banded TPH (unspecified)																				
EC >5-EC6 (unspecified)	S4UL	42	<LoD			< 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		
EC >6-EC7 (unspecified)	S4UL	70	<LoD			< 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		
EC >7-EC8 (unspecified)	S4UL	13	<LoD			< 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		
EC >08-EC10 (unspecified)	S4UL	27	<LoD			< 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		
EC >10-EC12 (unspecified)	S4UL	74	12			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12	< 1.0		
EC >12-EC16 (unspecified)	S4UL	140	14			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	14	3.4		
EC >16-EC21 (unspecified)	S4UL	260	23			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	18	23		
EC >21-EC35 (unspecified)	S4UL	1100	170			< 1.0	< 1.0	< 1.0	2.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	57	170		

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	SL01	SL01	SL02	SL02	SL02	SL02	SL03	SL03	SL03	SL03	SL04	SL05	SL05
				Depth (m)	0.20	1.50	0.10	0.20	0.30	0.60	0.10	0.20	0.30	0.60	0.60	0.20	0.60

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	SL01	SL01	SL02	SL02	SL02	SL02	SL03	SL03	SL03	SL03	SL04	SL05	SL05
				Depth (m)	0.20	1.50	0.10	0.20	0.30	0.60	0.10	0.20	0.30	0.60	0.60	0.20	0.60

Appendix E Watching Brief Records

Project: Barrington Road	Job No.: STV5959	Engineer: SN
Day: Friday	Date: 29/11/24	Weather: Sunny, Cold

Brief description of general site works being carried out
Ongoing construction works. Placement of topsoil and subsoil in garden areas
Purpose of the site visit
Inspection of topsoil and subsoil within garden plots 29, 30, 33, 34, 37-53. Obtain samples for chemical testing.
Details of the Site Inspection / Watching Brief
General Comments: Landscaping works ongoing. Plots not ready for final verification and topsoil yet placed in plots 29, 34 and 50. Contractor to supply photos upon placement Details of any contamination observed: No contamination observed. Subsoil contained occasional anthropogenic materials (e.g brick fragments) Samples Taken: VTP29 - subsoil VTP34 - subsoil VTP36 - topsoil VTP50 - subsoil VTP53 - subsoil VTP53 - topsoil
Material Movements
Summary of any ongoing material movements: Landscaping works ongoing.



Plot 36



Plot 36



Plot 36



Plot 53



Plot 53



Plot 53



Plot 29

Appendix F Laboratory Test Results



Final Report

Report No.: 24-40360-1

Initial Date of Issue: 16-Dec-2024

Re-Issue Details:

Client Soiltechnics Limited

Client Address: 1st Floor Unit 9 Westpoint Enterprise
Park
Clarence Avenue
Trafford Park
Manchester
M17 1QS

Contact(s): Admin

Project STV5959 Barrington Road

Quotation No.: **Date Received:** 09-Dec-2024

Order No.: POR020253 **Date Instructed:** 09-Dec-2024

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 13-Dec-2024

Date Approved: 16-Dec-2024

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: STV5959 Barrington Road

Client: Soiltechnics Limited		Chemtest Job No.:		24-40360	24-40360	24-40360	24-40360	24-40360	24-40360
Quotation No.:		Chemtest Sample ID.:		1907122	1907123	1907124	1907125	1907126	1907127
Order No.: POR020253		Client Sample Ref.:		1	1	1	1	1	2
		Client Sample ID.:		VTP29.01	VTP34.01	VTP36.01	VTP50.01	VTP53.01	VTP53.02
		Sample Location:		VTP29	VTP34	VTP36	VTP50	VTP53	VTP53
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.30	0.30	0.30	0.30	0.30	0.50
		Date Sampled:		05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
ACM Type		U	2192		N/A	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	17	20	19	20
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Clay	Clay	Clay
pH at 20C		M	2010		4.0	9.2	8.2	7.8	8.1
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.0	1.0	1.0	0.91
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	0.60
Arsenic		M	2455	mg/kg	0.5	6.9	8.6	5.7	6.7
Beryllium		U	2455	mg/kg	0.5	< 0.5	0.6	< 0.5	< 0.5
Cadmium		M	2455	mg/kg	0.10	0.59	0.24	0.18	0.17
Chromium		M	2455	mg/kg	0.5	20	18	13	15
Copper		M	2455	mg/kg	0.50	79	19	14	15
Mercury		M	2455	mg/kg	0.05	0.06	0.07	0.05	0.06
Nickel		M	2455	mg/kg	0.50	20	14	10	11
Lead		M	2455	mg/kg	0.50	46	45	34	35
Selenium		M	2455	mg/kg	0.25	0.36	0.43	< 0.25	0.25
Vanadium		U	2455	mg/kg	0.5	23	27	18	21
Zinc		M	2455	mg/kg	0.50	140	64	59	53
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	1.3	2.9	2.6	2.8
TPH >C5-C6	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	2.7
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	2.8	3.1	< 1.0
TPH >C21-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	3.0	2.7	< 1.0
Total TPH >C5-C35		N	2670	mg/kg	10	< 10	< 10	< 10	< 10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: STV5959 Barrington Road

Client: Soiltechnics Limited		Chemtest Job No.:					24-40360	24-40360	24-40360	24-40360	24-40360	24-40360
Quotation No.:		Chemtest Sample ID.:					1907122	1907123	1907124	1907125	1907126	1907127
Order No.: POR020253		Client Sample Ref.:					1	1	1	1	1	2
		Client Sample ID.:					VTP29.01	VTP34.01	VTP36.01	VTP50.01	VTP53.01	VTP53.02
		Sample Location:					VTP29	VTP34	VTP36	VTP50	VTP53	VTP53
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):					0.30	0.30	0.30	0.30	0.30	0.50
		Date Sampled:					05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024	05-Dec-2024
		Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.70	0.58	< 0.10
Anthracene		M	2800	mg/kg	0.10	0.33	< 0.10	< 0.10	< 0.10	0.31	0.46	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	0.72	0.45	0.41	1.2	2.3	0.51	
Pyrene		M	2800	mg/kg	0.10	0.67	0.36	0.44	1.3	2.2	0.43	
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.4	2.9	< 0.10	
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.96	3.1	< 0.10	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.5	3.0	< 0.10	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.55	2.6	< 0.10	
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	2.0	2.8	< 0.10	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.52	2.5	< 0.10	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.4	< 0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.70	2.7	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	11	28	< 2.0	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix G GQRA Screening Assessment

GQRA Screening

Assessments	Status	Date	Created by	Reviewed By
<i>Acute human health risk - Soils</i>	<i>Not undertaken</i>			
Chronic human health risk - Soils	Completed	18.12.24	JB	MOH
<i>Chronic human health risk - Groundwater vapour</i>	<i>Not undertaken</i>			
<i>Controlled waters risk - Surface water</i>	<i>Not undertaken</i>			
<i>Controlled waters risk - Drinking water</i>	<i>Not undertaken</i>			
<i>Controlled waters - Free phase indicator</i>	<i>Not undertaken</i>			
<i>Phytotoxicity</i>	<i>Not undertaken</i>			
<i>Ecotoxicity</i>	<i>Not undertaken</i>			

Key

Assessment	Abbr.	GQRA Source (in order of preference)	Last Update
All	NGA	No guideline value available	-
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	SP101a	SP101b	SP101c	SP101d	SP101e	VTP24	VTP24	VTP26
				Depth (m)	0.00	0.00	0.00	0.00	0.00	0.50	0.10	0.10
				Date	10/09/24	10/09/24	10/09/24	10/09/24	10/09/24	10/09/24	10/09/24	10/09/24
Inorganics - Metals												
Arsenic	C4SL	37	22		14	13	13	12	22	7.9	21	17
Beryllium	S4UL	1.7	1.2		0.8	1.1	0.8	0.6	1.2	0.6	1.2	0.9
Boron	S4UL	290	1.4		0.86	0.95	1.2	< 0.40	0.41	0.56	0.52	< 0.40
Cadmium	C4SL	22	0.59		0.26	0.49	0.19	< 0.10	0.24	< 0.10	0.24	0.15
Chromium (III)	S4UL	910	40		24	23	25	20	36	23	40	26
Chromium (VI)	C4SL	21	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper	S4UL	2400	160		27	160	30	27	45	19	43	34
Cyanide - Free	ATK	34	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Lead	C4SL	200	79		79	68	49	41	69	66	70	56
Mercury	S4UL	40	0.13		0.13	0.08	0.07	0.08	0.13	< 0.05	0.13	0.11
Nickel	S4UL	130	25		19	20	16	12	23	13	22	18
Selenium	S4UL	250	1.4		0.44	1.4	0.48	0.38	0.95	0.39	0.89	0.6
Vanadium	S4UL	410	73		34	36	73	25	46	27	43	35
Zinc	S4UL	3700	140		100	110	90	71	130	45	130	96
Inorganics - Asbestos												
Asbestos Type		N/A			-	-	-	-	-	-	-	-
Asbestos Screen		N/A			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Inorganics - Soil Parameters												
Organic matter		N/A			3.3	3.6	4.1	1.7	1.3	0.57	1.9	1.2

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	VTP28	VTP28	VTP29	VTP31	VTP34	VTP36	VTP50	VTP53
				Depth (m)	0.50	0.10	0.30	0.50	0.30	0.30	0.30	0.50
				Date	10/09/24	10/09/24	12/05/24	10/09/24	12/05/24	12/05/24	12/05/24	12/05/24
Inorganics - Metals												
Arsenic	C4SL	37	22		9.3	16	6.9	10	8.6	5.7	6.7	5.3
Beryllium	S4UL	1.7	1.2		1.1	1.2	< 0.5	0.8	0.6	< 0.5	< 0.5	< 0.5
Boron	S4UL	290	1.4		0.5	0.41	1	0.79	1	1	0.91	1.4
Cadmium	C4SL	22	0.59		0.19	0.49	0.59	0.2	0.24	0.18	0.17	0.14
Chromium (III)	S4UL	910	40		29	27	20	25	18	13	15	11
Chromium (VI)	C4SL	21	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper	S4UL	2400	160		18	32	79	25	19	14	15	43
Cyanide - Free	ATK	34	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Lead	C4SL	200	79		23	53	46	34	45	34	35	32
Mercury	S4UL	40	0.13		0.05	0.12	0.06	0.06	0.07	0.05	0.06	< 0.05
Nickel	S4UL	130	25		25	17	20	18	14	10	11	8.6
Selenium	S4UL	250	1.4		0.95	1	0.36	0.78	0.43	< 0.25	0.25	< 0.25
Vanadium	S4UL	410	73		41	32	23	30	27	18	21	16
Zinc	S4UL	3700	140		59	91	140	67	64	59	53	60
Inorganics - Asbestos												
Asbestos Type		N/A			-	-	-	-	-	-	-	-
Asbestos Screen		N/A			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Inorganics - Soil Parameters												
Organic matter		N/A			< 0.40	1.3	1.3	0.76	2.9	2.6	2.8	2.9

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	VTP53
				Depth (m)	0.30
				Date	12/05/24
Inorganics - Metals					
Arsenic	C4SL	37	22		7.2
Beryllium	S4UL	1.7	1.2		0.5
Boron	S4UL	290	1.4		0.95
Cadmium	C4SL	22	0.59		0.23
Chromium (III)	S4UL	910	40		17
Chromium (VI)	C4SL	21	<LoD		< 0.50
Copper	S4UL	2400	160		17
Cyanide - Free	ATK	34	<LoD		< 0.50
Lead	C4SL	200	79		52
Mercury	S4UL	40	0.13		0.07
Nickel	S4UL	130	25		14
Selenium	S4UL	250	1.4		0.33
Vanadium	S4UL	410	73		23
Zinc	S4UL	3700	140		61
Inorganics - Asbestos					
Asbestos Type		N/A			-
Asbestos Screen		N/A			No Asbestos Detected
Inorganics - Soil Parameters					
Organic matter		N/A			2.4

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location Depth (m)	SP101a	SP101b	SP101c	SP101d	SP101e	VTP24	VTP24	VTP26
					0.00	0.00	0.00	0.00	0.00	0.50	0.10	0.10
Organics - PAH & Phenol												
Acenaphthene	S4UL	210	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	S4UL	2400	0.46		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.18	< 0.10
Benzo(a)anthracene	S4UL	7.2	2.9		0.33	0.16	0.23	< 0.10	< 0.10	< 0.10	0.99	< 0.10
Benzo(a)pyrene	C4SL	5	2.8		0.38	< 0.10	0.33	< 0.10	< 0.10	< 0.10	0.95	< 0.10
Benzo(b)fluoranthene	S4UL	2.6	3		0.55	< 0.10	0.42	< 0.10	< 0.10	< 0.10	1.2	< 0.10
Benzo(ghi)perylene	S4UL	320	2.7		0.31	< 0.10	0.2	< 0.10	< 0.10	< 0.10	0.82	< 0.10
Benzo(k)fluoranthene	S4UL	77	2.6		0.21	< 0.10	0.14	< 0.10	< 0.10	< 0.10	0.88	< 0.10
Chrysene	S4UL	15	3.1		0.3	0.17	0.2	< 0.10	< 0.10	< 0.10	1	< 0.10
Dibenz(a,h)anthracene	S4UL	0.24	2.4		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.55	< 0.10
Fluoranthene	S4UL	280	2.3		0.84	0.31	0.56	0.15	0.3	< 0.10	1.4	0.24
Fluorene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	S4UL	27	2.5		0.32	< 0.10	0.21	< 0.10	< 0.10	< 0.10	0.89	< 0.10
Naphthalene	C4SL	15	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	S4UL	95	0.7		0.45	0.15	0.23	< 0.10	< 0.10	< 0.10	0.4	< 0.10
Phenol	S4UL	120	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	S4UL	620	2.2		0.78	0.33	0.5	0.18	0.25	< 0.10	1.3	0.25
Organics - Banded TPH (unspeciated)												
EC >5-EC6 (unspeciated)	S4UL	42	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >6-EC7 (unspeciated)	S4UL	70	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >7-EC8 (unspeciated)	S4UL	100	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location Depth (m)	VTP28 0.50	VTP28 0.10	VTP29 0.30	VTP31 0.50	VTP34 0.30	VTP36 0.30	VTP50 0.30	VTP53 0.50
Organics - PAH & Phenol												
Acenaphthene	S4UL	210	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	S4UL	2400	0.46		< 0.10	< 0.10	0.33	0.37	< 0.10	< 0.10	0.31	< 0.10
Benzo(a)anthracene	S4UL	7.2	2.9		< 0.10	< 0.10	< 0.10	1.9	< 0.10	< 0.10	1.4	< 0.10
Benzo(a)pyrene	C4SL	5	2.8		< 0.10	< 0.10	< 0.10	1.7	< 0.10	< 0.10	2	< 0.10
Benzo(b)fluoranthene	S4UL	2.6	3		< 0.10	< 0.10	< 0.10	2	< 0.10	< 0.10	1.5	< 0.10
Benzo(ghi)perylene	S4UL	320	2.7		< 0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10	0.7	< 0.10
Benzo(k)fluoranthene	S4UL	77	2.6		< 0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10	0.55	< 0.10
Chrysene	S4UL	15	3.1		< 0.10	< 0.10	< 0.10	1.9	< 0.10	< 0.10	0.96	< 0.10
Dibenz(a,h)anthracene	S4UL	0.24	2.4		< 0.10	< 0.10	< 0.10	1.3	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	S4UL	280	2.3		0.2	0.28	0.72	2	0.45	0.41	1.2	0.51
Fluorene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	S4UL	27	2.5		< 0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10	0.52	< 0.10
Naphthalene	C4SL	15	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	S4UL	95	0.7		< 0.10	0.12	< 0.10	0.46	< 0.10	< 0.10	0.7	< 0.10
Phenol	S4UL	120	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	S4UL	620	2.2		0.21	0.27	0.67	2	0.36	0.44	1.3	0.43
Organics - Banded TPH (unspeciated)												
EC >5-EC6 (unspeciated)	S4UL	42	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >6-EC7 (unspeciated)	S4UL	70	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >7-EC8 (unspeciated)	S4UL	100	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	VTP53
				Depth (m)	0.30
Organics - PAH & Phenol					
Acenaphthene	S4UL	210	<LoD		< 0.10
Acenaphthylene	S4UL	170	<LoD		< 0.10
Anthracene	S4UL	2400	0.46		0.46
Benzo(a)anthracene	S4UL	7.2	2.9		2.9
Benzo(a)pyrene	C4SL	5	2.8		2.8
Benzo(b)fluoranthene	S4UL	2.6	3		3
Benzo(ghi)perylene	S4UL	320	2.7		2.7
Benzo(k)fluoranthene	S4UL	77	2.6		2.6
Chrysene	S4UL	15	3.1		3.1
Dibenz(a,h)anthracene	S4UL	0.24	2.4		2.4
Fluoranthene	S4UL	280	2.3		2.3
Fluorene	S4UL	170	<LoD		< 0.10
Indeno(1,2,3-cd)pyrene	S4UL	27	2.5		2.5
Naphthalene	C4SL	15	<LoD		< 0.10
Phenanthrene	S4UL	95	0.7		0.58
Phenol	S4UL	120	<LoD		< 0.10
Pyrene	S4UL	620	2.2		2.2
Organics - Banded TPH (unspeciated)					
EC >5-EC6 (unspeciated)	S4UL	42	<LoD		< 1.0
EC >6-EC7 (unspeciated)	S4UL	70	<LoD		< 1.0
EC >7-EC8 (unspeciated)	S4UL	100	<LoD		< 1.0

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	SP101a	SP101b	SP101c	SP101d	SP101e	VTP24	VTP24	VTP26
				Depth (m)	0.00	0.00	0.00	0.00	0.00	0.50	0.10	0.10
EC >08-EC10 (unspeciated)	S4UL	27	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >10-EC12 (unspeciated)	S4UL	74	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >12-EC16 (unspeciated)	S4UL	140	2.7		2.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >16-EC21 (unspeciated)	S4UL	260	23		23	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >21-EC35 (unspeciated)	S4UL	1100	37		37	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	VTP28	VTP28	VTP29	VTP31	VTP34	VTP36	VTP50	VTP53
				Depth (m)	0.50	0.10	0.30	0.50	0.30	0.30	0.30	0.50
EC >08-EC10 (unspeciated)	S4UL	27	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >10-EC12 (unspeciated)	S4UL	74	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >12-EC16 (unspeciated)	S4UL	140	2.7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >16-EC21 (unspeciated)	S4UL	260	23		< 1.0	< 1.0	< 1.0	< 1.0	2.8	3.1	< 1.0	2.8
EC >21-EC35 (unspeciated)	S4UL	1100	37		< 1.0	< 1.0	< 1.0	< 1.0	3	2.7	< 1.0	3.3

Chronic human health risk (soils)

Scenario	
End user	Proposed site user
Receptor	Residential with homegrown produce
SOM	1.00%
GAC Preference	C4SLs over S4ULs
Unspeciated TPH GAC	Worst-case aliphatic/aromatic

Contaminant	Guideline source	Guideline value	Max value	Location	VTP53
				Depth (m)	0.30
EC >08-EC10 (unspeciated)	S4UL	27	<LoD		< 1.0
EC >10-EC12 (unspeciated)	S4UL	74	<LoD		< 1.0
EC >12-EC16 (unspeciated)	S4UL	140	2.7		2.7
EC >16-EC21 (unspeciated)	S4UL	260	23		7.2
EC >21-EC35 (unspeciated)	S4UL	1100	37		21

Chronic human health risk (soils)

Scenario														
End user		Proposed site user												
Receptor		Residential with homegrown produce												
SOM		1.00%												
GAC Preference		CASLs over S4ULs												
Unspeciated TPH GAC		Worst-case aliphatic/aromatic												
Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	VTP101	VTP101	VTP102	VTP102	VTP103	VTP103	VTP104	VTP104	VTP105	VTP105
				Depth (m)	0.15	0.50	0.10	0.50	0.10	0.50	0.10	0.40	0.10	0.50
				Date	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24	02/07/24
Inorganics - Metals														
Arsenic	C4SL	37	19		19	16	15	16	15	12	14	10	12	16
Boron	S4UL	290	2.2		0.49	1.9	1.9	2	2.2	2.1	0.65	1.4	0.64	1.9
Cadmium	C4SL	22	0.5		0.5	0.37	0.38	0.17	0.18	0.13	0.13	< 0.10	0.11	0.19
Chromium (III)	S4UL	910	47		5	8.7	6.8	32	27	30	27	28	23	47
Chromium (VI)	C4SL	21	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper	S4UL	2400	99		81	72	99	34	37	30	32	22	28	32
Cyanide - Free	ATK	34	<LoD		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Lead	C4SL	200	300		140	130	300	54	61	38	46	34	38	32
Mercury	S4UL	40	0.54		0.54	0.33	0.4	0.09	0.14	0.07	0.1	0.07	0.09	0.06
Nickel	S4UL	130	35		33	25	23	20	17	18	16	16	14	35
Selenium	S4UL	250	1.3		1.3	0.87	0.71	1.1	1.1	0.87	0.93	0.91	0.82	1.3
Vanadium	S4UL	410	59		32	32	30	41	37	37	31	36	27	59
Zinc	S4UL	3700	440		440	310	260	90	98	83	88	60	80	82
Inorganics - Asbestos														
Asbestos Type		N/A			-	-	-	-	-	-	-	-	-	-
Asbestos Screen		N/A			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Inorganics - Soil Parameters														
Organic matter		N/A			1.7	1.3	1.8	1.7	1.5	1.2	1.6	1.1	1.2	0.48
Organics - PAH & Phenol														
Acenaphthene	S4UL	210	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	S4UL	2400	0.11		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	S4UL	7.2	0.26		< 0.10	< 0.10	< 0.10	0.22	< 0.10	0.26	< 0.10	< 0.10	< 0.10	0.15
Benzo(a)pyrene	C4SL	5	0.11		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11
Benzo(b)fluoranthene	S4UL	2.6	0.1		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.1
Benzo(ghi)perylene	S4UL	320	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	S4UL	77	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	S4UL	15	0.24		< 0.10	< 0.10	< 0.10	0.21	< 0.10	0.24	< 0.10	< 0.10	< 0.10	0.14
Dibenz(a,h)anthracene	S4UL	0.24	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	S4UL	280	0.6		0.18	0.41	< 0.10	0.45	0.29	0.6	< 0.10	0.22	< 0.10	0.44
Fluorene	S4UL	170	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	S4UL	27	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	C4SL	15	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	S4UL	95	0.46		< 0.10	0.2	< 0.10	0.15	0.1	0.34	< 0.10	0.12	< 0.10	0.46
Phenol	S4UL	120	<LoD		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	S4UL	620	0.48		0.17	0.36	< 0.10	0.4	0.27	0.48	< 0.10	0.19	< 0.10	0.32
Organics - Banded TPH (unspeciated)														
EC >5-EC6 (unspeciated)	S4UL	42	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >6-EC7 (unspeciated)	S4UL	70	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >7-EC8 (unspeciated)	S4UL	100	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >8-EC10 (unspeciated)	S4UL	27	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >10-EC12 (unspeciated)	S4UL	74	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >12-EC16 (unspeciated)	S4UL	140	<LoD		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
EC >16-EC21 (unspeciated)	S4UL	260	420		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	420	< 1.0	< 1.0
EC >21-EC35 (unspeciated)	S4UL	1100	4200		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4200	< 1.0	< 1.0