



# CONTEST

**Contaminated Land Proficiency Testing Scheme**

## **Scheme Description**

**LGC Standards  
Proficiency Testing**

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Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
8	Jan 2013	Transfer of Sample 23 for TPH in soil from 'trial' to main scheme. Introduction of trial sample for VOCs in soil, and leachate material. Alteration of analyte name for 7a and addition of separate phenol compounds in 3c.	M. Whetton
9	Feb 2014	Clarification of phenol and cresol analytes in 3c, and chlorobenzenes in 19 and VOC trial. Inclusion of sample sizes for 23 and 25 (VOC in soils) and reduction in the maximum concentration for Sample 25. Inclusion of traceability information to Appendix A. Addition of 'Methods' section. New trial sample 26 for Organochlorine Pesticides in Soil added.	M. Whetton
10	Jan 2015	Split of trichlorobenzenes into individual analytes. Addition of sample 26 as regular sample. Inclusion of subcontracting information in 'Test Materials' section.	M. Whetton
11	Feb 2015	Correction of concentration range for 1,2,3-trichlorobenzene	M. Whetton
12	Mar 2015	Addition of Total Sulfur to sample 3B	M. Whetton
13	Jan 2016	Amended ranges for sample 12 Easily liberated sulphide, sample 15 Toluene and Ethylbenzene. Sample 3 PAHs cut off values added. Added 'Dry Matter Content Ratio' to sample 21. Standard solution for samples 25 and 26 amended to 1ml. Removed hard copy report information.	M. Whetton  N. Mason
14	Jan 2017	Addition of a phenol spike solution to sample 3C. New trial sample 27 for LOI Fines under the HMRC Requirements.	R. Sharma
15	Feb 2017	Changed the Phenol spike in group 3C, sample 22 and 23 from 2ml to 1ml	A. McCarthy
16	June 2017	Minor text changes to sample 27	R. Sharma
17	Jan 2018	Minor text changes.	R. Sharma
18	May 2018	Minor text changes to sample 21	R. Sharma
19	Dec 2018	The removal of vinyl chloride from sample 19 and 25. Two new samples added Sample 28 for Soil Texture and Sample 29 for Incinerator Bottom Ash. Website information added to page 3	R. Sharma  A. McCarthy

Notes: Where this document has been translated, the English version shall remain the definitive version

### **Scheme Aims and Organisation**

The primary aim of the Contaminated Land Proficiency Testing Scheme (CONTEST) is to enable laboratories performing the analysis of soils to monitor their performance and compare it with that of their peers. CONTEST also aims to provide information to participants on technical issues and methodologies relating to testing of contaminated land.

The CONTEST scheme year operates from April to March. Further information about CONTEST, including test material availability, round despatch dates and reporting deadlines, is available on the current CONTEST application form and on the LGC website [www.lgcstandards.com](http://www.lgcstandards.com).

The CONTEST scheme operates an advisory group made up of participants, industry experts and regulatory organisations. A list of advisory group members is available from LGC Standards on request. The advisory group meets twice a year and is concerned with all aspects of scheme development, operation and participant performance.

### **Test Materials**

Details of test materials available in CONTEST are given in Appendix A. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

Test material batches are tested for homogeneity for at least one test parameter where deemed appropriate. Details of homogeneity tests performed and results are given in the CONTEST Scheme Reports.

Some aspects of the scheme, such as test material production, homogeneity testing and stability assessment, can from time to time be subcontracted. When subcontracting occurs, it is placed with a competent subcontractor and LGC is responsible for this work. The planning of the scheme, the evaluation of performance and the authorisation of the final report will never be subcontracted.

### **Statistical Analysis**

Information on the statistics used in CONTEST can be found in the General Protocol and in the Scheme Report. Methods for determining assigned values and the values for SDPA used for individual samples are given in Appendix A

### **Methods**

Methods are listed in Appendix A and PORTAL. Please select the most appropriate method from the list. If none of the methods are appropriate, then please report your method as 'Other' and record a brief description in the Comments Section in PORTAL.

### **Results and Reports**

CONTEST results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email. However, participants may request result submission forms on which to report and return results if they are unable to report through electronic means. This will incur an additional charge.

CONTEST reports will be available on the website within 10 working days of round closure. Participants will be emailed a link to the report when it is available.

## APPENDIX A - Description of abbreviations used

### Assigned Value (AV)

The assigned value may be derived in the following ways:

- From the robust mean (RMean). This is the median of participant results after the removal of test results that are inappropriate for statistical evaluation, e.g. miscalculations, transpositions and other gross errors. Generally, the assigned value will be set using results from all methods, unless the measurement is considered method-dependant, in which case the assigned value will be set by method as illustrated in the report tables.

For some analytes, where there is a recognised reference method for that type of measurement, this may be used as the assigned value for a particular analyte i.e. it would be applied to results obtained by any method.

*Traceability: Assigned values which are derived from the participant results, or a sub-set of the results are not traceable to an international measurement standard. The uncertainty of assigned values derived in this way is estimated from the participant results, according to ISO 13528.*

- From a formulation value (Formulation). This denotes the use of an assigned value derived from sample preparation details, where known and exact quantities of analyte have been used to prepare the sample.

*Traceability: Assigned values calculated from the formulation of the test sample are traceable, via an unbroken metrological traceability chain, to an international measurement standard. The measurement uncertainty of the assigned value is calculated using the contributions from each calibration in the traceability chain.*

- From a qualitative formulation (Qual Form). This applies to qualitative tests where the assigned value is simply based on the presence/absence of the analyte in the test material.

*Traceability: Assigned values calculated from the qualitative formulation of the test sample are traceable to a certified reference standard or a microbiological reference strain.*

- From expert labs (Expert). The assigned value for the analyte is provided by an 'expert' laboratory.

*Traceability: Assigned values provided by an 'expert' laboratory may be traceable to an international measurement standard, according to the laboratory and the method used. The uncertainty of measurement for an assigned value produced in this way will be provided by the laboratory undertaking the analysis. Details of traceability and the associated uncertainty will be provided in the report for the scheme/round.*

### Range

This indicates the concentration range at which the analyte may be present in the test material.

### SDPA

SDPA represents the 'standard deviation for proficiency assessment' which is used to assess participant performance for the measurement of each analyte. This may be a fixed value (as stated), a percentage (%) of the assigned value or based on the robust standard deviation of the participant measurement results, either across all methods or by method depending on whether the measurement made is method dependent (see assigned value).

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### **Units**

This indicates the units used for the assessment of data. These are the units in which participants should report their results. For some analytes in some schemes participants may have a choice of which units to report their results, however, the units stipulated in this scheme description are the default units to which any results reported using allowable alternative results will be converted to.

### **DP**

This indicates the number of decimal places to which participants should report their measurement results.

**Group A**

**Metals**

**Sample 1a**

**Supplied as:**

1 x 8mL standard solution

Analyte	AV	Range	SDPA %	Units	DP
Barium	Formulation	2-12.5	5	mg/L	3
Beryllium	Formulation	0.02-0.15	5	mg/L	3
Cadmium	Formulation	0.02-0.2	5	mg/L	3
Chromium	Formulation	2-20	5	mg/L	2
Cobalt	Formulation	0.1-0.8	5	mg/L	3
Copper	Formulation	2-20	5	mg/L	2
Iron	Formulation	5-100	5	mg/L	2
Lead	Formulation	0.5-25	5	mg/L	2
Manganese	Formulation	0.5-15	5	mg/L	2
Molybdenum	Formulation	0.1-0.8	5	mg/L	3
Nickel	Formulation	0.5-2	5	mg/L	2
Thallium	Formulation	0.05-0.08	5	mg/L	4
Tin	Formulation	0.1-1	5	mg/L	4
Vanadium	Formulation	0.5-2	5	mg/L	3
Zinc	Formulation	1-25	5	mg/L	2

**Sample 1b**

**Supplied as:**

1 x 8mL standard solution

Analyte	AV	Range	SDPA %	Units	DP
Antimony	Formulation	0.05-0.5	10	mg/L	3
Arsenic	Formulation	0.2-5	10	mg/L	2
Selenium	Formulation	0.01-0.2	10	mg/L	3

**Sample 1c**

**Supplied as:**

1 x 8mL standard solution

Analyte	AV	Range	SDPA %	Units	DP
Mercury	Formulation	0.01-0.1	10	mg/L	3

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**Sample 2**

**Supplied as:**

1 x 60mL solution of soil extract (prepared following ISO 11466 for the extraction of metals)

Analyte	AV	Range	SDPA %	Units	DP
Antimony	RMean	All	12.5	mg/L	3
Arsenic	RMean	All	12.5	mg/L	3
Barium	RMean	All	7.5	mg/L	3
Beryllium	RMean	All	7.5 ;10 if AV <1	mg/L	3
Cadmium	RMean	All	7.5; 10 if AV <1	mg/L	3
Chromium	RMean	All	7.5; 10 if AV <2.5	mg/L	2
Cobalt	RMean	All	7.5	mg/L	2
Copper	RMean	All	7.5	mg/L	2
Iron	RMean	All	7.5	mg/L	2
Lead	RMean	All	7.5	mg/L	2
Manganese	RMean	All	7.5	mg/L	2
Mercury	RMean	All	12.5 ;15 if AV <0.2	mg/L	3
Molybdenum	RMean	All	7.5; 10 if AV <0.1	mg/L	3
Nickel	RMean	All	7.5; 10 if AV <2.5	mg/L	2
Selenium	RMean	All	12.5; 15 if AV <0.2	mg/L	3
Thallium	RMean	All	7.5; 10 if AV <1	mg/L	4
Tin	RMean	All	7.5; 10 if AV <1	mg/L	3
Vanadium	RMean	All	7.5	mg/L	2
Zinc	RMean	All	7.5	mg/L	2

**Sample 3a**

**Supplied as:**

1 x approximately 30g prepared soil, ground to pass 200µm sieve

Determinand	AV	Range	SDPA%	Units	DP	Cut-off
Antimony	RMean	All	15	mg/kg	2	0.5
Arsenic	RMean	All	15	mg/kg	2	1
Barium	RMean	All	10	mg/kg	2	10
Beryllium	RMean	All	10	mg/kg	2	0.5
Cadmium	RMean	All	10	mg/kg	2	0.3
Chromium	RMean	All	10	mg/kg	2	10
Cobalt	RMean	All	10	mg/kg	2	10
Copper	RMean	All	10	mg/kg	2	10
Iron	RMean	All	10	mg/kg	0	10
Lead	RMean	All	10	mg/kg	2	10
Manganese	RMean	All	10	mg/kg	2	10

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Determinand	AV	Range	SDPA%	Units	DP	Cut-off
Mercury	RMean	All	15	mg/kg	2	0.1
Molybdenum	RMean	All	10	mg/kg	2	1
Nickel	RMean	All	10	mg/kg	2	10
Selenium	RMean	All	15	mg/kg	2	0.3
Thallium	RMean	All	10	mg/kg	3	1
Tin	RMean	All	10	mg/kg	2	1
Vanadium	RMean	All	10	mg/kg	2	10
Zinc	RMean	All	10	mg/kg	2	10
Chromium (VI)	RMean	All	20	mg/kg	2	-

Measurable levels of all analytes may not be present in the soil sample for every round. When the consensus value (RMean) falls below the cut-off levels listed above, a z score is provided for information only and should be interpreted with care.

**Sample 13**

**Supplied as:** 1 x 60ml standard solution (containing potassium dichromate and another chromium salt)

Determinand	AV	Range	SDPA%	Units	DP
Chromium (VI)	Formulation	2-40	10	mg/L	2



**Group B****Inorganics****Sample 3b****Supplied as:**

1 x approximately 150g prepared soil, ground to pass 200µm sieve

Determinand	AV	Range	SDPA% (fixed)	Units	DP	Cut-off
Ammonia	RMean	All	20	mgN/kg	2	-
Complex Cyanide	RMean	All	20	mgCN/kg	2	2.5
Free Cyanide	RMean	All	20	mgCN/kg	2	2.5
Total Cyanide	RMean	All	20	mgCN/kg	2	25
Dry Matter	RMean	All	(0.75)	%	2	-
Loss on Ignition	RMean	All	10	%	2	-
pH	RMean	All	(0.2)	pH Units	2	-
Thiocyanate	RMean	All	20	mgSCN/kg	2	5
Total sulfate	RMean	All	10	mgSO <sub>4</sub> /kg	0	200
Easily liberated sulfide	RMean	All	20	mgS/kg	2	-
Water soluble boron	RMean	All	15	mg/kg	2	0.3
Water soluble chloride	RMean	All	15	mgCl/kg	2	-
Water soluble fluoride	RMean	All	15	mgF/kg	2	-
Water soluble sulfate	RMean	All	10	mgSO <sub>4</sub> /kg	1	-
Total Sulfur	RMean	All	RSD	mgS/kg	2	-

Measurable levels of all analytes may not be present in the soil sample for every round. When the consensus value (RMean) falls below the cut-off levels listed above, a z score is provided for information only and should be interpreted with care.

**Sample 6****Supplied as:**

1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Total cyanide	Formulation	4-15	10	mgCN/L	2

**Sample 8****Supplied as:**

1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Total sulfate	Formulation	100-800	10	mgSO <sub>4</sub> /L	2

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**Sample 10**

**Supplied as:** 1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Water soluble boron	Formulation	0.5-2.5	10	mg/L	2

**Sample 12**

**Supplied as:** 1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Easily liberated sulfide	RMean	10-90	20	mgS/L	2

**Sample 16**

**Supplied as:** 1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Thiocyanate	Formulation	1-5	10	mgSCN/L	2

**Sample 17**

**Supplied as:** 1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Total fluoride	Formulation	1-2.5	10	mgF/L	2

**Group C****Organics****Sample 3c****Supplied as:**

1 x approximately 70g prepared soil, ground to pass 200µm sieve

1 x 1ml phenol spiking solution

Determinand	AV	Range	SDPA%	Units	DP	Cut-off
Acenaphthene	RMean	All	20	mg/kg	2	0.5
Acenaphthylene	RMean	All	20	mg/kg	2	0.5
Anthracene	RMean	All	20	mg/kg	2	0.5
Benz(a)anthracene	RMean	All	20	mg/kg	2	0.5
Benzo(b)fluoranthene	RMean	All	20	mg/kg	2	0.5
Benzo(k)fluoranthene	RMean	All	20	mg/kg	2	0.5
Benzo(b/k)fluoranthene (sum)	RMean	All	20	mg/kg	2	0.5
Benzo(ghi)perylene	RMean	All	20	mg/kg	2	0.5
Benz(a)pyrene	RMean	All	20	mg/kg	2	0.5
Chrysene	RMean	All	20	mg/kg	2	0.5
Dibenz(ah)anthracene	RMean	All	20	mg/kg	2	0.5
Fluoranthene	RMean	All	20	mg/kg	2	0.5
Fluorene	RMean	All	20	mg/kg	2	0.5
Indeno(123-cd)pyrene	RMean	All	20	mg/kg	2	0.5
Naphthalene	RMean	All	20	mg/kg	2	0.5
Phenanthrene	RMean	All	20	mg/kg	2	0.5
Pyrene	RMean	All	20	mg/kg	2	0.5
Total PAH	RMean	All	20	mg/kg	2	-
Phenols	RMean	All	20	mg/kg	2	-
Cresols	RMean	All	20	mg/kg	2	-
Xylenols	RMean	All	20	mg/kg	2	-
Distillable phenolic substances	RMean	All	20	mg/kg phenol	2	-
PCB (28)	RMean	All	20	mg/kg	4	-
PCB (52)	RMean	All	20	mg/kg	4	-
PCB (101)	RMean	All	20	mg/kg	4	-
PCB (118)	RMean	All	20	mg/kg	4	-
PCB (138)	RMean	All	20	mg/kg	4	-
PCB (153)	RMean	All	20	mg/kg	4	-
PCB (180)	RMean	All	20	mg/kg	4	-
Elemental sulfur	RMean	All	20	mg/kg	2	-
Total organic carbon	RMean	All	10	mg/kg	1	-
TPH (C <sub>10</sub> -C <sub>40</sub> inclusive)	RMean	All	20	mg/kg	0	-

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Determinand	AV	Range	SDPA%	Units	DP	Cut-off
TPH Aliphatic >C <sub>10</sub> -C <sub>12</sub>	RMean	All	20	mg/kg	1	-
TPH Aliphatic >C <sub>12</sub> -C <sub>16</sub>	RMean	All	20	mg/kg	1	-
TPH Aliphatic >C <sub>16</sub> -C <sub>21</sub>	RMean	All	20	mg/kg	1	-
TPH Aliphatic >C <sub>21</sub> -C <sub>35</sub>	RMean	All	20	mg/kg	1	-
TPH Aliphatic >C <sub>35</sub> -C <sub>40</sub>	RMean	All	20	mg/kg	1	-
TPH Aromatic >EC <sub>10</sub> -EC <sub>12</sub>	RMean	All	20	mg/kg	1	-
TPH Aromatic >EC <sub>12</sub> -EC <sub>16</sub>	RMean	All	20	mg/kg	1	-
TPH Aromatic >EC <sub>16</sub> -EC <sub>21</sub>	RMean	All	20	mg/kg	1	-
TPH Aromatic >EC <sub>21</sub> -EC <sub>35</sub>	RMean	All	20	mg/kg	1	-
TPH Aromatic >EC <sub>35</sub> -EC <sub>40</sub>	RMean	All	20	mg/kg	1	-

Measurable levels of all analytes may not be present in the soil sample for every round. When the consensus values (RMean) of the individual PAHs in this sample fall below 1mg/kg, a z score is provided for information only and should be interpreted with care.

**Sample 5**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Acenaphthene	Formulation	1-4	10	mg/L	3
Acenaphthylene	Formulation	1-4	10	mg/L	3
Anthracene	Formulation	0.2-0.8	10	mg/L	3
Benz(a)anthracene	Formulation	0.2-0.8	10	mg/L	3
Benzo(b)fluoranthene	Formulation	0.4-1.5	10	mg/L	3
Benzo(k)fluoranthene	Formulation	0.4-1.5	10	mg/L	3
Benzo(b/k)fluoranthene (sum)	Formulation	0.8-3.0	10	mg/L	3
Benzo(ghi)perylene	Formulation	0.4-1.5	10	mg/L	3
Benz(a)pyrene	Formulation	0.2-0.8	10	mg/L	3
Chrysene	Formulation	0.2-0.8	10	mg/L	3
Dibenz(ah)anthracene	Formulation	0.4-1.5	10	mg/L	3
Fluoranthene	Formulation	0.4-1.5	10	mg/L	3
Fluorene	Formulation	0.4-1.5	10	mg/L	3
Indeno(123-cd)pyrene	Formulation	0.2-0.8	10	mg/L	3
Naphthalene	Formulation	1-4	10	mg/L	3
Phenanthrene	Formulation	0.2-0.8	10	mg/L	3
Pyrene	Formulation	0.2-0.8	10	mg/L	3

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**Sample 7a**

**Supplied as:** 1 x 60ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Monohydric phenols (by distillation)	RMean	All	20	mg/L phenol	2

**Sample 7b**

**Supplied as:** 2 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Total phenols (sum of phenol, cresols and xylenols)	Formulation	All	20	mg/L	2
Total Cresols	Formulation	4-12	20	mg/L	2
Total Xylenols	Formulation	2-6	20	mg/L	2
Phenol	Formulation	3-12	20	mg/L	2

**Sample 11**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
PCB (28)	Formulation	0.2-1	10	mg/L	2
PCB (52)	Formulation	0.2-1	10	mg/L	2
PCB (101)	Formulation	0.2-1	10	mg/L	2
PCB (118)	Formulation	0.2-1	10	mg/L	2
PCB (138)	Formulation	0.2-1	10	mg/L	2
PCB (153)	Formulation	0.2-1	10	mg/L	2
PCB (180)	Formulation	0.2-1	10	mg/L	2

**Sample 14a**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
TPH, Range C <sub>10</sub> – C <sub>40</sub> (inclusive)	RMean	5000-15000	10	mg/L	1

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**Sample 14b**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
TPH, Aliphatic $\leq C_6$	RMean	50-200	10	mg/L	2
TPH, Aliphatic $>C_6-C_8$	RMean	50-200	10	mg/L	2
TPH, Aliphatic $>C_8-C_{10}$	RMean	50-200	10	mg/L	2
TPH, Aromatic $C_6$	RMean	50-200	10	mg/L	2
TPH, Aromatic $>C_6-C_8$	RMean	50-200	10	mg/L	2
TPH, Aromatic $>C_8-C_{10}$	RMean	50-200	10	mg/L	2

**Sample 15**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
Benzene	Formulation	20-80	10	$\mu\text{g/L}$	2
Toluene	Formulation	20-80	10	$\mu\text{g/L}$	2
Ethylbenzene	Formulation	20-80	10	$\mu\text{g/L}$	2
o-xylene	Formulation	50-150	10	$\mu\text{g/L}$	2
m + p-Xylenes	Formulation	50-200	10	$\mu\text{g/L}$	2

**Sample 19**

**Supplied as:** 1 x 2ml standard solution

Determinand	AV	Range	SDPA%	Units	DP
1,2,3-trichlorobenzene	Formulation	30-100	10	$\mu\text{g/L}$	2
1,2,4-trichlorobenzene	Formulation	30-100	10	$\mu\text{g/L}$	2
2-Chlorotoluene	Formulation	30-80	10	$\mu\text{g/L}$	2
1,2-Dichloroethane	Formulation	30-80	10	$\mu\text{g/L}$	2
1,2-Dichloroethene	Formulation	30-80	10	$\mu\text{g/L}$	2
Dichloromethane	Formulation	30-80	10	$\mu\text{g/L}$	2
Hexachloro-1,3-butadiene	Formulation	50 - 100	10	$\mu\text{g/L}$	2
1,1,1,2-Tetrachloroethane	Formulation	30-100	10	$\mu\text{g/L}$	2
1,1,1-Trichloroethane	Formulation	30-100	10	$\mu\text{g/L}$	2
Tetrachloromethane	Formulation	<100	10	$\mu\text{g/L}$	2
Trichloroethene	Formulation	30-100	10	$\mu\text{g/L}$	2
Trichloromethane	Formulation	30 - 100	10	$\mu\text{g/L}$	2

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**Sample 20**

**Supplied as:** 2 x 10mL standard solutions (sample + blank)

Participants are provided with a solution containing six semi volatile organic compounds (SVOCs) for qualitative identification. This sample is designed to test the ability of a laboratory to identify SVOCs in an organic solvent. A list of potential contaminants is provided in Appendix B. In addition, participants will also be provided with a sample blank.

**Group D**

**Leachate**

**Sample 18**

**Supplied as:** 1 x approximately 200g prepared soil, ground to pass 200µm sieve

Determinand	AV	Range	SDPA%	Units	DP
Antimony	RMean	All	10	mg/L	4
Arsenic	RMean	All	10	mg/L	4
Barium	RMean	All	10	mg/L	4
Cadmium	RMean	All	10	mg/L	4
Calcium	RMean	All	10	mg/L	2
Chromium	RMean	All	10	mg/L	4
Copper	RMean	All	10	mg/L	4
Iron	RMean	All	10	mg/L	4
Lead	RMean	All	10	mg/L	4
Magnesium	RMean	All	10	mg/L	2
Mercury	RMean	All	10	mg/L	4
Molybdenum	RMean	All	10	mg/L	4
Nickel	RMean	All	10	mg/L	4
Potassium	RMean	All	10	mg/L	2
Selenium	RMean	All	10	mg/L	4
Sodium	RMean	All	10	mg/L	2
Tin	RMean	All	10	mg/L	4
Zinc	RMean	All	10	mg/L	4
Sulfate	RMean	All	10	mgSO <sub>4</sub> /L	2
Chloride	RMean	All	10	mgCl/L	2
Fluoride	RMean	All	10	mgF/L	3
Nitrate	RMean	All	10	mgNO <sub>3</sub> /L	3
Boron	RMean	All	10	mg/L	3
Chromium (VI)	RMean	All	10	mg/L	4

CONTEST Scheme Description

<b>Determinand</b>	<b>AV</b>	<b>Range</b>	<b>SDPA%</b>	<b>Units</b>	<b>DP</b>
Phosphate	RMean	All	10	mgP/L	3
Ammonia	RMean	All	10	mgN/L	3
Free Cyanide	RMean	All	10	mgCN/L	3
Total Cyanide	RMean	All	10	mgCN/L	2
Thiocyanate	RMean	All	10	mgSCN/L	2
pH	RMean	All	10	pH units	2
Conductivity (20°C)	RMean	All	10	µS/cm	1
COD	RMean	All	10	mgO <sub>2</sub> /L	2
TOC/DOC*	RMean	All	10	mg/L	2
Phenol Index	RMean	All	10	mg/L	2

\*Total Organic Carbon and Dissolved Organic Carbon are regarded as the same determinand in the leachate sample due to the filtration carried out as part of the analysis procedure.

Measurable levels of all analytes may not be present in the soil sample for every round. When the consensus values (RMean) of the individual metals and inorganics in this sample fall below 0.1mg/L, a z score is provided for information only and should be interpreted with care.



**Group E**

**WAC (Waste Acceptance Criteria)**  
**(In accordance with EN 12457-2:2002 - 10:1 single stage leaching test)**

**Sample 21**  
**Supplied as:**

**Soil for Leaching Tests**  
 1 x approximately 200g WAC material

Determinand	AV	Range	SDPA%	Units	DP
Dry Matter Content Ratio	RMean	All	10	%	2
Antimony	RMean	All	10	mg/kg	4
Arsenic	RMean	All	10	mg/kg	4
Barium	RMean	All	10	mg/kg	2
Cadmium	RMean	All	10	mg/kg	4
Chromium	RMean	All	10	mg/kg	3
Copper	RMean	All	10	mg/kg	3
Lead	RMean	All	10	mg/kg	3
Mercury	RMean	All	10	mg/kg	4
Molybdenum	RMean	All	10	mg/kg	3
Nickel	RMean	All	10	mg/kg	3
Selenium	RMean	All	10	mg/kg	3
Zinc	RMean	All	10	mg/kg	2
Sulfate	RMean	All	10	mgSO <sub>4</sub> /kg	0
Chloride	RMean	All	10	mgCl/kg	0
Fluoride	RMean	All	10	mgF/kg	2
Phenol Index	RMean	All	10	mg/kg	2
DOC	RMean	All	10	mg/kg	1
Total Dissolved Solids	RMean	All	10	mg/kg	0

CONTEST Scheme Description

**Sample 24\*\***  
**Supplied as:**

**Prepared Leachate**  
1 x approximately 1L leachate material, prepared in accordance with EN 12457-2:2002

Determinand	AV	Range	SDPA%	Units	DP
Antimony	RMean	All	10	mg/L	4
Arsenic	RMean	All	10	mg/L	4
Barium	RMean	All	10	mg/L	2
Cadmium	RMean	All	10	mg/L	4
Chromium	RMean	All	10	mg/L	3
Copper	RMean	All	10	mg/L	3
Lead	RMean	All	10	mg/L	3
Mercury	RMean	All	10	mg/L	4
Molybdenum	RMean	All	10	mg/L	2
Nickel	RMean	All	10	mg/L	3
Selenium	RMean	All	10	mg/L	3
Zinc	RMean	All	10	mg/L	2
Sulfate	RMean	All	10	mgSO <sub>4</sub> /L	0
Chloride	RMean	All	10	mgCl/L	0
Fluoride	RMean	All	10	mgF/l	2
Phenol Index	RMean	All	10	mg/L	2
DOC	RMean	All	10	mg/L	1
Total Dissolved Solids	RMean	All	10	mg/L	0

\*\*Please note that these samples are not currently within the scope of LGC's UKAS accreditation.

**Sample 22\*\*****BTEX in Soil****Supplied as:**

1 x 1mL standard solution

1 x 30g soil sample

Determinand	AV	Range	SDPA%	Units	DP
Benzene	Formulation	0.05-5	20	mg/kg	2
Toluene	Formulation	0.05-5	20	mg/kg	2
Ethylbenzene	Formulation	0.05-5	20	mg/kg	2
o-xylene	Formulation	0.05-5	20	mg/kg	2
m + p-Xylenes	Formulation	0.1-10	20	mg/kg	2

\*\*Please note that these samples are not currently within the scope of LGC's UKAS accreditation.

**Sample 23\*\*****Total Hydrocarbons in Soil****Supplied as:**

1 x 1mL standard solution

1 x 30g soil sample

Determinand	AV	Range	SDPA%	Units	DP
TPH, Aliphatic $\leq C_6$	RMean	1-50	20	mg/kg	2
TPH, Aliphatic $>C_6-C_8$	RMean	1-50	20	mg/kg	2
TPH, Aliphatic $>C_8-C_{10}$	RMean	1-50	20	mg/kg	2
TPH, Aromatic $C_6$	RMean	1-50	20	mg/kg	2
TPH, Aromatic $>C_6-C_8$	RMean	1-50	20	mg/kg	2
TPH, Aromatic $>C_8-C_{10}$	RMean	1-50	20	mg/kg	2

\*\*Please note that these samples are not currently within the scope of LGC's UKAS accreditation.

**Sample 25\*\*****VOCs in Soil****Supplied as:**

1 x 1mL standard solution

1 x 30g soil sample

Determinand	AV	Range	SDPA%	Units	DP
1,2,3-trichlorobenzene	Formulation	0.05- 1	20	mg/kg	2
1,2,4-trichlorobenzene	Formulation	0.05-1	20	mg/kg	2
2-Chlorotoluene	Formulation	0.05-1	20	mg/kg	2
1,2-Dichloroethane	Formulation	0.05-1	20	mg/kg	2
1,2-Dichloroethene	Formulation	0.05-1	20	mg/kg	2
Dichloromethane	Formulation	0.05-1	20	mg/kg	2
Hexachloro-1,3-butadiene	Formulation	0.05-1	20	mg/kg	2
1,1,1,2-Tetrachloroethane	Formulation	0.05-1	20	mg/kg	2
1,1,1-Trichloroethane	Formulation	0.05-1	20	mg/kg	2
Tetrachloromethane	Formulation	0.05-1	20	mg/kg	2

CONTEST Scheme Description

Determinand	AV	Range	SDPA%	Units	DP
Trichloroethene	Formulation	0.05-1	20	mg/kg	2
Trichloromethane	Formulation	0.05-1	20	mg/kg	2

\*\*Please note that these samples are not currently within the scope of LGC's UKAS accreditation.

**Sample 26\*\***                      **Organochlorine Pesticides in Soil**

**Supplied as:**                      1 x 1mL standard solution  
    1 x 30g soil sample

Determinand	AV	Range	SDPA%	Units	DP
Endrin	Formulation	0.05-5	20	mg/kg	2
Dieldrin	Formulation	0.05-5	20	mg/kg	2
Aldrin	Formulation	0.05-5	20	mg/kg	2
p,p'-DDT	Formulation	0.05-5	20	mg/kg	2
o,p-DDT	Formulation	0.05-5	20	mg/kg	2
p,p'-DDE	Formulation	0.05-5	20	mg/kg	2
p,p'-DDD	Formulation	0.05-5	20	mg/kg	2
Alpha Hexachlorocyclohexane	Formulation	0.05-5	20	mg/kg	2
Beta Hexachlorocyclohexane	Formulation	0.05-5	20	mg/kg	2
Delta Hexachlorocyclohexane	Formulation	0.05-5	20	mg/kg	2
Lindane (Gamma HCH)	Formulation	0.05-5	20	mg/kg	2
Trifluralin	Formulation	0.05-5	20	mg/kg	2
Alpha Endosulphan	Formulation	0.05-5	20	mg/kg	2
Beta Endosulphan	Formulation	0.05-5	20	mg/kg	2
Hexachlorobenzene	Formulation	0.05-5	20	mg/kg	2
Heptachlor	Formulation	0.05-5	20	mg/kg	2
Heptachlor epoxide	Formulation	0.05-5	20	mg/kg	2
Pentachlorobenzene	Formulation	0.05-5	20	mg/kg	2

\*\*Please note that these samples are not currently within the scope of LGC's UKAS accreditation.

**Sample 27\*\***                      **LOI Soil for HMRC Requirements**

**Supplied as:**                      1 x approximately 1kg LOI material

Determinand	AV	Range	SDPA%	Units	DP
Loss on Ignition at 440°C	RMean	5-20	10	%	2

\*\*Please note that this sample is not currently within the scope of LGC's UKAS accreditation.

CONTEST Scheme Description

**Sample 28\*\***  
**Supplied as:**

**Soil Texture**  
 1 x 500g soil

The intent of this sample is to test the ability of the laboratories in identifying the type of soil provided i.e. sand, clay, silt. Results returned will be identified as satisfactory or unsatisfactory.

\*\*Please note that this sample is not currently within the scope of LGC's UKAS accreditation.

**Sample 29\*\***  
**Supplied as:**

**Incinerator Bottom Ash**  
 1 x approximately 200g IBA material

Determinand	AV	Range	SDPA%	Units	DP
Arsenic	RMean	All	20	mg/kg	3
Barium	RMean	All	20	mg/kg	2
Cadmium	RMean	All	20	mg/kg	4
Copper	RMean	All	20	mg/kg	3
Iron	RMean	All	20	mg/kg	3
Lead	RMean	All	20	mg/kg	3
Magnesium	RMean	All	20	mg/kg	2
Manganese	RMean	All	20	mg/kg	3
Nickel	RMean	All	20	mg/kg	3
Potassium	RMean	All	20	mg/kg	2
Sodium	RMean	All	20	mg/kg	2
Total Chromium	RMean	All	20	mg/kg	2
Zinc	RMean	All	20	mg/kg	2
pH	RMean	All	(0.2)	pH Units	2
Alkali reserve	RMean	All	20	mg/kg	2

\*\*Please note that this sample is not currently within the scope of LGC's UKAS accreditation.

CONTEST Scheme Description

**APPENDIX B – Sample 20 potential SVOCs**

Chemical	CAS Number
1,2,4,5-Tetrachlorobenzene	95-94-3
1,2,4-Trichlorobenzene	120-82-1
1,3-Dinitrobenzene	99-65-0
2,3,4,6-Tetrachlorophenol	58-90-2
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
2,4-Dichlorophenol	120-83-2
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
2-Acetylaminofluorene	53-96-3
2-Chloronaphthalene	91-58-7
2-Chlorophenol	95-57-8
2-Methylnaphthalene	91-57-6
2-Nitroaniline	88-74-4
3-Methylcholanthrene	56-49-5
4-Bromophenyl phenyl ether	101-55-3
4-Chloro-3-methylphenol	59-50-7
4-Chlorophenyl phenyl ether	7005-72-3
4-Nitrophenol	100-02-7
5-Nitro-o-toluidine	99-55-8
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Acetophenone	98-86-2
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Benzo(k)fluoranthene	207-08-9
Benzyl alcohol	100-51-6
Bis(2-chloroethoxy)methane	111-91-1
Bis(2-chloroethyl)ether	111-44-4
Bis(2-chloroisopropyl)ether	108-60-1
Bis(2-ethylhexyl)phthalate	117-81-7
Butyl benzyl phthalate	85-68-7
Carbazole	86-74-8

Chemical	CAS Number
Chrysene	218-01-9
Dibenz(a,h)anthracene	53-70-3
Dibenzofuran	132-64-9
Diethyl phthalate	84-66-2
Dimethyl phthalate	131-11-3
Dimethylaminoazobenzene	60-11-7
Di-n-butyl phthalate	84-74-2
Ethyl methanesulfonate	62-50-0
Fluoranthene	206-44-0
Fluorene	86-73-7
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachloroethane	67-72-1
Hexachloropropene	1888-71-7
Indeno(1,2,3-cd)pyrene	193-39-5
Isophorone	78-59-1
Isosafrole	120-58-1
m-Cresol	108-39-4
Naphthalene	91-20-3
Nitrobenzene	98-95-3
N-Nitrosodiethylamine	55-18-5
N-Nitrosodi-n-butylamine	924-16-3
N-Nitrosodi-n-propylamine	621-64-7
N-Nitrosomethylethylamine	10595-95-6
N-Nitrosomorpholine	59-89-2
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
o-Cresol	95-48-7
p-Cresol	106-44-5
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene	82-68-8
Phenacetin	62-44-2
Phenanthrene	85-01-8
Phenol	108-95-2
Pyrene	129-00-0
Safrole	94-59-7