



Aquacheck

Aquacheck Proficiency Testing Scheme

Scheme Description

LGC Standards Proficiency Testing

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Aquacheck Scheme Description

Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
12	Jan 2013	Inclusion of samples for sulfide and chlorophyll a in the main scheme. Introduction of conductivity to 2H and 2S, turbidity to 11 and salinity to 17A. Removal of a number of analytes in Sample 50 and alteration of assigned value source. 3C 'Combined Chlorine' amended to 3C 'Total Chlorine'. Indicative concentrations updated based on previous round data. Changes to SDPAs. Addition of new analytes to samples 7A, 9, 19A, 21 and sample D WFD trial. Reorganisation of samples relating to herbicides; 8, 8B and 20 and inclusion of new sample, 20B. Inclusion of samples for taste and odour, sediment, geosmin and methyl isoborneol and fungicides to Aquacheck trials. Alteration of the ranges for Pharmassure/EDTA trial sample.	M. Whetton
13	Feb 2013	Change to materials supplied for Sample 3, temperature information added to conductivity, further clarification added to SRP analytes, sample format updated for Sample 11. Addition of phenol index to 6B and 18B and arsenic to metals in high salinity water trial. Amended concentration ranges and SDPAs for 20B.	M. Whetton
14	Nov 2013	Amended unit for arsenic in metals in high salinity water trial sample. Identified analytes which are not covered by accreditation scope. Addition of information for traceability of assigned values.	M. Whetton
15	Feb 2014	Inclusion of samples for plutonium and uranium, residual bromine and UV absorbing organic constituents (254 nm) to Aquacheck trials. Addition of several substituted Phenols to 6B and 18B, Removal of phenol index from 6B and 18B. Inclusion of non-ionic surfactants to Sample 3, high chlorate & chlorite to Sample 3A, additional metals to Sample 12. Removal of fixed SDPA values for Sample 18A, update of fixed values for 13, 14, 19A, 19B and 19C.	M. Whetton
16	Jan 2015	Updated maximum concentration for total monosubstituted phenols in 6B and 18B. Updated fixed SDPA to reflect larger concentration range. Removed '180°C' from Total Dissolved Solids analytes. Inclusion of non-ionic surfactants to sample 11. Inclusion of samples for WFD in the main scheme. Sample name changed from Metals in high salinity water to Cations and anions in high salinity water and new analytes added to this sample. Diclofenac added to the pharmaceuticals trial sample. New samples added to the Aquacheck trials: BOD/COD at high concentration levels, haloacetic acids, synthetic pyrethroid insecticides, process water, microcystin-LR and perchlorate. Inclusion of subcontracting information in 'Test Materials' section.	M. Whetton

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17	Oct 2015	Captan added to Fungicides trial sample. Disclaimers updated for non-accredited samples. Removed Hard copy Report information.	R. Sharma N. Mason
18	Jan 2016	1,2,4-trimethylbenzene and MTBE added to sample 6C. Inclusion of samples for chelating agents, inorganic and organic fertilizer and low Level CIP2 contaminants to Aquacheck trials. Process waters split into two groups sulfuric/tartaric acid and chloride. Removal of EDTA from pharmaceuticals trial.	R. Sharma

Notes:

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

Scheme Aims and Organisation

The primary aim of the Aquacheck Proficiency Testing Scheme (Aquacheck) is to enable laboratories performing the analysis of organic and inorganic chemicals in clean and wastewaters, sludges and soils to monitor their performance and compare it with that of their peers. Aquacheck also aims to provide information to participants on technical issues and methodologies relating to testing of such samples.

The Aquacheck scheme year operates from April to March. Further information about Aquacheck, including test material availability, round despatch dates and reporting deadlines, are available on the current Aquacheck application form.

The Aquacheck 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 Aquacheck 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 Aquacheck 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 Aquacheck 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 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

Aquacheck 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.

Aquacheck reports will be available on the website within four 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 (median) of participant results (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 and indicated 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 (Form). 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. For some analytes, only the maximum is quoted. In these cases, the minimum will be 20% of the maximum value.

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).

Two values may be included in the tables for the SDPA; a percentage value and a fixed value; given in brackets. Where the percentage SDPA would be less than the fixed value, the fixed value will be used in calculation of participants' performance scores. The fixed values shown are in the units in which the analytes should be reported.

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.

DP

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

Aquacheck Scheme Description

Sample 1H

Supplied as:

Major Inorganic Components (in hard water)

2 x 1L hard water sample
 1 x 30mL kjeldahl nitrogen spiking solution
 1 x 30mL total phosphorus spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Calcium	RMean	60-130	7.5 (1)	mgCa/L	2
Magnesium	RMean	2-10	7.5 (0.25)	mgMg/L	2
Total Hardness	RMean	50-150	10 (5)	mgCa/L	1
Alkalinity	RMean	150-300	10 (15)	mgHCO ₃ /L	1
Potassium	RMean	1-5	7.5 (0.2)	mgK/L	3
Sodium	RMean	10-35	7.5 (0.5)	mgNa/L	2
Chloride	RMean	10-40	7.5 (2)	mgCl/L	2
Sulfate	RMean	10-40	7.5 (1)	mgSO ₄ /L	2
Fluoride	RMean	1800	7.5 (75)	µgF/L	0
Conductivity (20°C)	RMean	300-700	7.5	µS/cm	1
Kjeldahl Nitrogen	Formulation	5	10 (0.1)	mgN/L	2
Total Phosphorus	RMean	2.6	10 (0.025)	mgP/L	2
Barium	RMean	20-180	10 (4)	µgBa/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past. Single values in this table are maximum values.

Sample 1S

Supplied as:

Major Inorganic Components (in Soft Water)

2 x 1L soft water sample
 1 x 30mL kjeldahl nitrogen spiking solution
 1 x 30mL total phosphorus spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Calcium	RMean	6-40	7.5 (1)	mgCa/L	2
Magnesium	RMean	0.5-10	7.5 (0.25)	mgMg/L	2
Total Hardness	RMean	6-50	10 (1.2)	mgCa/L	1
Alkalinity	RMean	10-90	10 (1.5)	mgHCO ₃ /L	1
Potassium	RMean	0.3-4	7.5 (0.2)	mgK/L	3
Sodium	RMean	5-30	7.5 (0.5)	mgNa/L	2
Chloride	RMean	5-45	7.5 (1)	mgCl/L	2
Sulfate	RMean	3-70	7.5 (1)	mgSO ₄ /L	2
Fluoride	RMean	1800	7.5 (75)	µgF/L	0

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Analyte	AV	Range	SDPA % (fixed)	Units	DP
Conductivity (20°C)	RMean	70-300	7.5 (5)	µS/cm	1
Kjeldahl Nitrogen	Formulation	5	10 (0.1)	mgN/L	2
Total Phosphorus	RMean	2.6	10 (0.025)	mgP/L	2
Barium	RMean	10-120	10 (4)	µgBa/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past. Single values in this table are maximum values.

Sample 1A Major Ions in Higher Salinity Potable Water

Supplied as:

- 1 x 1L spiked matrix water sample
- 1 x 25mL TOC spiking solution
- 1 x 500mL pH sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Sodium	Formulation	300	7.5 (0.5)	mgNa/L	0
Magnesium	Formulation	60	7.5 (0.25)	mgMg/L	1
Chloride	Formulation	300	7.5 (1)	mgCl/L	0
Sulfate	Formulation	350	7.5 (1)	mgSO4/L	0
pH at 20-25°C	RMean	Range 4-10	(0.1)	-	2
Conductivity (20°C)	RMean	3000	7.5	µS/cm	0
Total organic carbon (TOC)	RMean	10	10 (0.25)	mgC/L	2
Total Dissolved Solids	RMean	2000	7.5 (10)	mg/L	0

Sample 2H Nutrients and Others (in Hard Water)

Supplied as:

- 1 x 1L hard water sample
- 7 x 30mL spiking solutions for nitrite, ammonia, soluble reactive phosphorus, colour, permanganate index, total cyanide and free cyanide)
- 1 x 500mL pH/conductivity sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	RMean	5-40	10 (0.1)	mgNO3/L	2
Silicate	RMean	2-10	7.5 (0.1)	mgSiO2/L	2
Nitrite	Formulation	0.35	7.5 (0.005)	mgNO2/L	3
Ammonia	RMean	0.6	10 (0.025)	mgNH4 /L	3
Soluble reactive phosphorus (PO ₄)	RMean	2600	7.5 (10)	µgP/L	0
pH at 20-25°C	RMean	4-10	(0.1)	-	2
Analyte	AV	Range	SDPA % (fixed)	Units	DP
Conductivity (20°C)	RMean	100-800	7.5	µS/cm	0

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Colour	Formulation	24	10 (1)	Hazen	2
Permanganate index (PI)	Formulation	6	10 (0.25)	mgO ₂ /L	2
Total Cyanide	Formulation	60	10 (2.5)	µgCN/L	1
Free Cyanide	Formulation	60	10 (2.5)	µgCN/L	1
Nitrate	RMean	3-40	7.5 (0.1)	mgNO ₃ /L	2
Total Dissolved Solids	RMean	500	10 (10)	mg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past. Single values in this table are maximum values.

Sample 2S

Supplied as:

Nutrients and Others (in Soft Water)

- 1 x 1L soft water sample
- 8 x 30mL spiking solutions for nitrite, nitrate, ammonia, soluble reactive phosphorus, colour, permanganate index, total cyanide and free cyanide)
- 1 x 500mL pH/conductivity sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	RMean	0.2-10	10 (0.1)	mgNO ₃ /L	2
Silicate	Rmean	2-12	7.5 (0.1)	mgSiO ₂ /L	2
Nitrite	Formulation	0.35	7.5 (0.005)	mgNO ₂ /L	3
Ammonia	Rmean	0.6	10 (0.025)	mgNH ₄ /L	3
Soluble reactive phosphorus (PO ₄)	Rmean	2600	7.5 (50)	µgP/L	0
pH at 20-25°C	Rmean	4-10	(0.1)	-	2
Conductivity (20°C)	RMean	100-800	7.5	µS/cm	0
Colour	Formulation	24	10 (1)	Hazen	2
Permanganate index (PI)	Formulation	6	10 (0.25)	mgO ₂ /L	2
Total Cyanide	Formulation	60	10 (2.5)	µgCN/L	1
Free Cyanide	Formulation	60	10 (2.5)	µgCN/L	1
Nitrate	Formulation	1-30	7.5 (0.1)	mgNO ₃ /L	2
Total Dissolved Solids	RMean	300	10 (10)	mg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past. Single values in this table are maximum values.

Sample 2A
Supplied as: **pH in Poorly Buffered Waters**
 2 x 500mL pH samples

Analyte	AV	Range	SDPA % (fixed)	Units	DP
pH at 20-25°C – Low	RMean	3-5	(0.1)	-	2
pH at 20-25°C – High	RMean	6-9	(0.1)	-	2

Sample 3
Supplied as: **Non-Specific Analytes in Clean Water**
 7 x 30mL spiking solutions for BOD, COD, suspended solids, MBAS, non-ionic surfactants, turbidity and DOC

Analyte	AV	Max	SDPA % (fixed)	Units	DP
BOD (5 day)	Formulation	Range 1-6	10 (0.3)	mgO ₂ /L	2
COD	Formulation	250	7.5 (5)	mgO ₂ /L	1
Suspended solids	RMean	30	10 (1)	mg/L	2
Methylene blue active substances (MBAS)	Formulation	240	10 (10)	µgLS/L	1
Non-ionic surfactants	Formulation	1	10	mg/L	2
Dissolved organic carbon	Formulation	5	10 (0.1)	mgC/L	2
Turbidity	RMean	7	7.5 (0.2)	NTU	2

Sample 3A
Supplied as: **Inorganic Disinfection By-products in Clean Water**
 4 x 30mL spiking solutions for bromide, bromate, chlorite and chlorate (high and low level spiking solutions)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Bromide	Formulation	100	10 (2.5)	µgBr/L	1
Bromate	Formulation	12	10 (0.5)	µgBrO ₃ /L	2
Chlorate (low level)	Formulation	100	10 (2.5)	µgClO ₃ /L	1
Chlorite (low level)	Formulation	100	10 (1.5)	µgClO ₂ /L	1
Chlorate (high level)	Formulation	140-700	7.5	µg/L	0
Chlorite (high level)	Formulation	140-700	7.5	µg/L	0

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Sample 3B **Free Chlorine In Clean Water**
Supplied as: 1 x 500mL matrix water sample
 1 x 10mL free chlorine spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Free Chlorine	Formulation	0.5	10 (0.03)	mgCl ₂ /L	3

Sample 3C **Total Chlorine in Clean Water**
Supplied as: 1 x 500mL matrix water sample
 1 x 10mL total chlorine spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total Chlorine	RMean	0.5	10 (0.03)	mgCl ₂ /L	3

Sample 4 **Metals in Surface Water (Preserved in 0.5% Nitric Acid)**
Supplied as: 1 x 500mL metals sample containing all analytes except silver
 1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Iron	RMean	350	7.5 (10)	µg/L	1
Manganese	RMean	60	7.5 (2)	µg/L	1
Copper	RMean	500	7.5 (5)	µg/L	0
Aluminium	RMean	300	7.5 (10)	µg/L	1
Zinc	RMean	500	7.5 (5)	µg/L	0
Silver	RMean	12	7.5 (0.4)	µg/L	2
Barium	RMean	600	7.5 (10)	µg/L	0
Boron	RMean	1200	7.5 (25)	µg/L	0
Strontium	RMean	1000	7.5 (10)	µg/L	0
Lithium	RMean	50	7.5 (2)	µg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

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Sample 4G

Metals in Groundwater (Preserved in 0.5% Nitric Acid)

Supplied as:

1 x 500mL metals sample containing all analytes except silver
1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Iron	RMean	1000	7.5 (10)	µg/L	0
Manganese	RMean	100	7.5 (2.5)	µg/L	1
Copper	RMean	50	7.5 (1)	µg/L	1
Aluminium	RMean	100	10 (5)	µg/L	1
Zinc	RMean	50	10 (1)	µg/L	1
Silver	RMean	10	10 (0.4)	µg/L	2
Barium	RMean	500	7.5 (10)	µg/L	0
Boron	RMean	500	7.5 (10)	µg/L	0
Strontium	RMean	600	7.5 (10)	µg/L	0
Lithium	RMean	50	7.5 (2)	µg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

Sample 5

Toxic Metals in Surface Water (Preserved in 0.5% Nitric Acid)

Supplied as:

1 x 500mL metals sample containing all analytes except mercury and tin
2 x 30mL spiking solutions for mercury and tin

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cadmium	RMean	6	7.5 (0.2)	µg/L	2
Lead	RMean	25	7.5 (0.5)	µg/L	1
Nickel	RMean	24	7.5 (0.8)	µg/L	1
Selenium	RMean	12	10 (0.5)	µg/L	2
Arsenic	RMean	12	10 (0.4)	µg/L	2
Antimony	RMean	6	10 (0.25)	µg/L	2
Mercury	RMean	1.2	10 (0.05)	µg/L	3
Cobalt	RMean	25	7.5 (1)	µg/L	1
Vanadium	RMean	25	7.5 (1)	µg/L	1
Chromium	RMean	60	7.5 (2)	µg/L	1
Molybdenum	RMean	25	7.5 (1)	µg/L	1
Tin	RMean	100	10 (1)	µg/L	1
Beryllium	RMean	5	7.5 (0.2)	µg/L	2

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

Sample 5G

Supplied as:

Toxic Metals in Groundwater (Preserved in 0.5% Nitric Acid)

1 x 500mL metals sample containing all analytes except mercury and tin

1 x 30mL mercury spiking solution

1 x 30mL tin spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cadmium	RMean	5	10 (0.2)	µg/L	2
Lead	RMean	50	7.5 (0.5)	µg/L	1
Nickel	RMean	20	10 (1)	µg/L	1
Selenium	RMean	5	10 (0.5)	µg/L	2
Arsenic	RMean	10	10 (0.5)	µg/L	2
Antimony	RMean	5	10 (0.25)	µg/L	2
Mercury	RMean	5	10 (0.05)	µg/L	2
Cobalt	RMean	10	10 (0.8)	µg/L	2
Vanadium	RMean	10	10 (0.75)	µg/L	2
Chromium	RMean	25	10 (1.5)	µg/L	2
Molybdenum	RMean	25	10 (1)	µg/L	1
Tin	RMean	20	10 (1)	µg/L	1
Beryllium	RMean	10	10 (0.8)	µg/L	2

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

Sample 6A

Supplied as:

Haloforms and Chlorinated Solvents in Clean Water

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Chloroform	Formulation	120	10 (2.5)	µg/L	1
Bromodichloromethane	Formulation	120	10 (2.5)	µg/L	1
Dibromochloromethane	Formulation	120	10 (2.5)	µg/L	1
Bromoform	Formulation	120	10 (2.5)	µg/L	1
Trichloroethene	Formulation	12	10 (0.5)	µg/L	2
Tetrachloroethene	Formulation	12	10 (0.5)	µg/L	2
Carbon Tetrachloride	Formulation	3.6	10 (0.15)	µg/L	2
1,2-Dichloroethane	Formulation	3.6	10 (0.15)	µg/L	2

Sample 6B
Supplied as: **Phenols in Clean Water**
 1 x 2L groundwater sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Phenol	Formulation	600	10 (25)	ng/L	0
2-Chlorophenol	Formulation	600	10 (25)	ng/L	0
4-Chlorophenol	Formulation	600	10 (25)	ng/L	0
3-Bromophenol*	Formulation	600	10 (25)	ng/L	0
2,4-Dichlorophenol	Formulation	600	10 (25)	ng/L	0
2,4,6-Trichlorophenol	Formulation	600	10 (25)	ng/L	0
Pentachlorophenol	Formulation	600	10 (25)	ng/L	0
2,5-Dimethylphenol*	Formulation	600	10 (25)	ng/L	0
3,5-Dimethylphenol*	Formulation	600	10 (25)	ng/L	0
2-Methylphenol (o-cresol)*	Formulation	600	10 (25)	ng/L	0
3-Methylphenol (m-cresol)*	Formulation	600	10 (25)	ng/L	0
4-Methylphenol (p-cresol)*	Formulation	600	10 (25)	ng/L	0
Total monosubstituted methylphenols*	Formulation	1800	10 (75)	ng/L	0

*analytes marked with an asterisk are not included in LGC's UKAS scope of accreditation

Sample 6C
Supplied as: **Benzene, Toluene and Xylenes in Clean Water**
 1 x 2L groundwater sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Benzene	Formulation	1.2	10 (0.05)	µg/L	3
Toluene	Formulation	3	10 (0.05)	µg/L	2
Ethylbenzene	Formulation	3	10 (0.05)	µg/L	2
Styrene	Formulation	3	10 (0.05)	µg/L	2
o-Xylene	Formulation	3	10 (0.05)	µg/L	2
m-Xylene	Formulation	3	10 (0.05)	µg/L	2
p-Xylene	Formulation	3	10 (0.05)	µg/L	2
Total xylene	Formulation	9	10 (0.15)	µg/L	2
m-+ p-Xylene	Formulation	6	10 (0.1)	µg/L	2
1,2,4-trimethylbenzene	Formulation	10	10 (0.15)	µg/L	2
MTBE (methyl tert-butyl ether)	Formulation	10	10 (0.15)	µg/L	2

Sample 7A
Supplied as:**Organochlorine Pesticides in Clean Water**

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Endrin	Formulation	120	10 (5)	ng/L	1
Dieldrin	Formulation	50	10 (1.5)	ng/L	1
Aldrin	Formulation	50	10 (1.5)	ng/L	1
p,p'-DDT	Formulation	120	10 (5)	ng/L	1
o,p-DDT	Formulation	120	10 (5)	ng/L	1
p,p'-DDE	Formulation	120	10 (5)	ng/L	1
o,p'-DDE*	Formulation	120	10 (5)	ng/L	1
p,p'-DDD	Formulation	120	10 (5)	ng/L	1
o,p'-DDD (TDE)*	Formulation	120	10 (5)	ng/L	1
Alpha Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Beta Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Delta Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Lindane (Gamma HCH)	Formulation	120	10 (5)	ng/L	1
Trifluralin	Formulation	120	10 (5)	ng/L	1
Alpha Endosulphan	Formulation	120	10 (5)	ng/L	1
Beta Endosulphan	Formulation	120	10 (5)	ng/L	1
Hexachlorobenzene	Formulation	120	10 (5)	ng/L	1
Heptachlor	Formulation	50	10 (1.5)	ng/L	1
Heptachlor epoxide	Formulation	50	10 (1.5)	ng/L	1
Pentachlorobenzene	Formulation	120	10 (5)	ng/L	1
Pendimethalin*	Formulation	120	10 (5)	ng/L	1
Cis-chlordane*	Formulation	120	10 (5)	ng/L	1
Trans-chlordane*	Formulation	120	10 (5)	ng/L	1
Methoxychlor*	Formulation	120	10 (5)	ng/L	1

*analytes marked with an asterisk are not included in LGC's UKAS scope of accreditation

Sample 7B
Supplied as:**Chlorinated Solvents in Clean Water**

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Hexachlorobutadiene	Formulation	120	10 (6)	ng/L	1

Aquacheck Scheme Description

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Carbon Tetrachloride	Formulation	400	10 (25)	ng/L	0
Tetrachloroethene	Formulation	400	10 (25)	ng/L	0
1,2,4-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
Trichloroethene	Formulation	400	10 (25)	ng/L	0
1,1,1-Trichloroethane	Formulation	400	10 (25)	ng/L	0
1,3,5-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
1,2,3-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
1,2-Dichloroethane	Formulation	400	10 (25)	ng/L	0
Chloroform	Formulation	400	10 (25)	ng/L	0

Sample 7C

Polycyclic Aromatic Hydrocarbons (2 Spikes) in Clean Water

Supplied as:

1 x 2L groundwater sample
2 x 10mL spiking solutions

Spiking solution 7C1

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Fluoranthene	Formulation	50	10 (2)	ng/L	1
Benzo(b)fluoranthene	Formulation	25	10 (2)	ng/L	2
Benzo(k)fluoranthene	Formulation	25	10 (2)	ng/L	2
Benz(a)pyrene	Formulation	12	10 (0.5)	ng/L	2
Benzo(ghi)perylene	Formulation	25	10 (2)	ng/L	2
Indeno(1,2,3-cd)pyrene	Formulation	25	10 (2)	ng/L	2

Spiking solution 7C2

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Acenaphthene	Formulation	25	10 (2)	ng/L	2
Acenaphthylene	Formulation	25	10 (2)	ng/L	2
Anthracene	Formulation	25	10 (2)	ng/L	2
Benz(a)anthracene	Formulation	25	10 (2)	ng/L	2
Chrysene	Formulation	25	10 (2)	ng/L	2
Dibenz(ah)anthracene	Formulation	25	10 (2)	ng/L	2
Fluorene	Formulation	25	10 (2)	ng/L	2
Naphthalene	Formulation	25	10 (2)	ng/L	2
Perylene	Formulation	25	10 (2)	ng/L	2
Phenanthrene	Formulation	25	10 (2)	ng/L	2
Pyrene	Formulation	25	10 (2)	ng/L	2

Sample 7D
Supplied as:

Polychlorinated Biphenyls in Clean Water

1 x 2L groundwater sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
PCB (28)	Formulation	100	10 (1)	ng/L	1
PCB (52)	Formulation	100	10 (1)	ng/L	1
PCB (101)	Formulation	100	10 (1)	ng/L	1
PCB (118)	Formulation	100	10 (1)	ng/L	1
PCB (138)	Formulation	100	10 (1)	ng/L	1
PCB (153)	Formulation	100	10 (1)	ng/L	1
PCB (180)	Formulation	100	10 (1)	ng/L	1

Sample 8

Acid Herbicides in Clean Water

Supplied as:

1 x 2L groundwater sample
 2 x 10mL spiking solutions

Spiking solution 8(1)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
MCPA	Formulation	120	10 (5)	ng/L	1
MCPB	Formulation	120	10 (5)	ng/L	1
2,4-D	Formulation	120	10 (5)	ng/L	1
Dichlorprop	Formulation	120	10 (5)	ng/L	1
Dicamba	Formulation	120	10 (5)	ng/L	1
2,4-DB	Formulation	120	10 (5)	ng/L	1
Bentazone	Formulation	120	10 (5)	ng/L	1
Mecoprop	Formulation	120	10 (5)	ng/L	1
Propyzamide	Formulation	120	10 (5)	ng/L	1
loxynil	Formulation	120	10 (5)	ng/L	1
Bromoxynil	Formulation	120	10 (5)	ng/L	1
Triclopyr	Formulation	120	10 (5)	ng/L	1
Clopyralid*	Formulation	120	10 (5)	ng/L	1
Fluroxypyr*	Formulation	120	10 (5)	ng/L	1
2,3,6-TBA*	Formulation	120	10 (5)	ng/L	1
2,4,5-T*	Formulation	120	10 (5)	ng/L	1
Dichlobenil*	Formulation	120	10 (5)	ng/L	1
Bromacil*	Formulation	120	10 (5)	ng/L	1
Metazachlor*	Formulation	120	10 (5)	ng/L	1
Propachlor*	Formulation	120	10 (5)	ng/L	1

Aquacheck Scheme Description

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Benazolin*	Formulation	120	10 (5)	ng/L	1
2,4,5-TP (Fenoprop)*	Formulation	120	10 (5)	ng/L	1
Metaldehyde	Formulation	120	10 (5)	ng/L	1

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Spiking solution 8(2)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Glyphosate	Formulation	120	10 (5)	ng/L	1
AMPA	Formulation	120	10 (5)	ng/L	1

Sample 8B **Triazines and Urea Herbicides in Clean Water**

Supplied as: 1 x 2L groundwater sample
 2 x 10mL spiking solutions

Spiking solution 8B(1)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Isoproturon	Formulation	120	10 (5)	ng/L	1
Diuron	Formulation	120	10 (5)	ng/L	1
Linuron	Formulation	120	10 (5)	ng/L	1
Chlortoluron	Formulation	120	10 (5)	ng/L	1
Monuron	Formulation	120	10 (5)	ng/L	1
Methabenzthiazuron*	Formulation	120	10 (5)	ng/L	1
Diflufenican*	Formulation	120	10 (5)	ng/L	1
Metamitron*	Formulation	120	10 (5)	ng/L	1

Spiking solution 8B(2)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Simazine	Formulation	120	10 (5)	ng/L	1
Atrazine	Formulation	120	10 (5)	ng/L	1
Propazine	Formulation	120	10 (5)	ng/L	1
Cyanazine*	Formulation	120	10 (5)	ng/L	1
Trietazine*	Formulation	120	10 (5)	ng/L	1
Prometryn*	Formulation	120	10 (5)	ng/L	1
Terbutryn*	Formulation	120	10 (5)	ng/L	1
Ametryn*	Formulation	120	10 (5)	ng/L	1
Carbetamide*	Formulation	120	10 (5)	ng/L	1
Pirimicarb*	Formulation	120	10 (5)	ng/L	1

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 9
Supplied as: **Organophosphorus Pesticides in Clean Water**
 1 x 2L groundwater sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Azinphos-methyl	Formulation	120	10 (5)	ng/L	1
Azinphos-ethyl	Formulation	120	10 (5)	ng/L	1
Dichlorvos	Formulation	120	10 (5)	ng/L	1
Fenitrothion	Formulation	120	10 (5)	ng/L	1
Malathion	Formulation	120	10 (5)	ng/L	1
Mevinphos	Formulation	120	10 (5)	ng/L	1
Chlorfenvinphos	Formulation	120	10 (5)	ng/L	1
Diazinon	Formulation	120	10 (5)	ng/L	1
Fenthion	Formulation	120	10 (5)	ng/L	1
Parathion-ethyl	Formulation	120	10 (5)	ng/L	1
Parathion-methyl	Formulation	120	10 (5)	ng/L	1
Chlorpyrifos	Formulation	120	10 (5)	ng/L	1
Cypermethrin	Formulation	120	10 (5)	ng/L	1
Propetamphos*	Formulation	120	10 (5)	ng/L	1

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Aquacheck Scheme Description

Sample 10

Nutrients and other analytes in Wastewater

Supplied as:

6 x 30mL spiking solutions for nitrate, nitrite and ammonia, silicate, soluble reactive phosphorus and chloride, total cyanide, free cyanide, kjeldahl nitrogen and total phosphorus

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	Formulation	10	10 (0.25)	mgN/L	2
Nitrate	Formulation	7.5	7.5 (0.25)	mgN/L	2
Nitrite	Formulation	2.5	7.5 (0.05)	mgN/L	2
Ammonia	Formulation	20	7.5 (0.25)	mgN/L	2
Silicate	Formulation	25	7.5 (0.25)	mgSiO ₂ /L	1
Soluble Reactive Phosphorus (PO ₄)	Formulation	10	7.5 (0.25)	mgP/L	2
Chloride	Formulation	500	7.5 (10)	mgCl/L	0
Total Cyanide	Formulation	2.5	10 (0.05)	mgCN/L	2
Kjeldahl Nitrogen	Formulation	25	10 (0.25)	mgN/L	1
Free Cyanide	Formulation	2.5	10 (0.05)	mgCN/L	2
Total Nitrogen	Formulation	55	10 (0.5)	mgN/L	1
Total Phosphorus	Formulation	20	7.5 (0.05)	mgP/L	1

Sample 11

Non-Specific Analytes in Wastewater

Supplied as:

6 x 30mL spiking solutions for BOD, COD, MBAS, D/TOC, suspended solids and non-ionic surfactants
1 x 125mL sample for turbidity analysis

Analyte	AV	Max	SDPA % (fixed)	Units	DP
BOD (5 day)	Formulation	200	10 (4)	mgO ₂ /L	1
COD	Formulation	250	7.5 (5)	mgO ₂ /L	1
Suspended solids	RMean	50	10 (1)	mg/L	1
Methylene blue active substances (MBAS)	Formulation	75	10 (1)	mgLS/L	1
Dissolved/Total organic carbon	Formulation	250	7.5 (5)	mgC/L	1
Turbidity	RMean	10-50	10	NTU	1
Non-ionic surfactants	Formulation	10-50	10	mg/L	1

Aquacheck Scheme Description

Sample 12

Supplied as:

Metals in Wastewater (Preserved in 0.5% Nitric Acid)

1 x 250mL concentrated synthetic effluent sample
 1 x 125mL metals sample containing all analytes except mercury
 1 x 30mL mercury spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Antimony*	Formulation	5	10 (0.2)	µg/L	2
Arsenic	Formulation	50	10 (2)	µg/L	1
Aluminium	Formulation	2.5	7.5 (0.05)	mg/L	2
Chromium	Formulation	0.25	7.5 (0.01)	mg/L	3
Iron	Formulation	5	7.5 (0.1)	mg/L	2
Manganese	Formulation	2.5	7.5 (0.05)	mg/L	2
Cadmium	Formulation	50	7.5 (1)	µg/L	1
Copper	Formulation	0.25	7.5 (0.01)	mg/L	3
Lead	Formulation	0.25	7.5 (0.01)	mg/L	3
Nickel	Formulation	1	7.5 (0.02)	mg/L	3
Zinc	Formulation	5	7.5 (0.1)	mg/L	2
Mercury	Formulation	25	10 (0.5)	µg/L	1
Selenium	Formulation	50	10 (2.5)	µg/L	1
Molybdenum	Formulation	1	7.5 (0.02)	mg/L	3
Tellurium*	Formulation	1	10 (0.05)	µg/L	3
Uranium*	Formulation	1	10 (0.05)	µg/L	3

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 12C

Supplied as:

Chromium (VI) in Wastewater

1 x 500mL synthetic waste water sample
 1 x 30mL chromium (VI) spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Chromium (VI)	Formulation	200	10 (5)	µg/L	1

Aquacheck Scheme Description

Sample 13
Supplied as:

Sewage Sludge Inorganics and Specific Elements
 1 x 20g sludge sample

Analyte	AV	Likely Range	SDPA % (fixed)	Units	DP
Arsenic	RMean	0.3-15	10 (0.25)	mg/kg	2
Cadmium	RMean	0.1-10	10 (0.1)	mg/kg	2
Chromium	RMean	50-400	10 (5)	mg/kg	1
Copper	RMean	10-450	10 (10)	mg/kg	0
Lead	RMean	1-150	10 (5)	mg/kg	1
Mercury	RMean	0.03-3	10 (0.05)	mg/kg	2
Molybdenum	RMean	0.1-10	10 (0.5)	mg/kg	2
Nickel	RMean	1-100	10 (2)	mg/kg	1
Vanadium	RMean	1-40	10 (1)	mg/kg	2
Zinc	RMean	50-1500	10 (20)	mg/kg	0
Selenium	RMean	0.1-2	10 (0.15)	mg/kg	2
Total boron	RMean	10-60	10 (1)	mg/kg	1
Fluoride	RMean	10-1000	10 (12.5)	mg/kg	0
Total nitrogen	RMean	1-8	10 (0.25)	% N	2
Total phosphorus	RMean	0.1-3	10 (0.05)	% P	2
Total potassium	RMean	0.1-5	10 (0.05)	% K	3
Cobalt	RMean	0.2-20	10 (0.5)	mg/kg	1
Iron	RMean	1000-100000	10	mg/kg	0
Manganese	RMean	50-1000	10	mg/kg	0

Sample 13 uses natural sludge samples from different sources. The range figures given above provide an indication of the concentrations that may be supplied; they are values from a range of recent samples provided within the Aquacheck scheme.

Aquacheck Scheme Description

Sample 14
Supplied as:

Agricultural Soil Inorganics and Specific Elements
 1 x 100g soil sample

Analyte	AV	Likely Max	SDPA % (fixed)	Units	DP
Arsenic	RMean	20	10 (0.5)	mg/kg	2
Cadmium	RMean	1	10 (0.05)	mg/kg	3
Chromium	RMean	100	10 (5)	mg/kg	1
Copper	RMean	40	10 (1.5)	mg/kg	2
Lead	RMean	50	10 (2)	mg/kg	1
Mercury	RMean	0.5	10 (0.025)	mg/kg	3
Molybdenum	RMean	4	10 (0.1)	mg/kg	3
Nickel	RMean	40	10 (1.5)	mg/kg	2
Vanadium	RMean	100	10 (2.5)	mg/kg	1
Zinc	RMean	150	10 (5)	mg/kg	1
Selenium	RMean	1	10 (0.1)	mg/kg	3
Total boron	RMean	100	10	mg/kg	2
Water extractable boron	RMean	10	10 (1)	mg/kg	2
Fluoride	RMean	100	10 (25)	mg/kg	1
Total nitrogen	RMean	4000	10	mg/kg	0
Total phosphorus	RMean	1000	10 (10)	mg/kg	0
Total potassium	RMean	6000	10	mg/kg	0
Cobalt	RMean	20	10 (0.5)	mg/kg	2
Iron	RMean	30,000	10	mg/kg	0
Manganese	RMean	1000	10	mg/kg	0
Total solids	RMean	100	(0.5)	%	1
Loss on ignition	RMean	20	10	%	2
pH at 20-25°C	RMean	10	(0.2)	-	2
Extractable phosphorus	RMean	50	10 (5)	mg/kg	1
Extraction of potassium	RMean	250	10 (5)	mg/kg	1
Extraction of magnesium	RMean	500	10 (5)	mg/kg	1
Extraction of sodium	RMean	200	10 (5)	mg/kg	1
Organic carbon content	RMean	10	20 (0.5)	%	2
Conductivity	RMean	1500	10 (2.5)	uS/cm	0
Carbonate content	RMean	100000	10 (3)	mg/kg	2

Sample 14 uses natural soil samples from different sources. The range figures given above provide an indication of the concentrations that may be supplied; they are values from a range of recent samples provided within the Aquacheck scheme.

Sample 15 **Settleable Solids in Wastewater**
Supplied as: 1 x 1L settleable solids sample

Analyte	AV	Likely Max	SDPA % (fixed)	Units	DP
Settleable solids	RMean	20-100	20	mL/L	2

Sample 16 **Compositional Analysis of Sewage Sludge**
Supplied as: 1 x 50g real sewage sludge sample

Analyte	AV	Likely Max	SDPA % (fixed)	Units	DP
Total Solids (105±5°C)	RMean	50	5 (0.5)	%	2
Loss on ignition (500±5°C)	RMean	60	5 (0.5)	%	2
pH at 20-25°C	RMean	4-10	(0.2)	-	2
Calcium	RMean	60000	10 (250)	mg/kg weight dried	0
Magnesium	RMean	10000	10 (7.5)	mg/kg weight dried	0

Sample 16 uses natural sludge samples from different sources. The range figures given above provide an indication of the concentrations that may be supplied; they are values from a range of recent samples provided within the Aquacheck scheme.

Sample 17A **Major Wastewater Analytes**
Supplied as: 1 x 1L sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
pH at 20-25°C	RMean	Range 3-10	(0.1)	-	2
Settled chemical oxygen demand (COD)	RMean	1000	10 (10)	mgO ₂ /L	0
Total COD	Formulation	2100	7.5 (10)	mgO ₂ /L	0
Suspended Solids	RMean	1000	7.5 (10)	mg/L	0
Conductivity (20°C)	RMean	Range 0.5-45	7.5	mS/cm	2
Total dissolved solids	RMean	Range 0.3-30	7.5 (0.05)	g/L	2
Non filterable COD	RMean	1000	10 (10)	mgO ₂ /L	0
Salinity	RMean	30	Robust SD	-	2

Sample 17B
Supplied as:

Total Phenol, Cyanide and Sulfate in Wastewater

- 1 x 125mL phenol sample
- 1 x 125mL sulfate sample
- 1 x 125mL cyanide sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total Phenol	Formulation	50	10 (0.05)	mg/L	1
Cyanide	Formulation	25	10 (0.05)	mgCN/L	2
Sulfate	Formulation	1000	7.5 (25)	mgSO4/L	0

Sample 17C
Supplied as:

Metals in Wastewater (Preserved in 0.5% Nitric Acid)

- 1 x 250mL metals sample containing all analytes except mercury, tin and silver
- 1 x 30mL mercury spiking solution
- 1 x 30mL tin spiking solution
- 1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Aluminium	Formulation	10	7.5 (0.025)	mg/L	2
Antimony	Formulation	0.5	10 (0.025)	mg/L	3
Arsenic	Formulation	0.5	10 (0.025)	mg/L	3
Barium	Formulation	10	7.5 (0.025)	mg/L	2
Boron	Formulation	50	7.5 (0.5)	mg/L	1
Cadmium	Formulation	250	7.5 (0.25)	µg/L	0
Chromium	Formulation	5	7.5 (0.0125)	mg/L	2
Cobalt	Formulation	5	7.5 (0.0125)	mg/L	2
Copper	Formulation	5	7.5 (0.0125)	mg/L	2
Iron	Formulation	10	7.5 (0.025)	mg/L	2
Lead	Formulation	5	7.5 (0.0125)	mg/L	2
Manganese	Formulation	5	7.5 (0.0125)	mg/L	2
Molybdenum	Formulation	5	7.5 (0.0125)	mg/L	2
Mercury	Formulation	25	10 (0.5)	µg/L	1
Nickel	Formulation	5	7.5 (0.0125)	mg/L	2
Selenium	Formulation	0.5	10 (0.025)	mg/L	3
Silver	Formulation	0.5	7.5 (0.005)	mg/L	3
Tin	Formulation	0.5	10 (0.025)	mg/L	3
Vanadium	Formulation	5	7.5 (0.0125)	mg/L	2
Zinc	Formulation	5	7.5 (0.0125)	mg/L	2

Aquacheck Scheme Description

Sample 17D

Ammonia, Phosphate and Nitrogen in Wastewater

Supplied as:

1 x 125mL ammonia and soluble reactive phosphorus sample
 1 x 125mL total phosphorus sample
 1 x 125mL total nitrogen sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Ammonia	Formulation	25	7.5 (0.25)	mgN/L	1
Soluble Reactive Phosphorus (PO ₄)	Formulation	125	7.5 (2.5)	mgP/L	1
Total Phosphorus	Formulation	125	7.5 (2.5)	mgP/L	1
Total Nitrogen	Formulation	125	10 (2.5)	mgN/L	1

Sample 18A

Haloforms and Chlorinated Solvents in Wastewater

Supplied as:

1 x 500mL concentrated synthetic effluent sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Chloroform	Formulation	1200	10	µg/L	0
Bromodichloromethane	Formulation	1200	10	µg/L	0
Dibromochloromethane	Formulation	1200	10	µg/L	0
Bromoform	Formulation	1200	10	µg/L	0
Trichloroethene	Formulation	120	15	µg/L	1
Tetrachloroethene	Formulation	120	15	µg/L	1
Carbon Tetrachloride	Formulation	36	15	µg/L	1
1,2-Dichloroethane	Formulation	36	15	µg/L	1

Sample 18B

Phenols in Wastewater

Supplied as:

1 x 500mL concentrated synthetic effluent sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Phenol	Formulation	6000	10 (50)	ng/L	0
2-Chlorophenol	Formulation	6000	10 (50)	ng/L	0
4-Chlorophenol	Formulation	6000	10 (50)	ng/L	0
3-Bromophenol*	Formulation	6000	10 (50)	ng/L	0
2,4-Dichlorophenol	Formulation	6000	10 (50)	ng/L	0
2,4,6-Trichlorophenol	Formulation	6000	10 (50)	ng/L	0
Pentachlorophenol	Formulation	6000	10 (50)	ng/L	0
2,5-Dimethylphenol*	Formulation	6000	10 (50)	ng/L	0

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
3,5-Dimethylphenol*	Formulation	6000	10 (50)	ng/L	0
2-Methylphenol (o-cresol)*	Formulation	6000	10 (50)	ng/L	0
3-Methylphenol (m-cresol)*	Formulation	6000	10 (50)	ng/L	0
4-Methylphenol (p-cresol)*	Formulation	6000	10 (50)	ng/L	0
Total monosubstituted methylphenols*	Formulation	18000	10 (150)	ng/L	0

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 18C

Benzene, Toluene and Xylenes in Wastewater

Supplied as:

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Benzene	Formulation	24	10 (1)	µg/L	2
Toluene	Formulation	60	10 (3)	µg/L	1
Ethylbenzene	Formulation	60	10 (3)	µg/L	1
Styrene	Formulation	60	10 (3)	µg/L	1
o-Xylene	Formulation	60	10 (3)	µg/L	1
m-Xylene	Formulation	60	10 (3)	µg/L	1
p-Xylene	Formulation	60	10 (3)	µg/L	1
Total xylene	Formulation	180	10 (9)	µg/L	1
m-+ p-Xylene	Formulation	120	10 (6)	µg/L	1

Sample 19A

Organochlorine Pesticides in Wastewater

Supplied as:

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Endrin	Formulation	1200	10 (50)	ng/L	0
Dieldrin	Formulation	500	10 (25)	ng/L	0
Aldrin	Formulation	500	10 (25)	ng/L	0
p,p'-DDT	Formulation	1200	10 (50)	ng/L	0
o,p'-DDT	Formulation	1200	10 (50)	ng/L	0
p,p'-DDE	Formulation	1200	10 (50)	ng/L	0
o,p'-DDE*	Formulation	1200	10 (50)	ng/L	0
p,p'-DDD	Formulation	1200	10 (50)	ng/L	0
o,p'-DDD (TDE)*	Formulation	1200	10 (50)	ng/L	0

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Alpha Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Beta Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Delta Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Lindane (Gamma HCH)	Formulation	1200	10 (50)	ng/L	0
Trifluralin	Formulation	1200	10 (50)	ng/L	0
Alpha endosulphan	Formulation	1200	10 (50)	ng/L	0
Beta endosulphan	Formulation	1200	10 (50)	ng/L	0
Hexachlorobenzene	Formulation	1200	10 (50)	ng/L	0
Heptachlor	Formulation	500	10 (25)	ng/L	0
Heptachlor epoxide	Formulation	500	10 (25)	ng/L	0
Pentachlorobenzene	Formulation	1200	10 (50)	ng/L	0
Pendimethalin*	Formulation	1200	10 (50)	ng/L	0
Cis-chlordane*	Formulation	1200	10 (50)	ng/L	0
Trans-chlordane*	Formulation	1200	10 (50)	ng/L	0
Methoxychlor*	Formulation	1200	10 (50)	ng/L	0

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 19B

Chlorinated Solvents in Wastewater

Supplied as:

1 x 500mL concentrated synthetic effluent sample
1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Hexachlorobutadiene	Formulation	1200	10 (60)	ng/L	0
Carbon Tetrachloride	Formulation	4000	10 (200)	ng/L	0
Tetrachloroethene	Formulation	4000	10 (200)	ng/L	0
1,2,4-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
Trichloroethene	Formulation	4000	10 (200)	ng/L	0
1,1,1-Trichloroethane	Formulation	4000	10 (200)	ng/L	0
1,3,5-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
1,2,3-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
1,2-Dichloroethane	Formulation	4000	10 (200)	ng/L	0
Chloroform	Formulation	4000	10 (200)	ng/L	0

Sample 19C
Supplied as:

Polycyclic Aromatic Hydrocarbons (2 Spikes) in Wastewater
 1 x 500mL concentrated synthetic effluent sample
 2 x 10mL spiking solutions

Spiking solution 19C1

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Fluoranthene	Formulation	500	10 (25)	ng/L	0
Benzo(b)fluoranthene	Formulation	250	10 (12)	ng/L	0
Benzo(k)fluoranthene	Formulation	250	10 (12)	ng/L	0
Benzo(a)pyrene	Formulation	120	10 (6)	ng/L	1
Benzo(ghi)perylene	Formulation	250	10 (12)	ng/L	0
Indeno(1,2,3-cd)pyrene	Formulation	250	10 (12)	ng/L	0

Spiking solution 19C2

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Acenaphthene	Formulation	250	10 (12)	ng/L	0
Acenaphthylene	Formulation	250	10 (12)	ng/L	0
Anthracene	Formulation	250	10 (12)	ng/L	0
Benzo(a)anthracene	Formulation	250	10 (12)	ng/L	0
Chrysene	Formulation	250	10 (12)	ng/L	0
Dibenz(ah)anthracene	Formulation	250	10 (12)	ng/L	0
Fluorene	Formulation	250	10 (12)	ng/L	0
Naphthalene	Formulation	250	10 (12)	ng/L	0
Perylene	Formulation	250	10 (12)	ng/L	0
Phenanthrene	Formulation	250	10 (12)	ng/L	0
Pyrene	Formulation	250	10 (12)	ng/L	0

Sample 19D
Supplied as:

Polychlorinated Biphenyls (PCBs) in Wastewater
 1 x 500mL concentrated synthetic effluent sample
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
PCB (28)	Formulation	1000	10 (10)	ng/L	0
PCB (52)	Formulation	1000	10 (10)	ng/L	0
PCB (101)	Formulation	1000	10 (10)	ng/L	0
PCB (118)	Formulation	1000	10 (10)	ng/L	0
PCB (138)	Formulation	1000	10 (10)	ng/L	0
PCB (153)	Formulation	1000	10 (10)	ng/L	0

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
PCB (180)	Formulation	1000	10 (10)	ng/L	0

Sample 20

Supplied as:

Acid Herbicides in Wastewater

1 x 500mL concentrated synthetic effluent sample

2 x 10mL spiking solutions

Spiking solution 20(1)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
MCPA	Formulation	1200	10 (50)	ng/L	0
MCPB	Formulation	1200	10 (50)	ng/L	0
2,4-D	Formulation	1200	10 (50)	ng/L	0
Dichlorprop	Formulation	1200	10 (50)	ng/L	0
Dicamba	Formulation	1200	10 (50)	ng/L	0
2,4-DB	Formulation	1200	10 (50)	ng/L	0
Bentazone	Formulation	1200	10 (50)	ng/L	0
Mecoprop	Formulation	1200	10 (50)	ng/L	0
Propyzamide	Formulation	1200	10 (50)	ng/L	0
Ioxynil	Formulation	1200	10 (50)	ng/L	0
Bromoxynil	Formulation	1200	10 (50)	ng/L	0
Triclopyr	Formulation	1200	10 (50)	ng/L	0
Clopyralid*	Formulation	1200	10 (50)	ng/L	0
Fluroxypyr*	Formulation	1200	10 (50)	ng/L	0
2,3,6-TBA*	Formulation	1200	10 (50)	ng/L	0
2,4,5-T*	Formulation	1200	10 (50)	ng/L	0
Dichlobenil*	Formulation	1200	10 (50)	ng/L	0
Bromacil*	Formulation	1200	10 (50)	ng/L	0
Metazachlor*	Formulation	1200	10 (50)	ng/L	0
Propachlor*	Formulation	1200	10 (50)	ng/L	0
Benazolin*	Formulation	1200	10 (50)	ng/L	0
2,4,5-TP (Fenoprop)	Formulation	1200	10 (50)	ng/L	0
Metaldehyde	Formulation	1200	10 (50)	ng/L	0

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Aquacheck Scheme Description

Spiking solution 20(2)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Glyphosate	Formulation	1200	10 (50)	ng/L	0
AMPA	Formulation	1200	10 (50)	ng/L	0

Sample 20B

Supplied as:

Triazines and Urea Herbicides in Wastewater

1 x 500mL concentrated synthetic effluent sample

2 x 10mL spiking solutions

Spiking solution 20B(1)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Isoproturon	Formulation	1200	10 (50)	ng/L	0
Diuron	Formulation	1200	10 (50)	ng/L	0
Linuron	Formulation	1200	10 (50)	ng/L	0
Chlortoluron	Formulation	1200	10 (50)	ng/L	0
Monuron	Formulation	1200	10 (50)	ng/L	0
Methabenzthiazuron*	Formulation	1200	10 (50)	ng/L	0
Diflufenican*	Formulation	1200	10 (50)	ng/L	0
Metamitron*	Formulation	1200	10 (50)	ng/L	0

Spiking solution 20B(2)

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Simazine	Formulation	1200	10 (50)	ng/L	0
Atrazine	Formulation	1200	10 (50)	ng/L	0
Propazine	Formulation	1200	10 (50)	ng/L	0
Cyanazine*	Formulation	1200	10 (50)	ng/L	0
Trietazine*	Formulation	1200	10 (50)	ng/L	0
Prometryn*	Formulation	1200	10 (50)	ng/L	0
Terbutryn*	Formulation	1200	10 (50)	ng/L	0
Ametryn*	Formulation	1200	10 (50)	ng/L	0
Carbetamide*	Formulation	1200	10 (50)	ng/L	0
Pirimicarb*	Formulation	1200	10 (50)	ng/L	0

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 21**Supplied as:****Organophosphorus Pesticides in Wastewater**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Azinphos-methyl	Formulation	1200	10 (50)	ng/L	0
Azinphos-ethyl	Formulation	1200	10 (50)	ng/L	0
Dichlorvos	Formulation	1200	10 (50)	ng/L	0
Fenitrothion	Formulation	1200	10 (50)	ng/L	0
Malathion	Formulation	1200	10 (50)	ng/L	0
Mevinphos	Formulation	1200	10 (50)	ng/L	0
Chlorfenvinphos	Formulation	1200	10 (50)	ng/L	0
Diazinon	Formulation	1200	10 (50)	ng/L	0
Fenthion	Formulation	1200	10 (50)	ng/L	0
Parathion-ethyl	Formulation	1200	10 (50)	ng/L	0
Parathion-methyl	Formulation	1200	10 (50)	ng/L	0
Chlorpyrifos	Formulation	1200	10 (50)	ng/L	0
Cypermethrin	Formulation	1200	10 (50)	ng/L	0
Propetamphos*	Formulation	1200	10 (50)	ng/L	0

*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 22**Supplied as:****Qualitative Organics by GCMS in Clean Water**

1 x 1mL sample containing ten organic compounds

1 x 1mL blank sample

Ten organic analytes are provided for qualitative identification. This sample is designed to test the ability of laboratories to identify organic compounds via GCMS analysis.

Participants are provided with a solution containing ten organic compounds. The test requires that participants identify the ten compounds present. Results returned will be identified as satisfactory or unsatisfactory. Participants are also provided with a solvent blank.

The choice of the ten organic compounds is designed to avoid the formation of reaction by-products.

Sample 22A **Qualitative Organics by Purge and Trap GCMS in Clean Water**
Supplied as: 1 x 40mL sample containing six organic compounds
 1 x 40mL blank sample

Six organic analytes are provided for qualitative identification. This sample is designed to test the ability of laboratories to identify organic compounds via purge and trap GCMS analysis.

Participants are provided with a solution containing six organic compounds. The test requires that participants identify the six compounds present. Results returned will be identified as satisfactory or unsatisfactory. Participants are also provided with a solvent blank.

The choice of the 6 organic compounds is designed to avoid the formation of reaction by-products.

Sample 23 **Mineral Oil in Wastewater**
Supplied as: 1 x variable volume sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Volume of sample provided	Formulation	Range 0.3-0.9	5	L	3
Total Hydrocarbons by GC Analysis	Formulation	50	15 (1)	mg/L	1
Total Hydrocarbons by IR Analysis	Formulation	50	15 (1)	mg/L	1
Total Hydrocarbons by Gravimetric Analysis	Formulation	50	15 (1)	mg/L	1

A 50:50 mixture of Type A and Type B mineral oils will be used to prepare these samples. This is designed to match the needs of ISO 9377 with a carbon range of C10 to C40 inclusive.

Sample 24 **Oil and Grease in Wastewater**
Supplied as: 1 x variable volume sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Volume of sample provided	Formulation	Range 0.75-0.9	5	L	3
Total Oil and Grease	Formulation	40-200	15 (1)	mg/L	1

Sample 25 **Qualitative Determination in Clean Water**
Supplied as: 1 x 2L sample

The intent of this Sample is to test the ability of laboratories to detect and identify an unknown contaminant in surface/potable waters. This Sample is designed for laboratories which may be involved in investigating potentially contaminated potable or surface waters and tests both the extraction and identification stages of investigations.

Participants are provided with a two litre water sample and one or more ‘indicators’ of a potential problem, e.g. water is discoloured or has an oily sheen.

Participants are asked to identify the contaminating substance(s). Results returned will be identified as satisfactory or unsatisfactory.

Sample 26 **PFOS and PFOA in Clean Water**
Supplied as: 1 x 5mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
PFOS	Formulation	1-10	10	µg/L	2
PFOA	Formulation	2-20	10	µg/L	2

Sample 27 **AOX in Wastewater**
Supplied as: 1 x 10mL spiking solution
 1 x 500mL synthetic effluent matrix

Analyte	AV	Max	SDPA % (fixed)	Units	DP
AOX	Formulation	10	10	mgCl/L	2

Sample 28 **Formaldehyde in Clean Water**
Supplied as: 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Formaldehyde	Formulation	0.01-1	10	mg/L	3

Sample 29 **High and Low COD**
Supplied as: 1 x 250mL spiking solution for high level COD
 1 x 250mL spiking solution for low level COD

Analyte	AV	Max	SDPA % (fixed)	Units	DP
COD – high	Formulation	500-10000	5	mgO ₂ /L	0
COD – low	Formulation	14-70	10	mgO ₂ /L	1

Aquacheck Scheme Description

Sample 30 **Gross Alpha and Gross Beta in Clean Water**
Supplied as: 1 x 2L sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Gross Alpha as ²³⁹ Plutonium	RMean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Alpha as ²⁴¹ Americium	Rmean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Alpha as ²³⁰ Thorium	RMean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Beta as ⁴⁰ Potassium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3
Gross Beta as ¹³⁷ Caesium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3
Gross Beta as ⁹⁰ Strontium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3

Sample 31 **Aqueous Tritium in Clean Water**
Supplied as: 1 x 250mL sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Aqueous Tritium	Formulation	25-75 (occasionally up to 150)	10	Bq/L	2

Sample 32** **Sulfide in Wastewater**
Supplied as: 1 x 125mL sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Total sulfide	Formulation	4-20	10	mg/L	2

Sample 33** **Chlorophyll a in Clean Water**
Supplied as: 1 x 5mL vial of Algae extract

Analyte	AV	Range	SDPA	Units	DP
Chlorophyll a	RMean	1-300	RSD	mg/m3	2

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 34**
Sample A**
Supplied as:

Water Framework Directive

1 x 500mL metals sample, 1 x 30mL mercury spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Cadmium	RMean	0.05-0.25	10	µg/L	3
Lead	RMean	0.7-10	10	µg/L	2
Mercury	RMean	0.02-2	10	µg/L	3
Nickel	RMean	5-50	10	µg/L	2

Sample B**

Supplied as:

1 x 10mL spiking solution
 1 x 2L groundwater

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Atrazine	Formulation	0.15-0.75	25	µg/L	3
Diuron	Formulation	0.05-0.25	25	µg/L	3
Isoproturon	Formulation	0.08-0.4	25	µg/L	3
Simazine	Formulation	0.2-2	25	µg/L	3

Sample C**

Supplied as:

1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Alachlor	Formulation	0.04-0.4	25	µg/L	3
Chlorfenvinphos	Formulation	0.02-0.2	25	µg/L	3
Chlorpyrifos	Formulation	0.01-0.1	25	µg/L	3

Sample D**

Supplied as:

1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Pentylphenol	Formulation	0.04-0.4	25	µg/L	3
Hexylphenol	Formulation	0.04-0.4	25	µg/L	3
Heptylphenol	Formulation	0.04-0.4	25	µg/L	3
Octylphenol	Formulation	0.02-0.2	25	µg/L	3
Nonylphenol	Formulation	0.04-0.4	25	µg/L	3
Pentachlorophenol	Formulation	0.05-0.5	25	µg/L	3
Bisphenol A	Formulation	0.02-1	25	µg/L	3

Aquacheck Scheme Description

Sample E**

Supplied as: 1 x 10mL spiking solution
1 x 2L groundwater

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Endosulphan	Formulation	0.003-0.03	25	µg/L	4
Hexachlorobenzene	Formulation	0.003-0.03	25	µg/L	4
Hexachlorocyclohexane	Formulation	0.003-0.03	25	µg/L	4
Pentachlorobenzene	Formulation	0.003-0.03	25	µg/L	4
Trifluralin	Formulation	0.01-0.1	25	µg/L	3
Hexachlorobutadiene	Formulation	0.02-0.2	25	µg/L	3

Sample F**

Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Benz(a)pyrene	Formulation	0.01-0.1	25	µg/L	3
Benzo(b)fluoranthene	Formulation	0.01-0.1	25	µg/L	3
Benzo(ghi)perylene	Formulation	0.001-0.01	25	µg/L	4
Benzo(k)fluoranthene	Formulation	0.01-0.1	25	µg/L	3
Indeno(123-cd)pyrene	Formulation	0.001-0.01	25	µg/L	4
Anthracene	Formulation	0.03-0.3	25	µg/L	3
Fluoranthene	Formulation	0.03-0.3	25	µg/L	3

Sample G**

Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Tributyltin compounds	Formulation	2-10	25	ng/L	2

Sample H**

Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
1,2-Dichloroethane	Formulation	2-20	25	µg/L	2
Dichloromethane	Formulation	5-50	25	µg/L	2
Trichlorobenzenes	Formulation	0.1-1	25	µg/L	2
Trichloromethane	Formulation	0.5-5	25	µg/L	2

Aquacheck Scheme Description

Sample I**

Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %(fixed)	Units	DP
2,4,4-Tribromodiphenylether (BDE 28)	Formulation	0.2-1	25	ng/L	3
2,2,4,4,5-Pentabromodiphenylether (BDE 99)	Formulation	0.2-1	25	ng/L	3
2,2,4,4,5,6-Hexabromodiphenylether (BDE 154)	Formulation	0.2-1	25	ng/L	3

Sample J**

Supplied as: 1 x 10mL spiking solution for DEHP
1 x 10mL spiking solution for benzene and naphthalene
1 x 10ml blank DEHP sample in methanol

Analyte	AV	Range	SDPA % (fixed)	Units	DP
DEHP	Formulation	0.3-3	25	µg/L	2
Benzene	Formulation	2-20	25	µg/L	2
Naphthalene	Formulation	0.5-5	25	µg/L	2

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 35**

BOD/COD at high concentration

Supplied as: 1 x 250ml sample for the determination of COD and BOD

Analyte	AV	Max	SDPA % (fixed)	Units	DP
COD	Formulation	500	5	mgO ₂ /L	1
BOD	Formulation	300	10	mgO ₂ /L	1

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 36**

Taste and odour

Supplied as: 1 x 500mL sample for determination of taste
1 x 1L sample for determination of odour

Analyte	AV	Range	SDPA	Units	DP
TFN	RMean	Various	1.0000	-	1
TON	RMean	Various	1.0000	-	1

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 37** **Acrylamide**
Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Acrylamide	Formulation	0.05-0.5	10	µg/L	3

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 38** **UV Absorbing Organic Constituents (254 nm)**
Supplied as: 1 x 30ml spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
UV absorption	RMean	0.900	Robust SD	cm ⁻¹	3

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 39** **Geosmin and MIB**
Supplied as: 1 x 1L sample containing all determinands

Analyte	AV	Range	SDPA %	Units	DP
Geosmin	Formulation	2-200	15	ng/L	2
Methyl isoborneol	Formulation	2-200	15	ng/L	2

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 40** **Fungicides**
Supplied as: 1 x 10mL spiking solution
 1 x 500mL of groundwater sample

Analyte	AV	Range	SDPA %	Units	DP
Carbendazim	Formulation	120	10 (5)	ng/L	1
Chlorothalonil	Formulation	120	10 (5)	ng/L	1
Fenpropimorph	Formulation	120	10 (5)	ng/L	1
Flutriafol	Formulation	120	10 (5)	ng/L	1
Epoxyconazole	Formulation	120	10 (5)	ng/L	1
Flusilazole	Formulation	120	10 (5)	ng/L	1
Cyproconazole	Formulation	120	10 (5)	ng/L	1
Tebuconazole	Formulation	120	10 (5)	ng/L	1
Azoxystrobin	Formulation	120	10 (5)	ng/L	1
Boscalid	Formulation	120	10 (5)	ng/L	1
Kresoxym-methyl	Formulation	120	10 (5)	ng/L	1
Captan	Formulation	120	10 (5)	ng/L	1

**Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Sample 50
Supplied as:

Ecotoxicology
 1 x 500mL sample

Analyte	AV	SDPA % (fixed)	Units	DP
<i>Daphnia Magna</i> 48hr EC50	RMean	30	% Dilution	3
<i>Daphnia Magna</i> 24hr EC50	RMean	30	% Dilution	3
<i>Vibrio Fischeri</i> 30 minute IC50 (ISO 11348-3)	RMean	30	% Dilution	3
Other 30 min luminescent bacteria IC50 tests	RMean	30	% Dilution	3
15 minute luminescent bacteria IC50 tests	RMean	30	% Dilution	3
Freshwater algae growth inhibition test (<i>Pseudokirschneriella subcapitata</i>)	RMean	30	% Dilution	3

Participants are required to dilute the sample provided in line with their usual practice, and to determine the EC50 (or IC50) dilution using any or all of the ecotoxicity tests listed. The solution will contain zinc sulfate at a concentration in the range 10 to 200mgZn/L. The % dilutions to produce an EC50 returned will be converted to mg Zn/L and performance scores awarded based on a suitable assigned value with a percentage SDPA of 30%.

APPENDIX B – Aquacheck Trials

The sample descriptions below are intended as a guide only. Please be aware that, due to the nature of the trials, and to aid their development, the details may change from time to time. Where participants would be interested in alternative ranges or additional analytes, please do not hesitate to contact LGC Standards Proficiency Testing with details.

LGC Standards PT reserves the right not to provide the samples should they prove technically unfeasible.

The samples provided in the trials are not currently within the scope of LGC's UKAS accreditation.

Cations and anions in High Salinity Water

Supplied as: 1 x 500mL metals sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Arsenic	Formulation	10-50	10	µg/L	1
Boron	Formulation	6-30	10	mg/L	1
Cadmium	Formulation	0.2-1	10	µg/L	3
Copper	Formulation	0.2-1	10	µg/L	3
Iron	Formulation	0.3-1.5	10	mg/L	2
Magnesium	Formulation	300-1500	10	mg/L	0
Manganese	Formulation	0.2-1	10	µg/L	3
Molybdenum	Formulation	2-10	10	µg/L	2
Strontium	Formulation	15-75	10	mg/L	1
Zinc	Formulation	1-5	10	µg/L	2
Barium	Formulation	10-100	10	mg/L	1
Calcium	Formulation	100-2000	10	mg/L	0
Lithium	Formulation	10-100	10	mg/L	1
Phosphorus	Formulation	100-500	10	mg/L	0
Sodium	Formulation	100-10000	10	mg/L	0
Sulfur	Formulation	100-1000	10	mg/L	0

Triclosan

Supplied as: 1 x 10mL spiking solution
1 x 2L groundwater

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Triclosan	Formulation	0.01-100	10	µg/L	2

Semi-Volatile Organic Compounds

Supplied as: 1 x 10mL spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
TBC***	Formulation	1-15	10	µg/L	2

Participants are provided with a solution containing six semi volatile organic compounds (SVOCs) for quantitative determination. A list of potential analytes is provided in Appendix C.

Aquacheck Scheme Description

Pharmaceuticals

Supplied as:

1 x 10mL spiking solution for pharmaceuticals

Analyte	AV	Range (Max)	SDPA % (fixed)	Units	DP
Ibuprofen	Formulation	1	10	µg/L	3
Propranolol	Formulation	1	10	µg/L	3
Ofloxacin	Formulation	1	10	µg/L	3
Oxytetracycline	Formulation	1	10	µg/L	3
Salicylic acid	Formulation	1	10	µg/L	3
Fluoxetine	Formulation	1	10	µg/L	3
Diclofenac	Formulation	1	10	µg/L	3

MCerts

Supplied as:

1 x 500mL sample containing all determinands

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Ammonia	Formulation	0.5-10	10	mgN/L	2
COD	Formulation	10-100	7.5	mgO ₂ /L	1
Conductivity (20°C)	RMean	500-1000	7.5	µS/cm	1
Nitrate	Formulation	3.75-30	7.5	mgN/L	3
Nitrite	Formulation	0.1-4	7.5	mgN/L	3
Orthophosphate	Formulation	0.13-10	10	mgP/L	3
pH at 20-25°C	RMean	7-8	(0.1)	-	2
Total arsenic	Formulation	0.5-10	10	µg/L	2
Total copper	Formulation	0.5-5	10	µg/L	2
Total mercury	Formulation	0.01-0.1	10	µg/L	3
Total cadmium	Formulation	0.1-1	10	µg/L	2
Total lead	Formulation	0.4-4	10	µg/L	2
Total nickel	Formulation	5-50	10	µg/L	1
Turbidity	RMean	3-30	10	NTU	2

Plutonium and Uranium

Supplied as:

1 x 250ml sample for determination of plutonium

1 x 250ml sample for determination of uranium

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Plutonium-239	RMean	0.6	Robust SD	Bq/L	3
Uranium-234	RMean	1	Robust SD	Bq/L	3
Uranium-235	RMean	0.05	Robust SD	Bq/L	4
Uranium-238	RMean	1	Robust SD	Bq/L	3
Total Uranium	RMean	100	Robust SD	µg/L	2

Perchlorate

Supplied as:

1 x 30ml spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Perchlorate	Formulation	50	Robust SD	ug/L	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round

Aquacheck Scheme Description

Haloacetic Acids

Supplied as: 1 x 30ml spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Monochloroacetic acid	Formulation	50	10	ug/L	2
Dichloroacetic acid	Formulation	50	10	ug/L	2
Trichloroacetic acid	Formulation	50	10	ug/L	2
Monobromoacetic acid	Formulation	50	10	ug/L	2
Dibromoacetic acid	Formulation	50	10	ug/L	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Synthetic pyrethroid insecticides

Supplied as: 1 x 30ml spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Bifenthrin	Formulation	250	10	ng/L	1
Cyfluthrin	Formulation	250	10	ng/L	1
Cypermethrin	Formulation	250	10	ng/L	1
Flumethrin	Formulation	250	10	ng/L	1
Permethrin	Formulation	250	10	ng/L	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Process water (sulfuric/tartaric acid)

Supplied as: 1 x 100mL solution for determination of sulfuric/tartaric acid

Analyte	AV	Range	SDPA %	Units	DP
Sulfuric acid	Formulation	20 – 60	10	g/L	1
Tartaric acid	Formulation	40 - 120	10	g/L	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Process water (chloride)

Supplied as: 1 x 100mL solution for determination of chloride by titration
1 x 100mL solution for determination of chloride by ISE

Analyte	AV	Range	SDPA %	Units	DP
Chloride by titration	Formulation	0.05 – 1.0	10	g/L	1
Chloride by ISE	Formulation	2 - 10	10	mg/L	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Microcystin-LR

Supplied as: 1 x 30ml spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Microcystin-LR	Formulation	5	Robust SD	ug/L	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Aquacheck Scheme Description

Chelating Agents

Supplied as:

1 x 500mL sample containing all determinands

Analyte	AV	Max	SDPA % (fixed)	Units	DP
EDTA	Formulation	100	10	µg/L	2
NTA	Formulation	200	10	µg/L	2
DTPA	Formulation	200	10	µg/L	2
ADA	Formulation	200	10	µg/L	2
MGDA	Formulation	200	10	µg/L	2

Inorganic NPK Fertilizer

Supplied as:

1 x 50g sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Total nitrogen	RMean	All	10	%	1
Ammoniacal nitrogen	RMean	All	10	%	1
Urea nitrogen	RMean	All	10	%	1
Soluble potash	RMean	All	10	%	1
Mercury	RMean	All	10	mg/kg	2
Lead	RMean	All	10	mg/kg	2
Cadmium	RMean	All	10	mg/kg	2
Calcium	RMean	All	10	mg/kg	2
Fluoride	RMean	All	10	mg/kg	2
Total nitrogen	RMean	All	10	%	1
Total phosphorus	RMean	All	10	%	1
Total potassium	RMean	All	10	%	1
Iron	RMean	All	10	%	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round (analytes may change in each round depending on fertilizer used).

Organic Fertilizer

Supplied as:

1 x 50g sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Total nitrogen	RMean	All	10	%	1
Available phosphate (P ₂ O ₅)	RMean	All	10	%	1
Soluble otash (K ₂ O)	RMean	All	10	%	1
Magnesium	RMean	All	10	%	1
Arsenic	RMean	All	10	mg/kg	2
Cadmium	RMean	All	10	mg/kg	2
Chromium	RMean	All	10	mg/kg	2
Manganese	RMean	All	10	%	2
Zinc	RMean	All	10	%	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round (analytes may change in each round depending on fertilizer used).

Aquacheck Scheme Description

Low Level CIP2 contaminants

Supplied as: 3 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Benzo(a)pyrene	Formulation	0.02	10	ng/L	3
Fluoranthene	Formulation	0.02	10	ng/L	3
Cypermethrin	Formulation	0.01	10	ng/L	3
PFOS	Formulation	0.09	10	ng/L	3
PFOA	Formulation	0.09	10	ng/L	3

Aquacheck Scheme Description

APPENDIX C – Potential SVOCs

Chemical	CAS Number	Chemical	CAS Number
1,2,4-trichlorobenzene	120-82-1	Benzo(g,h,i)perylene	191-24-2
1,2-dichlorobenzene	95-50-1	Benzo(k)fluoranthene	207-08-9
1,2-dinitrobenzene	528-29-0	Benzyl alcohol	100-51-6
1,3-dichlorobenzene	541-73-1	Bis(2-chloroethoxy)methane	111-91-1
1,3-dinitrobenzene	99-65-0	Bis(2-chloroisopropyl)ether	108-60-1
1,4 dichlorobenzene	106-46-7	Bis(2-ethylhexyl)adipate	103-23-1
1,4-dinitrobenzene	100-25-4	Bis(2-ethylhexyl)phthalate	117-81-7
1-methylnaphthalene	90-12-0	Bis-2-chloroethyl ether	111-44-4
2,3,4,6-tetrachlorophenol	58-90-2	Butyl benzyl phthalate	85-68-7
2,3,5,6-tetrachlorophenol	935-95-5	Carbazole	86-74-8
2,4 dinitrotoluene	121-14-2	Chrysene	218-01-9
2,4,5-trichlorophenol	95-95-4	Dibenz(a,h)anthracene	53-70-3
2,4,6-trichlorophenol	88-06-2	Dibenzofuran	132-64-9
2,4-dichlorophenol	120-83-2	Dibutyl phthalate	84-74-2
2,4-dimethylphenol	105-67-9	Diethyl phthalate	84-66-2
2,6-dinitrotoluene	606-20-2	Dimethylphthalate	131-11-3
2-chloronaphthalene	91-58-7	Di-n-octyl phthalate	117-84-0
2-chlorophenol	95-57-8	Diphenylamine	122-39-4
2-methylnaphthalene	91-57-6	Fluoranthene	206-44-0
2-methylphenol	95-48-7	Fluorene	86-73-7
2-nitroaniline	88-74-4	Hexachloro-1,3-butadiene	87-68-3
2-nitrophenol	88-75-5	Hexachlorobenzene	118-74-1
4-bromodiphenyl ether	101-55-3	Hexachlorocyclopentadiene	77-47-4
4-chloro-3-methylphenol	59-50-7	Hexachloroethane	67-72-1
4-chloroaniline	106-47-8	Indeno(1,2,3 cd)pyrene	193-39-5
4-chlorodiphenyl ether	7005-72-3	Isophorone	78-59-1
Acenaphthene	83-32-9	Naphthalene	91-20-3
Acenaphthylene	208-96-8	Nitrobenzene	98-95-3
Aniline	62-53-3	n-nitroso-di-n-propylamine	621-64-7
Anthracene	120-12-7	Pentachlorophenol	87-86-5
Azobenzene	103-33-3	Phenanthrene	85-01-8
Benz(a)anthracene	56-55-3	Phenol	108-95-2
Benzo(a)pyrene	50-32-8	Pyrene	129-00-0
Benzo(b)fluoranthene	205-99-2		