



# Scheme Description

## Air and Stack emissions (AIR) Proficiency Testing Scheme

[lgcstandards.com/AXIO](https://lgcstandards.com/AXIO)  
[axiopt@lgcgroup.com](mailto:axiopt@lgcgroup.com)

Issue No: 18  
Issued: July 2025



**RECORD OF ISSUE STATUS AND MODIFICATIONS**

Issue	Issue Date	Details	Authorised by
7	January 2017	New trial diesel fume sample 16 added, new gravimetric sample 17 added. Inclusion of Appendix B; a list of potential compounds for sample 22.	R. Sharma
8	January 2018	New sample 18 added for Beryllium. SPDA set to 10% for sample 40. Amendments to Sample 1/1a – changes to spiking levels. Amendments to Sample 21 – a-pinene removed and replaced with diacetyl (not accredited). Samples 9, 14, 22 and 40 now accredited.	R. Sharma
9	Dec 2018	New sample 1B and 1C. Revision of Sample 2 as 2F, 2X and 2I options. Removal of sample 10C and 41. List of potential compounds for sample 22 updated. Website information added to page 3	R. Sharma A. McCarthy
10	Nov 2019	Revision of Samples 1/1A/1B/1C. New trial Sample 19 added and the removal of Sample 15. Descriptor for Sample 7 and 32 updated. Antimony added to Sample 13. Selenium added to Sample 33 & Sample 38. Appendix B – list of compounds updated.  Removed 'Standards' from page 1 Amended HSE logo	R. Sharma  A McCarthy
11	Sept 2020	Updated the volume range for Sample 32	R. Sharma
12	July 2021	Updated email address and UKAS logo	A.Collins
13	Sep 2022	Removed Cyclohexanone from Sample 21 and replaced with Styrene Updated the list of compounds in sample 22	R. Sharma S. Xystouris
14	Sept 2023	Removed sample 19 and updated the DP information for Sample 18. The number of spiked filters supplied for Sample 2 and 2I amended to 3 filters.	S. Xystouris R. Sharma
15	July 2024	Added Phosphate in Sample 14	R. Sharma S. Xystouris
16	January 2024	Removed Phosphate from sample 14	S. Xystouris
17	April 2025	Sample 17 marked as 'Accredited within the boundaries of LGC's flexible scope of UKAS accreditation'.	R. Sharma
18	July 2025	Sample 17 added to fixed scope Removed sample 1C	A Collins R Sharma

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

## SCHEME INFORMATION

### Scheme Aims and Organisation

The Air & Stack Emissions (AIR) Proficiency testing (PT) scheme combines the materials previously offered by the WASP PT scheme, operated by HSE, and the STACKS PT scheme, provided by LGC. This scheme is managed and operated by LGC Standards Proficiency Testing and is supported through technical advice from HSE.

The primary aim of the AIR PT scheme is to enable laboratories performing the analysis of air sampling media (filters, sorbent tubes and stack/impinger solutions) to monitor their performance and compare it with that of their peers. AIR PT also aims to provide information to participants on technical issues and methodologies relating to testing of these test materials.

The AIR PT scheme has been designed to provide external quality assurance for laboratories carrying out chemical analysis of workplace air samples. In many countries, legislation exists to control the exposure of workers to hazardous chemicals, in order to ensure that any risk to personnel is minimised. This may include measurement to assess exposures and to test the effectiveness of containment or ventilation. In response to increasing regulatory requirements, the scheme has subsequently expanded in providing test samples for laboratories undertaking ambient air analysis and for laboratories undertaking material emission testing.

Similarly, legislation exists to control atmospheric pollution, requiring the monitoring of chimney stacks. The AIR PT scheme has been designed to provide external quality assurance for laboratories carrying out chemical analysis of air samples derived from such point sources.

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

### Test Materials

Details of test materials available in AIR are given in the 'Samples Available' section. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

In each distribution (round) participants will receive up to four test specimens, dependant on the sample type that they have subscribed to. Each test specimen can contain one or more measurands (analytes) prepared at various concentrations on appropriate sampling media. Blank media may also be supplied, where appropriate.

Test material batches are tested for homogeneity for at least one test parameter where it is deemed appropriate, to ensure the samples are fit for their intended use. Details of homogeneity tests performed, results and assessment are provided in the AIR PT Scheme Reports.

Further details regarding the sample types, measurands, spike concentrations, preparation and checking of test materials and references to suitable standard methods that may be employed to analyse such samples are available on request.

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.

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 AIR 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 the 'Samples Available' section.

### Methods

Methods are listed 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

AIR PT results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email.

AIR PT 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.

For some samples previously provided in the WASP PT scheme, arrangements exist to permit the release of results and laboratory identity in specific circumstances only. These are:

- Enrolment in AIR PT for samples 7, 8 and 12 only for those laboratories joining via AIHA Industrial Hygiene Proficiency Analytical Testing (IHPAT) program requires agreement on behalf of these participants that the results shall be released to AIHA Laboratory Accreditation Programs (AIHA-LAP) for accreditation purposes.
- Enrolment in AIR PT by UK laboratories, for sample 11 only, requires agreement on behalf of these participants that summary performance shall be released to the UK Department, Food and Rural Affairs (DEFRA) and subsequently published on the DEFRA Local Air Quality Management (AQM) website.

## 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.

### SDPA

The 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).

### Units

This indicates the units used for the assessment of data and 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.

## SAMPLES AVAILABLE

### Workplace Air Samples

#### Sample PT-AR-01

Supplied as:

#### Metals

4 x 25 mm diameter mixed cellulose ester filter spiked with metal solutions plus 2 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	All	Formulation	5-50	5%	µg	1
Chromium	All	Formulation	10-200	5%	µg	1
Cobalt	All	Formulation	10-200	5%	µg	1
Copper	All	Formulation	10-200	5%	µg	1
Iron	All	Formulation	10-250	5%	µg	1
Manganese*	All	Formulation	10-200	5%	µg	1
Nickel	All	Formulation	10-200	5%	µg	1
Lead	All	Formulation	10-200	5%	µg	1
Zinc	All	Formulation	10-200	5%	µg	1

\*For this sample, the manganese measurand is not included in LGC's UKAS scope of accreditation.

#### Sample PT-AR-1A\*\*

Supplied as:

#### Metals

4 x 37 mm diameter cellulose acetate "cassette capsule" spiked with metal solutions plus 2 x blank capsules

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	All	Formulation	5-50	5%	µg	1
Chromium	All	Formulation	10-200	5%	µg	1
Cobalt	All	Formulation	10-200	5%	µg	1
Copper	All	Formulation	10-200	5%	µg	1
Iron	All	Formulation	10-250	5%	µg	1
Manganese	All	Formulation	10-200	5%	µg	1
Nickel	All	Formulation	10-200	5%	µg	1
Lead	All	Formulation	10-200	5%	µg	1
Zinc	All	Formulation	10-200	5%	µg	1

\*\* This sample is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-1B\*\***

**Supplied as:**

**Metals**

4 x 37 mm diameter mixed cellulose ester filters spiked with metal solutions plus 2 x blank filters

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	All	Formulation	5-50	5%	µg	1
Chromium	All	Formulation	10-200	5%	µg	1
Cobalt	All	Formulation	10-200	5%	µg	1
Copper	All	Formulation	10-200	5%	µg	1
Iron	All	Formulation	10-250	5%	µg	1
Manganese	All	Formulation	10-200	5%	µg	1
Nickel	All	Formulation	10-200	5%	µg	1
Lead	All	Formulation	10-200	5%	µg	1
Zinc	All	Formulation	10-200	5%	µg	1

\*\* This sample is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-02**

**Supplied as:**

**Direct on filter measurement of Quartz**

3 x 25 mm diameter PVC filters (GLA5000) loaded with aerosolised quartz by employing the BCIRA respirable sampler (Higgins-Dewell design). One blank filter supplied for participants using XRD technique (sample 2X), up to four blank filters for participants using FTIR technique (sample 2F).

Analyte	Method	AV	Range	SDPA	Units	DP
Respirable grade quartz	All	Robust Mean	60-460	10%	µg	1

**Sample PT-AR-2I**

**Supplied as:**

**Indirect measurement of Quartz by ashing and redeposition onto analytical filter or by KBr disc**

3 x 25 mm diameter PVC filters (GLA5000) loaded with aerosolised quartz by employing the BCIRA respirable sampler (Higgins-Dewell design). One blank filter supplied for participants (Sample 2I).

Analyte	Method	AV	Range	SDPA	Units	DP
Respirable grade quartz	All	Robust Mean	60-460	10%	µg	1

**Sample PT-AR-03**

**Supplied as:**

**Filters, dust analysis**

4 x 25mm diameter glass fibre (GFA) filters, will be spiked with sodium borate salt as a mass surrogate plus 3 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Mass of solids	Gravimetry	Robust Mean	0.2-2.0	10%	mg	3

**Sample PT-AR-04**

Supplied as:

**Filters, dust analysis**

4 x 37mm diameter glass fibre (GFA) filters, will be spiked with sodium borate salt as a mass surrogate plus 3 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Mass of solids	Gravimetry	Robust Mean	0.2-2.0	10%	mg	3

**Sample PT-AR-05**

Supplied as:

**Volatile Organic Compounds**

4 x charcoal filled glass sorbent tubes dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by solvent desorption plus 4 x blank sorbent tubes. Two of these blank sorbent tubes are unopened to be used if required by participant for internal spike recovery tests

Analyte	Method	AV	Range	SDPA	Units	DP
Benzene	All	Robust Mean	10-400	5%	µg	1
Toluene	All	Robust Mean	50-2500	5%	µg	1
Xylene (all isomers)	All	Robust Mean	50-5000	5%	µg	1
Ethyl benzene	All	Robust Mean	20-400	5%	µg	1

**Sample PT-AR-06**

Supplied as:

**Volatile Organic Compounds**

4 x charcoal filled glass sorbent tubes dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by solvent desorption plus 4 x blank sorbent tubes. Two of these blank sorbent tubes are unopened to be used if required by participant for internal spike recovery tests.

Analyte	Method	AV	Range	SDPA	Units	DP
1,1,1,-trichloroethane	All	Robust Mean	250-12000	5%	µg	1
n-hexane	All	Robust Mean	25-1000	5%	µg	1
n-butyl acetate	All	Robust Mean	250-12000	5%	µg	1
Trichloroethylene	All	Robust Mean	80-7000	5%	µg	1
Tetrachloroethene	All	Robust Mean	100-4000	5%	µg	1

**Sample PT-AR-07**
**Supplied as:**
**Volatile Organic Compounds**

4 x spiked Tenax TA filled sorbent tubes (Perkin Elmer type-6.4mm OD, 5 mm ID and 90 mm long) for analysis by thermal desorption plus 2 x blank sorbent tubes.

Analyte	Method	AV	Range	SDPA	Units	DP
Benzene	All	Robust Mean	0.5-15	5%	µg	1
Toluene	All	Robust Mean	2-200	5%	µg	1
Xylene (all isomers)	All	Robust Mean	2-200	5%	µg	1
Ethyl benzene	All	Robust Mean	0.5-50	5%	µg	1

**Sample PT-AR-08**
**Supplied as:**
**Aldehydes**

4 x 25 mm diameter glass fibre filters (GFA) spiked with formaldehyde and acetaldehyde, 2,4,DNPH derivatives, plus 3 x DNPH only treated blanks.

Analyte	Method	AV	Range	SDPA	Units	DP
Formaldehyde	All	Robust Mean	1.5-30	5%	µg	2
Acetaldehyde	All	Robust Mean	1.5-30	5%	µg	2

**Sample PT-AR-09**
**Supplied as:**
**Chromium (VI)**

4 x 25 mm diameter NaOH treated Millipore PVDF filters spiked with Cr(VI) plus 2 x NaOH only blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Chromium (VI)	All	Formulation	5-50	10%	µg	1

**Sample PT-AR-10A/10B\*\*\* Metals in Dust**
**Supplied as:**

1 x powder sample reflecting metal containing dusts/fumes encountered in the workplace environment. Sample matrices:

**10A:** Welding fume derived from mild and stainless-steel welding process.

Analyte*	Method	AV **	Range	SDPA	Units	DP
Chromium	All	Formulation/Expert	0.1-20	10%	% (m/m)	2
Cobalt	All	Formulation/Expert	0.1-20	10%	% (m/m)	2
Copper	All	Formulation/Expert	0.1-20	10%	% (m/m)	2
Iron	All	Formulation/Expert	0.1-70	10%	% (m/m)	2
Manganese	All	Formulation/Expert	0.1-30	10%	% (m/m)	2
Nickel	All	Formulation/Expert	0.1-20	10%	% (m/m)	2
Zinc	All	Formulation/Expert	0.1-30	10%	% (m/m)	2

**10B:** Lead containing dusts

Analyte	Method	AV **	Range	SDPA	Units	DP
Lead	All	Formulation/Expert	0.1-50	10%	% (m/m)	2

\*One or more of the above elements will be included in each round.

\*\*Depending upon the dust sample selected either a formulation or an expert value will be used. The AV used will be documented in the round report

\*\*\*These samples 10A and 10B are not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-16\*\***

Supplied as:

**Diesel Fume**

4 x 25 mm diameter quartz fibre filters loaded with diesel fume plus 3 x blank filters (for analysis in accordance with NIOSH 5040, VDI 2465 part 2 or equivalent).

Analyte	Method	AV	Range	SDPA	Units	DP
Elemental carbon	All	Robust mean	10 - 250	Robust SD	µg	1

\*\*This sample is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-18\*\***

Supplied as:

**Beryllium**

4 x 37 mm diameter mixed cellulose ester filter spiked with beryllium solutions plus 2 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Beryllium	All	Formulation	0.02 - 20	10%	µg	2

**Ambient Air Samples**

**Sample PT-AR-11**

Supplied as:

**Nitrogen Dioxide**

4 x Palmes-type diffusion tubes spiked with sodium nitrite as a surrogate for Nitrogen dioxide (NO<sub>2</sub>)

Analyte	Method	AV	Range	SDPA	Units	DP
NO <sub>2</sub> as nitrite	All	Robust Mean	0.4-3	7.5%	µg	2

**Sample PT-AR-12**

Supplied as:

**Volatile Organic Compounds**

4 x Tenax TA filled sorbent tubes (Perkin Elmer type - 6.4mm OD, 5 mm ID and 90 mm long) dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by thermal desorption plus 2 x blank sorbent tubes

Analyte	Method	AV	Range	SDPA	Units	DP
Benzene	All	Robust Mean	25-1000	7.5%	ng	1
Toluene	All	Robust Mean		7.5%	ng	1
Xylene (all isomers)	All	Robust Mean		7.5%	ng	1
Ethyl benzene	All	Robust Mean		7.5%	ng	1

**Sample PT-AR-12A\*\***

Supplied as:

**Volatile Organic Compounds (Fenceline monitoring according to EPA 325B)**

4 x Carbotack X filled sorbent tubes (Perkin Elmer type - 6.4mm OD, 5mm ID and 90mm long) dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by thermal desorption plus 2 x blank sorbent tubes

Analyte	Method	AV	Range	SDPA	Units	DP
Benzene	All	Robust Mean	25-1000	7.5%	ng	1
Toluene	All	Robust Mean		7.5%	ng	1
Xylene (all isomers)	All	Robust Mean		7.5%	ng	1
Ethyl benzene	All	Robust Mean		7.5%	ng	1

**Sample PT-AR-13\*\***

Supplied as:

**Metals at Ambient air concentrations**

4 x 47 mm diameter quartz fibre filters spiked with metal solutions plus 2 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Antimony	All	Formulation	10-500	10%	ng	1
Arsenic	All	Formulation	10-500	10%	ng	1
Cadmium	All	Formulation	10-500	10%	ng	1
Nickel	All	Formulation	50-15,000	10%	ng	1
Lead	All	Formulation	1000-20,000	10%	ng	1

\*\*This sample is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-14**

Supplied as:

**Anions on filters**

4 x 47 mm diameter quartz filters spiked with anion solutions plus 2 x blank filters.

Analyte	Method	AV	Range	SDPA	Units	DP
Chloride	All	Formulation	5-50	10%	µg	1
Nitrate	All	Formulation	5-50	10%	µg	1
Sulfate	All	Formulation	5-50	10%	µg	1

**Sample PT-AR-17**

Supplied as:

**Filters, dust analysis**

4 x 47 mm diameter quartz fibre filters, will be spiked with sodium borate salt as a mass surrogate plus 3 x blank filters (for analysis in accordance with EN 12341).

Analyte	Method	AV	Range	SDPA	Units	DP
Mass of solids	All	Robust Mean	0.2-8.0	10%	mg	3

**Indoor/Chamber Air Samples**

**Sample PT-AR-21**

Supplied as:

**Volatile Organic Compounds at Chamber air concentrations**

4 x Tenax TA filled sorbent tubes (Perkin Elmer type - 6.4mm OD, 5 mm ID and 90 mm long) dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by thermal desorption plus 2 x blank sorbent tubes.

Analyte	Method	AV	Range	SDPA	Units	DP
n-hexane, Benzene, MIBK, Toluene, Butyl acetate, Styrene, p-Xylene, Diacetyl*, Phenol, 124-TMB, Limonene, 4-PCH, Dodecane	All	Robust Mean	25-1000	15%	ng	0

\*For this sample, the diacetyl measurand is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-22**

Supplied as:

**Qualitative determination of Volatile Organic Compounds**

2 x Tenax TA filled sorbent tubes (Perkin Elmer type - 6.4mm OD, 5 mm ID and 90 mm long) dynamically loaded from the gas phase (prepared in accordance with procedures set out in ISO 6145 part 4) for analysis by thermal desorption plus 2 x blank sorbent tubes.

Analyte	Method	AV	Range	SDPA	Units	DP
Qualitative determination of VOCs including alcohol, aliphatic, aromatic, ester, halocarbon and terpene compounds	All	Formulation	25-1000	N/A	ng	N/A

A list of potential compounds is provided in Appendix B.

### STACK EMISSIONS Samples

#### Sample PT-AR-31

##### Supplied as:

#### Mercury

1 x variable volume 2.2% m/m potassium permanganate/6% m/m sulphuric acid impinger solution (prepared in accordance with BS EN 13211) containing mercury.

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	90-110	5%	mL	0
Mercury	All	Formulation	0.005-0.5	25%	mg/L	3

#### Sample PT-AR-32

##### Supplied as:

#### Mercury

1 x variable volume 4% m/m potassium dichromate/20% m/m nitric acid impinger solution (prepared in accordance with BS EN 13211) containing mercury

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	90-110	5%	mL	0
Mercury	All	Formulation	0.005-0.5	25%	mg/L	3

#### Sample PT-AR-33

##### Supplied as:

#### Metals

1 x variable volume 3.3% nitric acid impinger solution (prepared in accordance with BS EN 14385) containing trace elements

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	150-300	5%	mL	0
Antimony	All	Formulation	0.005-0.5	5%	mg/L	3
Arsenic	All	Formulation	0.005-0.5	5%	mg/L	3
Cadmium	All	Formulation	0.005-0.5	5%	mg/L	3
Chromium	All	Formulation	0.005-0.5	5%	mg/L	3
Cobalt	All	Formulation	0.005-0.5	5%	mg/L	3
Copper	All	Formulation	0.005-0.5	5%	mg/L	3
Lead	All	Formulation	0.005-0.5	5%	mg/L	3
Manganese	All	Formulation	0.005-0.5	5%	mg/L	3
Nickel	All	Formulation	0.005-0.5	5%	mg/L	3
Selenium*	All	Formulation	0.005-0.5	5%	mg/L	3
Thallium	All	Formulation	0.005-0.5	5%	mg/L	3
Vanadium	All	Formulation	0.005-0.5	5%	mg/L	3

Up to six of the trace elements listed above will be included in each round

\*For this sample, the selenium measurand is not included in LGC's UKAS scope of accreditation.

**Sample PT-AR-34**

Supplied as:

**Sulfur dioxide**

 1 x variable volume hydrogen peroxide impinger solution (prepared in accordance with BS EN 14791) containing sulfur dioxide. Sulfur dioxide is determined by the measurement of sulfate (SO<sub>4</sub>) present in the solution.

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	150-400	5%	mL	0
Sulfur dioxide	All	Formulation	0.2-25	10%	mgSO <sub>4</sub> /L	2

**Sample PT-AR-35**

Supplied as:

**Hydrogen fluoride**

1 x variable volume 0.1M sodium hydroxide impinger solution (prepared in accordance with BS EN 15713) containing hydrogen fluoride

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	150-250	5%	mL	0
Hydrogen fluoride	All	Formulation	0.02-1	10%	mgHF/L	2

**Sample PT-AR-36**

Supplied as:

**HCl (hydrogen chloride and hydrochloric acid)**

1 x variable volume impinger solution (prepared using chloride-free reagents, in accordance with BS EN 1911-2) containing hydrogen chloride

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	150-300	5%	mL	0
Hydrogen chloride	All	Formulation	0.2-20	10%	mgHCl/L	2

**Sample PT-AR-37**

Supplied as:

**Ammonia**

1 x variable volume 0.28% sulfuric acid impinger solution (prepared in accordance with US EPA method 26) containing ammonia

Analyte	Method	AV	Range	SDPA	Units	DP
Volume	Various	Formulation	150-400	5%	mL	0
Ammonia	All	Formulation	0.2-20	10%	mgNH <sub>3</sub> /L	2

**Sample PT-AR-38\*\***

Supplied as:

**Metals (on filters)**

1 x 47 mm diameter Quartz filter containing trace elements and fly ash (prepared in accordance with BS EN 14385)

Analyte*	Method	AV	Range	SDPA	Units	DP
Antimony	All	Formulation	1-500	10%	µg	1
Arsenic	All	Formulation	1-500	10%	µg	1
Cadmium	All	Formulation	1-500	10%	µg	1
Chromium	All	Formulation	1-500	10%	µg	1
Cobalt	All	Formulation	1-500	10%	µg	1
Copper	All	Formulation	1-500	10%	µg	1

Analyte*	Method	AV	Range	SDPA	Units	DP
Antimony	All	Formulation	1-500	10%	µg	1
Arsenic	All	Formulation	1-500	10%	µg	1
Cadmium	All	Formulation	1-500	10%	µg	1
Chromium	All	Formulation	1-500	10%	µg	1
Cobalt	All	Formulation	1-500	10%	µg	1
Copper	All	Formulation	1-500	10%	µg	1
Lead	All	Formulation	1-500	10%	µg	1
Manganese	All	Formulation	1-500	10%	µg	1
Nickel	All	Formulation	1-500	10%	µg	1
Selenium	All	Formulation	1-500	10%	µg	1
Thallium	All	Formulation	1-500	10%	µg	1
Vanadium	All	Formulation	1-500	10%	µg	1

\*Up to six of the trace elements listed above will be included in each round.

**Sample PT-AR-39\*\***

**Rinsing solution, dust analysis (by Gravimetry)**

Supplied as:

1 x 250mL rinsing solution containing dissolved and suspended solids (prepared in accordance with EN 13284-1)

Analyte	Method	AV	Range	SDPA	Units	DP
Total Solids	Gravimetry	Formulation	2.5-20	Robust SD	mg	2

**Sample PT-AR-40**

**Filters, dust analysis (by Gravimetry)**

Supplied as:

4 x 47mm diameter Quartz filters, will be spiked with potassium hydrogen phthalate salt as mass surrogate (for analysis in accordance with EN 13284-1)

Analyte	Method	AV	Range	SDPA	Units	DP
Mass of solids	Gravimetry	Robust Mean	2.5-20	10%	mg	2

\*\*This sample is not included in LGC's UKAS scope of accreditation.

**APPENDIX B – Potential Compounds**

Chemical
1-Bromopropane
1-Methoxy-2-propanol (propylene glycol monomethyl ether)
1-Methoxy-2-propylacetate (propylene glycol monomethyl ether acetate)
1-Methylnaphthalene
1-Octene
1,1,1-Trichloroethane
1,1,2-Trifluorotrchloroethane
1,1,2,2-Tetrachloroethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,2,3,5-Tetramethylbenzene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3,5-Trichlorobenzene
1,3,5-Trimethylbenzene
1,4-Dichlorobenzene
1,4-Dioxane
2-Butoxyethyl acetate
2-Ethyl-1-hexanol
2-Methyl-2-butanol
2-Pentanol
2-Phenoxyethanol
2,3-Pentanedione
2,4-Dimethylheptane
2,4-Dimethylphenol
2,4-Pentanedione
3-Ethyltoluene
3-Methylbutan-1-ol
3-Methyloctane
4-Ethylphenol
4-Fluorotoluene
4-Methylpentan-2-ol
a-Methylstyrene
a-Pinene
a-Terpineol
Acetophenone
Acrylonitrile
b-pinene
Benzene
Benzyl alcohol

Chemical
Diacetone alcohol
Diacetyl (2,3-Butanedione)
Ethyl acetate
Ethyl acrylate
Ethylbenzene
Furfural
g-Terpinene
Hexyl acetate
Hexyl acrylate
Isoamyl acetate
Isobutyl acetate
Isobutanol
Isooctane (2,2,4-Trimethylpentane)
Isophorone
Limonene
Linalool
m-Cresol
Menthone
Methylcyclopentane
Methyl ethyl ketone
Methyl isobutyl ketone
Methoxyethanol
Methyl t-butyl ether
Methyl methacrylate
Methyl salicylate
n-Butanol
n-Butyl acetate
n-Decane
n-Dodecane
n-Hexane
n-Heptane
n-Octane
n-Nonane
n-Propanol
n-Propyl acetate
n-Tetradecane
Naphthalene
N-Methyl-2-pyrrolidinone (NMP)
o-Xylene
Octamethylcyclotetrasiloxane (OMCTS)
Octan-3-one

Chemical
Benzyl chloride
Butan-2-ol
Butoxyethanol
Butyl acrylate
Camphene
Carvone
Chlorobenzene
Cumene
Cyclohexane
Cyclohexene
Cyclohexanone
Decamethylcyclopentasiloxane (DMCPS)
Decamethyltetrasiloxane

Chemical
p-Anisaldehyde
p-Xylene
Pentan-2-one
Phenol
Propylbenzene
Styrene
Tetrachloroethylene
Tetrahydrofuran
Tetralin (1,2,3,4-Tetrahydronaphthalene)
Toluene
Trichloroethylene
Trichloropropane