Environmental quality monitoring Product catalogue for our Consett laboratory

Soil, water, fuel and waste

Normec DETS

Improve Quality. Reduce Risk.

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Market leading laboratory

Normec DETS is part of Normec, an ambitious, independent and fast-growing organisation in the testing, inspection, certification and compliance (TICC) industry. We provide a range of analytical testing and technical solutions for our customers.

With over twenty years' experience in the industry, we serve a client base of environmental consultants, site investigation companies, remediation companies, local authorities, regulators, waste companies and industrial manufacturers. We have two laboratories that are accredited to ISO 17025 and MCERTS:

- Normec DETS, Consett, County Durham, a UKAS accredited testing laboratory No. 2139
- Normec DETS, Lenham Heath, Kent, a UKAS accredited testing laboratory No. 4480

With a dedicated team of 160+ and state of the art laboratories, we are well equipped to deal with varied and demanding client requirements. We also have our own team of drivers and vans.

We offer a full range of environmental determinands for metals, organics (TPH, PAHs, VOCs, SVOCs, pesticides) all standard water quality parameters (pH, EC, anions, BOD, COD, TSS, TDS etc), plus specialist soil tests.

We also offer a range of specialist waste analyses including TOC, LoI, SRF, ADF, CV, WAC and other leaching tests.

Our Consett laboratory is recognised as a centre of excellence for asbestos analysis and offers the following tests:

- Asbestos identification
- Asbestos quantification, including fibre dispersion and counting
- Respirable fibres
- Respirable fibres in respirable dust
- Classification for licensed or non-licensed work

This product catalogue provides an overview of our services for our Consett laboratory. For specific details about our Lenham laboratory, contact 01622 850 410 or enquiries-dets@normecgroup.com.

The first section provides summary sheets for soils and waters, with the subsequent pages providing in depth information on individual determinands, limits of detection, and accreditation status, plus a number of commonly requested suites and packages.

We can also provide a range of specialist analysis. Please contact us for more details.

02

Deviating samples

In light of the guidance provided by the Laboratory Committee of the European cooperation for Accreditation (EA) in document EA/LC (07) 60, UKAS would like to reiterate its position relating to the handling of deviating samples by accredited laboratories and the disclaimers required in test reports or certificates.

Deviating samples are samples that are not (correctly) preserved, for example they may have exceeded their maximum preservation time, lack the date and time of sampling, are not cooled or have inappropriate headspace. As a result, deviating samples may jeopardise the validity of the reported test result.

Accreditation bodies which are members of EA have previously observed that laboratories, in particular those operating in highly competitive markets, were not critical about the samples they received. Large numbers of deviating samples were accepted, analysed, and test reports were issued without any remark.

The EA Laboratory Committee members concluded that such practice is not in the interest of the laboratories, their customers or other end-users of the test result(s), nor of the accreditation bodies. Laboratories must therefore inform customers regarding samples which are deviating and include appropriate comments in their final reports.

Issued February 2025

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Soils summary

Analyte	Minimum required (g)	Container G = 1l glass P = 1l plastic	Stability	LOD	Units	Preparation method	Extraction method	Analysis method	Accreditation (MCERTS includes 17025)
Acid herbicides	250	G	2 weeks	35	ug/kg	As received	Formic acid /acetonitrile	LCMS MS	17025
Alkalinity	500	G or P	1 week	10	mg/kg	Dried & crushed	Aqueous Extraction	Titration	None
Aluminium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Ammoniacal nitrogen	500	G or P	3 days	0 .5	mg/kg	As received	Aqueous Extraction	Colorimetric	MCERTS
Antimony	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Arsenic	500	G or P	6 months	0.2	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Asbestos ID	1000	G or P	None	n/a	n/a	Mechanical	n/a	PL Microscope	17025
Asbestos quantification	1000	G or P	None	0 .001	%	Dispersion	n/a	PCO Microscope	17025
Asbestos bulk ID	500	G or P	None	n/a	n/a	Mechanical	n/a	PL Microscope	17025
Barium	500	G or P	6 months	1 .5	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Beryllium	500	G or P	6 months	0 .2	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Boron, water soluble	500	G or P	6 months	0 .2	mg/kg	Dried & crushed	Hot Aqueous Extraction	ICP OES	MCERTS
Bromide	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	IC	None
BTEX	60	60ml glass	2 weeks	0 .01	mg/kg	As received	Headspace	GC FID	MCERTS
Cadmium	500 G or P	G or P	6 months	0 .1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Calcium, available	500	G or P	6 months	0 .1	mg/kg	Dried & crushed	Ammonium Nitrate	ICP OES	None
Carbonate	500	G or P	4 weeks	1	%	Dried & crushed	1M Hydrochloric Acid	Titration	17025
Chloride water soluble	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	IC	17025
Chloride water soluble	500	G or P	1 month	0 .01	%	Dried & crushed	Aqueous Extraction	Titration	17025
Chloride acid soluble	500	G or P	1 month	0 .01	%	Dried & crushed	Nitric Acid Extraction	Titration	17025
Chromium	500	G or P	6 months	0 .15	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Chromium Hexavalent	500	G or P	1 month	1	mg/kg	As received	Aqueous Extraction	Colorimetric	None
Cobalt	500	G or P	6 months	0 .7	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS

Analyte	Minimum required (g)	Container G = 1l glass P = 1l plastic	Stability	LOD	Units	Preparation method	Extraction method	Analysis method	Accreditation (MCERTS includes 17025)
Copper	500	G or P	6 months	0 .2	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Cyanide total	500	G or P	2 weeks	0 .1	mg/kg	As received	Sodium Hydroxide	Continuous flow	MCERTS
Cyanide free (easily liberatable)	500	G or P	2 weeks	0 .1	mg/kg	As received	Sodium Hydroxide	Continuous flow	MCERTS
Cyanide complex	500	G or P	2 weeks	0 .2	mg/kg	n/a	n/a	Calculation	None
Cyclohexane Ext . Matter - CEM	500	G	2 weeks	50	mg/kg	As received	Cyclohexane	Gravimetric	None
Electrical conductivity	500	G or P	1 week	1	µS/cm	Dried & crushed	Aqueous Extraction	Potentiometric	17025
Electrical conductivity	500	G or P	1 week	1	µS/cm	Dried & crushed	Calcium Sulphate	Potentiometric	None
EPH (extractable petroleum hydrocarbons)	250	G	2 weeks	10	mg/kg	As received	DCM Extraction	GC FID	MCERTS
EPH (extractable petroleum hydrocarbons)	250	G	2 weeks	10	mg/kg	As received	Hexane: Acetone Extraction	GCGC	MCERTS
Fluoride	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	IC	17025
Iron total	500	G or P	6 months	25	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	17025
Lead	500	G or P	6 months	0 .3	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Lithium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Loss on ignition	500	G or P	4 weeks	0 .01	%	Dried & crushed	n/a	Gravimetric	MCERTS
Magnesium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Magnesium, available	500	G or P	6 months	0 .1	mg/kg	Dried & crushed	Ammonium Nitrate	ICP OES	None
Manganese	500	G or P	6 months	20	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Mercury	500	G or P	4 weeks	0 .05	mg/kg	Dried & crushed	Aqua Regia Digest	AFS	MCERTS
Mercury elemental	100	G or P	4 weeks	0 .6	µg/kg	As received	Argon purge	AFS	None
Mercury organic	100	G or P	4 weeks	100	µg/kg	Dried & crushed	Acid Digest	AFS	None
Mercury inorganic	100	G or P	4 weeks	100	µg/kg	Dried & crushed	Acid Digest	AFS	None
Molybdenum	500	G or P	6 months	0 .4	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Nickel	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS

Analyte	Minimum required (g)	Container G = 1l glass P = 1l plastic	Stability	LOD	Units	Preparation method	Extraction method	Analysis method	Accreditation (MCERTS includes 17025)
Nitrate	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	IC	17025
Nitrate	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	Colorimetric	None
Nitrite	500	G or P	1 month	1	mg/kg	Dried & crushed	Aqueous Extraction	IC	17025
Nitrite	500	G or P	1 month	0.5	mg/kg	Dried & crushed	Aqueous Extraction	Colorimetric	None
Nitrogen total	500	G or P	1 month	0.01	%	Dried & crushed	Infra-red	Calculation	None
Nitrogen Kjeldahl	500	G or P	1 month	0.01	%	Dried & crushed	n/a	Calculation	None
Nitrogen total Oxidised	500	G or P	1 month	7	mg/kg	Dried & crushed	Aqueous Extraction	Colorimetric	None
OCPs (organo-chlorine pesticides)	250	G	1 month	0.1	mg/kg	As received	Hexane/ acetone	GC MS	None
OPPs (organophos-phorous pesticides)	250	G	2 weeks	0.1	mg/kg	As received	Hexane/ acetone	GC MS	None
Organic matter	500	G or P	28 days	0.1	%	Dried & crushed	Sulphuric Acid Digest	Titration	MCERTS
pH	500	G or P	1 week	1	pH units	Dried & crushed	Aqueous Extraction	Potentiometric	MCERTS
PAHs	250	G	2 weeks	0.1	mg/kg	As received	Hexane/ acetone	GC MS	17025
PCBs	250	G	1 month	0.01	mg/kg	As received	Hexane/ acetone	GC MS	MCERTS
Phenols Monohydric	500	G or P	2 weeks	0.3	mg/kg	As received	Sodium Hydroxide	Continuous Flow	MCERTS
Phenols speciated	250	G	2 weeks	0.01	mg/kg	As received	DCM	GC MS	None
Phosphate	500	G or P	1 month	0.1	mg/kg	Dried & crushed	Aqueous Extraction	Colorimetric	None
Phosphorous	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Phosphorous, available	500	G or P	6 months	0.1	mg/kg	Dried & crushed	NaHCO3	ICP OES	None
Potassium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Potassium, available	500	G or P	6 months	0.1	mg/kg	Dried & crushed	Ammonium Nitrate	ICP OES	None
PRO/GRO	60	60ml glass	2 weeks	0.01	mg/kg	As received	Headspace	GC FID	None
Selenium	500	G or P	6 months	0.5	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Silica	500	G or P	6 months	10	mg/kg	Dried & crushed	None	XRF	None

Analyte	Minimum required (g)	Container G = 1l glass P = 1l plastic	Stability	LOD	Units	Preparation method	Extraction method	Analysis method	Accreditation (MCERTS includes 17025)
Silver	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Sodium	500	G or P	6 months	0 .1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Sodium, available	500	G or P	6 months	0 .1	mg/kg	Dried & crushed	Ammonium Nitrate	ICP OES	None
Strontium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Sulphate water soluble	500	G or P	1 month	10	mg/l	Dried & crushed	Aqueous Extraction	ICP OES	MCERTS
Sulphate water soluble	500	G or P	1 month	1	mg/l	Dried & crushed	Aqueous Extraction	IC	17025
Sulphate total	500	G or P	1 month	0 .01	%	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Sulphide	500	G or P	1 week	10	mg/kg	As received	Distillation	Titration	None
Sulphur total	500	G or P	1 week	0 .01	%	Dried & crushed	Aqua Regia Digest	ICP OES	17025
Sulphur elemental	250	G or P	1 week	0 .75	mg/kg	As received	DCM	HPLC	MCERTS
SVOCs	250	G	2 weeks	0 .1	mg/kg	As received	Hexane/ acetone	GC MS	17025
Tellurium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Thallium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
Thiocyanate	500	G or P	2 weeks	0 .6	mg/kg	As received	Sodium Hydroxide	Continuous Flow	MCERTS
Tin	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	17025
Titanium	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	None
TOC (total organic carbon)	500	G or P	4 weeks	0 .5	%	Dried & crushed	None	Auto analyser	MCERTS
TEM (toluene extractable matter)	500	G	2 weeks	40	mg/kg	As received	Toluene	Gravimetric	None
TPH CWG C10 to C40	250	G	2 weeks	10	mg/kg	As received	Hexane/DC M	GC FID	MCERTS
TPH CWG C10 to C40	250	G	2 weeks	10	Mg/kg	As received	Hexane: Acetone Extraction	GCGC	MCERTS
Triazines	250	G	2 weeks	0 .1	mg/kg	As received	Hexane/ acetone	GC MS	None
Vanadium	500	G or P	6 months	0 .8	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
VOCs	60	60ml glass	1 week	0 .01	mg/kg	As received	Headspace	GC MS	17025
Zinc	500	G or P	6 months	1	mg/kg	Dried & crushed	Aqua Regia Digest	ICP OES	MCERTS
Zinc, available	500	G or P	6 months	0 .002	mg/kg	Dried & crushed	EDTA Extraction	ICP OES	None
Zinc equivalent	500	G or P	6 months	0 .002	mg/kg	n/a	n/a	Calculation	None

Soils summary

Per- & Poly- fluoroalkyl Substances are widely used around the world to make products that resist heat, stains, grease and water. Some of these substances have been found to be toxic and have been linked to health problems including liver damage, kidney cancer and birth defects.

We've developed a method to identify PFAS compounds in environmental samples.

Determinands	Method	LOD	UNITS	Accreditation
Perfluoro-n-butanoic acid (PFBA)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-pentanoic acid (PFPeA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-butanesulfonate (PFBS)	LCMS MS	0.2	ug/kg	N
1H,1H,2H,2H-perfluoro-1-hexanesulfonate (4-2 FTSA)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-hexanoic acid (PFHxA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-pentanesulfonate (PFPeS)	LCMS MS	0.2	ug/kg	N
Tetrafluoro-2-(heptafluoropropoxy)-propanoic acid (HFPO-DA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-butanesulfonamide (FBSA)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-heptanoic acid (PFHpA)	LCMS MS	0.2	ug/kg	N
Perfluorohexanesulfonate (PFHxS) (Linear+Branched)	LCMS MS	0.2	ug/kg	N
Dodecafluoro-3H-4,8-dioxanonanoate (DONA)	LCMS MS	0.2	ug/kg	N
1H,1H,2H,2H-perfluoro-1-octanesulfonate (6-2 FTS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-octanoic acid (PFOA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-heptanesulfonate (PFHpS)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-hexanesulfonamide (FHxSA)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-nonanoic acid (PFNA)	LCMS MS	0.2	ug/kg	N
Perfluorooctanesulfonate (PFOS) (Linear+Branched)	LCMS MS	0.2	ug/kg	N
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (9Cl-PF3ONS)	LCMS MS	0.2	ug/kg	N
1H,1H,2H,2H-perfluoro-1-decanesulfonate (8-2 FTSA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-nonanesulfonate (PFNS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-decanoic acid (PFDA)	LCMS MS	0.2	ug/kg	N
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-decanesulfonate (PFDS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-undecanoic acid (PFUdA)	LCMS MS	0.2	ug/kg	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-octanesulfonamide (PFOSA)	LCMS MS	0.2	ug/kg	N
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3OUdS)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-undecanesulfonate (L-PFUdS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-dodecanoic acid (PFDoA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-dodecanesulfonate (L-PFDoS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-tridecanoic acid (PFTrDA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-tridecanesulfonate (L-PFTrDS)	LCMS MS	0.2	ug/kg	N
Perfluoro-n-tetradecanoic acid (PFTDA)	LCMS MS	0.2	ug/kg	N
Perfluorohexanesulfonate (PFHxS) (Branched)	LCMS MS	0.2	ug/kg	N
Perfluorohexanesulfonate (PFHxS) (Linear)	LCMS MS	0.2	ug/kg	N

Determinands	Method	LOD	UNITS	Accreditation
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	0.2	ug/kg	N
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	0.2	ug/kg	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	0.2	ug/kg	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	0.2	ug/kg	N
Perfluoro-1-undecanesulfonic acid (L-PFUdS)	LCMS MS	0.194	ug/kg	N

Notes

In most cases, the analysis can be performed on a significantly reduced weight of sample, but to provide as representative a sample as possible, these weights are recommended.

All determinands are reported on a dry weight basis, therefore sufficient soil must be provided to allow a moisture content to be analysed for all as received analysis.

A separate tub/bag must be supplied if an asbestos analysis is required, and these must be double bagged for transportation.

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Waters summary

Analyte	Minimum required (ml)	Container G=1l glass P=1l plastic	Stability	LOD	Unit	Prep/Extraction Method	Method	Accreditation
Acid Herbicides	250	G	7 days	0 .02	ug/l	n/a	LCMS MS	17025
Acidity	500	G or P	2 weeks	10	mg/l	n/a	Titration	None
Alkalinity	500	G or P	2 weeks	10	mg/l	n/a	Titration	17025
Aluminium	500	G or P	6 months	10	ug/l	n/a	ICP MS	17025
Ammonia	500	G or P	21 days	0 .015	mg/l	n/a	Calculation	None
Ammoniacal Nitrogen	500	G or P	21 days	0 .015	mg/l	n/a	Colorimetric	17025
Antimony	500	G or P	6 months	0 .17	ug/l	n/a	ICP MS	17025
Arsenic	500	G or P	6 months	0 .16	ug/l	n/a	ICP MS	17025
Barium	500	G or P	6 months	0 .26	ug/l	n/a	ICP MS	17025
Beryllium	500	G or P	6 months	0 .1	ug/l	n/a	ICP MS	None
Bismuth	500	G or P	6 months	1	ug/l	n/a	ICP MS	None
BOD	500	G or P	2 days	1	mg/l	5 day ATU	Meter	17025
Boron	500	G or P	6 months	12	ug/l	n/a	ICP MS	None
Bromide	500	G or P	1 month	0 .1	mg/l	n/a	IC	None
BTEX	40	40ml glass	1 week	1	ug/l	Headspace	GC FID	17025
Cadmium	500	G or P	6 months	0 .03	ug/l	n/a	ICP MS	17025
Calcium	500	G or P	6 months	0 .1	mg/l	n/a	ICP MS	17025
Chloride	500	G or P	1 month	0 .1	mg/l	n/a	IC	17025
Chlorine	250	G or P	1 day	0 .01	mg/l	n/a	Kit	None
Chromium	500	G or P	6 months	0 .25	ug/l	n/a	ICP MS	17025
Chromium Hexavalent	500	G or P	4 days	7	ug/l	n/a	Colorimetric	17025
Cobalt	500	G or P	6 months	0 .16	ug/l	n/a	ICP MS	17025
COD	150	G or P	6 months	10	mg/l	Dichromate digestion	Colorimetric	17025/ MCERTS
Copper	500	G or P	6 months	0 .4	ug/l	n/a	ICP MS	17025
Cyanide total	500	G or P	14 days	0.1	ug/l	Sodium Hydroxide	Continuous Flow	17025
Cyanide free	500	G or P	14 days	0.1	ug/l	Sodium Hydroxide	Continuous Flow	17025
Cyanide complex	500	G or P	14 days	0 .1	ug/l	n/a	Calculation	17025
Cyclohexane Ext . Matter - CEM	500	G	1 month	1	mg/l	Cyclohexane	Gravimetric	17025
Dissolved organic carbon (DOC)	250	G or P	28 days	2	mg/l	Filtration	Auto Analyser	17025
Dissolved oxygen	250	G or P	2 days	0 .1	mg/l	n/a	Meter	None
Electrical conductivity	500	G or P	24 hours	1	uS/cm	n/a	Potentiometric	17025

Analyte	Minimum required (ml)	Container G=1l glass P=1l plastic	Stability	LOD	Unit	Prep/Extraction Method	Method	Accreditation
EPH	250	G or P	4 days	10	ug/l	DCM Extraction	GC FID	17025
Fluoride	500	G or P	28 days	0 .1	mg/l	n/a	IC	None
Hardness	250	G or P	6 months	0 .1	mg/l	n/a	Calculation	17025
Iodide	250	G or P	28 days	0 .1	mg/l	n/a	IC	None
Iron total	500	G or P	6 months	5 .5	ug/l	n/a	ICP MS	17025
Iron Ferric	500	G or P	1 week	0 .1	mg/l	n/a	Calculation	None
Iron Ferrous	500	G or P	1 week	0 .1	mg/l	Sulphuric Acid Digest	Colorimetric	None
Lead	500	G or P	6 months	0 .09	ug/l	n/a	ICP MS	17025
Lithium	500	G or P	6 months	1	ug/l	n/a	ICP MS	None
Magnesium	500	G or P	6 months	0 .02	mg/l	n/a	ICP MS	17025
Manganese	500	G or P	6 months	0 .22	ug/l	n/a	ICP MS	17025
Mercury	500	G or P	6 months	0 .001	ug/l	n/a	AFS	17025
Mercury elemental	100	G or P	2 weeks	1	ug/l	Argon purge	AFS	None
Mercury organic	100	G or P	2 weeks	1	ug/l	n/a	AFS	None
Mercury inorganic	100	G or P	28 days	1	ug/l	n/a	AFS	None
Microplastics	250	G	2 weeks	0.1	g	n/a	Gravimetric	None
Molybdenum	500	G or P	6 months	1 .1	ug/l	n/a	ICP MS	None
Nickel	500	G or P	6 months	0 .5	ug/l	n/a	ICP MS	17025
Nitrate	500	G or P	28 days	0 .1	mg/l	n/a	IC	17025
Nitrate	500	G or P	28 days	0 .1	mg/l	n/a	Colorimetric	None
Nitrite	500	G or P	5 days	0 .1	mg/l	n/a	IC	17025
Nitrite	500	G or P	5 days	0 .035	mg/l	n/a	Colorimetric	17025
Nitrogen total	500	G or P	1 month	1	mg/l	n/a	Infra-red	None
Nitrogen Kjeldahl	500	G or P	1 month	1	mg/l	n/a	Calculation	None
Nitrogen total Oxidised	500	G or P	5 days	0 .7	mg/l	n/a	Colorimetric	17025
OCPs	250	G	1 week	1	ug/l	DCM extraction	GC MS	None
OPPs	250	G	1 week	1	ug/l	DCM extraction	GC MS	None
pH	500	G or P	24 hours	1	pH units	n/a	Potentiometric	17025
PAHs (total)	250	G	4 days	0 .2	ug/l	DCM extraction	GC MS	17025
PCBs (total)	250	G	1 week	1	ug/l	DCM extraction	GC MS	17025
PFAS	250	G	2 weeks	3	ng/l	n/a	LCMSMS	None
Phenols Monohydric	500	G or P	3 weeks	1 .5	ug/l	Sodium Hydroxide	Continuous Flow	17025
Phenols Speciated	250	G	3 weeks	0 .5	ug/l	DCM	GC MS	None
Phosphate	500	G or P	5 days	0 .01	mg/l	n/a	Colorimetric	17025

Analyte	Minimum required (ml)	Container G=1l glass P=1l plastic	Stability	LOD	Unit	Prep/Extraction Method	Method	Accreditation
Phosphorous	500	G or P	6 months	10	ug/l	n/a	ICP MS	17025
Potassium	500	G or P	6 months	0 .08	mg/l	n/a	ICP MS	17025
Phosphorous	500	G or P	6 months	10	ug/l	n/a	ICP MS	17025
Potassium	500	G or P	6 months	0 .08	mg/l	n/a	ICP MS	17025
PRO/GRO	60	60ml glass	7 days	1	ug/l	Headspace	GC FID	17025
Selenium	500	G or P	6 months	0 .25	ug/l	n/a	ICP MS	17025
Silver	500	G or P	6 months	0 .13	ug/l	n/a	ICP MS	None
Sodium	500	G or P	6 months	0 .07	mg/l	n/a	ICP MS	17025
Strontium	500	G or P	6 months	0 .4	ug/l	n/a	ICP MS	None
Sulphate	500	G or P	28 days	0 .01	mg/l	n/a	ICP OES	None
Sulphate	500	G or P	28 days	0 .1	mg/l	n/a	IC	17025
Sulphide	500	G or P	1 week	10	ug/l	n/a	Colorimetric	17025
Sulphur total	500	G or P	1 week	10	mg/l	n/a	ICP OES	None
Sulphur elemental	250	G or P	1 week	84	ug/l	DCM extraction	HPLC	17025
SVOCs	250	G	1 week	1	ug/l	DCM extraction	GC MS	None
TDS	250	G or P	1 week	5	mg/l	Filtration	Gravimetric	17025
Tellurium	500	G or P	6 months	0 .1	ug/l	n/a	ICP MS	None
Thallium	500	G or P	6 months	0 .08	ug/l	n/a	ICP MS	None
Thiocyanate	500	G or P	3 days	20	ug/l	Sodium Hydroxide	Colorimetric	17025
Tin	500	G or P	6 months	0 .4	ug/l	n/a	ICP MS	None
Organo Tin compounds (total)	500	G	2 weeks	10	ug/l	DCM extraction	GCMS	None
Titanium	500	G or P	6 months	0 .3	ug/l	n/a	ICP MS	None
TOC	500	G or P	28 days	1	mg/l	n/a	Auto analyser	17025
Toluene Ext . Matter - TEM	500	G	1 month	1	mg/l	Toluene	Gravimetric	17025
TPH CWG C10 to C40	250	G	4 days	10	ug/l	Hexane/DCM	GC FID	None
Triazines	250	G	1 month	1	ug/l	DCM extraction	GC MS	None
TSS	250	G or P	48 hours	5	mg/l	Filtration	Gravimetric	17025
Vanadium	500	G or P	6 months	0 .6	ug/l	n/a	ICP MS	17025
VOCs	40	40ml glass	1 week	varies	ug/l	Headspace	GC MS	17025
Zinc	500	G or P	6 months	1 .3	ug/l	n/a	ICP MS	17025

Notes
Most inorganic tests can be performed an a significantly reduced volume, but not the organics. If very low detection limits are required for organics, a larger volume may be required.

If preserved bottles are used, the samples must be filtered on site, particularly for metals.

Samples should be stored at 4.5 +/- 3.5^{o}C as stated in the MCERTS standard for water testing.

Free ammonia is derived by calculation from the ammoniacal nitrogen and the pH of the sample.

BOD samples should always be taken in a separate bottle with no head space.

Per- & Poly- fluoroalkyl Substances (PFAS)

Determinands	Method	LOD	UNITS	Accreditation
Perfluoro-n-butanoic acid (PFBA)	LCMS MS	10	ng/l	N
Perfluoro-n-pentanoic acid (PFPeA)	LCMS MS	3	ng/l	N
Perfluoro-1-butanesulfonate (PFBS)	LCMS MS	3	ng/l	N
1H,1H,2H,2H-perfluoro-1-hexanesulfonate (4-2 FTSA)	LCMS MS	3	ng/l	N
Perfluoro-n-hexanoic acid (PFHxA)	LCMS MS	3	ng/l	N
Perfluoro-1-pentanesulfonate (PFPeS)	LCMS MS	3	ng/l	N
Tetrafluoro-2-(heptafluoropropoxy)-propanoic acid (HFPO-DA)	LCMS MS	3	ng/l	N
Perfluoro-1-butanesulfonamide (FBSA)	LCMS MS	3	ng/l	N
Perfluoro-n-heptanoic acid (PFHpA)	LCMS MS	3	ng/l	N
Perfluorohexanesulfonate (PFHxS) (Linear+Branched)	LCMS MS	3	ng/l	N
Dodecafluoro-3H-4,8-dioxanonanoate (DONA)	LCMS MS	3	ng/l	N
1H,1H,2H,2H-perfluoro-1-octanesulfonate (6-2 FTS)	LCMS MS	3	ng/l	N
Perfluoro-n-octanoic acid (PFOA)	LCMS MS	3	ng/l	N
Perfluoro-1-heptanesulfonate (PFHpS)	LCMS MS	3	ng/l	N
Perfluoro-1-hexanesulfonamide (FHxSA)	LCMS MS	3	ng/l	N
Perfluoro-n-nonanoic acid (PFNA)	LCMS MS	3	ng/l	N
Perfluorooctanesulfonate (PFOS) (Linear+Branched)	LCMS MS	3	ng/l	N
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (9Cl-PF3ONS)	LCMS MS	3	ng/l	N
1H,1H,2H,2H-perfluoro-1-decanesulfonate (8-2 FTSA)	LCMS MS	10	ng/l	N
Perfluoro-1-nonanesulfonate (PFNS)	LCMS MS	10	ng/l	N
Perfluoro-n-decanoic acid (PFDA)	LCMS MS	3	ng/l	N
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	10	ng/l	N
Perfluoro-1-decanesulfonate (PFDS)	LCMS MS	10	ng/l	N
Perfluoro-n-undecanoic acid (PFUdA)	LCMS MS	10	ng/l	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	10	ng/l	N
Perfluoro-1-octanesulfonamide (PFOSA)	LCMS MS	10	ng/l	N
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3OUdS)	LCMS MS	10	ng/l	N
Perfluoro-1-undecanesulfonate (L-PFUdS)	LCMS MS	10	ng/l	N
Perfluoro-n-dodecanoic acid (PFDoA)	LCMS MS	10	ng/l	N
Perfluoro-1-dodecanesulfonate (L-PFDoS)	LCMS MS	10	ng/l	N
Perfluoro-n-tridecanoic acid (PFTrDA)	LCMS MS	10	ng/l	N
Perfluoro-1-tridecanesulfonate (L-PFTrDS)	LCMS MS	10	ng/l	N
Perfluoro-n-tetradecanoic acid (PFTDA)	LCMS MS	10	ng/l	N
Perfluorohexanesulfonate (PFHxS) (Branched)	LCMS MS	3	ng/l	N
Perfluorohexanesulfonate (PFHxS) (Linear)	LCMS MS	3	ng/l	N
Perfluorooctanesulfonate (PFOS) (Branched)	LCMS MS	3	ng/l	N
Perfluorooctanesulfonate (PFOS) (Linear)	LCMS MS	3	ng/l	N
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	10	ng/l	N
N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA)	LCMS MS	10	ng/l	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	10	ng/l	N
N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA)	LCMS MS	10	ng/l	N
Perfluoro-1-undecanesulfonic acid (L-PFUdS)	LCMS MS	9.68	ng/l	N

05

Mircoplastics

Water

Our new capability is based on the National Oceanic and Atmospheric Administration (NOAA) method and provides analysis to quantify microplastics in marine environmental samples and calculates concentrations using a variety of metrics.

Microplastics are small pieces of plastic that are less than five millimeters long and can be harmful to our ocean and aquatic life.

Determinands and Limits of Detection (LOD)

The limit of detection of the method is 0.1 grams per litre. The unit of the detection limit is dependent on the report format selected and can be either g, g/l or %.

There are three report formats with the NOAA method that all have the same LOD as above. The standard and default format is listed first in the bullet points below:

- MP-G-L is the total microplastics extracted from the whole sample in grams
- MP-GL-L is the microplastics in the sample reported as g/litre (sample volumes will be measured prior to extraction)
- MP-PC-L is the microplastics content as a percentage of the total weight of solids extracted (which can include wood, seaweed and other organics).

06

Gases

Soil gas analysis is useful in determining if methane is generated from a site, or to provide a profile of possible contamination such as volatile solvents or petroleum products. Gases are usually sampled in Tedlar bags.

Bulk gas

Determinand	LOD	Units	Accreditation
Methane	0 .005	%	None
Carbon Dioxide	0 .005	%	None
Oxygen		%	None
Nitrogen	0 .005	%	None
Carbon Monoxide	0 .005	%	None
Hydrogen	1	%	None
Hydrogen sulphide	0 .005	%	None

C1 - C7

Determinand	LOD	Units	Accreditation
Acetylene	0 .005	%	None
Ethylene	0 .005	%	None
Ethane	0 .005	%	None
Methyl acetylene	0 .005	%	None
Propylene	0 .005	%	None
Propane	0 .005	%	None
Butane	0 .005	%	None

07

Fuels

We offer a wide range of testing on recovered waste materials including SRF, ADF, compositional and elemental analysis.

Test	LOD	Units	SRF – In-house method based on:	Solid biofuel – In-house method based on:
Sample preparation				
Analysis Moisture	0 .10	%	BS EN ISO 21660-3	BS EN ISO 18134-3
Total Moisture	0 .10	%	BS EN 15414	BS EN ISO 18134-2
Ash Content -Coal (as analysed, as received, dry basis)	0 .10	%	*****	*****
Ash Content - Solid Biomass & SRF (as analysed, as received, dry basis)	0 .10	%	BS EN ISO 21656	BS EN ISO 18122
Gross Calorific Value (as analysed, as received, dry & dry ash free basis)	1 .00	MJ/kg	BS EN ISO 21654	BS EN ISO 18125
Net Calorific Value (as received & dry basis)	1 .00	MJ/kg	BS EN ISO 21654	BS EN ISO 18125
Bulk Density	0 .50	kg/m3	BS EN 15401	BS EN ISO 17828
Biomass	5	%	BS EN ISO 21644	*****
Non-biomass content (dry basis)	5	%	BS EN ISO 21644	*****
Bromine	0 .05	%	*****	*****
Chlorine (as analysed, as received, dry & dry ash free basis)	0 .05	%	*****	*****
Fluorine	0 .035	%	*****	*****
Iodine	0 .010	%	*****	*****
Total Halides	1 .00	%	*****	*****
Carbon (as analysed, as received, dry & dry ash free basis)	0 .1	%	BS EN ISO 21663	BS EN ISO 16948
Hydrogen (as analysed, as received, dry & dry ash free basis)	0 .3	%	BS EN ISO 21663	BS EN ISO 16948
Oxygen - by difference (as analysed, as received, dry & dry ash free basis)	4	%	*****	*****
Nitrogen (as analysed, as received, dry & dry ash free basis)	0 .3	%	BS EN ISO 21663	BS EN ISO 16948
Sulphur (as analysed, as received, dry & dry ash free basis)	0 .010	%	*****	*****
Fixed Carbon (as analysed, as received, dry & dry ash free basis)	0 .10	%	*****	*****
Silicon	10 .0	mg/kg	*****	*****
Cyanide total	0 .10	mg/kg	*****	*****
Sulphide	10 .0	mg/kg	*****	*****
Biomethane Potential	0 .10	M3/Tonne	*****	*****
Volatile Matter (as analysed, as received, dry & dry ash free basis)	0 .10	%	BS EN ISO 22167	BS EN ISO 18123

Test	LOD	Units	SRF – In-house method based on:	Solid biofuel – In-house method based on:
Metals				
Aluminium	1 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Antimony	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Arsenic	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Barium	10 .00	mg/kg	BS EN 15411	*****
Beryllium	0 .10	mg/kg	BS EN 15411	*****
Cadmium	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Calcium	5 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Chromium	0 .20	mg/kg	BS EN 15411	BS EN ISO 16968
Cobalt	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Copper	0 .20	mg/kg	BS EN 15411	BS EN ISO 16968
Iron	1 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Lead	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Magnesium	1 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Manganese	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Mercury	0 .30	mg/kg	BS EN 15411	BS EN ISO 16968
Molybdenum	0 .50	mg/kg	BS EN 15411	BS EN ISO 16968
Nickel	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Phosphorus	0 .10	mg/kg	BS EN 15410	BS EN ISO 16967
Potassium	1 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Rhodium	10 .00	mg/kg	*****	*****
Selenium	0 .10	mg/kg	BS EN 15411	*****
Silver	10 .00	mg/kg	*****	*****
Sodium	5 .00	mg/kg	BS EN 15410	BS EN ISO 16967
Strontium	10 .00	mg/kg	*****	*****
Thallium	0 .20	mg/kg	BS EN 15411	*****
Tin	0 .10	mg/kg	*****	*****
Titanium	0 .10	mg/kg	BS EN 15410	BS EN ISO 16967
Vanadium	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968
Zinc	0 .10	mg/kg	BS EN 15411	BS EN ISO 16968

Test	LOD	Units	SRF – In-house method based on:	Solid biofuel - In-house method based on:
Visual Inspection				
Colour	n/a	n/a	*****	*****
Cellulosic Materials	0 .10	%	*****	*****
Cloth Materials	0 .10	%	*****	*****
Inert Materials	0 .10	%	*****	*****
Metal Materials	0 .10	%	*****	*****
Paper Materials	0 .10	%	*****	*****
Plastics Materials	0 .10	%	*****	*****
Biodegradable Municipal Waste Content (Compositional Analysis)	0 .10	%	*****	*****
PSD				
Passed through 2mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Passed through 4mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Retained on 16mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Retained on 2mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Retained on 30mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Retained on 4mm	0 .10	%	BS EN 15415	BS EN ISO 17827
Retained on 8mm	0 .10	%	BS EN 15415	BS EN ISO 17827

Technical information

Description	Det/Suite	Preparation	LOD	Units	Accreditation
- Moisture, total	MOIS-TOT-F	As received	0 .1	%	17025
- Antimony	Sb-oe3F	Air dried	0 .1	Mg/kg	17025
- Arsenic	As-oe3F	Air dried	0 .1	Mg/kg	17025
- Cadmium	Cd-oe3F	Air dried	0 .1	Mg/kg	17025
- Chromium	Cr-oe3F	Air dried	0 .2	Mg/kg	17025
- Cobalt	Co-oe3F	Air dried	0 .1	Mg/kg	17025
- Copper	Cu-oe3F	Air dried	0 .2	Mg/kg	17025
- Lead	Pb-oe3F	Air dried	0 .1	Mg/kg	17025
- Manganese	Mn-oe3F	Air dried	0 .1	Mg/kg	17025
- Mercury	Hg-ps3F	Air dried	0 .3	Mg/kg	17025
- Nickel	Ni-oe3F	Air dried	0 .1	Mg/kg	17025
- Selenium	Se-oe3F	Air dried	0 .1	Mg/kg	17025
- Tellurium	Te-oe3F	Air dried	10	Mg/kg	None
- Thallium	Tl-oe3F	Air dried	0 .2	Mg/kg	17025
- Tin	Sn-oe3F	Air dried	0 .1	Mg/kg	17025
- Vanadium	V-oe3F	Air dried	0 .1	Mg/kg	17025
- Zinc	Zn-oe3F	Air dried	0 .1	Mg/kg	17025
- Bromine	Br2-an1F	Air dried	0 .05	%	None
- Chlorine (as received)	Cl2-AR1F	As received	0 .05	%	17025
- Chlorine (dry basis)	Cl2-DRY1F	Air dried	0 .05	%	17025
- Chlorine (as analysed)	Cl2-an1F	Air dried	0 .05	%	17025
- Chlorine (dry ash free)	Cl2-DAF1F	Air dried	0 .05	%	17025
- Fluorine	Fl2-an1F	Air dried	0 .035	%	17025
- Iodine	Io-an1F	Air dried	0 .01	%	None
- Halides, total	HAL-TOT1F	Air dried	1	%	None

Description	Det/Suite	Preparation	LOD	Units	Accreditation
- Gross Calorific Value (as received)	GCV-REC-F	As received	1	MJ/kg	17025
- Gross Calorific Value (dry basis)	GCV-DRY-F	Dry basis	1	MJ/kg	17025
- Gross Calorific Value (dry ash free)	GCV-DAF-F	Dry ash free	1	MJ/kg	17025
- Net Calorific Value (as received)	NCV-REC-F	As received	1	MJ/kg	17025
- Net Calorific Value (dry basis)	NCV-DRY-F	Dry basis	1	MJ/kg	17025
- Ash Content (dry basis)	ASH-DRY-F	Dry basis	0 .1	%	17025
- Carbon (as received)	CARB-REC-F	As received	0 .1	%	17025
- Carbon (dry basis)	CARB-DRY-F	Dry basis	0 .1	%	17025
- Carbon (dry ash free)	CARB-DAF-F	Dry ash free	0 .1	%	17025
- Sulphur (as received)	SUL-REC-F	As received	0 .01	%	17025
- Sulphur (dry basis)	SUL-DRY-F	Dry basis	0 .01	%	17025
- Sulphur (dry ash free)	SUL-DAF-F	Dry ash free	0 .01	%	17025
- Biomass (dry basis) by Calorific Value	BIOMASS2-F	Dry basis	1	%	17025
- Ferrous Metal	FERR-F	As received	0 .1	%	None
- Non-Ferrous Metal	NONFERR-F	As received	0 .1	%	None
- Glass	GLASS-F	As received	0 .1	%	None
- Organic Materials	ORG-F	As received	0 .1	%	None
- Carpet & Mats	C&M-F	As received	0 .1	%	None
- Fines <10mm	FINE10-F	As received	0 .1	%	None
- Leather & Rubber	L&R-F	As received	0 .1	%	None
- Paper & Cardboard	P&C-F	As received	0 .1	%	None
- Rigid Plastic	RIGIDP-F	As received	0 .1	%	None
- Soft Plastic	SOFTP-F	As received	0 .1	%	None
- Textiles	TEXTILES-F	As received	0 .1	%	None
- Tissue	TISS-F	As received	0 .1	%	None
- Stones	STONES-F	As received	0 .1	%	None
- Wood	WOOD-F	As received	0 .1	%	None

08
Waste

Waste characterisation and leachate analysis

Classification of a waste requires both characterisation of the solid material and also a leaching test to determine the possibility of mobile contaminants contaminating the surrounding environment. There are various leaching tests available, but the most commonly requested is based on BS EN 12457 – 2. The solid material is agitated for 24 hours, filtered, and the resulting eluate analysed for a range of determinands.

Inert WAC

Determinand	LOD	Units	Accreditation for analysis only, not for leachate preparation
Eluates for compliance using BS EN 12457 - 2 (1 batch)			
Arsenic	0.16	ug/l	17025
Barium	0.26	ug/l	17025
Cadmium	0.03	ug/l	17025
Chromium	0.25	ug/l	17025
Copper	0.40	ug/l	17025
Mercury	0.01	ug/l	17025
Molybdenum	1.10	ug/l	None
Nickel	0.50	ug/l	17025
Lead	0.09	ug/l	17025
Antimony	0.17	ug/l	17025
Selenium	0.25	ug/l	17025
Zinc	1.30	ug/l	17025
Chloride	0.10	mg/l	17025
Fluoride	0.10	mg/l	None
Sulphate	0.10	mg/l	17025
Total Dissolved Solids (TDS)	5	mg/l	None
Phenol Index	100	ug/l	17025
Dissolved Organic Carbon at own pH or pH 7.5-8.0	2	mg/l	17025
Solid Suites			
Total Organic Carbon	0.5	%	MCERTS
BTEX	0.04	mg/kg	MCERTS
PCBs (7 congeners)	0.01	mg/kg	MCERTS
EPH C10-C40	10	mg/kg	MCERTS
PAHs - total 17 including coronene	1.6	mg/kg	17025 except coronene

Hazardous WAC

Determinand	LOD	Units	Accreditation for analysis only
Eluates for compliance using BS EN 12457 - 2 (1 batch)			
Arsenic	0.16	ug/l	17025
Barium	0.26	ug/l	17025
Cadmium	0.03	ug/l	17025
Chromium	0.25	ug/l	17025
Copper	0.40	ug/l	17025
Mercury	0.01	ug/l	17025
Molybdenum	1.10	ug/l	None
Nickel	0.50	ug/l	17025
Lead	0.09	ug/l	17025
Antimony	0.17	ug/l	17025
Selenium	0.25	ug/l	17025
Zinc	1.30	ug/l	17025
Chloride	0.10	mg/l	17025
Fluoride	0.10	mg/l	None
Sulphate	0.10	mg/l	17025
Total Dissolved Solids (TDS)	5	mg/l	None
Phenol Index	100	ug/l	17025
Dissolved Organic Carbon at own pH or pH 7.5-8.0	2	mg/l	17025
Solid Suites			
Total Organic Carbon	0.5	%	MCERTS
Loss on ignition	0.01	%	MCERTS
Acid neutralisation capacity	1	moles/kg	None

Full WAC

Determinand	LOD	Units	Accreditation
Eluates for compliance using BS EN 12457 - 2 (1 batch)			
Arsenic	0.16	ug/l	17025
Barium	0.26	ug/l	17025
Cadmium	0.03	ug/l	17025
Chromium	0.25	ug/l	17025
Copper	0.40	ug/l	17025
Mercury	0.01	ug/l	17025
Molybdenum	1.10	ug/l	None
Nickel	0.50	ug/l	17025
Lead	0.09	ug/l	17025
Antimony	0.17	ug/l	17025
Selenium	0.25	ug/l	17025
Zinc	1.30	ug/l	17025
Chloride	0.10	mg/l	17025
Fluoride	0.10	mg/l	None
Sulphate	0.10	mg/l	17025
Total Dissolved Solids (TDS)	5	mg/l	None
Phenol Index	100	ug/l	17025
Dissolved Organic Carbon at own pH or pH 7.5-8.0	2	mg/l	17025
Solid Suites			
Total Organic Carbon	0.5	%	MCERTS
Loss on ignition	0.01	%	MCERTS
BTEX	0.04	mg/kg	MCERTS
PCBs (7 congeners)	0.01	mg/kg	MCERTS
EPH C10-C40	10	mg/kg	MCERTS
pH	1	pH units	MCERTS
Acid neutralisation capacity	1	moles/kg	None
PAHs - total 17 including coronene	1.6	mg/kg	17025 except coronene

Hazardous waste / WM3 POP suite

Determinand	LOD	Units	Accreditation
Dioxins and Furans : POPS Hazardous Waste / WM3 Suite	Various	ug/kg	Subcontracted
POPs basic GC-MSMS / LC-MSMS Suite	Various	mg/kg	Subcontracted
DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane)	0 .1	mg/kg	None
Chlordane	0 .1	mg/kg	None
Hexachlorocyclohexanes, including lindane	0 .1	mg/kg	None
Dieldrin	0 .1	mg/kg	None
Endrin	0 .1	mg/kg	None
Heptachlor	0 .1	mg/kg	None
Hexachlorobenzene	0 .1	mg/kg	None
Chlordecone	0 .1	mg/kg	None
Aldrin	0 .1	mg/kg	None
Pentachlorobenzene	0 .1	mg/kg	None
Mirex	0 .1	mg/kg	None
Hexabromobiphenyl	0 .1	mg/kg	None
Toxaphene species by GCMS	0 .1	mg/kg	None
Total PCBs (aroclor 1254 or 1260)	0 .01	mg/kg	None
Flamability	n/a	n/a	None

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Metals

Metals are determined using ICP-OES or ICP MS, and the dried and crushed soils are digested in aqua regia prior to analysis. Waters are filtered and then acidified. We can determine metals on soils using XRF, but this will give a total measurement, expressed as the oxide, which may be higher than by ICP.

Soils

	Method	LOD	Units	Accreditation
Aluminium	ICP OES	1	mg/kg	None
Antimony	ICP OES	1	mg/kg	None
Arsenic	ICP OES	0 .2	mg/kg	MCERTS
Barium	ICP OES	1 .5	mg/kg	MCERTS
Beryllium	ICP OES	0 .2	mg/kg	MCERTS
Boron (WS)	ICP OES	0 .2	mg/kg	MCERTS
Cadmium	ICP OES	0 .1	mg/kg	MCERTS
Calcium	ICP OES	1	mg/kg	None
Calciu, available	ICP OES	0 .1	mg/kg	None
Chromium	ICP OES	0 .15	mg/kg	MCERTS
Chromium (hex.)	Colourimetric	1	mg/kg	None
Cobalt	ICP OES	0 .7	mg/kg	MCERTS
Copper	ICP OES	0 .2	mg/kg	MCERTS
Copper, available	ICP OES	0 .002	mg/kg	None
Iron	ICP OES	25	mg/kg	17025
Lead	ICP OES	0 .3	mg/kg	MCERTS
Lithium	ICP OES	1	mg/kg	None
Magnesium	ICP OES	1	mg/kg	None
Magnesium, available	ICP OES	0 .1	mg/kg	None
Manganese	ICP OES	20	mg/kg	MCERTS

Metals on soils is performed on a dried and crushed sample, apart from speciated mercury.

	Method	LOD	Units	Accreditation
Mercury (total)	AFS	0 .05	mg/kg	MCERTS
Mercury (elemental)	AFS	0 .6	ug/kg	None
Mercury (organic)	AFS	100	ug/kg	None
Mercury (inorganic)	AFS	100	ug/kg	None
Molybdenum	ICP OES	0 .4	mg/kg	MCERTS
Nickel	ICP OES	1	mg/kg	MCERTS
Phosphorus	ICP OES	1	mg/kg	None
Phosphorus, available	ICP OES	0 .1	mg/kg	None
Potassium	ICP OES	1	mg/kg	None
Potassium, available	ICP OES	0 .1	mg/kg	None
Selenium	ICP OES	0 .5	mg/kg	MCERTS
Silicon (as SiO2)	XRF	10	mg/kg	None
Silver	ICP OES	1	mg/kg	None
Sodium	ICP OES	0 .1	mg/kg	None
Sodium, available	ICP OES	0 .1	mg/kg	None
Strontium	ICP OES	1	mg/kg	None
Sulphur (total)	ICP OES	0 .01	%	17025
Sulphur, elemental	HPLC	0 .75	mg/kg	MCERTS
Tellurium	ICP OES	1	mg/kg	None
Thallium	ICP OES	1	mg/kg	None
Tin	ICP OES	1	mg/kg	17025
Titanium	ICP OES	1	mg/kg	None
Vanadium	ICP OES	0 .8	mg/kg	MCERTS
Zinc	ICP OES	1	mg/kg	MCERTS
Zinc, available	ICP OES	0 .002	mg/kg	None
Zinc (equivalent)	Calculation	0 .002	mg/kg	None

Waters

Metals on waters can be performed on a filtered sample (dissolved metals), or an unfiltered sample (total metals).

	Method	LOD	Units	Accreditation
		Dissolved		
Aluminium	ICP MS	10	ug/l	17025
Antimony	ICP MS	0 .17	ug/l	17025
Arsenic	ICP MS	0 .16	ug/l	17025
Barium	ICP MS	0 .26	ug/l	17025
Beryllium	ICP MS	0 .10	ug/l	None
Bismuth	ICP MS	1	ug/l	None
Boron	ICP MS	12	ug/l	None
Cadmium	ICP MS	0 .03	ug/l	17025
Calcium	ICP MS	0 .1	mg/l	17025
Chromium	ICP MS	0 .25	ug/l	17025
Chromium (hex .)	Colourimetric	7	ug/l	17025
Cobalt	ICP MS	0 .16	ug/l	17025
Copper	ICP MS	0 .4	ug/l	17025
Iron	ICP MS	5 .5	ug/l	17025
Iron (ferric/ferrous)	Colourimetric	0 .1	mg/l	None
Lead	ICP MS	0 .09	ug/l	17025
Lithium	ICP MS	1	ug/l	None
Magnesium	ICP MS	0 .02	mg/l	17025
Manganese	ICP MS	0 .22	ug/l	17025
Mercury (total)	ICP MS	0 .01	ug/l	17025
Mercury (elemental)	AFS	1	ug/l	None
Mercury (organic)	AFS	1	ug/l	None
Mercury (inorganic)	AFS	1	ug/l	None
Molybdenum	ICP MS	1 .1	ug/l	None
Nickel	ICP MS	0 .5	ug/l	17025
Phosphorus	ICP MS	10	ug/l	17025
Potassium	ICP MS	0 .08	mg/l	17025
Selenium	ICP MS	0 .25	ug/l	17025
Silicon (as SiO2)	Colourimetric	0 .1	mg/l	None
Silver	ICP MS	0 .13	ug/l	None
Sodium	ICP MS	0 .07	mg/l	None
Strontium	ICP MS	0 .4	ug/l	None
Sulphur (total)	ICP OES	10	mg/l	None
Sulphur, elemental	HPLC	84	ug/l	17025
Tellurium	ICP MS	0 .1	ug/l	None
Thallium	ICP MS	0 .08	ug/l	None
Tin	ICP MS	0 .4	ug/l	None
Titanium	ICP MS	0 .3	ug/l	None
Vanadium	ICP MS	0 .6	ug/l	17025
Zinc	ICP MS	1 .3	ug/l	17025

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Physical tests and wet chemistry

This section includes physical tests, plus the standard water quality parameters.

Some parameters should be measured on site for optimum results, e.g. pH, dissolved oxygen, redox potential.

BOD is a time critical analysis and should be analysed within 24 hours of sampling, although the test takes 5 days. The sample should be taken in a separate 100ml bottle, with no headspace.

Soils

	Method	LOD	Units	Accreditation
pH	Potentiometric	1	pH units	MCERTS
Conductivity	Potentiometric	1	uS/cm	17025
Loss on ignition	Gravimetric	0 .01	%	MCERTS
Moisture content	Gravimetric	0 .01	%	17025
Ash content	Gravimetric	0 .01	%	None
Flashpoint	Closed cup	n/a	oC	None
Particle size distribution	Sieve	n/a	%	None
Stone content	Gravimetric	0 .1	%	None
Calorific value	Calorimeter	1	Mj/kg	17025

BARGE bioaccessability test (on soils)

This test is designed to mimic the uptake of contaminants from the gastro intestinal system. Soils are extracted in a series of reagents to facilitate this uptake, followed by analysis for a range of metals. This parameter can be extremely useful in assessing human health risk and can reduce expensive remediation.

Waters

	Method	LOD	Units	Accreditation
pH	Potentiometric	1	pH units	17025
Conductivity	Potentiometric	1	uS/cm	17025
Specfic gravity	Gravimetric	n/a	g/cm3	None
Redox potential	Meter	n/a	mV	None
Dissolved oxygen	Meter	2	mg/l	None
Turbidity	Meter	1	NTU	None
Total dissolved solids	Gravimetric	5	mg/l	17025
Total suspended solids	Gravimetric	5	mg/l	17025
Volatile suspended solids	Gravimetric	5	mg/l	None
Non-volatile suspended solids	Gravimetric	5	mg/l	None
BOD	5 day ATU	1	mg/l	17025
COD	Colourimetric	10	mg/l	17025 (MCERTS*)
Alkalinity as CaCO3	Titration	10	mg/l	17025
Acidity	Titration	10	mg/l	None

**Only for trade effluent to sewer*

Nitrogen compounds in water

	Method	LoD	Units	Accreditation
Ammoniacal nitrogen (NH3 + NH4)	Colourimetric	0 .015	mg/l	17025
Free ammonia (NH3)*	Calculation	0 .015	mg/l	None
Kjeldahl nitrogen (amm . N + org . N)	Calculation	0 .2	mg/l	None
Organic nitrogen (Kjeldahl N - amm . N)	Calculation	1	mg/l	None
Total nitrogen (NO3 + NO2 + Kjeldahl N)	Infra-red	1	mg/l	None
Nitrate (NO3)	Colourimetric	0 .1	mg/l	None
Nitrate (NO3)	IC	0 .1	mg/l	17025
Nitrite (NO2)	Colourimetric	0 .035	mg/l	17025
Nitrite (NO2)	IC	0 .1	mg/l	17025
Total oxidised nitrogen (NO2 + NO3)	Colourimetric	0 .7	mg/l	17025

**Need pH for this*

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Anions

Anions can be determined either by ion chromatograpy, colourimetric spectroscopy orby ICPl. Water samples are filtered prior to analysis,and soils are usually extracted in water.

Soils

		Method	LOD	Units	Accreditation
Chloride	Water soluble	IC	1	mg/kg	17025
Sulphate	Water soluble	ICP OES	1	mg/kg	MCERTS
Sulphate	Acid soluble	ICP OES	0 .01	%	MCERTS
Nitrate	Water soluble	IC	1	mg/kg	17025
Nitrite	Water soluble	IC	1	mg/kg	17025
Phosphate	Water soluble	Colourimetric	0 .1	mg/kg	None
Fluoride	Water soluble	IC	1	mg/kg	17025
Bromide	Water soluble	IC	1	mg/kg	None
Sulphide	Acid soluble	Titration	10	mg/kg	None
Sulphur, total		ICP OES	0 .01	%	17025
Sulphur, elemental		HPLC	0 .75	mg/kg	MCERTS
Total cyanide		Colourimetric	0 .1	mg/kg	MCERTS
Free (easily liberated cyanide)		Colourimetric	0 .1	mg/kg	MCERTS
Complex cyanide		Calculation	0 .2	mg/kg	None
Thiocyanate		Colourimetric	0 .6	mg/kg	MCERTS

Waters

		Method	LOD	Units	Accreditation
Chloride		IC	0 .1	mg/l	17025
Sulphate		IC	0 .1	mg/l	17025
Nitrate		Colourimetric	0 .1	mg/l	None
Nitrate		IC	0 .1	mg/l	17025
Nitrite		Colourimetric	0 .035	mg/l	17025
Nitrite		IC	0 .1	mg/l	17025
Phosphate		Colourimetric	0 .01	mg/l	17025
Fluoride		IC	0 .1	mg/l	None
Bromide		IC	0 .1	mg/l	None
Sulphide		Colourimetric	10	ug/l	17025
Sulphur, total		ICP OES	10	mg/l	None
Total cyanide		Colourimetric	0 .1	ug/l	17025
Free (easily liberated cyanide)		Colourimetric	0 .1	ug/l	17025
Complex cyanide		Calculation	0 .1	ug/l	17025
Thiocyanate		Colourimetric	20	ug/l	17025

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Asbestos analyses

Samples for asbestos analysis should always be placed in a separate double bagged container. It is preferable to take approximately 1 kg of soil for analysis, due to the lack of homogeneity of asbestos.

		LOD	Accreditation
Stage 1	Identification: presence/absence of asbestos fibres using Polarised Light Microscopy as per HSG248	n/a	17025
Stage 2	Quantification: detailed gravimetric, using PLM	0 .001%	17025
Stage 3	Quantification: fibre dispersion, measurement and counting, using PLM and PCM	0 .001%	17025
	Respirable fibres - mass of asbestos fibres in range 1- 5 microns	0 .001%	None
	Potentially respirable fibres	0 .001%	None
Respirable fibres in respirable dust - new test used in risk assessment for airborne fibres on site		0 .001%	None
Classification into licensed or non-licensed work - moisture absorption		n/a	17025

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Total Petroleum Hydrocarbons (TPH)

TPH represents an extremely complex group of compounds (over 10,000), consisting of aliphatic, aromatic and NSO (nitrogen, sulphur, oxygen containing compounds).

Analysis is by GCFID, with headspace for the volatile petroleum hydrocarbons (VPH C5 - 10),and DCM based solvent extraction for the heavier hydrocarbons (EPH C10 – 40).

VPH is often referred to as PRO (petrol range organics) or GRO (gasoline range organics. VPH samples should be collected in 40ml glass vials for waters, and 60 g glass jars for soils, in duplicate to allow for repeats.

TPH screen (soils only)

	LOD	Units	Accreditation
TPH (C6-40) single extraction	10	mg/kg	None

Volatile Petroleum Hydrocarbons (VPH)

Soils

Waters

	LOD	Units	Accreditation	LOD	Units	Accreditation
Benzene	0 .01	mg/kg	MCERTS	1	ug/l	17025
Toluene	0 .01	mg/kg	MCERTS	1	ug/l	17025
Ethylbenzene	0 .01	mg/kg	MCERTS	1	ug/l	17025
Xylenes (mixed isomers)	0 .01	mg/kg	MCERTS	1	ug/l	17025
BTEX, total	0 .01	mg/kg	MCERTS	1	ug/l	17025
C5 - 10, VPH	0 .01	mg/kg	None	1	ug/l	17025

Extractable petroleum hydrocarbons (EPH)

Soils

Waters

	LOD	Units	Accreditation	LOD	Units	Accreditation
EPH, C10 - 40	10	mg/kg	MCERTS	10	ug/l	17025
Cleaned up EPH(removes NSOs)	10	mg/kg	None	10	ug/l	None
Mineral oil (removes aromatics and NSOs)	10	mg/kg	None	10	ug/l	None
Diesel range organics , DRO (C10 - 24)	10	mg/kg	MCERTS	10	ug/l	None
Diesel range organics , DRO (C25 - 28)	10	mg/kg	None	10	ug/l	None
Lube oil range organics, LORO (C24 - 40)	10	mg/kg	MCERTS	10	ug/l	None

Speciated TPH (Criteria Working Group - CWG)

Soils

Waters

	LOD	Units	Accreditation	LOD	Units	Accreditation
TPH Aliphatic >C5-6	0 .01	mg/kg	None	1	µg/l	17025
TPH Aliphatic >C6-8	0 .01	mg/kg	None	1	µg/l	17025
TPH Aliphatic >C8-10	0 .01	mg/kg	None	1	µg/l	17025
TPH Aliphatic >C10- 12	1 .5	mg/kg	MCERTS	1	µg/l	none
TPH Aliphatic >C12- 16	1 .2	mg/kg	MCERTS	1	µg/l	none
TPH Aliphatic >C16- 21	1 .5	mg/kg	MCERTS	1	µg/l	none
TPH Aliphatic >C21- 35	3 .4	mg/kg	MCERTS	1	µg/l	none
TPH Aliphatic >C35- 44	3 .4	mg/kg	None	-	-	-
TPH Aromatic >EC5-7 (Benzene)	0 .01	mg/kg	None	1	µg/l	17025
TPH Aromatic >EC7-8 (Toluene)	0 .01	mg/kg	None	1	µg/l	17025
TPH Aromatic >EC8- 10	0 .01	mg/kg	None	1	µg/l	17025
TPH Aromatic >EC10- 12	0 .9	mg/kg	MCERTS	1	µg/l	none
TPH Aromatic >EC12- 16	0 .5	mg/kg	MCERTS	1	µg/l	none
TPH Aromatic >EC16- 21	0 .6	mg/kg	MCERTS	1	µg/l	none
TPH Aromatic >EC21- 35	1 .4	mg/kg	MCERTS	1	µg/l	none
TPH Aromatic >EC35- 44	1 .4	mg/kg	None	-	-	-
Benzene	-	-	-	1	µg/l	17025
Toluene	-	-	-	1	µg/l	17025

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Volatile Organic Compounds (VOCs)

For the most meaningful results, it is crucial that samples are taken in the correct containers with no headspace, and are kept cold during transportation and storage prior to analysis.

Samples are analysed by headspace GCMS and run in full scan mode. Although the 64 target compounds are accurately quantified, additional compounds can be identified as TICs (tentatively identified compounds) – these must be requested when submitting samples for analysis.

Samples should be collected in 40ml glass vials (waters) or 60g glass jars (soils), in duplicate, with no headspace.

Soils

	Method	LOD	Units	Accreditation
- o-Xylene	GCMS	0 .01	mg/kg	17025
- Tetrachloroethylene	GCMS	0 .01	mg/kg	17025
- 1,2,3-trichlorobenzene	GCMS	0 .01	mg/kg	17025
- cis-1,3-dichloropropene	GCMS	0 .01	mg/kg	17025
- m+p-Xylene	GCMS	0 .01	mg/kg	17025
- 1,3-dichloropropane	GCMS	0 .01	mg/kg	17025
- Chlorobenzene	GCMS	0 .01	mg/kg	17025
- 1,3,5-trimethylbenzene	GCMS	0 .01	mg/kg	17025
- 1,2-dibromoethane	GCMS	0 .01	mg/kg	17025
- Dibromochloromethane	GCMS	0 .01	mg/kg	17025
- Hexachlorobutadiene	GCMS	0 .01	mg/kg	17025
- 1,1,2-trichloroethane	GCMS	0 .01	mg/kg	17025
- trans-1,3-dichloropropene	GCMS	0 .01	mg/kg	17025
- Toluene	GCMS	0 .01	mg/kg	17025
- Bromodichloromethane	GCMS	0 .01	mg/kg	17025
- Dibromomethane	GCMS	0 .01	mg/kg	17025
- n-propylbenzene	GCMS	0 .01	mg/kg	17025
- 2-chlorotoluene	GCMS	0 .01	mg/kg	17025
- 1,2-dichloropropane	GCMS	0 .01	mg/kg	17025
- Trichloroethylene	GCMS	0 .01	mg/kg	17025

	Method	LOD	Units	Accreditation
- 1,2-dichloroethane	GCMS	0 .01	mg/kg	17025
- 1,1-dichloropropene	GCMS	0 .01	mg/kg	17025
- Carbon tetrachloride	GCMS	0 .01	mg/kg	17025
- Naphthalene	GCMS	0 .01	mg/kg	17025
- Benzene	GCMS	0 .01	mg/kg	17025
- n-butylbenzene	GCMS	0 .01	mg/kg	17025
- 1,2-dichlorobenzene	GCMS	0 .01	mg/kg	17025
- 1,2-dibromo-3-chloropropane	GCMS	0 .01	mg/kg	17025
- 1,2,4-trichlorobenzene	GCMS	0 .01	mg/kg	17025
- Tert-butylbenzene	GCMS	0 .01	mg/kg	17025
- 1,2,4-trimethylbenzene	GCMS	0 .01	mg/kg	17025
- sec-butylbenzene	GCMS	0 .01	mg/kg	17025
- 1,4-dichlorobenzene	GCMS	0 .01	mg/kg	17025
- 1,2,3-trichloropropane	GCMS	0 .01	mg/kg	17025
- Bromobenzene	GCMS	0 .01	mg/kg	17025
- Isopropylbenzene	GCMS	0 .01	mg/kg	17025
- 4-chlorotoluene	GCMS	0 .01	mg/kg	17025
- MBTE	GCMS	0 .01	mg/kg	None
- Vinyl Chloride	GCMS	0 .01	mg/kg	17025
- Cis-1,2-dichloroethylene	GCMS	0 .01	mg/kg	17025
- p-isopropyltoluene	GCMS	0 .01	mg/kg	17025
- 1,3-dichlorobenzene	GCMS	0 .01	mg/kg	17025
- 1,1,1,2-tetrachloroethane	GCMS	0 .01	mg/kg	17025
- Ethylbenzene	GCMS	0 .01	mg/kg	17025
- 1,1,1-trichloroethane	GCMS	0 .01	mg/kg	17025
- Chloroform	GCMS	0 .01	mg/kg	17025
- 1,1-dichloroethane	GCMS	0 .01	mg/kg	17025
- Trans-1,2-dichloroethylene	GCMS	0 .01	mg/kg	17025
- 2,2-dichloropropane	GCMS	0 .01	mg/kg	17025
- Bromoform	GCMS	0 .01	mg/kg	17025
- Bromochloromethane	GCMS	0 .01	mg/kg	17025
- Styrene	GCMS	0 .01	mg/kg	None
- 1,1 Dichloroethylene	GCMS	0 .01	mg/kg	17025

Waters

	Method	LOD	Units	Accreditation
- 1,2,3-trichlorobenzene	GCMS	1	ug/l	17025
- Carbon tetrachloride	GCMS	1	ug/l	17025
- 1,1-dichloropropene	GCMS	1	ug/l	17025
- Ethylbenzene	GCMS	1	ug/l	17025
- 1,1,1,2-tetrachloroethane	GCMS	1	ug/l	17025
- 1,3-dichlorobenzene	GCMS	2	ug/l	17025
- p-isopropyltoluene	GCMS	1	ug/l	17025
- 2,2-dichloropropane	GCMS	2	ug/l	17025
- Dichlorodifluoromethane	GCMS	1	ug/l	17025
- Chloromethane	GCMS	1	ug/l	17025
- Bromomethane	GCMS	1	ug/l	17025
- Chloroethane	GCMS	1	ug/l	17025
- Trichlorofluoromethane	GCMS	1	ug/l	None
- 1,1,2,2-tetrachloroethane	GCMS	1	ug/l	17025
- Vinyl Chloride	GCMS	1	ug/l	17025
- MTBE	GCMS	1	ug/l	None
- Naphthalene	GCMS	1	ug/l	17025
- Hexachlorobutadiene	GCMS	1	ug/l	17025
- 1,2,4-trichlorobenzene	GCMS	1	ug/l	17025
- 1,2-dibromo-3-chloropropane	GCMS	1	ug/l	17025
- 1,2-dichlorobenzene	GCMS	1	ug/l	17025
- n-butylbenzene	GCMS	1	ug/l	17025
- 1,4-dichlorobenzene	GCMS	1	ug/l	17025
- sec-butylbenzene	GCMS	1	ug/l	17025
- 1,2,4-trimethylbenzene	GCMS	1	ug/l	17025
- Tert-butylbenzene	GCMS	1	ug/l	17025
- 4-chlorotoluene	GCMS	1	ug/l	17025
- 1,3,5-trimethylbenzene	GCMS	1	ug/l	17025
- 2-chlorotoluene	GCMS	1	ug/l	17025
- n-propylbenzene	GCMS	1	ug/l	17025
- 1,2,3-trichloropropane	GCMS	1	ug/l	17025
- Bromobenzene	GCMS	1	ug/l	17025
- Isopropylbenzene	GCMS	1	ug/l	17025
- Bromoform	GCMS	1	ug/l	17025
- Styrene	GCMS	1	ug/l	17025
- o-Xylene	GCMS	1	ug/l	17025
- m+p-Xylene	GCMS	2	ug/l	17025
- Chlorobenzene	GCMS	1	ug/l	17025
- 1,2-dibromoethane	GCMS	1	ug/l	17025

	Method	LOD	Units	Accreditation
- Dibromochloromethane	GCMS	1	ug/l	17025
- 1,3-dichloropropane	GCMS	1	ug/l	17025
- Tetrachloroethylene	GCMS	1	ug/l	17025
- 1,1,2-trichloroethane	GCMS	1	ug/l	17025
- trans-1,3-dichloropropene	GCMS	1	ug/l	17025
- Toluene	GCMS	1	ug/l	17025
- Trans-1,2-dichloroethylene	GCMS	1	ug/l	17025
- 1,1-dichloroethane	GCMS	1	ug/l	17025
- Cis-1,2-dichloroethylene	GCMS	1	ug/l	17025
- Bromochloromethane	GCMS	4	ug/l	17025
- Chloroform	GCMS	1	ug/l	17025
- 1,1-dichloroethylene	GCMS	1	ug/l	17025
- 1,1,1-trichloroethane	GCMS	1	ug/l	17025
- Benzene	GCMS	1	ug/l	17025
- 1,2-dichloroethane	GCMS	1	ug/l	17025
- Trichloroethylene	GCMS	1	ug/l	None
- Dibromomethane	GCMS	1	ug/l	17025
- 1,2-dichloropropane	GCMS	1	ug/l	17025
- Bromodichloromethane	GCMS	4	ug/l	17025
- cis-1,3-dichloropropene	GCMS	1	ug/l	17025

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Semi Volatile Organic Compounds (SVOCs)

SVOCs are determined using GCMS, but a solvent extraction of the sample is required prior to analysis. As for VOCs, it is possible to request TICs in addition to the target list.

Soils **Waters**

	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
- 2,4,5-Trichlorophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 2,3,4,6-Tetrachlorophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 4-Bromophenylphenylether	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Azobenzene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Dibenzofuran	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Acenaphthene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 3-Nitroaniline	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 1,2-Dinitrobenzene	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 2,4-Dinitrotoluene	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 4-Nitrophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 2,3,5,6-Tetrachlorophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 2,4,6-Trichlorophenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Hexachlorocyclopentadiene	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- 2-Methylnaphthalene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 4-Chloro-3-methylphenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Naphthalene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Hexachlorobenzene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 1,2,4-Trichlorobenzene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Aniline	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- Bis(2-chloroisopropyl)ether	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Phenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 2-Chlorophenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Benzyl Alcohol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 2-Methylphenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 3&4-Methylphenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 2,4-Dimethylphenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None

Soils

Waters

	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
- Bis-(dichloroethoxy)methane	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- 2,4-Dichlorophenol	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Carbazole	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	None
- Benzo(ghi)perylene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Dibenzo(ah)anthracene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Indeno(123cd)pyrene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	None
- Benzo(a)pyrene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Benzo(k)fluoranthene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Benzo(b)fluoranthene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Di-n-octylphthalate	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Chrysene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Benzo(a)anthracene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Pyrene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Fluoranthene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Bis(2-ethylhexyl)phthalate	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Butylbenzylphthalate	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- Di-n-butylphthalate	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Anthracene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- 2-Methyl-4,6-Dinitrophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- 4-Nitroaniline	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- 4-Chlorophenylphenylether	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- Fluorene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Diethylphthalate	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Diphenylamine	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- 2-Chloronaphthalene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- 2-Nitroaniline	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- Pentachlorophenol	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- 2,6-Dinitrotoluene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- Acenaphthylene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- 1,3-Dinitrobenzene	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- Phenanthrene	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a
- 1,4-Dinitrobenzene	GCMS	0 .1	mg/kg	None	GCMS	1	ug/l	n/a
- Dimethylphthalate	GCMS	0 .1	mg/kg	17025	GCMS	1	ug/l	n/a

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Polyaromatic Hydrocarbons

Soils

PAHs are some of the most commonly requested analyses, and are determined by solvent extraction, followed by GCMS. Benzo(a)pyrene is a common marker compound requested by the regulators.

	Method	LOD	Units	Accreditation
Acenaphthene	GCMS	0 .03	mg/kg	MCERTS
Acenaphthylene	GCMS	0 .03	mg/kg	MCERTS
Anthracene	GCMS	0 .03	mg/kg	17025
Benzo(a)Anthracene	GCMS	0 .03	mg/kg	MCERTS
Benzo(b)fluoranthene	GCMS	0 .03	mg/kg	MCERTS
Benzo(k)fluoranthene	GCMS	0 .03	mg/kg	MCERTS
Benzo(g,h,i)perylene	GCMS	0 .03	mg/kg	MCERTS
Benzo(a)Pyrene	GCMS	0 .03	mg/kg	MCERTS
Chrysene	GCMS	0 .03	mg/kg	17025
Di-benzo(a,h)anthracene	GCMS	0 .03	mg/kg	MCERTS
Fluoranthene	GCMS	0 .03	mg/kg	MCERTS
Fluorene	GCMS	0 .03	mg/kg	17025
Indeno(1,2,3-cd)pyrene	GCMS	0 .03	mg/kg	MCERTS
Naphthalene	GCMS	0 .03	mg/kg	MCERTS
Phenanthrene	GCMS	0 .03	mg/kg	MCERTS
Pyrene	GCMS	0 .03	mg/kg	MCERTS

	Method	LOD	Units	Accreditation
Acenaphthene	GCFID	0 .1	mg/kg	17025
Acenaphthylene	GCFID	0 .1	mg/kg	17025
Anthracene	GCFID	0 .1	mg/kg	17025
Benzo(a)Anthracene	GCFID	0 .1	mg/kg	17025
Benzo(b)fluoranthene	GCFID	0 .1	mg/kg	17025
Benzo(k)fluoranthene	GCFID	0 .1	mg/kg	17025
Benzo(g,h,i)perylene	GCFID	0 .1	mg/kg	17025
Benzo(a)Pyrene	GCFID	0 .1	mg/kg	17025
Chrysene	GCFID	0 .1	mg/kg	17025
Di-benzo(a,h)anthracene	GCFID	0 .1	mg/kg	17025
Fluoranthene	GCFID	0 .1	mg/kg	17025
Fluorene	GCFID	0 .1	mg/kg	17025
Indeno(1,2,3-cd)pyrene	GCFID	0 .1	mg/kg	17025
Naphthalene	GCFID	0 .1	mg/kg	17025
Phenanthrene	GCFID	0 .1	mg/kg	17025
Pyrene	GCFID	0 .1	mg/kg	17025

Waters

	Method	LOD	Units	Accreditation
Acenaphthene	GCMS	0 .01	µg/l	17025
Anthracene	GCMS	0 .01	µg/l	17025
Acenaphthylene	GCMS	0 .01	µg/l	17025
Benzo(a)anthracene	GCMS	0 .01	µg/l	17025
Benzo(a)pyrene	GCMS	0 .01	µg/l	17025
Benzo(b)fluoranthene	GCMS	0 .01	µg/l	17025
Benzo(ghi)perylene	GCMS	0 .01	µg/l	17025
Benzo(k)fluoranthene	GCMS	0 .01	µg/l	17025
Chrysene	GCMS	0 .01	µg/l	17025
Dibenzo(ah)anthracene	GCMS	0 .01	µg/l	17025
Fluoranthene	GCMS	0 .01	µg/l	17025
Fluorene	GCMS	0 .01	µg/l	17025
Indeno(123cd)pyrene	GCMS	0 .01	µg/l	17025
Naphthalene	GCMS	0 .05	µg/l	17025
Phenanthrene	GCMS	0 .01	µg/l	17025
Pyrene	GCMS	0 .01	µg/l	17025
PAH (Total)	GCMS	0 .20	µg/l	17025

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Polychlorinated Biphenyls (PCBs)

PCBs can be expressed as a total, but the individual congen or suites are most commonly requested.

PCB 7 Congeners

Soils

Waters

Determinand	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
101	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .3	ug/l	17025
118	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .6	ug/l	17025
138	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
153	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
180	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
28/31	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .3	ug/l	17025
52	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025

PCB WHO 12 congeners (dioxin like PCBs)

Soils

Waters

Determinand	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
77	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
81	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
105	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
114	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
118/123	GCMS	0 .01	mg/kg	None	GCMS	0 .6	ug/l	17025
126	GCMS	0 .01	mg/kg	None	GCMS	0 .5	ug/l	17025
156	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
157	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
167	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
169	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
189	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025

PCB 7 congeners and PCB WHO 12 congeners (dioxin like)

Soils

Waters

Determinand	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
101	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .3	ug/l	17025
118	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .6	ug/l	17025
138	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
153	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
180	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
28/31	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .3	ug/l	17025
52	GCMS	0 .01	mg/kg	MCERTS	GCMS	0 .2	ug/l	17025
77	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
81	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
105	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
114	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
118/123	GCMS	0 .01	mg/kg	None	GCMS	0 .6	ug/l	17025
126	GCMS	0 .01	mg/kg	None	GCMS	0 .5	ug/l	17025
156	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
157	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
167	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025
169	GCMS	0 .01	mg/kg	None	GCMS	0 .2	ug/l	17025
189	GCMS	0 .01	mg/kg	None	GCMS	0 .3	ug/l	17025

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Phenols

Phenols are some of the most common contaminants in soils and waters, due to their high solubility, and can be extremely toxic both to plants and animals.

Phenols by GCMS

Soils

Waters

	Method	LOD	Units	Accreditation	Method	LOD	Units	Accreditation
Phenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
4-chloro-3- methylphenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2-chlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,4-dichlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,4-dimethylphenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2-nitrophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,4-dinitrophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
Pentachlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
p-cresol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,6-dimethylphenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,6-dichlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,4,6-trichlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2,3,4,6-tetrachlorophenol	GCMS	0 .01	mg/kg	None	GCMS	0 .1	ug/l	None
2-methylphenol	-	-	-	-	GCMS	0 .1	ug/l	None
3,5-dimethylphenol	-	-	-	-	GCMS	0 .1	ug/l	None
3+4-methylphenol	-	-	-	-	GCMS	0 .1	ug/l	None
4-chlorophenol	-	-	-	-	GCMS	0 .1	ug/l	None

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Pesticides

Pesticides are very varied, with very different chemistries depending on their structure, so there is no overall screening test. Our combined pesticide suite selects some of the most common pesticides as an indicator. The method is solvent extraction followed by GCMS for specific target compounds.

Combined pesticide suite

Soils

Waters

Determinand	Method	LOD	Units	Accreditation	LOD	Units	Accreditation
Aldrin	GCMS	0.1	mg/kg	None	1	ug/l	None
Alpha-BHC	GCMS	0.1	mg/kg	None	1	ug/l	None
Azinphos Methyl	GCMS	0.1	mg/kg	None	1	ug/l	None
Beta-BHC	GCMS	0.1	mg/kg	None	1	ug/l	None
Delta-BHC	GCMS	0.1	mg/kg	None	1	ug/l	None
Diazinon	GCMS	0.1	mg/kg	None	1	ug/l	None
Dichlorvos	GCMS	0.1	mg/kg	None	1	ug/l	None
Dieldrin	GCMS	0.1	mg/kg	None	1	ug/l	None
Endosulfan I	GCMS	0.1	mg/kg	None	1	ug/l	None
Endosulfan II	GCMS	0.1	mg/kg	None	1	ug/l	None
Endosulfan Sulphate	GCMS	0.1	mg/kg	None	1	ug/l	None
Endrin	GCMS	0.1	mg/kg	None	1	ug/l	None
Ethyl Parathion	GCMS	0.1	mg/kg	None	1	ug/l	None
Fenitrothion	GCMS	0.1	mg/kg	None	1	ug/l	None
Gamma-BHC(lindane)	GCMS	0.1	mg/kg	None	1	ug/l	None
Heptachlor	GCMS	0.1	mg/kg	None	1	ug/l	None
Heptachlor Epoxide	GCMS	0.1	mg/kg	None	1	ug/l	None
Malathion	GCMS	0.1	mg/kg	None	1	ug/l	None
Methyl Parathion	GCMS	0.1	mg/kg	None	1	ug/l	None
Methoxychlor (total)	GCMS	0.1	mg/kg	None	1	ug/l	None
Mevinphos	GCMS	0.1	mg/kg	None	1	ug/l	None
p, p' DDT	GCMS	0.1	mg/kg	None	1	ug/l	None
p,p'-DDE	GCMS	0.1	mg/kg	None	1	ug/l	None
p,p'-TDE(DDD)	GCMS	0.1	mg/kg	None	1	ug/l	None

Organochlorine pesticide suite

Soils

Waters

Determinand	Method	LOD	Units	Accreditation	LOD	Units	Accreditation
Aldrin	GCMS	0 .1	mg/kg	None	1	ug/l	None
Alpha – BHC	GCMS	0 .1	mg/kg	None	1	ug/l	None
Beta – BHC	GCMS	0 .1	mg/kg	None	1	ug/l	None
Cis-chlordane	GCMS	0 .1	mg/kg	None	1	ug/l	None
Dieldrin	GCMS	0 .1	mg/kg	None	1	ug/l	None
Endosulfan Sulphate	GCMS	0 .1	mg/kg	None	1	ug/l	None
Endosulphan I	GCMS	0 .1	mg/kg	None	1	ug/l	None
Endosulphan II	GCMS	0 .1	mg/kg	None	1	ug/l	None
Endrin	GCMS	0 .1	mg/kg	None	1	ug/l	None
Gamma –BHC (Lindane)	GCMS	0 .1	mg/kg	None	1	ug/l	None
Heptachlor	GCMS	0 .1	mg/kg	None	1	ug/l	None
Heptachlor epoxide	GCMS	0 .1	mg/kg	None	1	ug/l	None
Hexachlorobenzene	GCMS	0 .1	mg/kg	None	1	ug/l	None
Isodrin	GCMS	0 .1	mg/kg	None	1	ug/l	None
o, p'-DDE	GCMS	0 .1	mg/kg	None	1	ug/l	None
o, p'-DDT	GCMS	0 .1	mg/kg	None	1	ug/l	None
o, p'-Methoxychlor	GCMS	0 .1	mg/kg	None	1	ug/l	None
o,p'-TDE (DDD)	GCMS	0 .1	mg/kg	None	1	ug/l	None
p, p' DDT	GCMS	0 .1	mg/kg	None	1	ug/l	None
p, p'-Methoxychlor	GCMS	0 .1	mg/kg	None	1	ug/l	None
p,p'-DDE	GCMS	0 .1	mg/kg	None	1	ug/l	None
p,p'-TDE(DDD)	GCMS	0 .1	mg/kg	None	1	ug/l	None
Permethrin	GCMS	0 .1	mg/kg	None	1	ug/l	None
Quintozene (PCNB)	GCMS	0 .1	mg/kg	None	1	ug/l	None
Tecnazene	GCMS	0 .1	mg/kg	None	1	ug/l	None
Trans-Chlordane	GCMS	0 .1	mg/kg	None	1	ug/l	None
Triallate	GCMS	0 .1	mg/kg	None	1	ug/l	None
Trifluralin	GCMS	0 .1	mg/kg	None	1	ug/l	None

Organochlorine pesticide suite

Soils

Waters

Determinand	LOD	Units	Accreditation	LOD	Units	Accreditation
Dichlorvos	0.1	mg/kg	None	1	ug/l	None
Azinphos ethyl	0.1	mg/kg	None	1	ug/l	None
Azinphos methyl	0.1	mg/kg	None	1	ug/l	None
Carbophenothion	0.1	mg/kg	None	1	ug/l	None
Chlorfenvinphos	0.1	mg/kg	None	1	ug/l	None
Chlorpyrifos	0.1	mg/kg	None	1	ug/l	None
Diazinon (Dimpylate)	0.1	mg/kg	None	1	ug/l	None
Dimethoate	0.1	mg/kg	None	1	ug/l	None
Ethyl Parathion (Parathion)	0.1	mg/kg	None	1	ug/l	None
Fenitrothion	0.1	mg/kg	None	1	ug/l	None
Fenthion	0.1	mg/kg	None	1	ug/l	None
Malathion	0.1	mg/kg	None	1	ug/l	None
Methyl Parathion	0.1	mg/kg	None	1	ug/l	None
Mevinphos	0.1	mg/kg	None	1	ug/l	None
Phosalone	0.1	mg/kg	None	1	ug/l	None
Propetamphos	0.1	mg/kg	None	1	ug/l	None
Triazophos	0.1	mg/kg	None	1	ug/l	None

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Acid herbicides

Soils **Waters**

Determinand	Method	LOD	Units	Accreditation	LOD	Units	Accreditation
Benazolin	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Bentazone	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Bromoxynil	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Clopyralid	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
2,4 – D	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
2,4 –DB	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Dicamba	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Dichloroprop	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Fenoprop	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Ioxynil	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
MCPA	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
MCPB	LCMS MS	35	ug/kg	17025	0 .02	ug/l	None
Mecoprop	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Picloram	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Pentachlorophenol	LCMS MS	35	ug/kg	MCPB	0 .02	ug/l	None
2,4,5 – T	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
2,3,6 – TBA	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025
Triclopyr	LCMS MS	35	ug/kg	17025	0 .02	ug/l	17025

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National Grid suites

Due to the large number of these sites in the UK, a specific suite of testing was devised in order to cover the most likely contaminants.

Soils

Determinand	LOD	Units	Accreditation
Free Cyanide	0 .1	mg/kg	MCERTS
Total Cyanide	0 .1	mg/kg	MCERTS
Complex Cyanide	0 .2	mg/kg	None
Elemental Sulphur	0 .75	mg/kg	MCERTS
Soluble sulphate (2:1 extract)	10	mg/l	MCERTS
Chloride (soluble)	1	mg/kg	17025
Ammoniacal Nitrogen as NH4	0 .5	mg/kg	MCERTS
As(0 .2), Cd(0 .1), Cr(0 .15), Cu(0 .2), Hg(0 .05), Ni(1), Pb(0 .3), Se(0 .5), Zn(1), Co(0 .7), Mo(0 .4)	See Brackets	mg/kg	MCERTS
Speciated phenols by HPLC	Various	mg/kg	None
PAH 16 by GC-MS	0 .03	mg/kg	MCERTS (13 only)
TPH CWG fractions	0 .01-3 .4	mg/kg	MCERTS
BTEX/MTBE by GC-MS	Various	mg/kg	MCERTS
pH	1 .0	pH units	MCERTS
Loss On Ignition (LOI)	0 .01	%	MCERTS
Natural Moisture Content	0 .1	%	17025
% Stones	1	%	None
Hexavalent Chromium	1	mg/kg	None

National Grid soil leachate

Determinand	LOD	Units	Accreditation
CEN 10:1 leachate prep - default			None
Complex Cyanide - Low Level	0 .1	ug/l	17025
Free cyanide - Low Level	0 .1	ug/l	17025
Total cyanide - Low Level	0 .1	ug/l	17025
Total Sulphur	10	mg/l	None
Sulphate	0 .1	mg/l	17025
Chloride	0 .1	mg/l	17025
Total Ammonium	0 .015	mg/l	17025
Low Level As(0.16), Cd(0.02), Cr(0.25), Cu(0.3), Pb(0.09), Hg(0.001), Ni(0.5), Se(0.25), Zn(0.5), Co(0.16), Fe(5.5), Mo(1.1), V(0.6),	See brackets	ug/l	17025
Hexavalent Chromium - Low Level	7	ug/l	17025
Speciated phenols by HPLC - Resourcinol, Catechol, Phenol, Total Cresols, Total Xylenols, 1-napthol, 2,3,5-trimethyl phenol	0 .1	ug/l	None
PAH 16 by GC-MS	0 .01	ug/l	17025
TPH CWG Fractions	See p .51	ug/l	See p .51
BTEX/MTBE by GC-MS Benzene (1), Toluene (1), Ethyl Benzene (1), m/p Xylene (2), o Xylene (1), MTBE (1)	See brackets	ug/l	17025 except MTBE
pH	1	pH units	17025
Total Organic Carbon (1) and/or DOC (2)	See brackets	mg/l	17025

NG Water

Determinand	LOD	Units	Accreditation
Complex Cyanide - Low Level	0 .1	ug/l	17025
Free cyanide - Low Level	0 .1	ug/l	17025
Total cyanide - Low Level	0 .1	ug/l	17025
Total Sulphur	10	mg/l	None
Sulphate	0 .1	mg/l	17025
Sulphide	10	ug/l	17025
Chloride	0 .1	mg/l	17025
Total Ammonium	0 .15	mg/l	17025
Low Level As(0.16), Cd(0.02), Cr(0.25), Cu(0.3), Pb(0.09), Hg(0.001), Ni(0.5), Se(0.25), Zn(0.5), Co(0.16), Fe(5.5), Mo(1.1), V(0.6), B(12)	See brackets	ug/l	17025 except Boron
Speciated phenols by HPLC - Resourcinol, Catechol, Phenol, Total Cresols, Total Xylenols, 1-napthol, 2,3,5-trimethyl phenol	0 .1	ug/l	None
PAH 16 by GC-MS	0 .01	ug/l	17025
TPH CWG fractions	See p .51	ug/l	See p .51
BTEX/MTBE by GC-MS (Benzene (1), Toluene (1), Ethyl Benzene (1), m/p Xylene (2), o Xylene (1), MTBE (1)	See brackets	ug/l	17025 except MTBE
pH	1	pH units	17025
Total Organic Carbon (1) and/or DOC (2)	See brackets	mg/l	17025
Total Suspended Solids	5	mg/l	17025
Electrical Conductivity	1	uS/cm	17025
Hexavalent Chromium - Low Level	7	ug/l	17025

NG MNA

Determinand	LOD	Units	Accreditation
Total Alkalinity as CaCO3	10	mg/l	17025
Dissolved methane	25	ug/l	None
Nitrate as NO3	0 .1	mg/l	17025
Nitrite as NO2	0 .1	mg/l	17025
Manganese II	100	ug/l	None
Iron II	100	ug/l	None
Iron III	100	ug/l	None
Dissolved CO2	0 .01	mg/l	None

Gasholder water suite

Determinand	LOD	Units	Accreditation
True colour	1	Hazen	None
Dissolved Methane	25	ug/l	None
Dissolved Oxygen	2	mg/l	None
COD	10	mg/l	17025
BOD	1	mg/l	17025
Total suspended solids	5	mg/l	17025
pH	1	pH units	17025
Sulphide	10	mg/l	17025
Sulphate	0 .1	mg/l	17025
Nitrate	0 .1	mg/l	17025
Phenols	0 .1	ug/l	None
Ammonia	0 .015	mg/l	None
Ammoniacal Nitrogen	0 .015	mg/l	17025
Fats, oils and grease	1	mg/l	17025
Metals: Fe(5.5), Zn(1.3), Cu(0.4), Hg(0.01), Cd(0.03), Cr(0.25), As(0 .16), Pb(0 .09)	see brackets	mg/l	17025
Total Cyanide	40	ug/l	17025
BTEX	1 m/p Xylene (2)	mg/l	17025
TOC	1	mg/l	17025
PAH USEPA 16	0 .01	ug/l	17025
TPH CWG Fractions	see below	ug/l	see below
TPH Aliphatic >C5-6	1	µg/l	17025
TPH Aliphatic >C6-8	1	µg/l	17025
TPH Aliphatic >C8-10	1	µg/l	17025
TPH Aliphatic >C10-12	1	µg/l	None
TPH Aliphatic >C12-16	1	µg/l	None
TPH Aliphatic >C16-21	1	µg/l	None
TPH Aliphatic >C21-35	1	µg/l	None
TPH Aromatic >EC5-7 (Benzene)	1	µg/l	17025
TPH Aromatic >EC7-8 (Toluene)	1	µg/l	17025
TPH Aromatic >EC8-10	1	µg/l	17025
TPH Aromatic >EC10-12	1	µg/l	None
TPH Aromatic >EC12-16	1	µg/l	None
TPH Aromatic >EC16-21	1	µg/l	None
TPH Aromatic >EC21-35	1	µg/l	None

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Monitored Natural Attenuation (MNA)

Water systems will slowly regulate themselves, given the right conditions, and this suite is designed to monitor the progress.

Determinand	LOD	Units	Accreditation
Total Alkalinity as CaCO3	10	mg/l	17025
Calcium	0 .09	mg/l	17025
pH	1	pH units	17025
DOC	2	mg/l	17025

MNA suite

Determinand	LOD	Units	Accreditation
Total Alkalinity as CaCO3	10	mg/l	17025
Dissolved methane	25	ug/l	None
Dissolved CO2	0 .01	mg/l	None
Manganese II	100	ug/l	None
Manganese IV	100	ug/l	None
Total Manganese	0 .22	ug/l	17025
Iron II	100	ug/l	None
Iron III	100	ug/l	None
Total Iron	5 .5	ug/l	17025
Nitrate as NO3	0 .1	mg/l	17025
Nitrite as NO2 (should be tested within 24 hours)	0 .1	mg/l	17025
Sulphate	0 .1	mg/l	17025
Sulphide	10	ug/l	17025
Total Inorganic Carbon	2	mg/l	None
Total Organic Carbon	2	mg/l	17025

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Landfill Directive lists

These suites list designated priority pollutants. Although the methods are accredited on waters, the actual leachate preparation is not accredited.

Landfill Directive list I

	Soil-leachate		
Determinand	**LOD**	**Units**	**Accreditation**
VOC target list including BTEX/MTBE + TICs by GC-MS	1	ug/l	None
SVOC target list including PAHs, phenol and chlorinated phenols plus TICs by GC-MS	Various	ug/l	None
Organophosphorus pesticides (21 compounds)	Various	ug/l	None
Tributyltin, triphenyltin, dibutyltin	1	ug/l	None
Total Mercury	0 .01	ug/l	None
Total Cadmium	0 .03	ug/l	None
EPH (C8-40) (total or dissolved) by GC-FID including mineral oil by calculation	10	ug/l	None
Total cyanide	40	ug/l	17025

Landfill Directive list 2

	Soil-leachate		
Determinand	**LOD**	**Units**	**Accreditation**
Total As, Cr, Cu, Pb, Ni, Se, Zn, B, Ba, Co, Mo, Sb , V, Be, Tl, P, Sn, Ti, Te, Ag	Various	ug/l	None
Total Uranium		currently subcontracted	
Organochlorine pesticides (33 compounds)	Various	ug/l	None
Acid Herbicides	Various	ug/l	None
Silica	0 .1	mg/l	None
Ortho-Phosphate as PO4	0 .01	mg/l	17025
Fluoride	0 .1	mg/l	None
Ammoniacal Nitrogen as NH3	0 .015	mg/l	17025
Nitrate as NO3	0 .1	mg/l	17025

List 1 and list 2 substances

As with the Landfill Directive, these compounds are designated priority pollutants.

EA List 1 dangerous substances (76/464/EEC)

Soils **Waters**

Determinand	LOD	Units	Accreditation	LOD	Units	Accreditation
Cadmium	0 .1	mg/kg	MCERTS	0 .03	ug/l	17025
Mercury	0 .05	mg/kg	MCERTS	0 .01	ug/l	17025
Carbon tetrachloride	0 .01	mg/kg	17025	1	ug/l	17025
Chloroform	0 .01	mg/kg	17025	1	ug/l	17025
1,2,4 -trichlorobenzene	0 .01	mg/kg	17025	1	ug/l	17025
1,2,3 - trichlorobenzene	0 .01	mg/kg	17025	1	ug/l	17025
Trichloroethene (trichloroethylene)	0 .01	mg/kg	17025	1	ug/l	None
1,2 -Dichloroethane	0 .01	mg/kg	17025	1	ug/l	17025
Tetrachloroethene (perchloroethylene)	0 .01	mg/kg	17025	1	ug/l	17025
Hexachlorobutadiene	0 .01	mg/kg	17025	1	ug/l	17025
Hexachlorobenzene	0 .1	mg/kg	17025	1	ug/l	None
Pentachlorophenol	0 .1	mg/kg	None	1	ug/l	None
Aldrin	0 .1	mg/kg	None	1	ug/l	None
Dieldrin	0 .1	mg/kg	None	1	ug/l	None
Endrin	0 .1	mg/kg	None	1	ug/l	None
o,p DDT	0 .1	mg/kg	None	1	ug/l	None
p,p -DDT	0 .1	mg/kg	None	1	ug/l	None

EA List 1 dangerous substances (76/464/EEC)

Soils

Waters

Determinand	LOD	Units	Accreditation	LOD	Units	Accreditation
pH	1	pH Units	MCERTS	1	pH Units	17025
Triphenyltin	1	mg/kg	None	1	ug/l	None
Tributyltin	1	mg/kg	None	1	ug/l	None
2,4 -D	35	ug/kg	17025	0 .02	ug/l	None
2,4 -DB	0 .1	mg/kg	None	0 .02	ug/l	17025
Mecoprop	35	ug/kg	17025	0 .02	ug/l	17025
Bentazone	35	ug/kg	17025	0 .02	ug/l	17025
Linuron	0 .1	mg/kg	None	0 .05	ug/l	None
Trifluralin	0 .1	mg/kg	None	1	ug/l	None
Endosulfan Sulphate	0 .1	mg/kg	None	1	ug/l	None
Endosulphan I	0 .1	mg/kg	None	1	ug/l	None
Endosulphan II	0 .1	mg/kg	None	1	ug/l	None

EA List 1 dangerous substances (76/464/EEC)

Soils

Waters

Determinand	LOD	Units	Accreditation	LOD	Units	Accreditation
Triazophos	0 .1	mg/kg	None	1	ug/l	None
Dichlorvos	0 .1	mg/kg	None	1	ug/l	None
Mevinphos	0 .1	mg/kg	None	1	ug/l	None
Dimethoate	0 .1	mg/kg	None	1	ug/l	None
Omethoate	0 .1	mg/kg	None	1	ug/l	None
Fenitrothion	0 .1	mg/kg	None	1	ug/l	None
Malathion	0 .1	mg/kg	None	1	ug/l	None
Azinphos-methly	0 .1	mg/kg	None	1	ug/l	None
Triazines	0 .1	mg/kg	None	1	ug/l	None
Atrazine	0 .1	mg/kg	None	1	ug/l	None
Simazine	0 .1	mg/kg	None	1	ug/l	None
Cyfluthrin	0 .1	mg/kg	None	1	ug/l	None
Permethrin	0 .1	mg/kg	None	1	ug/l	None
2,4 -dichlorophenol	0 .1	mg/kg	17025	1	ug/l	None
Naphthalene	0 .1	mg/kg	17025	1	ug/l	None
4-Chloro-3- xmethylphenol	0 .1	mg/kg	17025	1	ug/l	None
2 - Chlorophenol	0 .1	mg/kg	17025	1	ug/l	None
Biphenyl	0 .1	mg/kg	17025	1	ug/l	None
Benzene	0 .01	mg/kg	17025	1	ug/l	17025
Toluene	0 .01	mg/kg	17025	1	ug/l	17025
m,p- xylene	0 .01	mg/kg	17025	2	ug/l	17025
o- xylene	0 .01	mg/kg	17025	1	ug/l	17025
Arsenic	0 .2	mg/kg	MCERTS	0 .16	ug/l	17025
Boron	0 .2	mg/kg	MCERTS	12	ug/l	17025
Chromium	0 .15	mg/kg	MCERTS	0 .25	ug/l	17025
Copper	0 .2	mg/kg	MCERTS	0 .4	ug/l	17025
Iron	25	mg/kg	MCERTS	5 .5	ug/l	17025
Lead	0 .3	mg/kg	MCERTS	0 .09	ug/l	17025
Nickel	1	mg/kg	MCERTS	0 .5	ug/l	17025
Vanadium	0 .8	mg/kg	MCERTS	0 .6	ug/l	17025
Zinc (Total)	1	mg/kg	MCERTS	1 .3	ug/l	17025
Demeton	0 .1	mg/kg	None	1	ug/l	None

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Environmental forensics

The environmental forensic approach integrates and leverages the expertise of environmental chemists from the laboratory in partnership with the consultant. Environmental forensic chemistry investigations typically utilise a multi-level tiered interpretive approach to support the identification of the source of the contamination that has been characterised by environmental sample analysis.

To achieve a successful environmental forensic investigation, it will encompass forensic tool(s) which are best suited for a particular set of facts. The tiered approach is broken down into the following tiers:

- Tier 1- Identification of spill release product in contaminated samples shapes the environmental forensic investigation and is the foundation in the development of multiple lines of evidence approach. At this level typically, both standard and specialised methodologies are employed to identify the contaminant, including total petroleum hydrocarbons, PAHs, PCBs, metals and chlorinated solvents.
- Tier 2- At this level the investigator can now target the specific signature compounds unique to the contamination identified in Tier 1. Utilising gas chromatography coupled with mass spectrometry techniques targeted families of compounds such as bicyclic sesquiterpanes, alkylated PAHs and terpane biomarkers which all can be used to determine the degree of similarity to source materials, degree of weathering and/ or biodegradation.
- Tier 3- Building on the evidence obtained from Tier 1 and Tier 2 investigational analysis, the data visualisation can be represented in several different ways including chemical component histograms, double ratio cross plots and compound ratio analysis spider plots. All can be used to achieve the common objective of many forensic investigations translating environmental information to allocated responsibility for the contamination.

The successful execution requires an understanding of fate and transport as related to contaminant alterations, as well as the forensic tools employed for the investigation.

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