

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 1252 Accredited to ISO/IEC 17025:2017	SOCOTEC UK LIMITED	
	Issue No: 099 Issue date: 26 August 2021	
	Environmental Chemistry PO Box 100 Bretby Business Park Burton-on-Trent Staffordshire DE15 0XD	Contact: Mr Brad Collins Tel: +44 (0)1283554479 Fax: +44 (0)1283 554422 E-Mail: brad.collins@socotec.com website: www.socotec.co.uk
Testing performed by the Organisation at the locations specified		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
Address SOCOTEC House Bretby Business Park Ashby Road Bretby Burton upon Trent Staffs DE15 0YZ	Local contact Mr Brad Collins Tel: +44 (0)1283 554479	Environmental Chemistry Forensics Specialist Chemistry Bretby
Address Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP	Local contact Mr Jasper Hattink Tel: +44 (0)1235 776520 E-mail: salesuk@socotec.com	Environmental Radiochemistry Environmental Chemistry Didcot

Site activities performed away from the locations listed above:

Location details	Activity	Location code
All site locations suitable for the activities listed	Sampling and on-site testing	Site - Env



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DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
<p>FORENSICS</p> <p>DRUGS (and materials suspected of containing drugs)</p>	<p><u>Forensic Analysis</u></p> <p>Legal classification of controlled drugs (Misuse of Drugs Act 1971)</p> <p>Identification of:</p> <ul style="list-style-type: none"> - Amphetamine - Methamphetamine - MDA - MDMA - MDEA - MBDB - Cannabis - Cocaine - Diamorphine - Caffeine - Ketamine - Methadone - Diazepam - 5-MeO-DALT - UR-144 - Phenazepam - Papaverine - Etizolam - AM2201 - Buprenorphine - Nandrolone Decanoate - BB-22 - Benzocaine - Phenacetin - Paracetamol - Tetramisole 	<p>The organisation has demonstrated adherence to the relevant requirements of the Forensic Science Regulators Code of Practice and Conduct in relation to their Forensic Activities</p> <p>Documented In-House method ASUS 104 using GC-MS</p>	<p>Bretby</p>



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Identification of LSD	Documented In-House Method ASUS 603 using HPLC	Bretby
	Identification of Cannabis, cannabis resin and cannabis products	Documented in house method (FORS 204 Annex D) using – microscopy	Bretby
	Quantitation of: <ul style="list-style-type: none">- Amphetamine- MDMA- Ketamine	Documented In-House Method ASUS 126 using GC-MS	Bretby



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DRUGS (and materials suspected of containing drugs) (cont'd)	<u>Forensic Analysis (cont'd)</u> Quantitation of: - MDMA - Cannabis – THC - Cocaine - Diamorphine - Ketamine	Documented In-House Method ASUS 126 using GC-FID	Bretby
LACHRYMATORS	Identification of Ortho-chlorobenzalmalonitrile (CS)	Documented in house method (FORS 223) using GCMS	Bretby
RADIOCHEMISTRY	<u>Radiochemical Tests</u>	Documented In-House Methods	
SOILS Including Sediments and Sewage Sludge	Gross Alpha and Beta relative to: Pu-242 for alpha Am-241 for alpha Cs-137 for beta K-40 for beta	2005 using source preparation and proportional counting	Didcot
VEGETATION Including Land plants, Aquatic plants and marine plants	<u>Isotopes:</u> Sulphur-35 Plutonium-238, 239 + 240 Americium-241 Technetium-99 Uranium-234, 235 and 238	2111 using Radiochemical separation and Liquid scintillation counting 2117 using Radiochemical separation and Alpha Spectrometry 2134 using Radiochemical separation and Liquid scintillation counting 2123 using Radiochemical separation and Alpha spectrometry	Didcot Didcot Didcot Didcot



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	<u>Radiochemical Tests (cont'd)</u>		
SOILS Including Sediments and Sewage sludge	Thorium 228, 230 and 232	2112 using Radiochemical separation and Alpha spectrometry	Didcot
SOILS Including Sediments and Sewage sludge	Qualitative and quantitative determination of gamma-ray emitting radio isotopes	2029 (30 – 2000 keV) including the option to use GammaTool software to correct for sample density and composition where this is sufficiently well known using Gamma-Ray Spectrometry	Didcot
VEGETATION Including land plants, aquatic plants and marine plants			
FOODSTUFFS Including Feedingstuffs and Beverages			
WATERS Ground Water, Surface Water, Rain Water, Saline Water, Sea Water, Bottled Water, Potable Water (non-regulatory), Sewage Effluent, Trade Effluent and Landfill Leachate			
FILTERS Including (Air) Filters, Smears and Swabs			
SOILS Including Sediments and Sewage sludge	Strontium-90	ANU/SOP/2168 based on ISO 18589-5:2009 by gas flow proportional counting	Didcot



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	<u>Radiochemical Tests (cont'd)</u>		
SOILS Including Sediments and Sewage sludge	Carbon-14	2103 using Pyrolysis and Liquid scintillation counting	Didcot
VEGETATION Including land plants, aquatic plants and marine plants			
EFFLUENTS			
FILTERS Including (Air) Filters, Smears and Swabs			
DECOMMISSIONING MATERIALS Including Oils, Metals, Concretes, Brickworks, Cements, Masonry dusts and Rubbles			
All Solid Combustible Materials	Total Tritium	2094 using Pyrolysis and Liquid scintillation counting	Didcot
WATERS Ground water, Surface water, Rain water, Saline water, Seawater, Bottled water, Potable water (non- regulatory), Sewage effluent, Trade effluent, Landfill leachate	Alpha and Beta activity relative to: Pu-242 for alpha Am-241 for alpha Cs-137 for beta K-40 for beta	2002 based on BS ISO 9696 for gross alpha and BS ISO 9697 for gross beta and Methods for the Examination of Waters and Associated Materials	Didcot
	Polonium-210	2082 using Radiochemical separation and Alpha Spectrometry	Didcot
	Plutonium-238, 239 + 240 Americium-241 Uranium-234, 235 and 238	2116 using Radiochemical separation and Alpha Spectrometry	Didcot



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	<u>Radiochemical Tests (cont'd)</u>		
Ground water, Surface water, Landfill leachate, Saline water, Seawater, Sewage effluent, Bottled water and Potable water (non-regulatory)	Strontium-90	2105 by Gas flow proportional counting	Didcot
	Thorium-228, 230 and 232	2119 using radiochemical separation and Alpha Spectrometry	Didcot
	Technetium-99	2134 using Radiochemical separation and Liquid scintillation counting	Didcot
	Tritium	2003 using Distillation and Liquid Scintillation Counting	Didcot
Waters Ground water, Surface water, Rain water, Saline water, Sea water, Bottled water, Potable water (non-regulatory), Sewage effluent, Trade effluent and Landfill leachate	Tritium	2003 using Distillation and Liquid Scintillation Counting	Didcot
Groundwater, Surface water, Rain water, Bottled water and Potable water (non-regulatory)	Tritium	2093 using Distillation and Liquid Scintillation Counting	Didcot
ATMOSPHERIC POLLUTANTS AND EFFLUENTS			
Diffusion tubes	Nitrogen dioxide	1015 using spectrophotometry	Didcot
WATERS plus seawater, silt, sediment, seaweed, grass and soil	Sampling	ANU/SOP/2135	Site-Env
ENVIRONMENT i.e. beaches, strandlines, debris, riverbanks and canal banks	On-site Radiation Monitoring	ANU/SOP/2128	Site-Env



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ADVANCED CHEMISTRY and RESEARCH	<u>Chemical Testing</u>		
Rainwater	pH and Conductivity	ASC/SOP/109 electrochemical method	Bretby
Rainwater and Process Water	Ammonium Calcium Magnesium Potassium Sodium	ASC/SOP/106 using ion chromatography	Bretby
	Bromide Chloride Fluoride Nitrate Nitrite Phosphate Sulphate	ASC/SOP/110 using ion chromatography	Bretby
Tenax ATD tubes	Benzene Toluene Ethylbenzene Ortho-Xylene Meta and para-Xylenes	ASC/SOP/211 using ATD-GCMS	Bretby
	Hexachlorobutadienes Pentachlorobutadienes Tetrachlorobutadienes	ASC/SOP/206 using ATD-gas chromatography mass spectrometry and flame ionisation detection	Bretby
Carbopack ATD tubes	Benzene	ASC/SOP/236 by ATD-GCMS	Bretby



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES	<u>Chemical Tests</u>	Documented In-House Methods based on the following national, international and other recognised standards	
Impinger Solutions (3% hydrogen peroxide)	Bromide Chloride Phosphate Sulphate and Volume Measurement	ASC/SOP/110 using ion chromatography	Bretby
Impinger Solutions (0.1M sodium hydroxide)	Bromide Chloride Fluoride Nitrate Nitrite and Volume Measurement	ASC/SOP/110 using ion chromatography	Bretby
Impinger Solutions (80% IPA)	Sulphate and Volume Measurement	ASC/SOP/110 using ion chromatography	Bretby
Impinger Solutions (0.5M sulphuric acid)	Bromide Chloride Fluoride and Volume Measurement	ASC/SOP/110 using ion chromatography	Bretby
Impinger Solutions (0.1M sodium hydroxide, water or 0.5M sulphuric acid)	Hydrogen chloride, Hydrogen bromide, Hydrogen fluoride, and Volume Measurement	US EPA Method 26A using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (3% hydrogen peroxide)	Sulphur Dioxide (by calculation) and Volume Measurement	BS EN 14791:2017 using IC analysis (ASC/SOP/ 110)	Bretby
Impinger Solutions (0.1M sodium hydroxide)	Hydrogen fluoride and Volume Measurement	BS ISO 15713:2006 (modified) using IC analysis (ASC/SOP/110)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Testing (cont'd)</u>		
Impinger Solutions (process water)	Hydrogen Chloride and Volume Measurement	BS EN 1911:2010 using IC analysis (ASC/SOP110)	Bretby
Impinger Solutions (0.5M sulphuric acid)	Ammonia and Volume Measurement	BS EN ISO 21877:2019 using Ion Chromatography method ASC/SOP/108	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Trace elements As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Tl, V and Volume Measurement	BS EN 14385:2004 Using HF microwave digestion followed by ICP-MS analysis (ASC/SOP/117)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Trace elements Hg, In, Pd, Pt, Sn and Volume Measurement	HF microwave digestion followed by ICP-MS (ASC/SOP/117)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Trace elements Cd, Co, Cr, Cu, Mn, Ni, Pb, V and Volume Measurement	BS EN 14385:2004 Using HF microwave digestion followed by ICP-AES analysis (ASC/SOP/117)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Trace elements Fe, Zn and Volume Measurement	HF microwave digestion followed by ICP-AES (ASC/SOP/117)	Bretby
Impinger Solutions (nitric acid/potassium dichromate)	Trace element Hg and Volume Measurement	BS EN 13211:2001 using CVAFS (ASC/SOP/112)	Bretby
Surface water, Ground water, Sea water, lab-made leachate and landfill leachates	Hg	BS EN 13211:2001 using CVAFS (ASC/SOP/132)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Testing (cont'd)</u>		
DNPH tubes	Formaldehyde Acetaldehyde (As DNPH derivatives)	ASC/SOP/201 using HPLC	Bretby
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Testing (cont'd)</u>	National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard for laboratories carrying out testing of samples from stack emissions monitoring	
Impinger Solutions (0.5M sulphuric acid)	Ammonia and Volume Measurement	BS EN ISO 21877:2019 using Ion Chromatography method ASC/SOP/108	Bretby
Impinger Solutions (0.1M sodium hydroxide)	Fluoride (gaseous) and Volume Measurement	BS ISO 15713:2006 (modified) using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (0.1M sodium hydroxide)	Hydrogen fluoride and Volume Measurement	BS ISO 15713:2006 (modified) using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (process water)	Hydrogen Chloride and Volume Measurement	BS EN 1911:2010 using IC analysis (ASC/SOP110)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Testing (cont'd)</u>	National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard for laboratories carrying out testing of samples from stack emissions monitoring	
Impinger Solutions (0.1N sulphuric acid)	Hydrogen chloride, Hydrogen fluoride, and Volume Measurement	US EPA Method 26/26A using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (0.1N sodium hydroxide)	Chlorine, Bromine and Volume Measurement	US EPA Method 26/26A using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (nitric acid/potassium dichromate)	Mercury and Volume Measurement	BS EN 13211:2001 using CVAFS (ASC/SOP/112)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Mercury and Volume Measurement	BS EN 13211 :2001 using HF microwave digestion followed by ICP-MS (ASC/SOP/117)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Metals, specifically: Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, V and Zn and Volume Measurement	BS EN 14385:2004 Using HF microwave digestion followed by ICP-AES analysis (ASC/SOP/117)	Bretby
Filters, filters and probe rinses (nitric acid), impinger solutions (nitric acid/hydrogen peroxide)	Metals, specifically: As, Cd, Co, Cr, Cu, Hg, In, Mn, Ni, Pb, Pd, Pt, Sb, Sn, Ti, and V and Volume Measurement	BS EN 14385:2004 Using HF microwave digestion followed by ICP-MS analysis (ASC/SOP/117)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Testing (cont'd)</u>	National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard for laboratories carrying out testing of samples from stack emissions monitoring	
Impinger Solutions (80% IPA)	Sulphate and Volume Measurement	US EPA 8 using ion chromatography (ASC/SOP/110)	Bretby
Impinger Solutions (3% hydrogen peroxide)	Sulphur Dioxide (by calculation) and Volume Measurement	BS EN 14791:2017 using IC analysis (ASC/SOP/ 110)	Bretby



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ENVIRONMENTAL CHEMISTRY			
	<u>Chemical Testing</u>		
SOILS (includes made ground)	Aluminium Arsenic Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Phosphorus Potassium Sodium Strontium Vanadium Zinc	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials. Determination of Metals in Soils, Sediments and Sewage Sludge and Plants using ICP-OES, No ICPSOIL	Bretby
SOILS (includes made ground)	Antimony Arsenic Cadmium Chromium Cobalt Copper Lead Manganese Mercury Molybdenum Nickel Selenium Thallium Uranium Zinc	Documented In-House Method using ICPMS, No ICPMSS	Bretby



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MARINE SEDIMENTS	<u>Chemical Testing (cont'd)</u> Arsenic Tin Lead Copper	Documented in house method: ICPSEEXT - Hydrofluoric acid digestion followed by ICPMSSED analysis by ICPMS	Bretby
MARINE SEDIMENTS	Aluminium Barium Iron Manganese Strontium Chromium Nickel Vanadium Zinc	Documented in house method: ICPSEEXT - Hydrofluoric acid digestion followed by ICPSED analysis by ICP-OES	Bretby
SOILS (includes made ground)	Quantification of Phenol and its methylated isomers below: Methylphenols Dimethylphenols Trimethylphenols Total phenols	PHEHPLCUV by methanol/water extraction and HPLC with UV detection	Bretby
MARINE SEDIMENTS	Vanadium Chromium Manganese Nickel Copper Zinc Arsenic Cadmium Tin Mercury Lead	Documented in-house method SEDMEXT & SEDMS by Microwave Assisted Hydrofluoric Acid Digestion and ICPMS Quantification	Bretby



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MARINE SEDIMENTS (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Aluminium Barium Beryllium Iron Manganese Phosphorus Strontium Chromium Copper Vanadium Zinc Nickel	Documented in-house method SEDMEXT & SEDOES by Microwave Assisted Hydrofluoric Acid Digestion and ICPOES Quantification	Bretby
	PAH's in include: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Dibenzthiophene Fluoranthene Pyrene Benzo(a)anthracene Chrysene/Triphenylene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(e)pyrene Benzo(a)pyrene Indeno(123-cd)pyrene Dibenzo(ah)anthracene Benzo(ghi)perylene	Documented in house method – ASC SOP - 303 by Solvent Extraction and Method ASC SOP - 304 Determination By GC-MS(SIM)	Bretby



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MARINE SEDIMENTS (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Arsenic Cadmium Chromium Cobalt Copper Lead Manganese Mercury Nickel Zinc	Documented in house method ICPEXT for Aqua Regia extraction and ICPMSS for ICP-MS analysis	Bretby
	Organochlorine Pesticides (OCP) and Polychlorinated Biphenyls (PCB) Alpha-HCH Beta-HCH Dieldrin Gamma-HCH Hexachlorobenzene p,p-DDD p,p-DDE p,p-DDT PCB 18 PCB 28 PCB 31 PCB 44 PCB 47 PCB 49 PCB 52 PCB 66 PCB 101 PCB 105 PCB 110 PCB 118 PCB 128	In-house Method ASC-SOP-302 by solid phase extraction and GC-MS-MS	Bretby



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MARINE SEDIMENTS (cont'd)	<u>Chemical Testing (cont'd)</u> Organochlorine Pesticides (OCP) and Polychlorinated Biphenyls (PCB) (cont'd) PCB 138 PCB 141 PCB 149 PCB 151 PCB 153 PCB 156 PCB 158 PCB 170 PCB 180 PCB 183 PCB 187 PCB 194	In-house Method ASC-SOP-302 by solid phase extraction and GC-MS-MS	Bretby
	Organotin: Dibutyltin Tributyltin	In-house Method ASC-SOP-301 by GC-MS	Bretby
SOILS (includes made ground)	Fluoride (2:1 extraction)	Documented In-House Method using Ion Selective Electrode based on Methods for the Examination of Waters and Associated Materials, No ISEFSS	Bretby
	Sulphate (acid soluble)	Documented In-House Method using ICP-OES, No ICPACIDS	Bretby
	Sulphate (water soluble)	Documented In-House Method using ICP-OES, No ICPWSS	Bretby



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SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Sulphur (elemental)	Documented In-House Method based on Lattice Property Holdings Environmental Assessment Guidance Version 2.6. Solvent extraction followed by HPLC and UV detection, No ELESULP	Bretby
	pH	Documented In-House Method, No PHSOIL	Bretby
	Total Moisture Content	Documented In-House Method Oven drying @ 105°C, No TMSS	Bretby
SOILS (includes made ground)	Benzene Toluene Ethylbenzene m&p Xylenes o Xylene Total Xylenes MTBE	Documented In-House Method based on USEPA Methods 3810 and 8015. Technique used is headspace gas chromatography with flame ionisation detection, No BTEXHSA	Bretby
	Gasoline range organics (GRO) Total GRO >C5-C10 GRO >C5-C6 GRO >C6-C7 GRO >C7-C8 GRO >C8-C10 GRO >C5-C7 GRO >C6-C8	Documented In-House Method based on USEPA Methods 3810 and 8015. Technique used is headspace gas chromatography with flame ionisation detection, No GROHSA	Bretby



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SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u> Phenols: Phenol 2-Chlorophenol 2-Methylphenol 3 & 4-Methylphenol 2-Nitrophenol 2,4-Dimethylphenol 2,4-Dichlorophenol 4-Chlorophenol 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 4-Nitrophenol	Documented in house method PHEMS using GC-MS	Bretby
SOILS (includes made ground)	Semi Volatile Organic Compounds: Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)ether Hexachloroethane 3- & 4-Methylphenol Nitrobenzene 2-Nitrophenol 2,4-Dimethylphenol bis(2-Chloroethoxy)methane 2,4-Dichlorophenol Naphthalene 4-Chlorophenol 4-Chloro-3-methylphenol 2-Methylnaphthalene 1-Methylnaphthalene	Documented in house method SVOCSW using GC-MS	Bretby



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u> Semi Volatile Organic Compounds: (cont'd) 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene Biphenyl Diphenyl ether Acenaphthylene Dimethylphthalate 2,6-Dinitrotoluene Acenaphthene Dibenzofuran 2,4-Dinitrotoluene Fluorene Diethylphthalate 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Hexachlorobenzene Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate Benzo[a]anthracene Chrysene bis(2-Ethylhexyl)phthalate Di-n-octylphthalate Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Indeno[1,2,3-cd]pyrene Dibenzo[a,h]anthracene Benzo[g,h,i]perylene	Documented in house method SVOCSW using GC-MS (cont'd)	Bretby



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Total Petroleum Hydrocarbons (C8-C40) including aromatic/aliphatic fractionation and quantification according to carbon banding: DRO (C10-C24) MRO (C22-C34) KRO (C8-C14) C8-C10, C10-C12, C12-C16, C16-C21 and C21-C35	Documented In-House Method TPHFIDUS	Bretby
	PAH's including: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno (123-cd)pyrene Dibenz(ah)anthracene Benzo(ghi)perylene Total PAH (sum of 16 above)	In house method PAHMSUS using ultrasonic extraction with GCMS detection	Bretby



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SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Monohydric Phenols/Phenol index Volatile Organic Compounds: Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethene trans 1,2-Dichloroethene 1,1-Dichloroethane MTBE 2,2-Dichloropropane cis 1,2-Dichloroethene Bromochloromethane Chloroform 1,1,1-Trichloroethane Carbon Tetrachloride 1,1-Dichloropropene Benzene 1,2-Dichloroethane	Documented in house method using Skalar continuous flow No SFAPI Documented in house method VOCHSAS – Volatile Organic Compounds in Soil by Headspace GC-MS	Bretby Bretby



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u> Volatile Organic Compounds: (cont'd) Trichloroethene 1,2-Dichloropropane 2,2-Dichloropropane cis 1,2-Dichloroethene Bromochloromethane Dibromomethane Bromodichloromethane cis 1,3-Dichloropropene Toluene trans 1,3-Dichloropropene 1,1,2-Trichloroethane Tetrachloroethene 1,3-Dichloropropane Dibromochloromethane 1,2-Dibromoethane Chlorobenzene Ethylbenzene 1,1,1,2-Tetrachloroethane m and p-Xylene o-Xylene Styrene Bromoform iso-Propylbenzene Propylbenzene Bromobenzene 1,2,3-Trichloropropane 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene sec-Butylbenzene p-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane, Naphthalene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	Documented in house method VOCHSAS - Volatile Organic Compounds in Soil by Headspace GC-MS (cont'd)	Bretby



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SOILS (includes made ground) (cont'd)	<u>Chemical Testing (cont'd)</u>		
	Available Phosphorus/Phosphate	WSLM60 using Bicarbonate Extraction followed by Colorimetric quantification	Bretby
	Total Organic Carbon	TOEXT & WSLM59 by Sulphurous Acid Digestion followed by High Temperature Combustion followed by NDIR	Bretby
	<u>Chemical Testing</u>	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Sulphur (elemental)	Documented In-House Method Solvent extraction followed by HPLC and UV detection, No ELESULP	Bretby
	Sulphate (Total/acid soluble)	Documented In-House Method using ICP-OES, No ICPACIDS	Bretby
SOILS and MARINE SEDIMENT	Sulphate (water soluble)	Documented In-House Method using ICP-OES, No ICPWSS	Bretby
	Iron Barium	Documented In-House Method - ICP SOIL using aqua regia extraction and ICP-OES determination	Bretby
	SOILS (MCERTS) Sand, clay, and silty type soils and made ground		



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing</u> (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	Bretby
	PAH's including: Naphthalene Acenaphthene Fluorene Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Dibenz(ah)anthracene Indeno(123cd)pyrene Benzo(ghi)perylene	In house method PAHMSUS using ultrasonic extraction with GCMS detection	
	Phenol	PHEHPLCUV by methanol/water extraction and HPLC with UV detection	Bretby



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing</u> (cont'd)		
	Quantification of specific PCB Congeners below: PCB 28 PCB 52 PCB 77 PCB 81 PCB 101 PCB 105 + 141 PCB 114 PCB 118 PCB 123 PCB 126 PCB 138 PCB 153 PCB 156 PCB 157 PCB 167 PCB 169 PCB 180 PCB 189	HCEXTS and PCBECED by solvent extraction and GC-ECD	Bretby
	Volatile Organic Compounds:	Documented in house method VOCHSAS - Volatile Organic Compounds in Soil by Headspace GC-MS	Bretby
	Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane trans 1,2-Dichloroethene		



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing (cont'd)</u> Volatile Organic Compounds: (cont'd) 1,1-Dichloroethane MTBE 2,2-Dichloropropane cis 1,2-Dichloroethene Bromochloromethane Chloroform 1,1,1-Trichloroethane Carbon Tetrachloride 1,1-Dichloropropene Benzene 1,2-Dichloroethane 1,2-Dichloropropane Dibromomethane Bromodichloromethane cis 1,3-Dichloropropene Toluene trans 1,3-Dichloropropene 1,1,2-Trichloroethane Tetrachloroethene 1,3-Dichloropropane Dibromochloromethane 1,2-Dibromoethane Chlorobenzene Ethylbenzene 1,1,1,2-Tetrachloroethane m and p-Xylene o-Xylene Styrene Bromoform	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd) Documented in house method VOCHSAS - Volatile Organic Compounds in Soil by Headspace GC-MS (cont'd)	Bretby



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing (cont'd)</u>	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd)	Bretby
	Volatile Organic Compounds: (cont'd) iso-Propylbenzene Propylbenzene Bromobenzene 1,2,3-Trichloropropane 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Naphthalene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	Documented in house method VOCHSAS - Volatile Organic Compounds in Soil by Headspace GC-MS (cont'd)	
	Benzene Toluene Ethyl Benzene m&p Xylenes o Xylene Total Xylenes	Documented In-House Method Technique used is headspace gas chromatography with flame ionisation detection, No BTEXHSA	Bretby



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing (cont'd)</u>	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd)	
	Gasoline range organics: Total GRO >C5-C10 GRO >C5-C6 GRO >C6-C7 GRO >C7-C8 GRO >C8-C10 GRO >C5-C7 GRO >C6-C8	Documented In-House Method Technique used is headspace gas chromatography with flame ionisation detection, No GROHSA	Bretby
	Arsenic Chromium Cobalt Copper Lead Manganese Nickel Zinc Cadmium Mercury Selenium Molybdenum	Documented In-House Method using ICPMS, No ICPMSS	Bretby
	Water Soluble Boron	Documented in house method using hot water extraction with ICP-OES detection, No ICPBOR	Bretby
	Total Petroleum Hydrocarbons (C8 - C40)	Documented In-House Method TPHFIDUS	Bretby



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SOILS (MCERTS) Sand, clay, and silty type soils and made ground (cont'd)	<u>Chemical Testing (cont'd)</u>	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd)	
	Potassium Chloride extractable ammoniacal Nitrogen	Documented in house method using Konelab discrete analyser, No AMMAR	Bretby
	Free Cyanide Total Cyanide Thiocyanate	Documented in house method using Skalar Continuous flow analysis, No SFAPI	Bretby
WATERS	pH	Documented in house method using 1:2.5 soil to water suspension by method PHSOIL	Bretby
	<u>Chemical Tests</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Groundwaters, Trade effluents, Landfill Leachate, Laboratory Generated Leachate	Free Cyanide Total Cyanide Phenol Index Thiocyanate Free Sulphide as S	Documented In-House Method using segmented flow analysis SFAPI	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Groundwaters, Trade effluents, Laboratory Generated Leachate	Determination of dissolved and total metals: Aluminium Arsenic Barium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Sodium Strontium Sulphur Vanadium Zinc	Documented In-House Method using ICP-OES, No ICPWATVAR	Bretby
	Antimony Arsenic Cadmium Chromium Cobalt Copper Lead Manganese Mercury Molybdenum Nickel	Documented In-House Method using ICPMS, No ICPMSW	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Groundwaters, Trade effluents, Laboratory Generated Leachate (cont'd)	Determination of dissolved and total metals: (cont'd) Selenium Thallium Tin Uranium Vanadium Zinc	Documented In-House Method using ICPMS, No ICPMSW	Bretby
Landfill Leachates only	Aluminium Calcium Iron Magnesium Potassium Sodium Sulphate Arsenic Cadmium Chromium Copper Lead Mercury Nickel Selenium Zinc	Documented In-House Method using ICP-OES, No ICPWATVAR Documented In-House Method using ICPMS, No ICPMSW	Bretby Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Ground waters, Trade Effluents and Laboratory Generated Leachates	Fluoride	Documented In-House Method by Multiple Known Addition using an Automated Ion Selective Electrode based on the Standard Methods for the Examination of Water and Wastewater, No ISEF	Bretby
Surface and Ground waters, Trade Effluents and Laboratory Generated Leachates	Bromide	Documented In-House Method ICHALW - using Ion Chromatography	Bretby
	Gasoline range organics (GRO)	Documented In-House Method based on USEPA Methods 3810 and 8015 by headspace gas chromatography with flame ionisation detection, No GROHSA	Bretby
Surface and Groundwaters, Trade effluents Laboratory Generated Leachate Landfill Leachate	pH	Documented In-House Method using pH probe based on BS 2690:1984:Part 109, No PHCOND	Bretby
	Conductivity	Documented In-House Method using conductivity probe based on BS 2690:1984:Part 109, No PHCOND	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Groundwaters, Trade effluents Laboratory Generated Leachate Landfill Leachate (cont'd)	Chemical Oxygen Demand	Documented In-House colorimetric chromium oxidation method based on BS 6068:2.34:1988, No WSLM11	Bretby
Surface and Ground waters, trade effluents and landfill leachates	BOD	Documented in house method by luminescence DO probe No WSLM20	Bretby
Surface and Groundwaters, Trade effluents Laboratory Generated Leachate Landfill leachate	Total Alkalinity Hydroxide Alkalinity Carbonate Alkalinity Bicarbonate Alkalinity	Documented In-House titrimetric method based on BS 2690:1984:Part 109, No WSLM12	Bretby
	Total Organic Carbon	Documented In-House Method using TOC instrumental technique, No WSLM13	Bretby
Surface and groundwater, Trade effluents	Suspended Solids	Documented In-House gravimetric method based on BS 690:1981:Part 120, No WSLM10	Bretby
	Total Acidity	Documented In-House Method based on BS 2690:1984:Part 109, No WSLM17	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Surface and Groundwaters, Trade effluents Laboratory Generated Leachate Landfill leachate	Determination of: Ammonia Total Oxidised nitrogen Nitrite Nitrate Chloride Phosphate Thiocyanate Hexavalent Chromium	Documented In-House Method by automated discrete colorimetric analysis, No KONENS	Bretby
Surface and Groundwaters, Trade effluents	Total Iron Ferrous Iron	Documented In-House Method by automated discrete colorimetric analysis, No KONEFE	Bretby
Surface and Ground waters, Trade effluents, Landfill Leachates & Laboratory Generated Leachate	Quantification of Phenol and its methylated isomers below: Methylphenols Dimethylphenols Trimethylphenols Total phenols	PHEUVHPLC by methanol/water extraction and HPLC with UV detection	Bretby
Surface and Groundwaters, Trade effluents	Benzene Toluene Ethylbenzene Xylenes (o-, m/p-) MTBE	Documented In-House Method based on USEPA Methods 3810 and 8015. Technique used is headspace gas chromatography with flame ionisation detection, No BTEXHSA	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Ground Waters, Surface Waters and Trade effluents	Quantitative and semi-quantitative determination of Volatile Organic Compounds (VOC's) including: Chloromethane Chloroform Vinyl Chloride Chloroethane Trichlorofluoromethane 1,1-Dichloroethene Dichloromethane trans 1,2-Dichloroethene 1,1-Dichloroethane cis 1,2-Dichloroethene Bromochloromethane 1,1,1-Trichloroethane Carbon Tetrachloride 1,1-Dichloropropene 1,2-Dichloroethane Trichloroethene 1,2-Dichloropropane Dibromomethane Bromodichloromethane trans 1,3-Dichloropropene 1,1,2-Trichloroethane Tetrachloroethene Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-Tetrachloroethane Styrene Bromoform iso-Propylbenzene Propylbenzene Bromobenzene 1,2,3-Trichloropropane 2-Chlorotoluene	Documented in-house Method using Headspace Extraction, Gas Chromatography with Mass Spectrometry Detection No VOCHSAW	Bretby



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WATERS (cont'd)	<u>Chemical Tests (cont'd)</u>	Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials	
Ground Waters, Surface Waters and Trade effluents (cont'd)	Quantitative and semi-quantitative determination of Volatile Organic Compounds (VOC's) including: (cont'd) 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene p-Isopropyltoluene Benzene Toluene Ethylbenzene Xylenes (o-, m/p-)	Documented in-house Method using Headspace Extraction, Gas Chromatography with Mass Spectrometry Detection No VOCHSAW	Bretby



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<p>WATERS (cont'd)</p> <p>Surface waters, groundwaters, Trade effluents, laboratory produced leachate and landfill leachates</p>	<p><u>Chemical Tests (cont'd)</u></p> <p>PAH's including: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno (1,2,3-cd)pyrene Dibenzo[a,h]anthracene Benzo[g,h,i]pyrene Coronene Total PAH's (sum of 17 above)</p>	<p>Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials</p> <p>Documented In-House Method using ultrasonic extraction in pentane [Method HCEXTW] and GC-MS detection [Method PAHMSW]</p>	<p>Bretby</p>
<p>Surface and Groundwaters, Trade effluents Laboratory Generated Leachate Landfill Leachate</p>	<p>Total and speciated EPH including: Aliphatic (Mineral Oil) fraction, Aromatic (PAH) fraction and Banded EPH >C8-C40 >C8-C10 >C10-C12 >C12-C16 >C16-C21 >C21-C35 >C10-C24 (Diesel Range) >C8-C14 (Kerosene Range) >C22-C34 (Mineral Oil Range)</p>	<p>Documented In-House Method: HCEXTW - ultrasonic extraction in pentane followed by: Documented In-House Method: TPHFID - using GC-FID</p>	<p>Bretby</p>



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Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
<p>WATERS (cont'd)</p> <p>Surface and Groundwater, Trade Effluents and Landfill Leachates</p>	<p><u>Chemical Tests (cont'd)</u></p> <p>Acid Herbicides: 2,3,6 TBA 2,4,5-T 2,4-D 2,4-DB 2,4-Dinitrophenol Benazolin Bentazone Bromoxynil Clopyralid Dicamba Dichloroprop DNOC Fenoprop Fluroxypyr Ioxynil MCPA (MCP) MCPB Mecoprop PCP Triclopyr</p>	<p>Documented In-House Method based on Blue Book Methods for the Examination of Waters and Associated Materials</p> <p>AHBLCMS – SPE followed by detection using LC-MS/MS</p>	<p>Bretby</p>
END			