


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <p><b>Accredited to ISO/IEC 17025:2005</b></p>	<b>Environmental Scientifics Group Limited</b> Trading as <b>ESG</b>	
	<b>Issue No: 056    Issue date: 24 April 2012</b>	
	<b>ESG House</b> <b>Bretby Business Park</b> <b>Ashby Road</b> <b>Bretby</b> <b>Burton upon Trent</b> <b>Staffordshire</b> <b>DE15 0YZ</b>	<b>Contact: Mr P Raybould</b> <b>Tel: +44 (0)1283 554400</b> <b>Fax: +44 (0)1283 554422</b> <b>E-Mail: <a href="mailto:accreditations@esg.co.uk">accreditations@esg.co.uk</a></b> <b>Website: <a href="http://www.esg.co.uk">www.esg.co.uk</a></b>
<b>Testing performed by the Organisation at the locations specified below</b>		

### Locations covered by the organisation and their relevant activities

#### Laboratory locations:

Location details	Activity	Location code	
<b>Address</b> ESG House Bretby Business Park Ashby Road Bretby Burton upon Trent Staffs DE15 0YZ	<b>Local contact</b> Mr P Raybould  Tel: +44 (0)1283 554333 Fax: +44 (0)1283 554422 Email: <a href="mailto:sales@esg.co.uk">sales@esg.co.uk</a>	Forensics, Water Microbiology, Coatings, Environmental Chemistry, Specialist Chemistry  Support Functions: Quality Management including document control, auditing and quality control	Bretby
<b>Address</b> Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP	<b>Local contact</b> Mr P.Duncan  Tel: +44 (0)1235 750730 Fax: +44 (0)1235 750739 Email: <a href="mailto:sales@esg.co.uk">sales@esg.co.uk</a>	Environmental Chemistry Environmental Radiochemistry	Didcot
<b>Address</b> 4 Hexthorpe Road Doncaster S Yorks DN4 0AE	<b>Local contact</b> Mr D Green  Tel: +44 (0)1302 380150 Fax: +44 (0)1302 380158 Email: <a href="mailto:sales@esg.co.uk">sales@esg.co.uk</a>	Oils	Doncaster
<b>Address</b> Bristol Street Swindon Wiltshire SN1 5ET	<b>Local contact</b> Mr M Harris  Tel: +44 (0)1793 714714 Fax: +44 (0)1793 714715 Email: <a href="mailto:sales@esg.co.uk">sales@esg.co.uk</a>	Atmospheric Pollutants Physical Testing Environmental Chemistry	Swindon



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<b>Address</b> 2-8 Langlands Place Kelvin South Business Park East Kilbride G75 0YF	<b>Local contact</b> Mr D Hay  Tel: +44 (0)7949645479 Fax: +44 (0)1355 246730 Email: sales@esg.co.uk	Atmospheric Pollutants Physical Testing Stack Emissions Testing Water Microbiology	E Kilbride
<b>Address</b> Unit 5 Crown Industrial Estate Kenwood Road Reddish Stockport SK5 6PH	<b>Local contact</b> Mr A Palliser  Tel: +44 (0)161-443 0980 Fax: +44 (0)161-443 0989 Email: sales@esg.co.uk	Atmospheric Pollutants Physical Testing Stack Emissions Testing	Stockport
<b>Address</b> Unit C Acacia Building Vantage Point Business Village Mitcheldean Gloucestershire GL17 0DD	<b>Local contact</b> Dr N Ford  Tel: +44 (0)1594 546343 Fax: +44 (0)1594 546342 Email: sales@esg.co.uk	Atmospheric Pollutants Physical Testing Stack Emissions Testing	Mitcheldean
<b>Address</b> Asken Road Carcroft Doncaster DN6 8DC	<b>Local contact</b> Mr W Halkett  Tel: +44 (0)1302-724455 Fax: +44 (0)1302-727233 Email: sales@esg.co.uk	Physical Testing	Carcroft

**Site activities performed away from the locations listed above:**

Location details	Activity	Location code
Commercial and Industrial Premises	Dust Sampling	Site - Dust
Customer Sites Requiring Stack Emissions Testing	Stack Emissions Testing	Stacks
All site locations suitable for the activities listed	Sampling and on-site testing	Site - Env



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WORKPLACE ATMOSPHERES	<u>Health and Hygiene</u> Sampling of Airborne Dust	MDHS 14/3	Site - Dust
	Determination of Airborne Dust	MDHS 14/3 by Gravimetry	Bretby East Kilbride Swindon Carcroft
BODY FLUIDS Human Urine	<u>Forensic Analysis</u> Alcohol	Documented In-House Methods  Documented In-House Methods FORS 402 using immunoassay screening and FORS 403 using GC-MS confirmation	Bretby
Human Urine	Screening of: Amphetamines Barbiturates Benzodiazepines Cocaine Cannabinoids Methadone Opiates Propoxyphene	Documented In-House Method FORS 402 using immunoassay	Bretby
Human Urine	Confirmation of:  Amphetamine Methamphetamine Methylenedioxyamphetamine (MDA) Methylenedioxymethampheta mine (MDMA)  Amobarbital Butobarbital Pentobarbital Phenobarbital  Diazepam Oxazepam Cocaine	Documented In-House Method FORS 403 using GC-MS	Bretby



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Human Urine (cont'd)	<u>Forensic Analysis</u> (cont'd)	Documented In-House Methods	Bretby
	Confirmation of: (cont'd)	Documented In-House Method FORS 403 using GC-MS (cont'd)	
	Delta-9-THC-COOH Benzoylecgonine Methadone		
	Codeine Dihydrocodeine Morphine (Total) Propoxyphene		
	Identification of LSD	Documented In-House Method ASUS 603 using HPLC	
DRUGS	Identification of: Amphetamine Methamphetamine MDA MDMA MDEA MBDB Cannabis Cocaine Diamorphine	Documented In-House method ASUS 104 using GC-MS	Bretby
	Quantitation of: Amphetamine	Documented In-House Method ASUS 126 using GC-MS	Bretby
	Quantitation of: Methamphetamine MDA MDMA Cannabis - THC Cocaine Diamorphine	Documented In-House Method ASUS 126 using GC-FID	Bretby
	Recovery of glass samples and fragments from casework items	Documented In-House Method FORS 205 using visual examination and low power microscopy	Bretby
GLASS SAMPLES and FRAGMENTS			



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GLASS SAMPLES and FRAGMENTS	<u>Forensic Analysis</u> (cont'd)	Documented In-House Methods	Bretby
	Comparison of recovered glass fragments and control samples using physical and chemical analysis	Documented In-House Methods FORS 202 using GRIM3 for refractive index measurement FORS 216 - annealing	
DNPH IMPREGNATED MATERIALS Filters, Plastic and Glass Silica Gel tubes, Impinger Solutions	<u>Chemical Testing</u>	ASC/SOP/201 using HPLC ASUS 600	Bretby
	Formaldehyde Acetaldehyde		
WATER Potable, Natural, and Lightly Polluted Water	<u>Microbiological Testing</u>	Documented In-House Methods based on procedures in "The Microbiology of Drinking Water 2002" unless stated otherwise	Bretby E Kilbride
	Enumeration of Total Coliforms and <i>E coli</i>		
	Confirmation of Coliforms and <i>E coli</i>		
	Total Viable Counts at 22 °C, 30 °C and 37 °C		
Potable and Lightly Polluted waters	Legionella	SCI/ENV/212 based on BS 6068 4.12:1998	Bretby E Kilbride
OILS	<u>Physical Testing</u>	Documented In-House Methods	Doncaster
	Viscosity		
	<u>Chemical Testing</u>	Documented In-House Methods	Doncaster
	Polychlorinated Biphenyls (total screen)		
Wear metals and additives	MSUS 076 using Inductively Coupled Plasma Emission Spectrometry	Doncaster	



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OILS (cont'd)	<u>Chemical Testing</u> (cont'd)	Documented In-House Methods	
	Acid Number (0 - 25 mg KOH/g)	MSUS 081 based on IP Method 177	Doncaster
SOILS plus Incinerator Ashes, Sediments, Sludges and Vegetation	Base Number (1 - 20 mg KOH/g)	MSUS 065 based on IP Method 400	Doncaster
	<u>Chemical Tests</u>	Documented In-House Methods	
	Polychlorinated dibenzo-p-dioxins (PCDD) 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD Polychlorinated dibenzo-furans (PCDF) 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	3007 and 3003 using Gas Chromatography High Resolution Mass Spectrometry (GCHRMS)	Didcot
Polychlorinated biphenyls (PCBs) PCB 77 PCB 118 PCB 126 PCB 169 PCB 180	Preparation by 3007 Measurement by 3004 using Capillary Gas Chromatography Mass Spectrometry	Didcot	
SOILS plus Sediments, Silts, Sands, and Vegetation	<u>Radiochemical Tests</u>	Documented In-House Methods	
	Gross Alpha and Beta	2005 using source preparation and proportional counting	Didcot



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SOILS plus Sediments, Silts, Sands, and Vegetation (cont'd)	<u>Radiochemical Tests</u> (cont'd)	Documented In-House Methods	
	<u>Isotopes:</u>		
	Uranium-234, 235 and 238	2123 using radiochemical separation	Didcot
	Thorium-228, 230 and 232	2112 using Alpha Spectrometry	Didcot
	Plutonium-238, 239 + 240 Americium-241	2117 using radiochemical separation and Alpha Spectrometry	Didcot
	Technetium-99	2134 using radiochemical separation and liquid scintillation counting	Didcot
ENVIRONMENTAL SAMPLES including: Soils, Sediments, Silts, Sands, Vegetation, Foodstuffs, Atmospheric Pollutants, Effluents, and Waters	Sulphur-35	2111 using radiochemical separation and liquid scintillation counting	Didcot
	Qualitative and quantitative determination of gamma-ray emitting radio isotopes	2031 (low energy) and 2029 (> 120 KeV) using Gamma-Ray Spectrometry	Didcot
All Solid Combustible Materials	Total Tritium	2094	Didcot
WATERS Effluents plus Clean and Natural waters	Alpha and Beta activity	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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WATERS Effluents plus Clean and Natural waters (cont'd)	<u>Radiochemical Tests</u> (cont'd)	Documented In-House Methods (cont'd)	
	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	2093 using Distillation and Liquid Scintillation Counting	Didcot
Effluents	Tritium	2093 using Distillation and Liquid Scintillation Counting	Didcot
Clean and Natural Waters	Tritium	2093 using Distillation and Liquid Scintillation Counting	Didcot
WATERS including Leachates; Extracts; Digests; Effluents; Aqueous Solutions; Treated, Natural and Clean Waters	<u>Chemical Tests</u>	Documented In-House Methods	
	<u>Metals</u> Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Bromine, Cadmium, Calcium, Cerium, Cesium, Chromium, Chlorine, Cobalt, Copper, Dysprosium, Erbium, Europium, Gadolinium, Gallium, Germanium, Gold, Iron, Holmium Hafnium, Indium, Iridium, Lanthanum, Lead, Lithium, Lutetium, Magnesium, Manganese, Mercury, Molybdenum, Neodymium, Nickel, Niobium, Osmium, Palladium, Phosphorous, Platinum Potassium, Praseodymium, Rhenium, Rhodium, Rubidium, Ruthenium, Samarium, Scandium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Tantalum, Tellurium, Terbium, Thallium, Thulium, Tin, Titanium, Tungsten, Vanadium, Ytterbium, Yttrium, Zinc and Zirconium	Methods SOP/101 and SOP/102 using ICP-Mass Spectrometry and ICP-Atomic Emission Spectroscopy respectively	Bretby



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WATERS including Leachates; Extracts; Digests; Effluents; Aqueous Solutions; Treated, Natural and Clean Waters (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods (cont'd)	
	pH and Conductivity	ASC/SOP/109 electrochemical method	Bretby
	Ammonium Bromide Calcium Chloride Fluoride Magnesium Nitrate Nitrite Phosphate Potassium Sodium Sulphate	Ion Chromatography Methods ASC/SOP/106 ASC/SOP/107 ASC/SOP/110	Bretby
Aqueous Solutions	Polychlorinated dibenzo-p-dioxins (PCDD) 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD Polychlorinated dibenzo-furans (PCDF) 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Preparation by 3007 Measurement by 3003 using Gas Chromatography High Resolution Mass Spectrometry (GCHRMS)	Didcot



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WATERS including natural waters, clean and wastewaters, and effluents	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods (cont'd)	
	pH	SCI/ENV/303c	Swindon
	Solids: Suspended, Settleable and Rapidly Settleable	SCI/ENV/303a	Swindon
	Chemical Oxygen Demand	SCI/ENV/304	Swindon
	Trade effluent, environmental solid aqua-regia digests, clean water, and sea water	Mercury	ASC/SOP/112 using Atomic Fluorescence Spectrometry
WATERS plus seawater, silt, sediment, seaweed, grass, and soil	Sampling	HS/WI/2135	Site-Env
ENVIRONMENT ie beaches, strandlines, debris, riverbanks, and canal banks	On-site radiation monitoring	HS/WI/2128	Site-Env
ATMOSPHERIC POLLUTANTS AND EFFLUENTS	<u>Chemical Tests</u>	Documented In-House Methods	
Filters	Ammonium Chloride Nitrate Sodium Sulphate	ASC/SOP/106, ASC/SOP/107 ASC/SOP/110, ASC/SOP/111 using Ion chromatography	Bretby
Diffusion tubes	Nitrogen dioxide	1015 using spectrophotometry AQ/02 using autoanalyser	Didcot
	Ozone	1024 and 1087 using Ion Chromatography	Didcot
	Sulphur Dioxide	1011 using Ion Chromatography	Didcot
	Benzene Toluene Ethylbenzene Ortho-Xylene Meta and para-Xylenes	41a using GCMS	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS (cont'd)	<u>Chemical</u> Tests (cont'd)	Documented In-House Methods (cont'd)	
Diffusion Tubes and Thermal Desorption Tubes	Volatile Organic Compounds (screening method)	3022 using Thermal Desorption GC-MS	Bretby
Ambient Air Samples	Polychlorinated dibenzo-p-dioxins (PCDD) 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD Polychlorinated dibenzo-furans (PCDF) 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	BS EN 1948-2:2006 and BS EN 1948-3:2006 Extraction followed by GCHRMS analysis (3007, 3003 and 3018)	Didcot
	Dioxin-Like PCB's (Polychlorinated biphenyls) PCB-77 PCB-118 PCB-126 PCB-180 PCB-169	Preparation by 3007 Measurement by 3004 using Capillary Gas Chromatography Mass Spectrometry	Didcot
Charcoal Air Sampling Tubes	Mercury	ASC/SOP/113 using Atomic Fluorescence Spectrometry	Bretby
Thermal Desorption tubes	Hexachlorobutadiens Pentachlorobutadienes Tetrachlorobutadienes	ASC/SOP/206 using gas chromatography mass spectrometry and flame ionisation detection	Bretby



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COATINGS: NON METALLIC	<u>Coating Testing</u>	Documented In-House Methods	
	Panel Preparation	BS 3900 A3 and ISO 1514	Bretby
	Paints and Varnishes - Preparation of Samples for Testing	BS 3900 A2 and ISO 1513	Bretby
	Specular Gloss at 20 °C, 60 °C, and 85 °C	BS 3900 D5 and ISO 2813	Bretby
	Colour and colour difference	BS 3900 D9-10 and ISO 7724/2-3	Bretby
	Resistance to Humid Atmospheres Containing SO <sub>2</sub>	BS 3900 F8 and ISO 3231	Bretby
	Dry Film Thickness	BS 3900 C5 and ISO 2808	Bretby
	Scratch Resistance	BS 3900 E2 and ISO 1518	Bretby
	Neutral Salt Spray	BS 3900 F12, ASTM B117, BS EN ISO 9227:2006 - NSS test and ISO 7253	Bretby
	Accelerated Weathering - UV and Condensing Atmosphere	BS 3900 F16 and ISO 11507	Bretby
	Resistance to Liquids - Water Immersion	BS 3900 G8 and ISO 2812-2	Bretby
	Cross Cut	BS 3900 E6 and ISO 2409	Bretby
	Impact - Falling ball	BS 3900 E7	Bretby
	Through Dry State and Through Dry Time	BS EN 29117 and ISO 9117	Bretby
	Resistance to Humidity (Cyclic Condensation)	BS 3900 F2	Bretby
Conical Mandrel Bend Test	BS 3900 E11 and ISO 6860	Bretby	
Natural Weathering	BS 3900 F6	Bretby	
Surface Drying	BS 3900 C2 and ISO1517	Bretby	



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COATINGS: NON METALLIC (cont'd)	<u>Coating Testing</u> (cont'd)	Documented In-House Methods	
	Viscosity	BS 3900 A7-1 and ISO 2884-1	Bretby
	Surface Profile of Blast Cleaned Steel	ASTM D4417, Method B	Bretby
	Pull Off Adhesion	ASTM D4541	Bretby
	Volume Solids	BS 3900-A10:1998 ISO 3233:1998	Bretby
	Non Volatile Matter	BS 3900-B18:2003 BS EN ISO 3251:2003	Bretby
	Volatile Organic Compound (VOC) content	BS 3900-A23:2000 BS EN ISO 11890-1:2001	Bretby
Density (Pyknometer Method)	BS EN ISO 2811 BS 3900-A19	Bretby	
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 (sulphuric acid)	Ammonia	BS EN 14791:2005 using IC analysis (ASC/SOP/108)	Bretby
Impinger Solutions (sodium hydroxide, water or sulphuric acid)	Chloride Bromide Fluoride Nitrate Nitrite Phosphate Sulphate	US EPA Method 26 using IC analysis (ASC/SOP/110)	Bretby
Impinger Solutions (hydrogen peroxide)	Sulphur Dioxide	BS EN 14791:2005 using IC analysis (ASC/SOP/106 and 110)	Bretby
Impinger Solutions (sodium hydroxide)	Hydrogen fluoride	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 Tests</u> (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Impinger Solutions (water)	Hydrogen Chloride	BS EN 1911-3:1998 using IC analysis (ASC/SOP/106 and 110)	Bretby
Filters Probe and impinger rinses (toluene, acetone and water) XAD-2 resin trap	Polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzo-furans (PCDF): 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	BS EN 1948-2:2006 and BS EN 1948-3:2006 Extraction followed by GCHRMS analysis (3007, 3003 and 3018)	Didcot



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<p>ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)</p> <p>Filters Probe and impinger rinses (acetone, toluene, hexane and water) XAD-2 resin trap</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Polycyclic aromatic hydrocarbons (PAHs): Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(b)naph(2,1-d)thiophene Cyclopenta(c,d)pyrene Benzo(a)anthracene Chrysene Benzo(c)phenanthrene Benzo(b+)fluoranthene Benzo(k)fluoranthene Cholanthrene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene Dibenzo(ah/ac)anthracene Anthanthrene Debenzo(ai)pyrene</p>	<p>Documented In-House Methods based on the following national, international and other recognised standards</p> <p>BS ISO 11338-2:2003 Extraction followed by GCMS analysis (3009 and 3005)</p>	<p>Didcot</p>
<p>Filters Probe and impinger rinses (toluene, acetone and water) XAD-2 resin trap</p>	<p>Polychlorinated biphenyls (PCBs) PCB 77 PCB 118 PCB 126 PCB 169 PCB 180</p>	<p>BS EN 1948-2:2006, BS EN 1948-3:2006 - Extraction followed by GCMS analysis (3008 and 3004)</p>	<p>Didcot</p>



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Sorption tubes	Volatile organic compounds: Acetone Benzene Bromobenzene Bromodichloromethane n-butanol n-butylbenzene Carbon tetrachloride Chlorobenzene Chloroform 2-chlorotoluene 4-chlorotoluene n-decane Dibromochloromethane 1,2-dibromoethane Dibromomethane 1,2 dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichloroethane trans-1,2-dichloroethene Dichloromethane 1,2-dichloropropane 1,3-dichloropropane cis-1,3-dichloropropene Ethanol Ethyl acetate Ethylbenzene n-heptane n-hexane Naphthalene n-nonane n-octane n-pentane n-propanol Propan-2-ol n-propylbenzene Isopropylbenzene p-isopropyltoluene Styrene Tert butylbenzene	BS EN 13649:2002 - using thermal desorption and gas chromatography mass spectrometry (Method ref No 41)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards.	
Sorption tubes (cont'd)	Volatile organic compounds (cont'd)  Tetrachloroethene 1,1,1,2-tetrachloroethane Toluene 1,1,1-trichloroethane 1,1,2-trichloroethane Trichloroethene 1,2,4-trimethylbenzene 1,3,5-trimethylbenzene m- and p-xylene o-xylene	BS EN 13649:2002 - using thermal desorption and gas chromatography mass spectrometry (Method ref No 41) (cont'd)	Bretby
Filters Probe rinses (nitric acid) Impinger Solutions (nitric acid/hydrogen peroxide)	Trace elements (heavy metals): Arsenic, Antimony, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Lead, Selenium, Sodium, Titanium, Tin, Thallium, Vanadium, Zinc	BS EN 14385:2004 Using HF microwave digestion (1053) followed by: ICP-OES analysis (SOP/102) ICP-MS analysis (SOP/101)	Bretby
Filters probe rinses (nitric acid) Impinger Solutions (nitric acid/hydrogen peroxide, sulphuric acid/potassium permanganate, nitric acid/potassium dichromate)	Trace elements (heavy metals): Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Gallium, Germanium, Iron, Hafnium, Indium, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Niobium, Phosphorous, Potassium, Rubidium, Scandium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Tantalum, Tellurium, Thallium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium	MID 14385 (BS EN 14385:2004, BS EN 13211:2001 and BS EN 1483:2007) Using HF microwave digestion (1053) followed by: ICP-OES analysis (SOP/102) ICP-MS analysis (SOP/101)	Bretby



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ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Filters Probe rinses (nitric acid) Impinger Solutions (sulphuric acid/potassium permanganate, nitric acid/potassium dichromate)	Trace elements (heavy metals): Mercury	BS EN 13211:2001 Using HF microwave digestion (1053) followed by Atomic Fluorescence Spectrometry (ASC/SOP/112) or ICP-MS (ASC/SOP/101)	Bretby
Filters, Plastic and Glass Silica Gel tubes, Impinger Solutions	Formaldehyde Acetaldehyde	ASC/SOP/201 using HPLC ASUS 600	Bretby
Impinger Solutions	Nitrate Nitrite Phosphate	ASC/SOP/106 and 110 using Ion Chromatography	Bretby
ATMOSPHERIC POLLUTANTS	<u>Physical Testing</u>	Documented In-House Methods based on the following national, international and other recognised standards	
Filter papers and rinse solutions	Weighing of Particulate Matter	BS EN 13284-1:2002 BS ISO 9096:2003 (AE 021, IEM 006)	E Kilbride Stockport Mitcheldean
	Weighing of Particulate Matter <10 micron (PM <sub>10</sub> and PM <sub>2.5</sub> )	US EPA Method 201A (AE 021, IEM 006)	E Kilbride Stockport Mitcheldean
	Weighing of Particulate Matter <10 micron (PM <sub>10</sub> and PM <sub>2.5</sub> )	BS EN ISO 23210:2009 (AE 021, IEM 006)	E Kilbride Stockport Mitcheldean
Filter papers	Particulates (PM <sub>10</sub> )	Documented in house method No 54 based on BS EN 12341 :1999 Annex C using gravimetry	Glasgow / East Kilbride
Dust, airborne	Dust Deposition (soiling), evaluation of	Documented in-house method AE 140 using loss of reflectance measured by Rendell Dust Meter	Mitcheldean



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Testing of Stack Emissions to Atmosphere	<u>Sampling with Subsequent analysis by an ISO/IEC 17025 Accredited Laboratory</u>	National, International and other recognised standards using documented In-House work instructions to meet the requirements of DD CEN/TS 15675:2007/ BS EN 15259:2007	
	Nitrous Oxide	VDI2649, (IEM020)	Stacks
	Total Particulate Matter	BS ISO 12141:2002 (AE 006)	Stacks
	Iodine and Fluorine	US EPA Method 26/26A (AE 026, IEM 014)	Stacks
	Oxides of Nitrogen	US EPA Method 7D (AE 039, IEM014)	Stacks
	Particulate Matter <10 micron (PM <sub>10</sub> and PM <sub>2.5</sub> )	US EPA Method 201A (AE 036, IEM018)	Stacks
	Tar Fume, Bitumen Fume, and Oil Mist	Documented in-house methods AE 061, TP105 & TP106 based on BS EN 13284-1 :2002	Stacks
	Formaldehyde	US EPA Method 316 (IEM 014)	Stacks
	<u>Sampling and On-Line analysis</u>		
	Water Vapour	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
Hydrogen Cyanide	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks	
Sulphuric Acid	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</u> (cont'd)	National, International and other recognised standards using documented In-House work instructions to meet the requirements of DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Nitric Acid	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Ammonia	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Sulphur Hexafluoride	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Hydrogen Chloride	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Hydrogen Fluoride	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Carbon Dioxide	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Carbon Monoxide	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Nitrogen monoxide (NO)	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
Nitrogen dioxide (NO <sub>2</sub> )	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</u> (cont'd)	National, International and other recognised standards using documented In-House work instructions to meet the requirements of DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Oxides of Nitrogen (NO <sub>x</sub> )	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Nitrous Oxide (N <sub>2</sub> O)	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Sulphur Dioxide	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Sulphur Trioxide and Total Sulphur	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Methanol	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	Stacks
	Propane	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	
	Methane	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	
	Ethane	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	
Ethylene	ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)		



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</u> (cont'd)  <i>Halides and Halogens</i> <i>Speciated VOCs</i> <i>Other inorganic gases</i>  <b>The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual gaseous compounds they can sample and analyse to this method.</b>	National, International and other recognised standards using documented In-House work instructions to meet the requirements of DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)  ASTM D6348-03 (AE 016, AE 047 and IEM 019 - FTIR analyser)	
Testing of Stack Emissions to Atmosphere	<u>Sampling with Subsequent analysis by an ISO/IEC 17025 Accredited Laboratory</u>  Total Particulate Matter (0 to 50 mg/m <sup>3</sup> )  Total Particulate Matter (20 to 1000 mg/m <sup>3</sup> )  Particulate Matter <10 micron (PM <sub>10</sub> and PM <sub>2.5</sub> )  Hydrogen Chloride	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 and DD CEN/TS 15675:2007/ BS EN 15259:2007  BS EN 13284-1:2002 (AE 006, IEM 004)  BS ISO 9096:2003 (AE 006, IEM 004)  BS EN ISO 23210:2009 (AE 036, IEM 018)  BS EN 1911-2010 (AE 019, IEM 011)	Stacks  Stacks  Stacks  Stacks



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Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling with Subsequent analysis by an ISO/IEC 17025 Accredited Laboratory</u> (cont'd)	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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Hydrogen Fluoride	BS ISO 15713:2006 (AE 055, IEM 013)	Stacks
	Halides and Halogens: Hydrogen Bromide Hydrogen Iodide Chlorine Bromine	US EPA Methods 26 and 26A (AE 026, IEM 014)	Stacks
	Sulphur Dioxide	BS EN 14791:2005 (AE 053, IEM 012)	Stacks
	Sulphur Trioxide and Sulphuric Acid Mist	US EPA Method 8 (AE 121, IEM 014)	Stacks
	Ammonia	BS EN 14791:2005 (AE 057, IEM 014)	Stacks
	Hydrogen Sulphide	US EPA Method 11 (AE 032, IEM 014)	Stacks
	Hydrogen Cyanide Total Cyanide	US EPA OTM 29 (AE 133)	Stacks
	Isocyanates	US EPA CTM 036 (AE 027, IEM 016)	Stacks
	Metals	BS EN 14385:2004 (AE 028, IEM 008)	Stacks
Mercury	BS EN 13211:2001 (AE 030, IEM 007)	Stacks	



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Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling with Subsequent analysis by an ISO/IEC 17025 Accredited Laboratory</u> (cont'd)	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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Dioxins and Furans	BS EN 1948-1:2006 (AE 048, IEM 009)	Stacks
	Dioxin-like Polychlorinated Biphenyls (PCB's)	BS EN 1948-1:2006 (AE 048, IEM 009)	Stacks
	Polycyclic Aromatic Hydrocarbons (PAH's)	BS ISO 11338-1:2003 (AE 031, IEM 010)	Stacks
	Speciated VOC's (carbon and other suitable tubes) (direct sampling of dry stacks and dynamic dilution sampling of hot wet stacks) Mercaptans Amines and Amides Phenols Cresols Carboxylic Acids Aldehydes Formaldehyde	BS EN 13649:2002 (AE 018, IEM 017)	Stacks
	Methanol (direct sampling of dry stacks and dynamic dilution sampling of hot wet stacks)	BS EN 13649:2002 (AE 018)	Stacks
	<u>Sampling and On-Site analysis</u> Water Vapour	BS EN 14790:2005 (AE 004, IEM 005)	Stacks



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Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Pressure, Temperature and Velocity	BS EN 13284-1:2002 BS ISO 9096:2003 (AE 003, IEM 002)	Stacks
	Water Vapour*	EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks
	Ammonia*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Hydrogen Chloride*	EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks
	Hydrogen Fluoride*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Hydrogen Cyanide*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Carbon Dioxide*	ISO 12039:2001 (AE 007, AE 015 and IEM 002 NDIR analyser) EA TGN M22 (AE 063 - FTIR analyser)	Stacks
Carbon Monoxide*	BS EN 15058:2006 (AE 007, AE 015 and IEM 002 - NDIR analyser) EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks	



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Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</u> (cont'd)	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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Sulphur Trioxide and Sulphuric Acid Mist*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Sulphuric Acid*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Nitric Acid*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Nitrogen Monoxide (NO)*	BS EN 14792:2005 (AE 007, AE 015 and IEM 002 - Chemiluminescence analyser) EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks
	Nitrogen Dioxide (NO <sub>2</sub> )*	BS EN 14792:2005 (AE 065 and IEM 002 - Chemiluminescence analyser) EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks
	Oxides of Nitrogen*	BS EN 14792:2005 (AE 007, AE 015 and IEM 002 - Chemiluminescence analyser) EA TGN M22 (AE 063 - Validated FTIR analyser)	Stacks
Nitrous Oxide (N <sub>2</sub> O)*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Testing of Stack Emissions to Atmosphere (cont'd)	<u>Sampling and On-Line analysis</u> (cont'd)	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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)	
	Sulphur Dioxide*	EA TGN M21 (AE 007, AE 015 and IEM 002 - NDIR analyser) EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Sulphur Trioxide and Total Sulphur*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Methanol*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Ammonia*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Sulphur Hexafluoride*	EA TGN M22 (AE 063 - FTIR analyser)	Stacks
	Oxygen*	BS EN 14789:2005 (AE 007, AE 017, AE 054 and IEM 002 - Paramagnetic analyser) (AE 007 and AE 015 - Validated Zirconium cell analyser)	Stacks
Total Gaseous Organic Carbon* (TOC/VOC) (20 to 500 mg/m <sup>3</sup> )	BS EN 13526:2002 (AE 012, AE 014, AE 054 and IEM 002 - FID analyser)	Stacks	



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Testing of Stack Emissions to Atmosphere (cont'd)	<p><u>Sampling and On-Line analysis</u> (cont'd)</p> <p>Total Gaseous Organic Carbon* (TOC/VOC) (0 to 20 mg/m<sup>3</sup>)</p> <p><i>Halides and Halogens*</i> <i>Speciated VOCs*</i> <i>Other inorganic gases*</i></p> <p><b>The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual gaseous compounds they can sample and analyse to this method.</b></p>	<p>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 and DD CEN/TS 15675:2007/ BS EN 15259:2007 (cont'd)</p> <p>BS EN 12619:1999 (AE 012, AE 014, AE 054 and IEM 002 - FID analyser)</p> <p>EA TGN M22 (AE 063 - FTIR analyser)</p>	<p>Stacks</p> <p>Stacks</p>



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ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Environmental Scientifics Group Limited**  
Trading as  
**ESG**

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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
Stack Emissions - Continuous Emissions Monitoring Systems (CEMS)	QAL 2 and the Annual Surveillance Test (AST) for CEMS	Documented in-house procedure AE 063 to meet the requirements of BS EN 14181:2004, Environment Agency MID 14181 and other requirements of the Environment Agency (MCERTS) Performance Standard and DD CEN/TS 15675:2007/ BS EN 15259:2007	Stacks
END			

\* - The scale range of the analyser used for this test must be that detailed on its current MCERTS certificate or a range validated by the organisation to meet MCERTS requirements.