

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



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Accredited to
ISO/IEC 17025:2005

Natural Resources Wales trading as Natural Resources Wales Analytical Services (NRWAS)/ Gwasanaethau Dadansoddol Cyfoeth Naturiol Cymru (GDCNC)

Issue No: 023 Issue date: 06 February 2018

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Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
NATURAL, ESTUARINE AND SALINE WATERS	<u>Chemical Tests</u>	Documented In-House Methods based on Standing Committee of Analysts Methods using:
	General Inorganic Analysis	
	Formaldehyde	Spectrophotometric Techniques Method Number LL I 6.5 Test Code 383
	General Inorganic Analysis	
SOLIDS including SLUDGE, SEDIMENT and PLANT/FISH/BIOTA and ANIMAL TISSUES	Carbon Hydrogen Nitrogen	Elemental Analyser Method Number LL I CHN 11.2 & 11.3 Test Code 404
	Particle Size Distribution	Laser Diffraction Method Number LL I Particle Size Laser LL I 9.4 Test Code 1370
	Inorganic Analysis	
	Total Solids Mineral Solids	Gravimetric Techniques Method number LL ME TS 11.9 Test Code 97



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SOLIDS including SLUDGE, SOILS and SEDIMENT	<u>Chemical Tests</u> (cont'd)	
	Mercury	Fluorescence Detection Method number LL ME Hg 10.8 Test Code 345 (dry WT) Test Code 355 (wet WT) Test Code 1042 (sediment Marine (<2mm)) Test Code 1082 (HF <63mm)
BIOTA: FLORA & FAUNA	Metals , specifically:	Documented In-House Method LL ME 11.2 by microwave digestion with Aqua regia with subsequent analysis by:- ICPOES test code 1043 ICPMS test code 1041 LL ME ICPMS12.1 & 12.4 LL ME 22.1a ICAP OES -----and----- Documented In-House Method LL ME 11.3 by hot-block digestion using HF with subsequent analysis by:- ICPOES test code 756 ICPMS test code 341 LL ME ICPMS12.1 & 12.4 LL ME 22.1a ICAP OES
	Aluminium Arsenic Barium Cadmium Chromium Copper Iron Lead Lithium Manganese Nickel Strontium Vanadium Zinc	Documented In-House Method LL ME 23.5 by Collision / Reaction Cell ICP-MS Test Code 342 (dry WT) Test Code 353 (wet WT)



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Surface (River) Water, Ground Water, Treated Sewage Effluent, Treated Trade Effluent To Controlled Water, Untreated Trade Effluent To Controlled Water	<u>Chemical Tests (cont'd)</u> Metals , specifically: Aluminium Antimony Arsenic Barium Beryllium Cadmium Cobalt Copper Chromium Lead Molybdenum Manganese Nickel Selenium Silver Tellurium Thallium Tin Titanium Vanadium Uranium Zinc	Documented In-House Method LL001 NRW ICPMS-CRC by Collision / Reaction Cell and ICP- MS Test Code 1410 (dissolved) Test Code 1409 (total)
Surface (River) Water, Ground Water, Treated Sewage Effluent, Trade Effluent to Controlled Waters	Mercury	Documented In-House Method LL M Mercury Aq and Cold Vapour Atomic Fluorescence Spectrometry (CVAFS) Test Code 247 (dissolved) Test Code 248 (total)
Surface (River) Water, Ground Water, Treated Sewage Effluent, Trade Effluent to Controlled Waters	Metals , specifically: Aluminium Calcium Magnesium Potassium Sodium Lithium Strontium Iron Sulphate Sulphur Manganese Barium Boron	Documented In-House Method LL M ICPOES Aq and Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) Test Code 37 (dissolved) Test Code 38 (total)



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Fresh Surface Water (river water) Ground Water	<u>Chemical Tests (cont'd)</u> Acidic and Phenolic Polar Pesticides - ACID HERBICIDES specifically: Clopyralid Picloram 2,3,6-TBA Dicamba PPA Benazolin Fluroxypyr 4-CPA Bentazone PBA Bromoxynil 2,4-D MCPA Trichlorpyr Ioxynil Dichlorprop Mecoprop 2,4,5-T 2,4-DB MCPB Fenoprop Imazapyr	Documented In-House Method LL O Acid Herbs LC-QQQ by Liquid Chromatography Tandem Mass Spectrometry and direct aqueous injection LCMS QQQ Test Code 1214
Fresh Surface Water (river water) Ground Water, Saline Water	Synthetic Pyrethroids specifically: Bifenthrin Lambda Cyhalothrin cis-Permethrin trans-Permethrin Cyfluthrin Cypermethrin Deltamethrin Flumethrin	Documented In house method LL O PYRETS using solvent extraction and GC-MS-NCI analysis. Test Code 856



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Fresh Surface Water (river water) Ground Water, Saline Water Treated Sewage Effluent, Trade Effluent to controlled water	<u>Chemical Tests (cont'd)</u> Volatile Organic Compounds Specifically: 1,1,1,2-Tetrachloroethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,1-Dichloropropene 1,2,3-Trichloropropane 1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,2-Dibromo-3-chloropropane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloropropane 1,3,5-Trimethylbenzene 1,3-Dichlorobenzene 1,3-Dichloropropane 1,4-Dichlorobenzene 2,2-Dichloropropane 2-Chlorotoluene 3-Chlorotoluene 4-Chlorotoluene 4-Isopropyltoluene Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Carbon tetrachloride Chlorobenzene Chloroform Cis-1,2-Dichloroethene Cis-1,3-Dichloropropene Dibromochloromethane Dibromomethane Dichloromethane Ethylbenzene Isopropylbenzene n-Butylbenzene o-Xylene Propylbenzene m & p-Xylene (co-eluting pair) sec-Butylbenzene Styrene	Documented In-House Method LL O Volatile Organic Compounds by Static Headspace - Gas Chromatography - Single Quadrupole Mass Spectrometry (GC/MS) Test Code 54 Test Code 1296



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Fresh Surface Water (river water) Ground Water, Saline Water Treated Sewage Effluent, Trade Effluent to controlled water (cont'd)	<u>Chemical Tests</u> (cont'd) Volatile Organic Compounds Specifically: (cont'd) tert-Butylbenzene Tetrachloroethene Toluene trans-1,2-Dichloroethene trans-1,3-Dichloropropene Trichloroethene	Documented In-House Method LL O Volatile Organic Compounds by Static Headspace - Gas Chromatography - Single Quadrupole Mass Spectrometry (GC/MS) Test Code 54 Test Code 1296
	Volatile Organic Compounds Specifically: Chloromethane Trichlorofluoromethane Vinyl chloride ETBE MTBE TAME Carbon disulphide 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,3,5-Trichlorobenzene Hexachlorobutadiene Naphthalene Hexachloroethane Chloroethane	Documented In-House Method LL O Volatile Organic Compounds by Static Headspace - Gas Chromatography - Single Quadrupole Mass Spectrometry (GC/MS) Test Code 1296 (all below)
	1,1,2,2-Tetrachloroethane	Documented In-House Method LL O Volatile Organic Compounds by Static Headspace - Gas Chromatography - Single Quadrupole Mass Spectrometry (GC/MS) Test Code 1296
Fresh Surface Water (river water) Ground Water, Saline Water		



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Fresh Surface Water (river water) and Ground Water	<u>Chemical Tests</u> (cont'd) Phenolic compounds Specifically: Phenol 2-methylphenol (o-cresol) 3-methylphenol (m-cresol) 4-methylphenol (p-cresol) 2-chlorophenol 3-chlorophenol 4-chlorophenol 2,3-dimethylphenol (2,3-xylene) 2,4-dimethylphenol (2,4-xylene) 2,5-dimethylphenol (2,5-xylene) 2,6-dimethylphenol (2,6-xylene) 3,4-dimethylphenol (3,4-xylene) 3,5-dimethylphenol (3,5-xylene) 2,3-dichlorophenol 2,4-dichlorophenol 2,5-dichlorophenol 2,6-dichlorophenol 2-ethylphenol 2,4,5-trichlorophenol 2,4,6-trichlorophenol 2,3,5,6-tetrachlorophenol 4-chloro-2-methylphenol 4-chloro-3-methylphenol 4-chloro-3,5-dimethylphenol (PCMX) Pentachlorophenol	Documented In-House Method LL O Phenols GCMS using initial derivatisation, solvent extraction and GCMS-NCI analysis Test Code 62
Surface (Natural) Water (Acidic rain water, acidic river water) - Acid Water type samples (poor buffering capacity water)	Iron Sulphate	Documented In-House Method LL M ICPOES AR by iCAP ICPOES Test Code 324 (dissolved) Test Code 323 (total)
Surface (Natural) Water (Acidic rain water, acidic river water) - Acid Water type samples (poor buffering capacity water)	Sodium Potassium Magnesium Calcium	Documented In-House Method LL M ICPMS Acid Rain by ICPMS Test Code 326 (dissolved) Test Code 325 (total)
Fresh Surface Water (river water) Ground Water, Treated Sewage Effluent, Trade Effluent to controlled water, Saline Water	Biochemical Oxygen Demand	Documented In-House Method LL I BOD manual (based on SCA blue book) using a Dissolved Oxygen probe and meter Test Code 1



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Fresh Surface Water (river water) Ground Water, Treated Sewage Effluent, Trade Effluent to controlled water	<u>Chemical Tests</u> (cont'd)	
	Chemical Oxygen Demand	Documented In-House Method LL I COD manual (based on SCA blue book) using a Spectrophotometric sealed tube Test Code 5
	Total Suspended Solids	Documented In-House Method LL I TSS (based on SCA blue book) using Gravimetric analysis Test Code 869
	MBAS	Documented In-House Method LL I MBAS (based on SCA blue book) using a Spectrophotometric sealed tube Test Code 384
	Dissolved Organic Carbon	Documented In-House Method LL I DOC manual (based on SCA blue book) using a automated colorimetric continuous flow analyser Test Code 22
	pH (manual)	Documented In-House Method LL I pH (based on SCA blue book) using a manual pH meter Test Code 9
	Conductivity (manual)	Documented In-House Method LL I COND (based on SCA blue book) using a manual conductivity meter Test Code 9
	Turbidity (manual)	Documented In-House Method LL I TURB (based on SCA blue book) using a manual Turbidimeter Test Code 9
Total Alkalinity to pH 4.5	Documented In-House Method LL I Alkalinity (based on SCA blue book) using a METROHM System 855 robotic titro sampler Test Code 397	



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Fresh Surface Water (river water) Ground Water, Treated Sewage Effluent, Trade Effluent to controlled water (cont'd)	<u>Chemical Tests</u> (cont'd)	
	Colour	Documented In-House Method LL I Colour (based on SCA blue book) using a Hach Spectrophotometric colour analyser Test Code 20
Fresh Surface Water (river water) Ground Water	Sulphate	Documented In-House Method LL I Sulphate (based on SCA blue book) using a Gallery Photometric Discrete Colorimetric analyser Test Code 1192
	Nutrients specifically: Ammonia ortho-Phosphate Nitrite Total Oxidised Nitrogen Silicate Chloride Total Alkalinity to pH 4.5	Documented In-House Method LL I Nutrients and Alkalinity (based on SCA blue book) by discrete colorimetric analyser Test Code 25
	Kjeldahl Nitrogen 'by calculation'	Documented In-House Method LL I KN (based on SCA blue book) by calculation from Total nitrogen and Total oxidised nitrogen from colorimetric discrete analysis. Test Code 25
Fresh Surface Water (river water) Saline Water Esturine Water	Salinity	Documented In-House Method LL I Salinity (based on SCA blue book) using a manual conductivity meter Test Code 378
Treated Sewage Effluent, Trade Effluent to controlled water	Nutrients specifically: Ammonia ortho-Phosphate Nitrite Nitrate Total Oxidised Nitrogen Chloride	Documented In-House Method LL I Nutrients High (based on SCA blue book) by discrete colorimetric analyser Test Code 678



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NATURAL and SALINE WATER and Treated Sewage Effluent	<u>Microbiological Tests</u> <u>Isolation and enumeration of:</u> Intestinal Enterococci (presumptive and confirmed) <u>Detection of:</u> <i>Escherichia coli</i>	Document In House Methods based upon: The Microbiology of Recreational and Environmental Water (2000) (ISBN 1857 054 4666) NRW B STREP ENV by membrane filtration Test Code 1352 Test Code 1353 Documented In-House Method NRW B ECOLI TBX using membrane filtration Test Code 1126
END		