

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



7991

Accredited to
ISO/IEC 17025:2017

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

Issue No: 026 Issue date: 17 September 2021

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



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SOLIDS - SOILS, and SEDIMENT	<p><u>Chemical Tests</u> (cont'd)</p> <p>Metals, specifically:</p> <p>Aluminium Arsenic Barium Cadmium Chromium Copper Iron Lead Lithium Manganese Nickel Strontium Vanadium Zinc</p>	<p>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</p>
SOLIDS - SEDIMENT	<p>Metals, specifically:</p> <p>Aluminium Arsenic Barium Cadmium Chromium Copper Iron Lead Lithium Manganese Nickel Strontium Vanadium Zinc</p>	<p>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</p>



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



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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



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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
Fresh Surface Water (river water) Ground Water, Saline Water Treated Sewage Effluent, Trade Effluent to controlled water	Volatile Organic Compounds Specifically: Chloromethane 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)
Fresh Surface Water (river water) Ground Water, Saline Water	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



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



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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 Turbididmeter 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
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		