Schedule of Accreditation

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

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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
WATERS	Chemical Tests	Documented In-House Methods based on Standing Committee of Analysts Methods using:
Natural, estuarine and saline	**General Inorganic Analysis**	
	Formaldehyde	Spectrophotometric Techniques Method Number LL I 6.5 Test Code 383
SOLIDS including SLUDGE, SEDIMENT and PLANT/FISH/BIOTA and ANIMAL TISSUES	**General Inorganic Analysis**	
	Particle Size Distribution	Laser Diffraction Method Number LL I Particle Size Laser LL I 9.4 Test Code 1370
	Inorganic Analysis	
	Loss on Ignition	Gravimetric Techniques Method number LL ME TS 11.9 Test Code 97
	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)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
SOLIDS - SOILS, and SEDIMENT	**Metals**, specifically: Arsenic Barium Cadmium Chromium Copper Iron Lead Manganese Nickel Vanadium Zinc	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
SOLIDS - SEDIMENT	**Metals**, specifically: Aluminium Arsenic Barium Cadmium Chromium Copper Iron Lead Lithium Manganese Nickel Strontium Vanadium Zinc	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

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
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)
WATERS Surface (River) Water, Ground Water, Treated Sewage Effluent, Treated Trade Effluent To Controlled Water, Untreated Trade Effluent To Controlled Water	**Metals**, specifically: 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)
WATERS 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)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS 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)
WATERS Fresh Surface Water (river water) Ground Water	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 aqueuos injection LCMS QQQ Test Code 1214

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
WATERS Fresh Surface Water (river water) Ground Water, Saline Water Treated Sewage Effluent, Trade Effluent to controlled water	Chemical Tests (cont'd) **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 1296

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS Fresh Surface Water (river water) Ground Water, Saline Water Treated Sewage Effluent, Trade Effluent to controlled water (cont'd)	**Volatile Organic Compounds,** specifically: (cont'd) tert-Butylbenzene Tetrachloroethene Toluene trans-1,2-Dichloroethene trans-1,3-Dichloropropene Trichloroethene 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
WATERS 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

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS Fresh Surface Water (river water) and Ground Water	**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-xylenol) 2,4-dimethylphenol (2,4-xylenol) 2,5-dimethylphenol (2,5-xylenol) 2,6-dimethylphenol (2,6-xylenol) 3,4-dimethylphenol (3,4-xylenol) 3,5-dimethylphenol (3,5-xylenol) 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 (PCMX) Pentachlorophenol	Documented In-House Method LL O Phenols GCMS using initial derivatisation, solvent extraction and GCMS-NCI analysis Test Code 62
WATERS 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)
WATERS 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)
WATERS 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

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS Fresh Surface Water (river water) Ground Water, Treated Sewage Effluent, Trade Effluent to controlled water	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) and Gran's Plot using a METROHM System 855 robotic titro sampler Test Code 397

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS Fresh Surface Water (river water) Ground Water, Treated Sewage Effluent, Trade Effluent to controlled water (cont'd)	Colour	Documented In-House Method LL I Colour (based on SCA blue book) using a Hach Spectrophotometric colour analyser Test Code 20
	Sulphate	Documented In-House Method LL I Sulphate (based on SCA blue book) using a Gallery Photometric Discrete Colorimetric analyser Test Code 1192
WATERS Fresh Surface Water (river water) Ground Water	**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
WATERS Surface and Groundwater	**Nutrients**, specifically: Ammonia Chloride Total Oxidised Nitrogen Nitrate Nitrite Ortho-Phosphate Silicate Total Alkalinity to pH 4.5	Documented In-House Method LL I Nutrients (based on SCA blue book) by discrete colorimetric analyser Test Code 2948 and 2949 (filtered)
	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

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
	Chemical Tests (cont'd)	
WATERS 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
	Silicate	Documented In-House Method LL I Nutrients (based on SCA blue book) by discrete colorimetric analyser Test Code 2948 & 2949 filtered
WATERS	Microbiological Tests	Document In House Methods based on; The Microbiology of Recreational and Environmental Water
	Isolation and enumeration of:	
Natural and saline water and Treated Sewage Effluent	Intestinal Enterococci (presumptive and confirmed)	NRW B STREP ENV by membrane filtration Test Code 1352 Test Code 1353 based on MoREW part 4 2015
	Detection of:	
	Escherichia coli	Documented In-House Method NRW B ECOLI TBX using membrane filtration Test Code 1126 based on MoREW part 3 2016
END		