


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

| | | |
|---|---|--|
|  <p>1494</p> <p>Accredited to ISO/IEC 17025:2005</p> | United Utilities Water plc operating as United Utilities Scientific Services | |
| | Issue No: 043 Issue date: 25 April 2012 | |
| | Lingley Mere Laboratory PO Box 458 Lingley Green Avenue Great Sankey Warrington WA5 3LP | Contact: Mr J Perry Tel: +44 (0)1925 677077 Fax: +44 (0)1925 678933 E-Mail: jeff.perry@uuplc.co.uk Website: |
| Testing performed by the Organisation at the locations specified below | | |

Locations covered by the organisation and their relevant activities

Laboratory locations:

| Location details | | Activity | Location code |
|--|--|------------------------|---------------|
| Address Lingley Mere Laboratory PO Box 458 Lingley Green Avenue Great Sankey Warrington WA5 3LP | Local contact Mr J Perry Tel: +44 (0)1925 677077 Fax: +44 (0)1925 678933 E-Mail: jeff.perry@uuplc.co.uk Website: | Environmental Analysis | A |

Site activities performed away from the locations listed above:

| Location details | Activity | Location code |
|---|------------------------------|---------------|
| Waste Water Treatment Works (WWTW) Water Treatment Works (WTW) Service Reservoirs and Domestic Premises Ground and Surface Water Sources | Sampling and on-site testing | B |



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This schedule is ordered as follows:

Section 1

ISO 17025 + DWTS

Inorganic Chemistry

Organic Chemistry

Sensory

Radiochemistry

Microbiology and Cryptosporidium

Sampling

Section 2

ISO 17025 + MCERTS (waters)

Inorganic Chemistry

Organic Chemistry

Sampling

Section 3

ISO 17025 only

Inorganic Chemistry Waters

Organic Chemistry Waters

Inorganic Chemistry Sludges and Soils

Microbiology

Section 4

Flexible scopes

Note: accreditation to MCERTS (waters) and DWTS automatically confers an equivalent accreditation to ISO 17025



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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 |
|---|--|--|---------------|
| Section 1 | | | |
| WATERS Raw (surface water and groundwater), potable waters and bottled waters | Analysis for the purpose of enforcement of "The Water Supply (Water Quality)" (England) Regulations <u>Chemical Tests</u> Elements including: Alkalinity Ammonia Chloride Nitrate (by calculation) Nitrite Total Oxidised Nitrogen Silica | Methodology meeting the requirements of The Drinking Water Testing Specification Documented In-House Methods: QI 231/01 by discrete analyser by Aqua 900 | A |
| | Colour | QI 231/21 using segmented flow analysis | A |
| | Conductivity | QI 231/19 using glass electrode | A |
| | Total Organic Carbon | QI 231/15 using persulphate oxidation by non-dispersive infra-red detector | A |
| | Chlorophyll a | QI 242/03 using UV-Visible spectrophotometry | A |
| | pH | QI 230/28 using pH Meter | A |
| | Turbidity | QI 230/22 using nephelometry | A |
| | Total Cyanide | QI 231/53 using SFA and colorimetry | A |
| | Mercury | QI 231/50 using Cold Vapour Atomic Fluorescence Spectroscopy | A |



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| WATERS Raw (surface water and groundwater), potable waters and bottled waters (cont'd) | <u>Chemical Tests</u> (cont'd) | | |
| | Elements including: Antimony Arsenic Cadmium Chromium Copper Lead Nickel Selenium Silver Zinc | QI 231/06 using ICP-MS | A |
| | Elements including: Aluminium Calcium Iron Magnesium Manganese Phosphorus Sodium | QI 231/36 and QI 231/35 by VISTA ICP OES | A |
| | Elements including: Aluminium Iron Manganese | QI 231/35 by VISTA ICP OES | A |
| | Elements including: Barium Boron Potassium | QI 231/37 by Vista ICP | A |
| | Bromate | QI 231/44 and QI 231/58 by ion chromatography | A |
| | Sulphate Fluoride Bromide | QI 231/54 by ion chromatography | A |
| Elements including: Colour Conductivity Turbidity | QI 231/57 by Peerless robotic system | A | |



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| WATERS Raw (surface water and groundwater), potable waters and bottled waters (cont'd) | <u>Chemical Tests</u> (cont'd) | | |
| | <u>Halogenated Hydrocarbons including THM:</u> Elements including: Trichloromethane Bromodichloromethane Dibromochloromethane Tribromomethane Tetrachloromethane Trichloroethene Tetrachloroethene Total THM Total CHC | QI 260/11 using Headspace - Gas Chromatography with electron Capture Detector (Headspace - GC-ECD) | A |
| | <u>Polyaromatic Hydrocarbons:</u> Elements including: Benzo(b)fluoranthene* Benzo(k)fluoranthene* Indeno(1,2,3-cd)pyrene* Benzo(g,h,i)perylene* Benzo(a)pyrene Total PAH (total of 4 PAHs marked *) | QI 260/03 using solvent extraction followed by HPLC with fluorescence detection | A |
| Simazine Atrazine Propetamphos Propazamide Diazinon Ethofumesate | QI 260/59 by GCMS | A | |



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| <p>WATERS Raw (surface water and groundwater), potable waters and bottled waters (cont'd)</p> | <p><u>Chemical Tests</u> (cont'd)</p> <p>Pesticides and herbicides: Carbendazim Cyanazine Carbofuran Chlortoluron Metazochlor Isoproturon Diuron Triforine Linuron Methiocarb Carbetamide Metribuzin Mesosulfuron-methyl Simazine Atrazine Ethofumasate Propyzamide Propetamphos Diazinon</p> | <p>QI 260/61 by LC-MS-MS</p> | <p>A</p> |
| <p>Raw (surface water and groundwater) and potable water</p> | <p>Organochlorine pesticides: Lindane Heptachlor Aldrin Heptachlor Epoxide Dieldrin</p> | <p>QI 260/60 by GC-MS</p> | <p>A</p> |
| <p>Raw (groundwater only) and potable water</p> | <p>Benzene 1,2 DCE MTBE Toluene Ethylbenzene m/p xylene o xylene Total xylene</p> | <p>QI 260/52 by headspace GC-MS</p> | <p>A</p> |



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| WATERS Raw (surface water only) and potable water | <u>Chemical Tests</u> Herbicides: Clopyralid Dicamba Fluroxypyr Mesotrione Bromoxynil 2,4D MCPA Triclpyr loxynil Dichlorprop 2,4,5T Mecoprop 2,4DB MCPB | QI 260/70 using LC-MS-MS | A |
| Raw and potable water | <u>Sensory Tests</u> Quantitative Odour Quantitative Taste | QI 233/02 using assessed panel | A |
| | <u>Radiochemical Tests</u> Gross alpha | QI 232/01 using α /B multi-detector | A |
| | Gross beta | QI 232/02 using α /B multi-detector | A |
| WATERS Raw and potable water | <u>Microbiological Tests</u> Enumeration of: Colony count at 22 °C and 37 °C | Documented In-House Methods based on The Microbiology of Drinking Water 2002 and their subsequent updates - Methods for the Examination of Waters and Associated Materials. A report by the Environment Agency (EA). QI 240/11 using manual pour plate method | A |



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| <p>POTABLE AND RAW WATERS</p> <p>From: Consumer taps Standpipes Service reservoirs Water treatment works</p> <p>Raw waters including: Surface Waters: impounding reservoirs, canals, lakes Groundwater: boreholes</p> <p>Raw (groundwater and surface water) and Potable Water</p> | <p>For the purpose of enforcement of The Water Supply (Water Quality) Regulations 2000 (SI 2000/3184)</p> <p>Sampling: For Chemical and Microbiological Testing ((including cryptosporidium)</p> <p><u>On-site Testing</u></p> <p>pH</p> | <p>Where applicable the methodology meeting the requirements of The Drinking Water Testing Specification</p> <p>Documented In-house Procedures QI638/01 QI643/01</p> <p>Documented In-House Methods: Method QI640/01</p> | <p>B</p> <p>B</p> |
| | | | |



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| Section 2 | | | |
| WASTE WATERS | <u>Chemical Testing</u> | Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, sewage effluent and trade effluent | |
| Untreated sewage Treated sewage effluent Trade effluent | Total phosphorus | QI 251/34 using persulphate oxidation and UV digestion followed by air segmented flow analysis | A |
| | Total nitrogen | QI 251/39 using skalar total N analyser | A |
| | Arsenic Selenium | QI 231/59 by ICP-MS | A |
| | Choride Phosphate | QI 251/45 using continuous flow analyser | A |
| Treated sewage effluent | Suspended solids | QI 250/12 by gravimetry | A |
| | Anionic Surfactants | QI 251/06 by sealed tube | A |
| | Ammonia Chloride Phosphate Total Oxidised Nitrogen (TON) | QI 251/43 by discrete analyser | A |
| | Ammonia Nitrite Orthophosphate Total Oxidised Nitrogen (TON) | QI250/46 using air-segmented flow analyser | A |
| | Mercury | QI 251/42 by AFS | A |
| Untreated sewage Treated sewage effluent | Biochemical Oxygen Demand (BOD) | QI 251/17 based on 5-day biochemical oxygen demand, semi-automated, 2 nd edition, HMSO 1998 | A |
| | Chemical Oxygen Demand | QI251/19 high range | A |



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| WASTE WATERS | <u>Chemical Testing</u> | Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, sewage effluent and trade effluent | |
| Untreated sewage Trade effluent | Chemical Oxygen Demand | QI251/29 low range | A |
| Treated sewage effluent Trade effluent | <u>Metals:</u> Cadmium Chromium Copper Nickel Lead Zinc | QI 231/48 using ICP-OES | A |
| | Cadmium Chromium Copper Nickel Lead Zinc | QI 231/40 using ICP-MS | A |
| | Aluminium Cobalt Iron Manganese Molybdenum Vanadium | QI 231/51 using ICP-OES | A |
| | Ammonia Chloride Phosphate Total Oxidised Nitrogen (TON) | QI 231/02 using discrete analyser (aqua) | A |
| | Ammonia Nitrate (by calculation) Nitrite Total Oxidised Nitrogen | QI 251/44 using continuous flow | A |



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| WASTE WATERS | <u>Chemical Testing</u> | Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, sewage effluent and trade effluent | |
| Untreated sewage Treated sewage effluent Trade effluent | Organotin Compounds: Tributyltin Triphenyltin Pentachlorophenol <u>VOC's:</u> Dichloromethane Chloroform Carbon Tetrachloride 1,2 Dichloroethane Trichloroethene Tetrachloroethene Toluene o-xylene m/p-xylene 1,2,3 trichlorobenzene 1,2,4 trichlorobenzene 1,3,5 trichlorobenzene Bromoform Benzene Naphthalene MTBE n-hexane 1,1,1 trichloroethane 1.1.2 trichloroethane Dicyclopentadiene Hexachloro-1,3-butadiene | QI 260/29 by hexane extraction and derivatisation and analysis by GC-MS QI 260/53 by GC-MS QI 260/09 by GC-MS | A A A |
| Treated sewage effluent | On-site measurement of: pH | Documented in-house methods: QI 510/06 using pH meter | B |
| Trade effluent | Total residual chlorine | Documented in-house method QI 510/17 using hand held chlorometer | B |



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| WASTE WATERS | Sampling | Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, sewage effluent and trade effluent | |
| Treated sewage effluent Trade effluent to controlled waters | For chemical testing | Method QI 510 using manual spot sampling | B |
| | | | |



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| Section 3 | | | |
| WATERS | <u>Chemical Tests</u> | | |
| Waste waters | Chemical oxygen demand | QI 251/19 by sealed tube method | A |
| | Free and easily liberated cyanide | QI 231/22 | A |
| | Fluoride | QI 231/35 using Ion Selective Electrode | A |
| | Nitrate | A calculated value based on QI 231/02 | A |
| | Nitrite | QI 231/02 using discrete analyser | A |
| | Ortho-Phosphate | QI 231/02 using discrete analyser | A |
| | pH | QI 250/11 based on the measurement of electrical conductivity and laboratory determination of the pH value of natural and waste waters, HMSO 1978 | A |
| | Sulphate | QI 231/14 using Air-segmented Flow Analysis | A |
| | Suspended solids - mixed liquors | QI 250/13 based on HMSO 1980 using gravimetric technique | A |
| | Suspended solids, volatile material and ash | QI 250/12 based on HMSO 1980 | A |
| | Total organic carbon Total Nitrogen | QI 251/39 using Formacs analyser | A |
| | Total phosphorus | QI 251/34 using persulphate oxidation and UV digestion followed by air segmented flow analysis | A |
| | Total Nitrogen | QI 250/36 using Skalar Total Nitrogen Analyser | A |



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| WATERS (cont'd) | <u>Chemical Tests</u> (cont'd) | | |
| - Waste waters (cont'd) | Mercury | QI 230/12 using Cold Vapour Atomic Absorption Spectroscopy | A |
| | Alkalinity | QI 252/12 using air segmented flow analysis | A |
| | Anionic Surfactants | QI 251/06 by sealed tube | A |
| | Cationic Detergents | QI 251/01 based on the analysis of surfactants in waters, wastewaters and sludges, HMSO 1981 Method C | A |
| Waste Waters | Separable oils and grease | QI 251/10 based on suspended settleable and total dissolved solids in waters and effluents HMSO 1980 | A |
| Waste Waters (including trade effluent) | Percentage transmission in sewage effluents at 254 nm | QI 250/44 by UV spectrometer | A |
| | Elements including: Cadmium Chromium Copper Lead Nickel Zinc | QI 231/48 using vista ICP optical emission spectroscopy | A |
| Waste Waters (including trade effluent) and groundwater | Biochemical oxygen demand (BOD) | QI 251/17 based on 5-day biochemical oxygen demand, semi-automated, 2nd edition, HMSO 1988 | A |
| Waste Waters (including trade effluent) | Nitrite Orthophosphate Total Oxidised Nitrogen (TON) | QI 231/02 using discrete analyser | A |
| | Total Sulphide | QI 251/36 by DPD method using Spectrophotometer | A |



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| WATERS (cont'd) | <u>Chemical Tests</u> (cont'd) | | |
| Waste Waters | Elements including: Chlorobenzene 1,2-dichlorobenzene Ethylbenzene Styrene 2-ethylhexanol 2 and 3-chlorotoluene 4-chlorotoluene | QI 260/23 using GC-FID | A |
| | Elements including: 2-chlorophenol 4-chlorophenol 3,5-dimethylphenol 4-chloro-3-methylphenol Phenol 2-methylphenol 3 and 4-methylphenol 4-chloro-3,5-dimethylphenol 2,4-dichloro-3,5-dimethylphenol 2,4-dichlorophenol | QI 260/24 using GC-FID | A |
| | Alkylphenol ethoxylate non-ionic detergents | QI 260/33 using HPLC | A |
| Landfill leachate, trade effluent, surface water | Methane | QI 260/75 using Gas Chromatography with Flame Ionisation Detector (GC-FID) | A |
| SOIL | <u>Chemical Tests</u> | | |
| | Elements including: Cadmium Chromium Copper Molybdenum Nickel Lead Zinc | QI 231/47 by vista ICP optical emission spectroscopy | A |
| | Mercury | QI 252/13 by direct mercury analyser | A |
| | pH | QI 252/09 using auto analyser | A |



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| SOILS including sludges | <u>Chemical Tests</u> | Documented In-House Methods | | |
| | Extractable phosphate | QI 252/14 using discrete analyser | A | |
| | Elements including: Carbon Hydrogen Nitrogen Sulphur | QI 252/15 using elemental analyser | A | |
| | Elements including: Cadmium Chromium Copper Lead Nickel Zinc | QI 231/48 using vista ICP-OES | A | |
| | <u>Chemical Tests</u> | Documented In-House Methods | | |
| | SLUDGE only | pH | QI 252/07 using pH electrode | A |
| | | Total nitrogen Total Organic Carbon | QI 250/39 using FormacsAnalyser | A |
| | | Total phosphorus | QI 251/34 by acid digestion and colorimetry | A |
| | | Mercury | QI 230/12 using cold vapour atomic fluorescence spectroscopy | A |
| | | Elements including: Cadmium Chromium Copper Lead Molybdenum Nickel Zinc | QI 231/46 using digestion followed by ICP-OES | A |
| Chloride Phosphate | | QI251/45 using continuous flow analyser | A | |
| Ammonia Nitrate (by calculation) Nitrite Total Oxidised Nitrogen | | QI251/44 using continuous flow analyser | A | |



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| SLUDGE only (cont'd) | <u>Chemical Tests</u> (cont'd) Dry solids at 105 °C Organic and volatile matter at 700 °C | Documented In-House Methods QI252/19 using thermogravimetric analyser | A |
| PROCESS WATERS, BATHING WATERS, SEWAGE AND WASTE WATERS | <u>Microbiological Tests</u> | Documented In-House Methods based on The Microbiology of Drinking Water 2002 and their subsequent updates - Methods for the Examination of Waters and Associated Materials. A report by the Environment Agency (EA). | A |
| | Enumeration of: Colony count at 22 °C and 37 °C | QI 240/11 using manual pour plate method | A |
| | Isolation and enumeration/ confirmation of: Presumptive Total Coliforms and <i>Escherichia coli</i> | QI 240/02 manual method using membrane filtration and MLSB <u>or</u> MLGA as media | A |
| | Presumptive Total Coliforms and <i>Escherichia coli</i> | QI 241/31 by membrane filtration | A |
| | Manual confirmation tests of coliforms and <i>Escherichia coli</i> | QI 240/05 | A |
| | Isolation and enumeration/ confirmation of: Isolation and enumeration of <i>enterococci</i> | QI 240/07 manual method using membrane filtration | A |
| | <i>Enterococci</i> confirmation test | QI 240/16 | A |
| | Presumptive <i>Clostridium perfringens</i> | QI 240/09 manual method using membrane filtration | A |
| | Confirmed <i>Clostridium perfringens</i> | QI 240/17 | A |



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| PROCESS WATERS, BATHING WATERS, SEWAGE AND WASTE WATERS (cont'd) | <u>Microbiological Tests</u> (cont'd) | Documented In-House Methods based on The Microbiology of Drinking Water 2002 and their subsequent updates - Methods for the Examination of Waters and Associated Materials. A report by the Environment Agency (EA). (cont'd) | A |
| | Isolation and enumeration/ confirmation of: (cont'd) | | |
| | Speciation of <i>Enterobacteriaceae</i> | QI 240/19 using vitek system | A |
| | Isolation and/or enumeration of: | | |
| | <i>Salmonella</i> spp (confirmed) (excluding <i>Salmonella typhi</i>) | QI 241/01 membrane filtration using selective enrichment and MPN | A |
| | <i>Pseudomonas aeruginosa</i> (confirmed) (excluding non-pigmented strain) | QI 240/15 by membrane filtration | A |
| Raw (groundwater) and Potable | Cryptosporidium | QI 243/02 - Elution and primary concentration by Filta-Max QI 243/03 - Dynal IMS procedure QI 243/04 - Staining, examination and identification | A |
| | Legionella | QI 241/15 by membrane filtration | A |
| | Identification of Algal spp | QI 242/01 by membrane filtration and optical microscopy | A |
| - Sewage sludge | <u>Microbiological Tests</u> | Documented In-House Methods based on The Microbiology of Sewage Sludge 2003 and their subsequent updates - Methods for the Examination of Waters and Associated Materials. A report by the Environment Agency. | |
| | Isolation and/or enumeration of: | | |
| | <i>Salmonella</i> spp (confirmed) (excluding <i>Salmonella typhi</i>) | QI 241/01 using MPN | A |
| | <i>Escherichia coli</i> | QI 241/29 using manual method | A |



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|---|--|---|---------------|
| Section 4 | | | |
| SURFACE WATER, FINAL EFFLUENT, GROUND WATER AND SEA WATER GAS SEWAGE SLUDGE, SLUDGE CAKE AND WTW SLUDGE MIXED LIQUOR TRADE EFFLUENT WATER WITHIN TREATMENT SOIL | <u>Chemical Tests</u> Determinands listed in this schedule (Where the type of test states " <i>elements including</i> ", the method can be developed to include unspecified determinands) | Documented In house generic protocol QI 275/04 for analysis using analytical techniques included in this schedule | A |
| DRINKING WATERS | Determinands listed in this schedule (Where the type of test states " <i>elements including</i> ", the method can be developed to include unspecified determinands) | Methodology meeting the requirements of The Drinking Water Testing Specification and documented In house generic protocol QI 275//04 for analysis using analytical techniques included in this schedule | A |
| RAW WATERS PROCESS WATERS, BATHING WATERS, SEWAGE, WASTE WATERS, POTABLE AND GROUND WATERS, SEDIMENTS, SLUDGES, SEWAGE SLUDGE | <u>Microbiology Tests</u> Any determinand listed in this schedule | Documented In house generic protocol QI 275/07 for analysis using techniques included in this schedule | A |
| DRINKING WATERS | <u>Microbiology Tests</u> Any determinand listed in this schedule | Methodology meeting the requirements of The Drinking Water Testing Specification and documented In house generic protocol QI 275/07 for analysis using techniques included in this schedule | A |
| END | | | |