PE1646/E

Scottish Water submission of 30 June 2017

Thank you for the opportunity for Scottish Water to provide information to The Public Petitions Committee in consideration of Petition PE1646.

We were asked to answer five specific questions by the Committee and we enclose a detailed response as part of our submission which outlines the regulations, processes and protocols, together with the input of regulators and other agencies to ensure the public water supplies in Scotland are appropriately monitored.

It is important to stress that Scottish Water like other UK water companies operate in a highly regulated industry where public health is the prime concern. We welcome this regulation and framework which we believe acts in the best interests of customers.

We believe strongly that the role performed by the Drinking Water Quality Regulator is crucial to protecting and driving forward standards across the industry. This regime has seen drinking water quality in Scotland reach its highest ever levels across the country.

In relation to the chloramination process which is used to treat a number of drinking water supplies across Scotland, the UK and worldwide, I can confirm that this disinfection process is globally used and accepted as being an appropriate way to treat water. Should the Committee wish to consider information on this process we would suggest that this is done via an organisation such as the World Health Organisation.

I hope the information provided is helpful and we are more than happy to discuss any aspects of the details should the Committee wish.

1. Who tests the water?

Scotland's drinking water testing needs to meet the requirements of EC Directive 98/83/EC on the Quality of Water Intended for Human Consumption. In this Directive the essential quality standards at EU level are laid down together with identifying who is responsible for meeting specified requirements for the collection, transport and analysis of samples of the water that is supplied.

The Public Water Supplies (Scotland) Regulations 2014 sets out the requirements which Scottish Water must meet to monitor public drinking water supplies. These regulations set out the processes and procedures that organisations involved in sampling or testing drinking water must comply with. In addition, the frequency, performance and characteristics to be measured are stipulated in these Regulations and Paragraph 15 sets out the requirements for collecting and analysing samples.

The regulations include a requirement to have the samples analysed by a laboratory which has a system of quality control that is subjected to checking by an approved person, in this case, the United Kingdom Accreditation Service (UKAS).

UKAS has been approved by Scottish Ministers for this role. The organisation is independent of the Government and has been appointed as the national accreditation body by the Accreditation Regulations 2009 (SI No 3155/2009) and the EU Regulation (EC) 765/2008. It operates under a Memorandum of Understanding with the Government through the Secretary of State for Business, Energy and Industrial Strategy.
There is a Memorandum of Understanding (MoU) between all UK regulators of drinking water, including Scotland's drinking water quality regulator, which sets out that UKAS is responsible for accrediting organisations such as Scottish Water for the testing of drinking water on behalf of the regulators. The MoU states UKAS will act impartially from the Regulator, however UKAS are required to inform the Regulator of any significant anomalies and report on all findings.

UKAS accreditation

UKAS Accreditation is a means of independently and impartially assessing, by recognised technical experts, the technical competence and integrity of organisations offering evaluation services.

UKAS complete the same function across UK water companies and is recognised internationally. Accreditation to the Drinking Water Testing Specification (DWTS) is required by the Drinking Water Quality Regulator (DWQR) to allow Scottish Water Scientific Services to sample and test drinking water in accordance with Regulations. This model of operation is in place throughout the UK.

Scottish Water's Scientific Services is accredited by UKAS to ISO/IEC17025 to the Drinking Water Testing Specification (DWTS). ISO/IEC 17025:2005 is the international standard for the General Requirements for the Competence of Testing and Calibration Laboratories.

The Drinking Water Testing Specification (DWTS) is a publication prepared by UKAS in collaboration with the UK Drinking Water Regulators, setting out how the requirements of ISO/IEC 17025:2005 are applied to organisations undertaking sampling and testing of drinking water.

The Drinking Water Testing Specification and ISO/IEC 17025:2005 require the sampling and testing organisation to demonstrate the following:

- Impartiality (will be covered in answer to question 5 conflict of interest)
- Competency of staff
- Validity of analytical procedures (will be covered in answer to question 2 test protocols)
- Ongoing internal quality control of testing procedures (will be covered in answer to question 2 test protocols)
- Ongoing external quality control of testing procedures though proficiency testing (will be covered in answer to question 2 test protocols)
- Compliance with internal and external audit programmes (will be covered in answer to question 2 test protocols).

Scottish Water Scientific Services

Scottish Water's Scientific Services is headed by the Chief Scientist, Professor Elise Cartmell, and consists of a team of 325 staff split into two main functions - Laboratory and Technical Logistics. The laboratory function is based in Edinburgh and Inverness and is split into three main disciplines covering Microbiology, Organic Chemistry and Inorganic Chemistry. Technical logistics are based throughout Scotland including the islands and are responsible for the sampling and transport of all regulatory samples taken in accordance with DWTS.

Competency of Staff

Regulation 15 (2) (d) (i) of the Public Water Supplies (Scotland) Regulations 2014 outline the requirements for staff competence in relation to drinking water testing. These regulations have allowed UK wide aligned competencies.

Sixteen competencies have been derived from those required of chartered members of the Royal Society of Chemistry, the Institute of Biology and the Chartered Institute of Water and Environmental Management.

There are three broad categories of staff engaged in the testing processes - Competent Analysts, Competent Persons and Competent Technical Managers:

> Competent Technical Managers are degree qualified in a relevant scientific discipline and are required to hold Chartered status from the relevant scientific body. The Technical Manager in each team has a key role in ensuring the data generated by each test method meets the requirements of DWTS and the relevant regulations.
>
> Within Scottish Water, Competent Analysts and Competent Persons are generally qualified at Higher National Diploma (HND) or degree level in a relevant scientific discipline and are required to maintain a continuing professional development portfolio that meets the requirements of 9 of the competencies required for chartered status.

Records of all staff working in Scientific Services are maintained to ensure they are meeting professional requirements and these records are subject to both internal review and external audit (see section 2).

2. What are the test protocols?

The full scope of Scientific Services accredited analytical tests and sampling activity can be found within the Accreditation Schedule held on the UKAS web site:

www.ukasscheduleofaccreditation.co.uk

Test protocols are generally based on methods documented by The Standing Committee of Analysts (SCA) who exist to provide authoritative guidance on methods of sampling and analysis. In some cases methods can also be based on

other equivalent international standards. The SCA methods are published by the Environment Agency.

A table of the parameters routinely tested to demonstrate compliance with the Public Water Supplies (Scotland) Regulations 2014 is attached as an **Appendix** at the end of the document.

How often and where analytical water quality tests are completed is based on an annual monitoring programme. The Scottish Water Public Health & Water Regulation team submits a request to Scientific Services for the annual programme of regulatory sampling from water treatment assets and customer zones to be carried out. Using a standardised approved scheduling procedure ensures that the Scottish Water Scientific Services Scheduling Team is supplied with the information they require to complete the processes of creating and maintaining Scottish Water's regulatory sampling programmes. These regulatory programmes are put in place to ensure that Scottish Water discharges its requirements for sampling and analysis as laid down in legislation. Relevant legislation includes The Public Water Supplies (Scotland) Regulations 2014 and Information Letter 4/2007 (Raw Water monitoring requirements to conform with Article 7 of the Water Framework Directive and the 2001 regulations). To ensure a fair and true sample, operational teams have no forewarning of sampling activities. This is achieved by strict access control to the Laboratory Information Management System (LIMS) where the sampling schedule is held.

Validation of Test Protocols

Test protocols are subject to a validation process based on NS 30 A Manual On Analytical Quality Control For The Water Industry. The process involves the statistical evaluation of data to ensure the test method meets the performance requirements for each analytical parameter given in the regulations in terms of precision accuracy and limit of detection.

On fulfilling the required criteria including participation in external proficiency schemes the test method is assessed by UKAS to determine if it is suitable for accreditation.

Internal Quality Control

Analytical performance must meet the requirements for each parameter given in the Regulations and is demonstrated by the on-going use of Analytical Quality Control Samples (AQC). The AQC is one form of assurance that a test method is valid and results are reliable.

Analytical Quality Controls (AQC) are prepared from independently verified reference materials. Reference materials play an important role in underpinning the accuracy and validity of measurements made within laboratories. To have confidence when selecting reference materials, the laboratory needs to ensure that the producer of the

material is competent and that the material has been produced using a valid procedure.

AQCs are plotted to demonstrate that the test method is under statistical control against the performance requirements specified in the regulations. The performance of each test method is monitored on an on-going basis and appropriate actions must be taken to ensure test methods remain under statistical control. These processes are subject to regular review and also internal and external audit.

External Proficiency Testing

Scientific Services is required to participate in an external scheme for each parameter on the Accreditation Schedule for which an appropriate scheme is available.

Documented procedures are in place for the investigation and recording of all flagged results or "failures" notified by the organisers of the scheme.

The results from these schemes are key to demonstrating the on-going performance of each test method and subject to internal and external audit to demonstrate that the response to any failures takes account of impact on routine test results.

Equipment Protocols

To meet the requirements of the Regulations and ISO 17025, protocols are in place for equipment. Equipment maintenance programmes ensure autonomous, planned maintenance and on-going checks of the equipment's 'fitness for purpose' are assessed through Quality Checks determined from the original validation process.

Audit

External: Scientific Services are subject to annual external audit by the accreditation body UKAS. UKAS act independently of the Scottish Government and audit Scientific Services at length with around 25 audit days per year. UKAS have sufficient knowledge to challenge in all aspects of sampling and laboratory staff competence, impartiality, compliance with protocols and regulations, with the reports made available to DWQR. UKAS are recognised as being technically competent in their field, therefore challenge the technical perspective of Scientific Services as well as the systems and processes that the laboratory operates.

The DWQR can also audit Scientific Services at any time against the Regulatory requirements including paragraph 15, publishing their findings online to allow them to be accessible to consumers.

Internal: Scientific Services are also subject to audit by the Scottish Water Internal Audit Team. The role of the Internal Audit team, defined in its Charter and in accordance with professional standards, is to provide independent assurance that Scottish Water's risk management, governance and internal control processes are

operating effectively. Their independence is ensured through a direct reporting line to the Audit Committee Chair.

Scientific Services are also subject to audit by the Lean Management Systems Team, which includes the Quality Manager for the laboratories and sampling sections. The Quality Manager does not report directly into Scientific Services and has access to the Director of Strategic Customer Service Planning to escalate any risk for example to impartiality or processes.

Within Scientific Services annual audit plan alone, approximately 250 audits are completed and cover all aspects of the work carried out by Scientific Services from sampling protocols, independence and impartiality to reporting of results. All findings are documented and all findings are acted on by competent staff. Additionally Scientific Services have their own technical auditors who are independent of the activity audited and therefore complete audits outside their own section and line management.

3. Who analyses the results and makes recommendations based on those results?

It is the responsibility of the Scottish Water Public Health Team to analyse all results and notify key stakeholders of all failures following a standardised, approved process. The purpose of this procedure is to ensure the requirements for reporting drinking water quality failures under The Public Water Supplies (Scotland) Regulations 2014 are followed. The key stakeholders are the Drinking Water Quality Regulator (DWQR), Environmental Health Teams, NHS Health Protection Teams and Health Protection Scotland (HPS). In addition, relevant stakeholders within Scottish Water are also communicated with including the regulation, operational and planning teams.

There is a multi-agency plan for dealing with waterborne hazards impacting the public water supply. The Scottish Waterborne Hazard Plan (SWHP) is maintained by a working group comprised of representatives from Scottish Water, representatives of Scottish Local Authorities and NHS Boards, Health Protection Scotland and Scottish Government - Scottish Resilience.

The guidance (i) provides a framework for the management of a co-ordinated response to any actual or potential waterborne hazard associated with the public water supply in Scotland and (ii) outlines the actions to be taken by Scottish Water, NHS Boards, Local Authorities and other agencies in the event of an incident involving the suspected or actual contamination of a public water supply with potential public health implications.

The aims of the plan are to:

- Ensure a co-ordinated, multi-agency response to the detection of a waterborne hazard with the objective of controlling the hazard and preventing adverse health impacts.
- Provide a framework for the management of a co-ordinated response to any actual or potential waterborne hazard associated with the public water supply in Scotland.
- Outline the actions to be taken by Scottish Water, NHS Boards, Local Authorities and other agencies in the event of an incident involving the suspected or actual contamination of a public water supply with potential public health implications.

There is also Short-Term Health Risk Action Values For Drinking Water In Scotland (SHRAVs). These are guidelines for assessing the potential health risks of short-term exposure to contaminated drinking-water and are published by Health Protection Scotland and re-produced with permission from the UK Water Industry Research (UKWIR) and the Water Research Centre (WRc). "Health protection" values are generally derived from World Health Organisation (WHO) Guideline Values (GV).

The short-term exposure guideline values provided in this document are intended to assist in making a health risk assessment on a selected number of agents, mainly chemicals. Values are also quoted for a number of non-chemical parameters. The list is based on the Prescribed Concentration or Value (PCV) regulated parameters plus a number of others.

4. Who has the power to enforce the recommendations?

Scotland's Drinking Water Quality Regulator (DWQR) has the power to enforce recommendations on Scottish Water. The mechanisms of enforcement are outlined in the DWQR Enforcement Policy February 2015 and the relevant legislation for this Policy is:

- The Water (Scotland) Act 1980 (as amended)
- The Water Industry (Scotland) Act 2002 (as amended)
- The Cryptosporidium (Scottish Water) Directions 2003
- The Public Water Supplies (Scotland) Regulations 2014.

The Water Industry (Scotland) Act 2002 (The 2002 Act) vests specific powers in the DWQR in relation to the monitoring and enforcement of drinking water quality standards in Scotland:

- Power to obtain information
- Power of entry or inspection

- Power of enforcement action
- Emergency powers to require a water supplier to carry out works to ensure quality of water supplied is safe for public consumption
- Power to require information from local authorities.

The DWQR through exercising powers set out in Section 7(3) of the 2002 Act may authorise any person (an "authorised person") to exercise, on their behalf, any function of the Regulator.

The enforcement options which are available to the DWQR are:

- Advisory letters
- Recommend to Scottish Ministers the requirement for a Direction
- Notification of Contravention and request for an Undertaking
- Enforcement Notice
- Emergency Notice

5. Is there any conflict of interest within the process?

It is the policy of Scottish Water Scientific Services to conduct all of its activities with impartiality, confidentiality, integrity and in an ethical manner independent from any other part of Scottish Water. It is the responsibility of all Scientific Services employees to uphold and adhere to an approach of complete impartiality, free from any conflict of interest and financial pressures during the performance of their duties, whilst maintaining strict confidentiality of any data or reports produced. The highest ethical standard of professional conduct is expected in the performance of all duties.

Scientific Services are part of the Strategic Customer Service Planning Directorate who have a separate reporting line from the Customer Service Delivery Directorate who operate the drinking water treatment and supply network. The Chief Scientist, who heads Scientific Services has a direct reporting line to the Director of Strategic Customer Service Planning and then the Chief Executive to escalate any risk to impartiality. In addition, the performance targets for all Scientific Services staff are set to deliver sampling compliance and analytical performance targets and not to achieve water quality compliance standards.

Scottish Water also operates a "whistleblowing policy" where any individual can escalate to external 3rd party if they have any concerns regarding impartiality.

Finally, all ethical standards of professional scientific bodies are promoted and adhered to which is assessed through our audit and competency assessments. These professional scientific competencies require high standards of impartiality.

Appendix: Water Quality Parameters

Table 1 Outline of parameters and the test protocol reference for drinking water determinants

Parameter	Test Protocol	Method Basis
Coliforms	MD08 : Determination & Enumeration of Coliform Bacteria & E.Coli in Potable, Raw and Swimming Pool Waters using a single membrane filtration technique	The Microbiology of Drinking Water (2016) – Part 4 – Methods for the isolation and enumeration of coliform bacteria and *Escherichia coli* (including *E. coli* O157:H7)
E.coli	See above	See above
Total Viable Counts	The Determination of Colony Count in Potable, Raw and Swimming Pool Waters by Pour Plate Method	The Microbiology of Drinking Water (2012) - Part 7 – Methods for the enumeration of heterotrophic bacteria
Faecel Streptococci	MD04 The Determination of Enterococci in Potable and Raw Waters by Membrane Filtration	The Microbiology of Drinking Water (2012) - Part 5 – Methods for the Isolation and enumeration of enterococci
Clostridia	MD05 Clostridium Perfringens In Potable and Raw Waters by Membrane Filtration	The Microbiology of Drinking Water (2015) – Part 6 – Methods for the isolation and enumeration of sulphite-reducing clostridia and *Clostridium perfringens* by membrane filtration
Qualitative Odour	D58 Determination of Qualitative and Quantitative Taste and Odour in Raw and Potable Waters	The determination of taste and odour in drinking waters (2014)
Qualitative Taste	See above	See above
Quantitative Odour	See above	See above
Quantitative Taste	See above	See above
Cryptosporidium	MP18 Isolation and Identification of Cryptosporidium Oocysts in Raw and Potable Waters using Compressed Foam Filters	The Microbiology of Drinking Water (2010) - Part 14 - Methods for the isolation, identification and enumeration of *Cryptosporidium* oocysts and *Giardia* cysts
Free Chlorine	The Measurement of Free and Total Chlorine Residual in Potable Water Using HACH Colorimeter (Method Code S01)	Hach Pocket Colorimeter Chlorine Manual 1997. Hach Pocket Colorimeter II Chlorine Instruction Manual 2004
Total Chlorine	See above	See above

Alkalinity	IC078 - Alkalinity in Sewage Effluents, Industrial Effluents, Leachates, Sewage Sludge Supernatants, Raw and Potable Waters and pH in Crude,Final and Trade Effluents and Leachates	Environment Agency, The Determination of Alkalinity and Acidity on Water 1981; Methods for the Examination of Waters and Associated Materials;
Appearance	**ICO26 Determination of Appearance in Raw and Potable Waters	In house screening procedure
Aluminium, Iron, Manganese, Antimony, Arsenic, Cadmium, Copper, Chromium, Lead, Nickel & Selenium	ICPOES1 - Fe, Mn and Al in Potable and Raw Waters using a Perkin Elmer Optima 8300 ICP Spectrometer. GIC001 – Analysis of defined elements by Perkin Elmer Nexion 300X ICPMS Spectrometer* (also covers Al, Fe, Mn)	Standard Methods for the Examination of Water and Wastewater, 1989, 17th edition, published by APHA, AWWA, WPCF. USEPA Method 200.8
pH, Colour, Conductivity and Turbidity	GIC003 Conductivity, pH, Turbidity and Colour in Raw Water and Potable Waters by Peerless Autoanalyser System IN33 Turbidity in Potable and Raw waters. IN37 pH in Raw and Potable waters by pH meter. IN38 Conductivity in raw and potable waters by conductivity meter @20^{o}C IC002 Measurement of Colour in Raw and Potable waters by Uv-Vis Spectrometry	The Measurement of Electrical Conductivity and the Laboratory determination of the pH value of Natural, Treated and Waste Waters, 1978, Methods for the Examination of Waters and Associated Materials. HMSO ISBN 0 11 751 428 4. The Determination of pH in Low Ionic Strength Waters, 1988, Methods for the Examination of Waters and Associated Materials. HMSO ISBN 0 11 752 084 5. Department of the Environment, Methods for the Examination of Water and Associated Materials, Colour and Turbidity of Waters, 1981, Methods for the Examination of Waters and Associated Materials. HMSO ISBN 0 11 751 955 3.
Cyanide	IC008 Cyanide in Defined Matrices by Continuous	Cyanide in Waters etc 1988. Methods for the Examination

	Flow Analyser	of Waters and Associated Materials. HMSO ISBN 0 11 752219 8. SKALAR method for Total Cyanide, Catnr. I295-0047w/r Issue 102808/MH/99253508
TOC	D45.1 The Determination of Total Organic Carbon (TOC) in defined matrices	Skalar Formacs HT combustion TOC/TN Analyser, user manual. The instrumental determination of Total Organic Carbon, Total Oxygen and Related Determinands 1979 HMSO ISBN 0-11-751458-6
Ammonium, Chloride, Nitrate, Nitrite,	IC009 - The Determination Of Chloride, Nitrite, Nitrate, Ton, Ammonium and Phosphate (SR) In Defined Matrices By Discrete Auto Analyser	Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992, Pb. American Public Health Association. HMSO ISBN 0-87553-207-1. Department of the Environment, Method for the Examination of Water and Associated Material, Chloride in Waters, Sewage and Effluents, 1981. Department of the Environment, Method for the Examination of Water and Associated Material, Oxidised Nitrogen in Waters 1981. Department of the Environment Standing Committee of Analysts method "Method for the Spectrophotometric Determination of Ammonia in Water" published in the method book, "Ammonia in Water 1981
Boron, Sodium, Sulphate	ICPOES2 - Ca, Na, Mg, K, Ba, B, P, Li, Sulphate and Total Hardness (by Calculation) in Potable, Raw and Phosphate Dosed Waters using a	Standard Methods for the Examination of Water and Wastewater, 1989, 17th edition, published by APHA, AWWA, WPCF. Sulphate in Waters, Effluents

	Perkin Elmer Optima	and Solids (2nd Edition). 1988. HMSO, Methods for the Boron in Waters, Effluents, Sewage and some Solids, 1980. HMSO, (Methods for the Examination of Waters and Associated Materials)
Mercury	ICPMS1 - Mercury In Potable And Raw Waters Using A Perkin Elmer ICPMS Spectrometer	Determination of mercury in potable water by ICP-MS using gold as a stabilising agent. James Allibone, Ebby Fatemian and Peter Walker (Thames Water). Journal of Analytical Atomic Spectrometry, 1998.
GC MS Scan*	**OC066 Semi Quantitative Screening for Semi-Volatile Organic Compounds using Gas Chromatography Mass Spectrometry	Standard Methods, For The Examination Of Waste And Wastewater, 18th Edition, American Public Health Association, Pages 6-76 - 6-89.
Phenols*	O021 The Determination of Phenolic Compounds by GC/MS	Environment Agency The Determination of Microgram and Submicrogram Amounts of Individual Phenols in River and Potable Waters 1988; Methods for the Examination of Waters and Associated Materials.
Low level Phenols*, **	O021 The Determination of Phenolic Compounds by GC/MS O013 The Determination of THM's & Volatiles in Potable and Untreated Waters by Headspace Injection Gas Chromatography by GC/MS	Environment Agency The Determination of Microgram and Submicrogram Amounts of Individual Phenols in River and Potable Waters 1988; Methods for the Examination of Waters and Associated Materials. In house developed method with ISO17025 accreditation.
Benzene, 1,2-dichloroethane, Tetrachloroethene and Trichloroethene, Tetrachloromethane, THM: Total		
Benzo(a)pyrene, PAH Total	OC 012 Determination of Polycyclic Aromatic Hydrocarbons in Raw and Potable Waters By Solvent Extraction and High Performance Liquid	Environment Agency, The Determination of 6 Specific Polynuclear Aromatic Hydrocarbons in Waters (with notes on the determination of other PAH) 1985: Methods for

	Chromatography with Programmable Fluorescence Detection	the Examination of Waters and Associated Materials. **Environment Agency,** The Determination of 6 Specific Aromatic Hydrocarbons in Water (additional methods) 1997: Methods for the Examination of Waters and Associated Materials.
Fluoride, Bromate	O019 - Determination of Anions in Raw and Potable waters by Ion chromatography.	Determination of Disinfection By-Product Anions and Bromide in Drinking Water Using a Reagent-Free™ Ion Chromatography System Followed by Postcolumn Addition of an Acidified On-Line Generated Reagent for Trace Bromate Analysis, Dionex Application Note 171.
Aldrin, Dieldrin, Heptachlor, Heptachlor epoxide, Lindane	O020 The Determination of Pesticides and Herbicides in Raw and Potable Waters by GC/MS	Environment Agency, Organochlorine Insecticides and Polychlorinated Biphenyls in Waters 1978. Environment Agency, Organo-Phosphorous Pesticides in River and Drinking Water 1980 Tentative Method.
MCPP, MCPA, MCPB, 2,4-D, 2,4-DB, Dicamba	O024 The Determination of Acidic Herbicides by Triple Quad LC/MS/MS	In house developed method with ISO17025 accreditation.
Simazine, Atrazine, Linuron, Diuron, Propetamphos, Diazinon, Metazachlor, Metaldehyde, Isoproturon, Chlortoluron	O043 Determination of Mixed Pesticides, Herbicides and Fungicides by Direct Injection Triple Quad LC/MS/MS Analysis	In house developed method with ISO17025 accreditation.
Metsulfuron-methyl, Thifensulfuron-methyl, Tribenuron-methyl**	O018 Sulfonyl Urea Herbicides by Direct Injection LC/MS/MS	In house developed method with ISO17025 accreditation.
Cypermethrin, Flumethrin, Permethrin**	O009 The Determination of Pyrethroids and Flumethrin in Raw and Potable Waters by GCMS and GC-ECD	Environment Agency, Methods for the Determination of Synthetic Pyrethroid Insecticides in Waters by Gas Liquid Chromatography 1992, Methods for the Examination of Waters and Associated

		Materials.. Environment Agency, Pyrethrins and Permethrin in Potable Waters by Electron-Capture Gas Chromatography 1981, Methods for the Examination of Waters and Associated Materials.
Asulam	O022 Asulam by Direct Injection LC/MS/MS	In house developed method with ISO17025 accreditation.
Indicative dose –Gross alpha, Gross beta	RAD-1 Measurement of Alpha/Beta Activity in Potable and Raw Waters	Environment Agency, Measurement of Alpha and Beta Activity of Water and sludge samples. The determination of Radon - 222 and Radium - 226. The Determination of Uranium (including General X- Ray Flourescent Spectometric Analysis) 1985 - 1986.
Radon	RAD-3 Measurement of Radon in potable and raw waters	Water quality - Radon-222 - Part 4: Test method using two-phase liquid scintillation counting - 2013

*Additional screening tests analysed on request

** Outwith scope of accreditation

Total Pesticides – the sum of the concentrations of each pesticide analysed. The pesticides analysed are based on risk assessment.