



Private Drinking Water Monitoring Programme Audit Report

County:	Limerick City and County Council	Date of Audit:	21 st August 2019
Location visited:	Limerick City and County Council Offices	Date of issue of Audit Report:	4 th December 2019
		Auditors:	Ms. Derval Devaney (EPA) Dr. John Gray (Consultant)
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>, as amended. • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Private Water Supplies (ISBN: 978-1-84095-349-7)</i>. • The <i>EPA Information Note on Monitoring issued January 2019 to Local Authorities</i>. 		

MAIN FINDINGS

- Limerick City and Co. Co.'s regulated private water supplies register did not capture all private water supplies in its functional area that are required to be monitored for drinking water compliance purposes. Also, the register did not contain all the information required under the Drinking Water Regulations.
- Limerick City and Co. Co. did not monitor small private supplies for Group B parameters as is required and did not carry out compliance monitoring for turbidity or nitrite at water treatment plants of regulated private water supplies.
- Weaknesses in procedures were identified, particularly for the selection and taking of compliance samples and pre-determining sampling locations and dates to ensure that compliance samples are evenly spread and representative of water in the supply zone. Limerick City and Co. Co. has a list of small public water supplies where it is unclear whose responsibility (Irish Water or the City and County Council) they fall under and who undertakes compliance monitoring.

1. Introduction

Under the *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended*, the Environmental Protection Agency has a supervisory role in relation to the establishment and implementation of monitoring programmes prepared by Local Authorities. This audit was carried out to assess the performance of Limerick City and County Council (Co. Co.) in carrying out effective monitoring of private drinking water supplies in Limerick City and County to ensure the provision of clean and wholesome drinking water.

An audit of the 2018 monitoring programme implemented by Limerick City and Co. Co. was carried out at Limerick City and County Council Offices, Lissanalta House, Dooradoyle, Limerick, V94H5RR. Prior to the audit, the EPA assessed monitoring returns to identify any areas of discrepancy between samples taken and analysed and reported to EPA. Using a questionnaire as a guide, Limerick City and Co. Co. staff were interviewed to ascertain the principles and methodology for establishing monitoring programmes, sample point selection, sample classification, integrity of data reporting and notification procedures.

The audit observations and recommendations are listed in Sections 2 and 4 of this report. The following were in attendance during the audit.

Representing Limerick City and County Council:

Claire Linehan – Acting Senior Executive Scientist

John O’Halloran – Executive Scientist

Tom Tarpey – Senior Engineer

Rona Saunders – Assistant Scientist

Sinead Kennedy – Senior Executive Engineer

Eithne Lynch – Executive Technician

Representing the Environmental Protection Agency:

Ms. Derval Devaney - Inspector, EPA

Dr. John Gray - Consultant

2. Audit Observations

The audit process is a random sample on a particular day of a facility's operation. Where an observation or recommendation against a particular issue has not been reported, this should not be construed to mean that this issue is fully addressed.

1.	Compliance Monitoring Programme
	a) Information submitted by Limerick City and Co. Co. to the EPA as part of the

	<p>drinking water returns for 2018 indicate the county has 93 regulated private water supplies. However, the audit found that there was one private regulated supply which should have been on the Council's 2018 register and was not added to it until 2019, upon the detection and reporting of illness from members of the public due to contamination of the water supply (see Observation 4g below for further details).</p> <p>b) The Council stated there is a form on its website requesting private water suppliers who fall within the remit of the <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended</i>, to register with the Council. It stated it is a challenge to determine the regulated private water supplies that exist in its functional area when there is not a requirement for such water suppliers to volunteer this information to the Council.</p> <p>c) The Register of Regulated Private Water Supplies included the name and address of the water supplier, contact details, the type of business, the water source and type of treatment. However, population and volume data were not recorded in the register.</p> <p>d) The 2018 compliance monitoring programme is prepared by the Executive Technician and held on the Council's Information Technology (IT) system and is maintained by the Assistant Scientist. Population data is gathered when a subsidy application is made to the Council by the supplier. The population data is reviewed every five years when subsidy reports are submitted and by liaising with group water schemes who have a Design Build and Operating contract in place. Some volume data is not readily available for all supplies and was requested by the Council from some private water suppliers during 2019.</p> <p>e) The population or volume for regulated group water schemes was included in the compliance monitoring programme but this information was omitted for the regulated small private supplies. The Council stated it had assumed a population of < 50 persons for this supply type and that this matter is currently under review.</p> <p>f) Two Group A compliance samples were taken for the regulated small private supplies during 2018 but a Group B sample was not taken, as required, for those small private supplies that were considered to have a population of < 50 persons.</p> <p>g) An historical list of private water supplies was provided by the Health Service Executive (HSE) to Limerick City and Co. Co. The Council stated that the number of regulated private supplies has grown in recent years and 20 supplies were added to the register in 2018 following additional information provided by the HSE and 2019 saw further additions of supplies. It is recognised that an addition of a scheme to the list late in the year would mean that there would be an apparent shortfall in compliance sampling.</p> <p>h) The annual predetermined compliance sampling programme for regulated private supplies is prepared by Limerick City and Co. Co.'s Executive Technician who prepares a monthly sampling programme. The minimum number of Group A and Group B samples required are based on population and the approximate date on which a sample should be taken is recorded. With regard to the small</p>
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	<p>private supplies, a date for sampling is not provided in the monitoring programme but rather the month in which the sample should be taken. Limerick City and Co. Co.'s Technical Grade 1 co-ordinates the sampling to ensure the compliance monitoring programme is fulfilled.</p> <ul style="list-style-type: none"> i) Compliance sampling frequencies were examined for Carnane Group Water Scheme. While the required number of compliance samples were found to be scheduled into the compliance monitoring programme and results were entered into LabWorks; the EPA's Drinking Water Returns for 2018 show that aluminum, ammonium, iron and nitrite (at tap) were not monitored for compliance at the required frequency of four times during 2018 as part of Group A compliance monitoring. j) Sampling locations in larger water supplies are not pre-determined or specified in the monitoring programme and selection of sample location is based on sampler's knowledge and experience. For smaller water supplies, there are generally few, if any, alternative sampling locations. All locations sampled are grid referenced. k) Maps of the private water supplies distribution network and sampling locations are maintained for larger schemes and were verified by examination of maps of the "Distribution Network for Private Group Water Supply Schemes" dated July 2008. Samplers hold copies of these maps and locations of private schemes. However, the water supply zones have not been delineated for the larger schemes. l) Compliance samples are taken from taps at the point of use. Occasionally, samples are taken for investigative purposes from the treatment works or service reservoirs or from the supply zone, as was the case for Croagh PVT Group Water Scheme. m) Data from continuous monitors, if installed, is not used for compliance purposes and is only checked if a scheme is being audited. Turbidity (for surface water sources) or nitrite were not being recorded at private water treatment plants by the Council for compliance monitoring purposes as required. n) Limerick City and Co. Co. stated that the compliance monitoring programme does not include sampling for turbidity at the treatment works since all sources are borehole supplies and turbidity is only required for surface water sources. It was also stated that testing for turbidity would be carried out by the plant operator. However, the 2018 Drinking Water Returns indicate that there are 20 regulated private supplies (18 public group water schemes and two regulated private commercial supplies) that have surface water sources. o) As coagulant aids are not used in the treatment of regulated private water supplies in Limerick City and County, no provision is required to be made to determine acrylamide, epichlorohydrin and vinyl chloride levels in drinking water. p) The Council stated during the audit that most public group water schemes (i.e. private supplies served from a public water supply operated and managed by Irish Water) that exist in Limerick City and County are in their opinion small
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	<p>public supplies. These supplies are considered by the Council to be Irish Water's responsibility, but Irish Water have currently no plan in place to take these supplies in charge. It was acknowledged during the audit that the Department of Housing, Planning and Local Government are undertaking a nationwide review of these "orphan schemes" and the outcome of this review is awaited.</p>
2.	<p>Sampling Procedures and Sampling Manual</p> <ul style="list-style-type: none"> a) Limerick City and Co. Co. has a detailed Standard Operating Procedure (SOP) for sampling ("Standard Operating Procedure for Drinking Water Sampling (Audit) Drinking Water Audit Monitoring – SOP-FIELD-9"). This details safety concerns; specific sample containers; preservatives required; filling instructions; criteria for tap selection; and transport requirements for taking bacteriological samples. b) In the event that tankers or bowzers are deployed in an emergency, the sampling protocol according to the EPA handbook would be followed. However, there was no procedure available on the day of the audit relating to this. a) The sampling manual is a controlled document issued by the Quality Team and is subject to annual review on a pre-determined date. Any suggested changes are reviewed by the Quality Manager and amendments are recorded on the system. No hard-copy record is kept of its issue since the IT system logs when the manual is accessed. c) It is policy not to repeat sample points on each weekly list. The manual also requires that to avoid potential contamination, samples should not be taken from petrol stations, butcher shops, hairdressers, taps with filters or water softeners. However, any premises supplying drinking water should be included in the random selection of sampling locations. The SOP states compliance samples should preferably be taken from cold water taps in kitchens, which the EPA agrees is the correct location for compliance monitoring. d) Samples to be taken are pre-logged in the laboratory and given a number prior to the sampling event. If a sample could not be obtained the sample number is abandoned. The sampler records receipt of the sample in the lab once the sampling event is complete with the time it was checked in. This is also noted on the field sheet. e) In the event that a contracted lab is required for analysis, the contract laboratory receives pre-labelled sample bottles. Otherwise, Limerick City and Co. Co. lab uses a permanent marker to record details on labels which are securely fixed to the sample containers. Compliance samples are pre-designated as such and as the containers are pre-labelled before filling, it is not possible to alter the designation. The auditors did not inspect sample handling at the laboratory. f) A chain of custody is maintained throughout by the sampler delivering the sample and the analyst who receives them and distributes them to different analytical areas. The Laboratory Information Management System (LIMS) does not allow the generation of duplicate sample numbers. Individual and unique sample numbers are generated when samples are logged on to the system by

	<p>laboratory staff.</p> <p>g) If there are any issues arising with the integrity of the sample, it would be abandoned, and a second sample taken with a new reference number.</p> <p>h) Some sampling frequencies are increased if a parameter fails in a compliance sample. For example, investigative samples have been taken by Limerick City and Co. Co. for pH and nitrate in Group Water Schemes upon detection of a compliance sample failure of these parameters.</p>
3.	<p>Data Handling</p> <p>a) Analytical and associated data is recorded on the sampler's field sheet for on-site tests and in the laboratory by the relevant analyst. After the relevant Analytical Quality Control (AQC) data is verified the analytical data is entered on LABWORKS LIMS and archived.</p> <p>b) If a result on the database is subsequently shown to be incorrect it may be changed before the data is archived. After archiving, only the Certifying Team has editing rights. The system is capable of producing an audit trail of access to the system and of data entries.</p> <p>c) If the data from the laboratory is shown subsequently to be incorrect, a new laboratory report would be issued with corrected data to be entered on the system.</p> <p>d) All non-compliant results are reported immediately by telephone and e-mail to the water supplier and all results are issued to it if they are specifically requested by the private water supplier. Limerick City and Co. Co. do not publish compliance monitoring results on their website or routinely issue the compliance results to the water supplier but stated that most water suppliers would request the results which the City and Co. Co. would then send to them. Results for compliance monitoring of private supplies have been submitted to the EPA as part of the 2018 Drinking Water Monitoring Returns.</p> <p>e) Eight regulated private water supplies were identified in the 2018 Drinking Water Monitoring Returns to EPA where no samples were taken for <i>E. coli</i>. These supplies were reported in error and should have been removed from the EPA's Environmental Data Exchange Network (EDEN) system as they no longer exist, and an end date entered of no later than 31 December 2017.</p>
4.	<p>Exceedances of Parametric Values and Local Authority Enforcement</p> <p>a) Limerick City and Co. Co. follow HSE guidance issued in July 2016 entitled "Management of Initial Notification of a Drinking Water Issue of Potential Danger to Human Health" and guidelines proposed by the HSE as a template document in March 2010 for dealing with exceedances and incidents in water supplies. There is no internal documented procedure for notifying stakeholders. Any non-compliant data would be reported to and investigated by the Technical Manager of Limerick City and Co. Co. who would consult by email and telephone with the HSE for health advice. Non-compliant results would be notified to the supplier by telephone and e-mail for their information and investigation.</p>

	<p>b) Circumstances surrounding low levels of residual chlorine in Clovers Small Private Supply were discussed and relevant emails inspected which confirmed that appropriate action had been taken and advice issued to boil water during 2018. This notice was lifted in 2019.</p> <p>c) One sample taken on 20 August 2018 from Patrick O'Reardon Public House Athlacca Small Private Supply contained 24 No./100 ml coliform bacteria and 12 No./100 ml <i>E. coli</i> bacteria. The supply was put on a Boil Water Notice. It was established that the UV lamp at the borehole source had failed and was subsequently repaired.</p> <p>d) Nitrate at a concentration of 56 mg/l was detected in a sample taken on 29 January 2018 from Croagh PVT Group Water Scheme. HSE advice was sought and advice issued not to use the water for the preparation of food for babies under six months old. Nitrate monitoring was also increased by the City and Co. Co. as part of its investigative monitoring.</p> <p>e) A sample taken on 27 August 2018 from the Rossbrien Public Group Water Scheme contained 1,435 µg/l aluminium. Advice was issued not to use the water and this notice was lifted within one week. The high aluminum concentration was attributed to road works in the vicinity of the sampled location which disturbed deposits within the mains.</p> <p>f) One sample taken on 28 May 2018 from the Gooig, Clooncommins Public Group Water Scheme contained 2,177 µg/l aluminium and had a turbidity of 10.4 NTU and a colour of 112 Hazen. The scheme's water is fed from the Limerick City and Environs Public Water Supply which is operated and managed by Irish Water to whom the incident was referred for investigation and action.</p> <p>g) Limerick City and Co. Co.'s investigations into an outbreak of gastro-enteritis amongst those who played camogie matches at Croagh Kilfinny Gaelic Athletic Associated (GAA) grounds on 28 June 2019 was raised by the auditors who became aware of the matter via the media. The illness arose from players drinking water which was grossly contaminated with <i>E. coli</i>, coliform bacteria and enterococci from two regulated small private supplies (two commercial wells, one serving the Sports Complex and another serving the Club House) on the GAA grounds. Limerick City and Co. Co. stated that these supplies were not on its 2018 register as they were not aware they existed. The supplies have been added to their 2019 Register and Compliance Monitoring Programme and the Council wrote to the GAA's HQ requesting that it provides details of any other small private supplies that exist on their GAA grounds in Limerick City and County.</p> <p>h) The auditors noted that a response to the EPA's request for information on its enforcement activities during 2018, sent to Limerick City and County Council on 16 January 2019, was not responded to. This information was subsequently submitted to the EPA by email on 25 September 2019.</p> <p>i) During the audit the Limerick City and County Council stated that three boil water notices were in place during 2018 for private water supplies affecting a total population of 275. Limerick City and Co. Co. stated that currently there are</p>
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	three private water supplies with long-term boil water notices in place in Limerick City and County. The solution to one of those supplies is to connect to a Public Water Supply. The remaining two supplies were precautionary notices and funding was provided and remedial action undertaken. The Council plan to audit those two supplies to confirm if the actions taken can result in the notices being lifted. Limerick City and County Council also stated that three private supply audits were carried out during 2018. No directions were issued, or prosecutions taken during 2018.
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3. Auditors comments

Limerick City and County Council had 93 regulated private supplies listed in EDEN falling within its functional area. However, during the audit, it was found that some of these supplies no longer exist and others that fall under the remit of the City & Co. Co. were not included in the 2018 register. The maintenance and upkeep of an accurate register requires a dedicated resource to ensure this sector is appropriately monitored and supervised to ensure these water supplies are safe to drink. Limerick City and Co. Co. needs to make a concerted effort to identify private supplies which fall under the remit of the Drinking Water Regulations in its functional area and include them in its register capturing the required level of detail. A complete and up-to-date register will ensure the compliance monitoring programme is implemented correctly and will ensure regulated private water supplies are effectively delivering water that complies with the Drinking Water Standards.

Arrangements by Limerick City and County Council in assessing the quality of private water supplies for 2018 was generally found to be satisfactory. Weaknesses were highlighted however in relation to the lack of pre-determined sampling locations and dates and suitable alternative sample locations to ensure samples are evenly spread and, where appropriate, representative of the supply zone. Weaknesses were also found in the availability of some procedures and records (e.g. a procedure for reporting of failures to the HSE and Private Water Supplier and provision and publication of compliance monitoring results and notices).

4. Recommendations

Compliance Monitoring Programme

1. Limerick City and Co. Co. should ensure that:

- a) all regulated private supplies are included on its register and compliance monitoring programme;
- b) all relevant information pertaining to each private water supply should be recorded for the purposes of the register and the compliance monitoring programme as required by Regulation 8(3) of the *European Union (Drinking Water) Regulations 2014 (S.I. No.*

122/2014), *as amended*. For example, the name and address of the water supplier, the volume of water supplied per day (m³), the population served by the water supply, the type of treatment in place, the source of the water supply and the water supply zone code should be included in the register. The register should be maintained and kept up to date;

- c) records of populations and/or volumes for all private supplies (including small private supplies) that fall within its remit are up to date and included in the compliance monitoring programme so that the compliance monitoring frequency for Group A and Group B parameters for all regulated private supplies can be determined and implemented in accordance with the requirements of the *European Union (Drinking Water) (Amendment) Regulations 2017 (S.I. 464 of 2017)*. Limerick City and Co. Co. should also have regard to the monitoring requirements set out in the *EPA's Information Note on Monitoring issued January 2019 to Local Authorities*;
- d) compliance monitoring for turbidity (where there is a surface water source) and nitrite is undertaken as is required at regulated private water treatment plants;
- e) the compliance sampling programme includes specific predetermined sampling locations and a predetermined narrow window of sampling dates;
- f) maps of the private water supply's distribution network for Public and Private Group Water Supply Schemes include the water supply zone;
- g) a formal review of compliance sampling is undertaken to ensure samples are evenly distributed and representative of the entire water supply zone; and
- h) a review is undertaken of the disputed small public water supplies, in consultation with Irish Water and the Department of Housing, Planning and Local Government, in an effort to determine whose responsibility they fall under. Such supplies should be included in the relevant monitoring programme for 2020 and onwards.

Sampling Procedures

2. Limerick City and Co. Co. should:

- a) establish a formal protocol which sets out the criteria for the selection of random addresses for consumers' premises and for the selection of alternative addresses if required and that appropriate records are kept (e.g. the recording of alternative sample locations used and the reasons why these alternative locations were used and chosen);
- b) review the procedure for compliance sampling to ensure that it includes sampling of commercial premises that provide drinking water including petrol stations, hairdressers and butchers;
- c) review the procedure for compliance monitoring to ensure it includes requirements for labelling of samples (for e.g. include the requirement to use pre-printed labels rather than permanent marker); and
- d) develop a procedure to ensure that Section 4, Paragraph 4 of the EPA's handbook for private water supplies is adhered to in relation to sampling required on water when it is supplied from a tanker (or similar container) instead of through the

private distribution network.

Data handling

3. Limerick City and Co. Co. should ensure that:
 - a) all regulated private water supplies are entered into the EPA's database, EDEN, and that records are accurate and updated annually. Those supplies that are no longer active should be closed out on the system using the relevant close out date. The results of all Group A and Group B compliance samples required to be taken should be uploaded to EDEN to ensure there is no annual shortfall in compliance monitoring; and
 - b) all data relating to compliance monitoring of private regulated water supplies is routinely issued to the regulated Private Water Supplier as soon as it is available, and measures should be taken to publish this monitoring data and matters affecting the regulated private water supply (such as a Boil Water Notice or a Do Not Use Notice) in a prominent location on Limerick City and Co. Co.'s website.

Exceedances of Parametric Values and Local Authority Enforcement

4. Limerick City and Co. Co. should:
 - a) develop a written procedure for dealing with sample results that exceed the parametric values outlined in the *Drinking Water Regulations (SI no 122 of 2014), as amended*. The procedure should include:
 - i. reporting of the exceedance to the HSE, the water supplier and any other relevant party;
 - ii. communications with the water supplier to initiate investigations of the exceedance and determine its cause; and
 - iii. follow-up remedial action required to ensure the issue is resolved and water supplied is wholesome and clean. The criteria for determining whether and exceedance is trivial or more serious exceedances should be clearly defined within the procedure.
 - b) ensure that where failures have been detected in Regulated Private Water Supplies that appropriate follow-up action is taken by adopting a risk-based approach to enforcement. This approach should be particularly focused on supplies that have water restriction or boil water notices in place, have persistent non-compliances, have no treatment, have treatment plants that are overloaded or have been categorised as being high or very high risk in relation to *Cryptosporidium*. This enforcement risk-based approach should be documented and implemented to ensure appropriate action is taken by Limerick City & Co. Co. in the event that monitoring data reveals poor drinking water quality.
 - c) ensure that an annual audit plan is in place as is required under Regulation 17 of the *Drinking Water Regulations (SI no 122 of 2014), as amended* and in accordance with Section 13 of the EPA's Handbook for Private Supplies.


Follow-Up Actions Required by Limerick City and County Council

This report has been reviewed and approved by Emer Cooney, Inspector, EPA.

Limerick City and Co. Co. is recommended to put such measures in place as are necessary to implement the recommendations listed in this report. The actions by Limerick City and Co. Co. to address the recommendations taken may be verified by the Agency during any future audits.

The EPA also advises that the findings and recommendations from this audit report should, where relevant, be applied to other Regulated Private Public Water Supplies in Limerick City and Co. Co.'s functional area.

Report prepared by:



Date:

Derval Devaney

04 December 2019

Inspector