



# Drinking Water Monitoring Programme Audit Report

<b>County:</b>	Mayo	<b>Date of Audit:</b>	9 <sup>th</sup> November 2015
<b>Location visited:</b>	Mayo County Council Offices	<b>Date of issue of Audit Report:</b>	9 <sup>th</sup> February 2016
		<b>Auditors:</b>	Ms. Michelle Roche (EPA) Dr. John Gray (Consultant)
<b>Audit Criteria:</b>	<ul style="list-style-type: none"> <li>• The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>.</li> <li>• 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>.</li> </ul>		

## MAIN FINDINGS

- i. Mayo County Council should undertake a review of the temporal and spatial distribution of sampling for compliance monitoring. A formal and structured method of assessment should be developed and implemented to ensure that sampling represents the water supply zone as accurately as possible. The distribution of sample days, times and locations within a monitoring programme should be as wide as possible.
- ii. Mayo County Council should develop a written procedure for dealing with sample results that exceed the parametric values outlined in the Drinking Water Regulations (S.I. no 122 of 2014). The procedure should include actions to be taken to investigate the exceedance and report the exceedance to the HSE, private water supply owners and other relevant parties.

## 1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* the Environmental Protection Agency has a supervisory role in relation to the establishment and implementation of monitoring programmes both by Irish Water and Local Authorities. This audit was carried out to assess the performance of Mayo County Council in carrying out effective monitoring of private drinking water supplies to ensure the provision of clean and wholesome drinking water.

An audit of the 2014 monitoring programmes implemented in County Mayo was carried out at the Mayo County Council Offices on 9<sup>th</sup> November 2015. Using a questionnaire as a guide<sup>1</sup>, Mayo County Council 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.

<sup>1</sup> The questionnaire was based on those used by the Drinking Water Inspectorate, London, and modified for the purpose.

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

Representing Mayo County Council: (\*indicates that person was also present for the closing meeting)

Ms. Ann Browne – Water Services, Mayo County Council\*

Mr. Conrad Harley – Executive Engineer, Rural Water Services, Mayo County Council\*

Representing the Environmental Protection Agency:

Ms. Michelle Roche – Inspector, EPA\*

Dr. John Gray – Consultant, John Gray Consultancy\*

## 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.*

<p><b>1.</b></p>	<p><b>Compliance Monitoring Programme</b></p> <ul style="list-style-type: none"> <li>a. The 2014 compliance monitoring programme for private water supplies was prepared by Mayo County Council.</li> <li>b. The compliance monitoring programme for 2014 included: a list of all private water supplies in the county, population data for each supply, the required number and frequency of all check and audit samples and predetermined sample locations.</li> <li>c. Sample collection dates and suitable alternative sample locations were not pre-determined in the 2014 monitoring programme.</li> <li>d. Sample locations were selected randomly based on historical data sets which are displayed on GIS. Some locations mapped on GIS may not be completely accurate and therefore local knowledge is also utilised when choosing sample locations.</li> <li>e. No compliance samples were taken from water treatment plants or service reservoirs and no recordings from continuous monitors were used for compliance monitoring.</li> <li>f. Selection of alternative premises is not formalised although it is intended that between four and six sample points within consumer's premises will be identified for each scheme.</li> <li>g. The sampling and analysis of compliance samples in County Mayo is sub-contracted out to the Health Service Executive (HSE) for all check samples and to ELS Laboratories for all audit samples. The HSE and ELS receive a copy of the monitoring programme at the beginning of each year.</li> <li>h. A critical review of the temporal and spatial distribution of sampling, to ensure sampling represents the supply as accurately as possible, has not been carried out for County Mayo. Reliance is placed on the predetermined sampling plan.</li> </ul>
<p><b>2.</b></p>	<p><b>Operational Monitoring Programme</b></p> <ul style="list-style-type: none"> <li>a. Operational sampling for private water supplies in 2014 was carried out for investigative reasons only. No operational monitoring programme was prepared.</li> </ul>
<p><b>3.</b></p>	<p><b>Monitoring Programmes for Specific Parameters</b></p> <ul style="list-style-type: none"> <li>a. A specific pesticide monitoring programme has been established for the purpose of investigative sampling and is linked to the pesticide monitoring programme for public water supplies; however the programme does not include a specified list of individual pesticides.</li> </ul>

	<p>All private water supplies with a population greater than 500 persons were monitored for trihalomethanes.</p> <p>b. Mayo County Council does not have a specific sampling programme for tankers. Tankers are deployed in response to incidents and all have “Boil Water Advice” notices permanently fixed as well as additional notices on the tanker taps.</p>
<b>4.</b>	<p><b>Sampling Procedures</b></p> <p>a. Check and operational samples collected by the HSE were sampled and analysed in accordance with HSE sampling procedures, which are based on the ISO standards. Audit samples collected by ELS were sampled in accordance with ELS sampling procedures. Both HSE and ELS sample procedures were reviewed by Mayo County Council in 2014.</p> <p>b. Sampler’s daily worksheets are required to be maintained in both procedures; however Mayo County Council does not have direct access to these worksheets.</p> <p>c. Free and total chlorine concentrations were required to be taken with each sample collected for bacteriological analysis.</p> <p>d. Sampling procedures state that where a predetermined sample location and all alternative sample locations are unsuitable or inaccessible the sampler will inform Mayo County Council immediately.</p> <p>e. The HSE were provided with sample reference numbers by Mayo CC and ELS generated sample reference numbers in the laboratory.</p> <p>f. Sample bottle labels with adhesive backing were fixed securely to the sample container and appropriate information recorded.</p>
<b>5.</b>	<p><b>Data Handling</b></p> <p>a. Monitoring data for 2014 was recorded on the Mayo County Council LIMS system, with the HSE and ELS maintaining their own records.</p> <p>b. The HSE data system cannot link to Mayo County Council’s LIMS; therefore sample results were emailed to Mayo County Council and the data was manually entered on LIMS. This data transfer was then validated by a second person in Mayo County Council.</p> <p>c. Sample results from ELS were electronically transferred directly to Mayo County Council’s LIMS.</p> <p>d. Any changes made to data on the LIMS were automatically recorded and an audit trail of entries can be produced at any time. Once data has been validated on the LIMS, no changes can be made.</p> <p>e. No information was available regarding data handling procedures within the HSE or ELS.</p> <p>f. Sample results were uploaded to the EPA via EDEN at the beginning of 2015.</p> <p>g. Mayo County Council provides all sample results to the relevant private water supplies, by hardcopy, as soon as they become available.</p>
<b>6.</b>	<p><b>Exceedances of Parametric Values</b></p> <p>a. A documented procedure is in place between the HSE and Mayo County Council, outlining the actions to be taken where a sample result shows an exceedance of the microbiological or chemical parametric values outlined in the drinking water regulations (S.I. no 122 of 2014).</p> <p>b. The procedure outlines a cascade system by which the HSE contact Mayo County Council in the event that a water restriction or boil water should be considered.</p> <p>c. The procedure does not include sample results analysed by ELS. Although no written procedure is in place, ELS notify all parametric exceedances to Mayo County Council via email.</p> <p>d. Mayo County Council maintains an in-house record of all sample exceedances, the actions taken in response to those exceedances and the outcome of the actions.</p>
<b>7.</b>	<p><b>Review of Sampling Data</b></p> <p>a. Sample times recorded on the Mayo County Council LIMS showed that all samples were taken at 00:00 (midnight). This is a default time in LIMS and a review of actual sample</p>

	<p>records shows an expected spread of sample collection times.</p> <p>b. Samples were primarily collected on Mondays, Tuesdays and Wednesdays with less than 20 of the total 8,371 samples taken on Thursdays and Fridays.</p> <p>c. Sample collection was well distributed throughout the year.</p>
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### 3. AUDITORS COMMENTS

The monitoring programmes drawn up and implemented by Mayo County Council in 2014 were generally found to be satisfactory in assessing the quality of water in private water supplies. Weaknesses were highlighted in relation to the amount of randomness attributed to the selection of consumers' properties and the temporal distribution of sampling across the week. It was also noted that up to date documented procedures for implementing the monitoring programme and reacting to exceedances of the parametric values outlined in the Drinking Water Regulations (S.I. no 122 of 2014) were lacking. A review of all 2014 data submitted to the EPA by Mayo County Council determined that all sample results were accurately reported to the EPA.

### 4. RECOMMENDATIONS

#### Compliance Monitoring Programme

1. Mayo County Council should provide a predetermined narrow window of sampling dates to samplers.
2. Mayo County Council should provide predetermined alternative sample locations to samplers in the event that a sample location is unsuitable or inaccessible.
3. Mayo County Council should update the GIS mapping of private water supplies, including available sample locations and population.
4. Mayo County Council should ensure that all private water supply scheme data is updated on EDEN.
5. Mayo County Council should undertake a review of the temporal and spatial distribution of sampling for compliance monitoring. A formal and structured method of assessment should be developed and implemented to ensure that sampling is representing the water supply zone as accurately as possible. The spread of sample days, times and locations within a monitoring programme should be as wide as possible.

#### Monitoring Programmes for Specific Parameters

6. Mayo County Council should ensure that Section 4, Chapter 4 of the EPA Handbook is adhered to in relation to sampling required for water tankers. Sampling may be required on the water used to fill a tanker, depending on the length of time water is stored in the tanker and the source of the water used for filling.

#### Data Handling

7. Mayo County Council should consider developing a more robust system of transferring sample results to the Mayo County Council LIMS where automatic data transfer cannot be achieved. The current system of manually entering HSE sample results to LIMS is vulnerable to transcription errors and is resource intensive.
8. Mayo County Council should review the data handling procedures within the HSE and ELS to ensure they are robust.

9. Mayo County Council should ensure sampling times are accurately recorded in LIMS
10. Mayo County Council should ensure access to sampler's worksheets, if required.

**Exceedances of Parametric Values**

11. Mayo County Council should review the written procedure for dealing with sample results that exceed the parametric values outlined in the Drinking Water Regulations (S.I. no 122 of 2014).

**FOLLOW-UP ACTIONS REQUIRED BY MAYO COUNTY COUNCIL**

This report has been reviewed and approved by Ms Yvonne Doris, Drinking Water Team Leader.

Mayo County Council is recommended to put such measures in place as are necessary to implement the recommendations listed in this report. The actions by Mayo County Council to address the recommendations taken will be verified by the Agency during any future audits.

**Report prepared by:**  **Date:** 9<sup>th</sup> February 2016

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Inspector