

Site Visit Report

Under the *European Union (Drinking Water) Regulations 2014* as amended, the Environmental Protection Agency (EPA) is the supervisory authority in relation to Uisce Éireann and its role in the provision of public drinking water supplies. This audit was carried out to assess the performance of Uisce Éireann in providing clean and wholesome water to the public water supply named below.

The audit process is a sample of the performance of a water treatment plant and public water supply on a given date.

| Water Supply Zone | |
|---------------------------------|-------------------------|
| Name of Installation | South West Regional PWS |
| Organisation | Uisce Éireann |
| Scheme Code | 1900PUB1056 |
| County | Limerick |
| Site Visit Reference No. | SV27287 |

| Report Detail | |
|--------------------|-----------------|
| Issue Date | 09/02/2023 |
| Prepared By | Orla Harrington |

| Site Visit Detail | | | |
|----------------------------|---|------------------|-------|
| Date Of Inspection | 23/01/2023 | Announced | Yes |
| Time In | 10:30 | Time Out | 12:05 |
| EPA Inspector(s) | Orla Harrington | | |
| Additional Visitors | | | |
| Company Personnel | Uisce Éireann: Aine Butler, Duane O'Brien Limerick City and County Council (working under Service Level Agreement to Uisce Éireann): Brendan Collins, Neal Boyle, Dom Hayes. | | |

> Summary of Key Findings

1. There is no treatment barrier to *Cryptosporidium* entering the water supply from the spring sources serving South West Regional Public Water Supply.
2. The South West Regional Public Water Supply should be prioritised under Uisce Éireann's Disinfection Programme for Limerick. The current chlorine dosing arrangements are inadequate. There is no automatic switchover of the duty and standby pumps in the event of a malfunction. Uisce Éireann advised at the audit that disinfection upgrade works will be complete and commissioned by Quarter 4 2023. However provision for a *Cryptosporidium* barrier has not been included in the scope of the works.

> Introduction

The South West Regional Public Water Supply (PWS) serves a population of 4,330 and produces 2,236 m³/day. Raw water is sourced from four springs (referred to as the Tobergal Springs) at two locations approximately 150m south west of the water treatment plant (WTP). The combined raw water is gravity fed to the plant where pipes split the flow prior to entry. The raw water in each pipe undergoes disinfection by chlorination and treated water is then piped to Gurranes, Mountplummer and Castlemahon. The pipe to Castlemahon augments the Newcastle West PWS and also feeds a holding tank that serves Castlemahon village.

The audit was undertaken to assess the performance of Uisce Éireann in providing clean and wholesome drinking water following the detection of *Cryptosporidium* in the South West Regional PWS on the 16/11/2022. Follow up monitoring has been clear to date.

> Supply Zones Areas Inspected

The audit consisted of an inspection of the treatment plant, including three of the four spring sources.



1. Source Protection

| | Answer |
|--|---|
| 1.1 | Is the abstraction source(s) adequately protected against contamination? No |
| Comment | |
| <p>1. This supply is fed by four spring sources (three were visited during the audit), all reported to be in use since the 1960's. Three springs are located approximately 100m southwest of the water treatment plant in a securely fenced compound in close proximity to agricultural land. The fourth spring (not inspected) is located a further 50m south of the three springs in the middle of an agricultural field. It was reported that security is poor at this spring.</p> <p>2. The spring abstractions are housed in concrete chambers and access to the manhole was securely locked. The spring chambers are old and a significant build up of vegetation was evident. Limerick City and County Council were unable to confirm when the chambers were inspected or integrity tested.</p> <p>3. Raw water is conveyed by gravity to the plant where there is continuous monitoring for turbidity and flow. The average flow from the combined spring sources is 130 m³/hr and the online turbidity monitor had a reading of 0.029NTU on the day of the audit. There is an automatic pump shutdown and text alert system linked to the regulatory limit of 1 NTU (10 minutes) in raw water prior to chlorination.</p> <p>4. The landuse in the area is agriculture. At the audit, Limerick City and County Council could not confirm when the landowners within the zone of contribution were written to in relation to the presence of a drinking water supply in proximity to their lands and their obligations under the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2022 (S.I. No. 113 of 2022).</p> | |



2. Disinfection

| | | Answer |
|--|---|--------|
| 2.1 | Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible? | No |
| Comment | | |
| <p>1. The combined raw water is gravity fed to the plant and split into three streams prior to entry. Each stream is disinfected separately by chlorination using sodium hypochlorite. The treated water is then piped to Gurrane and Mountplummer reservoirs. The pipe to Castlemahon augments the Newcastle West PWS and also feeds a holding tank that serves Castlemahon village.</p> <p>2. Limerick City and County Council stated that there are chlorine monitors installed after the appropriate contact time has been achieved however these chlorine monitors are not alarmed to ensure that an immediate response can be made in the event of inadequate levels of chlorine in the final water.</p> <p>3. There is a chlorine monitor located post chlorine dosing on each line where a chlorine residual target of 0.8mg/l is aimed for before leaving the plant. The plant shuts down if the chlorine residual is less than 0.2 mg/l for more than 10 minutes on each line and the caretaker is alerted by text. There are four people on a cascade system for responding to alarms. There is no low chlorine alarm setting to allow plant operators react in time when chlorine levels drop below the target level for adequate disinfection. There are no high chlorine alarm setpoints or shutdown in place at the plant. On the day of the audit, the chlorine monitor was reading 0.75mg/l on the Gurrane line and 0.45 mg/l on the Castlemahon line.</p> <p>4. The auditor noted that there are no temperature and pH monitors at the plant, to ensure that allowance for temperature change and pH increase have been made for in establishing effective contact time.</p> | | |

| | | Answer |
|---|--------------------------------------|--------|
| 2.2 | Is the chlorine dosed appropriately? | No |
| Comment | | |
| <p>1. There are duty and standby chlorine dosing pumps but there is no automatic changeover in the event of a failure of the duty pump.</p> <p>2. Dosing is flow proportional but is not linked to a residual chlorine monitor such that any changes in the chlorine demand of the treated water can be responded to automatically by the dosing pumps. The site has been assessed under the Irish Water Disinfection Programme and upgrade works are scheduled to take place in 2023</p> | | |



3. Management and Control

| | | Answer |
|--|---|--------|
| 3.1 | Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand? | No |
| Comment | | |
| <p>1. A raw water turbidity shutdown of 1 NTU (delay 10 minutes) is in place at the plant. In the event of the raw water exceeding 1 NTU the water is then manually run to waste until turbidity levels return to normal. There are no alarm setpoints for turbidity to ensure any deviation is rapidly detected. Uisce Éireann advised that an automatic run to waste will be installed at the plant under the Disinfection Programme.</p> <p>2. Final water turbidity trend data provided prior to the audit displayed erratic spikes between 19/10/2022 and 18/01/2023. Limerick City and County Council stated that the final water turbidity monitor is located off the rising main and when the pumps are turned off it creates a spike. Limerick City and County Council believe that the information provided from this monitor is unreliable due to its location.</p> | | |

| | | Answer |
|--|---|--------|
| 3.2 | Has the protozoal compliance log treatment requirement been identified for the water treatment plant? | No |
| Comment | | |
| <p>1. On the 22/11/2022 the EPA was notified of the detection of <i>Cryptosporidium</i> (0.01/10L) in the treated water at South West Regional WTP from a sample taken on the 16/11/2022. The current treatment processes at the South West Regional do not provide a barrier against <i>Cryptosporidium</i> entering the supply. On the instruction of the HSE weekly monitoring was undertaken for two weeks and then monthly thereafter. No further <i>Cryptosporidium</i> exceedances have been reported.</p> <p>2. The protozoal compliance log treatment requirement for the plant has been provisionally assigned as log 4 pending completion of the sanitary survey. This gives a - 4 log treatment deficit. The plant is currently being monitored in accordance with the Irish Water Rationale for Monitoring <i>Cryptosporidium</i> in Public Water Supplies.</p> | | |

Recommendations

| | | | |
|--------------------|--|-----------------|------------|
| Subject | Southwest Regional Audit Recommendations | Due Date | 09/03/2023 |
| Action Text | <p>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendation(s) without delay.</p> <ol style="list-style-type: none"> 1. Log Credits: (i) confirm the protozoal log treatment requirement for the spring sources following completion of sanitary survey; (ii) provide details on how the protozoal log deficit will be addressed and (iii) ensure <i>Cryptosporidium</i> monitoring is undertaken as per Irish Water Rationale for Determining the Frequency of <i>Cryptosporidium</i> Monitoring in Public Supplies until the protozoal log deficit is addressed. 2. Disinfection: (i) install a high level chlorine alarm and shutdown; (ii) install low level chlorine alarm; (iii) install automatic switchover in the event of failure of one of the dosing pumps; and (iv) ensure the residual chlorine monitor installed at the established contact validation point is linked to SCADA and alarmed appropriately. 3. Ensure the final water turbidity monitor is in the correct location and representative of final water quality, linked to SCADA and alarmed appropriately. 4. Source Protection: (i) ensure the source is made secure and (ii) ensure all spring chambers are adequately sealed and maintained to prevent surface water ingress. 5. Liaise with Limerick City and County Council to ensure that local landowners have been written to in relation to their obligations under the <i>European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022, as amended</i>. 6. Provide a timeframe for completion of the disinfection programme upgrades and provide detail on the scope of the works to be undertaken. <p>Actions required by Uisce Éireann</p> <p>During the audit, Uisce Éireann representatives were advised of the audit findings and that action must be taken by Uisce Éireann to address the issues raised.</p> <p>Uisce Éireann should submit a report to the EPA on or before 09/03/2023 detailing the actions taken and planned, with timescales, to close out the above recommendations.</p> <p>The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies.</p> | | |