

# Site Visit Report

Under the *European Union (Drinking Water) Regulations 2023*, 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	
<b>Name of Installation</b>	Caragh Lake PWS 022A
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	1300PUB1046
<b>County</b>	Kerry
<b>Site Visit Reference No.</b>	SV29538

Report Detail	
<b>Issue Date</b>	19/08/2024
<b>Prepared By</b>	Regina Campbell

Site Visit Detail			
<b>Date Of Inspection</b>	16/07/2024	<b>Announced</b>	Yes
<b>Time In</b>	10:50	<b>Time Out</b>	12:20
<b>EPA Inspector(s)</b>	Regina Campbell		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Tommy Roche, Áine Butler, Eoin O' Connell. Kerry County Council (working in partnership with Uisce Éireann): Seamus O' Mahony, John Horgan, Dan Heffernan.		

## > Summary of Key Findings

1. Uisce Éireann have upgraded the treatment processes at Caragh Lake Water Treatment Plant and put a new groundwater borehole into production in order to minimise the risk of THM formation in the network. Satisfactory THM verification data was submitted in order to verify the effectiveness of the remedial action programme. Based on the findings of the audit, the EPA will consider the removal of the Caragh Lake Public Water Supply from the Trihalomethanes category of the Remedial Action List in the Q2 2024 update.
2. Caragh Lake Water Treatment Plant remains on the Remedial Action List under the Category EPA Audit Observation - Treatment and Management Issues until the Disinfection Upgrade is completed.
3. There is a granular activated carbon unit on standby at the plant which can be brought online at short notice in the event that treatment of the lake water via the slow sand filters recommences.

## > Introduction

Caragh Lake Public Water Supply (PWS) is on the EPA Remedial Action List (RAL) under two categories i) for elevated levels of THMs above the drinking water parametric value of 100 ug/l and ii) EPA Audit Observation – Treatment and Management Issues.

The scope of the audit was to assess the status of RAL upgrade works that were undertaken at Caragh Lake Water Treatment Plant to address the risk of THMs formation in the supply. The Caragh Lake PWS serves a population of 1,886 and produces 1,158 m<sup>3</sup>/day according to information on the EPA's Eden system (2023 figures).

Raw water is sourced from Lake Cummernamuck and borehole 1. The plant produces approximately 50 m<sup>3</sup>/hr which is made up of on average 45 m<sup>3</sup>/hr of lake water treated by Dissolved Air Flotation (DAF) and pressure filters and between 5 to 10 m<sup>3</sup>/hr of water from borehole 1 which is passed through a slow sand filter. The blended water is then disinfected by chlorination.

The purpose of the audit was to assess the suitability for the removal of the supply from the THM category of the Remedial Action List.

## > Supply Zones Areas Inspected

Borehole 1, the slow sand filters, DAF unit, pressure filters and water quality trend data were inspected.



## 1. Management and Control

	Answer	
1.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	Yes
<b>Comment</b>		
<p>The protozoal log treatment requirement for the plant is 3 log.</p> <p>Main source: the lake water treated via the DAF and pressure filters achieves 3 log credits when operated in accordance with the log treatment criteria as outlined in the EPA Treatment Manual: Filtration.</p> <p>Supplementary source: the groundwater treated via the slow sand filters achieves 2.5 log treatment when operated in accordance with the log treatment criteria as outlined in the EPA Treatment Manual: Filtration. which leaves a treatment deficit of 0.5 log for the supplementary source.</p> <p><i>Cryptosporidium</i> monitoring is ongoing and there have been no detections to date.</p>		

	Answer	
1.2	Are instrument calibrations within date?	No
<b>Comment</b>		
<p>The calibration stickers on the aluminium monitor and on the raw water SAC monitor did not show the most recent calibration date.</p>		

	Answer	
1.3	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
<b>Comment</b>		
<p>There are a number of outstanding open recommendations from the previous EPA Audit Report undertaken on the 19/08/2022 that will be included in this report as follows:</p> <p>No. 1 Uisce Éireann should provide details of the corrective actions and timeframe to address the treatment log deficit at the plant.</p> <p>No. 2 Uisce Éireann should a) install a chlorine monitor with suitable alarms after contact time is achieved and b) submit the scope and timeframe for the upgrade of the disinfection system at the plant.</p>		

## 2. Supply on the Remedial Action List

	Answer
2.1 Do the audit findings support progress made with the Remedial Action List upgrades?	Yes
<p><b>Comment</b></p> <p>Uisce Éireann have completed the following RAL upgrade works at the water treatment plant in order to minimise the risk of THM formation in the network:</p> <p><b>1. Treatment of the main lake source via the DAF unit and 4 no. pressure filters.</b> Key upgrades include installation of an inline static mixer post coagulant dosing, relocation of the floc pH probe and optimisation of plant dose rates, installation of a floc mixing tank and commissioning of the DAF and pressure filters. On average 45 m<sup>3</sup>/hr is produced via the DAF/pressure filter treatment system. The turbidity readings on the outlet of of each pressure filter were &lt; 0.1 NTU on the day of the audit.</p> <p><b>2. Development of new supplementary groundwater source.</b> Borehole 1 is in production since March 2024 and is passed through a slow sand filter in order to lower iron and manganese levels. Between 5-10 m<sup>3</sup>/hr from borehole 1 is passed through the slow sand filter. The UVT reading of the filtered groundwater was 91.57 % at the audit. There is a second borehole which is being developed on-site and is in the trial phase and Uisce Éireann said that it is hoped that it will come into production at a later stage and will further lessen the reliance on the lake source.</p> <p>Treatment of the lake water via slow sand filters has ceased since the end of February 2024. This stream was previously used to augment the DAF/pressure filter treated lake stream. Borehole 1 is now used as the supplementary source. There is are 2 no. GAC units installed at the plant which were used to treat the lake water treated by the slow sand filters. The GAC units ceased operation on 26/03/2024 as they are no longer needed. In the event that the treatment of lake water recommences via slow sand filters, then there is a protocol for bringing the GAC units back into operation.</p> <p>Both streams are blended prior to chlorination.</p> <p>There has been a comprehensive THM monitoring programme in place on the Caragh Lake PWS for a number of years. The last THM exceedance reported to the EPA was in May 2022. THM verification data was submitted for April, May and July 2024, during the time period when borehole 1 was in use and the GAC units were turned off, which demonstrates compliance with the THM drinking water standard.</p> <p>Based on the findings of the audit, the EPA will consider the removal of the Caragh Lake PWS from the Trihalomethanes category of the Remedial Action List in the Q2 2024 update.</p>	

	Answer
2.2 Is further information needed to assess completion of the Remedial Action List upgrade?	Yes
<p><b>Comment</b></p> <p>Caragh Lake PWS remains on the RAL under the category EPA Audit Observation - Treatment and Management Issues pending completion of the disinfection upgrade works which are scheduled for completion by the end of 2024.</p>	

## Recommendations

Subject	Caragh Lake Audit Recommendations 16/7/2024	Due Date	19/09/2024
Action Text	<p><b>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</b></p> <ol style="list-style-type: none"><li>1. i) Install a chlorine monitor with suitable alarms and inhibits after contact time is achieved and ii) provide an update on the scope and timeframe for completion of the disinfection upgrade.</li><li>2. i) Provide details of the corrective actions proposed to address the treatment log deficit at the plant and ii) continue to monitor the supply in accordance with Uisce Eireann’s Rationale for Determining the Frequency of <i>Cryptosporidium</i> Monitoring in Public Water Supplies.</li><li>3. i) Install a turbidity monitor on Borehole 1 and ii) provide an update on the production status of Borehole 2.</li><li>4. Maintain a record of i) the dates and the volume of lake water (m<sup>3</sup>/day) treated by the slow sand filters and ii) dates of when the GAC units are operational.</li><li>5. Ensure that calibration stickers are up to date for the aluminium monitor and the raw water SAC monitor.</li><li>6. Update EDEN with the correct sources for the supply.</li></ol> <p><b>Actions required by Uisce Éireann</b></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 19/09/24 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>		