

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	
Name of Installation	Carna/Kilkieran RWSS
Organisation	Uisce Éireann
Scheme Code	1200PUB1008
County	Galway
Site Visit Reference No.	SV28149

Report Detail	
Issue Date	29/09/2023
Prepared By	Ruth Barrington

Site Visit Detail			
Date Of Inspection	06/09/2023	Announced	Yes
Time In	10:30	Time Out	13:15
EPA Inspector(s)	Ruth Barrington Maria O'Connell		
Additional Visitors	Cormac MacGearailt		
Company Personnel	Uisce Éireann: Vincent McGrath, Eoin Hughes, Fintan Joyce Galway County Council (working in partnership with Uisce Éireann): Pierce Faherty, Martin Cloherty, Brendan Hynes		

> Summary of Key Findings

1. An alarm for high turbidity dialled out and was responded to on 18/08/2023, however the alarm did not recur when turbidity continued to rise overnight.
2. Filter turbidity inhibits were disabled on 18/09/2023 so the water treatment plant did not shut down in response to elevated turbidity.
3. Management of water treatment processes on-site is compromised by the lack of filter run to waste facilities.

> Introduction

Carna/ Kilkieran public water supply serves a population of 2,294 people. Water from Lough Lerin (lower lake) and Lough Aunore (upper lake) is treated at Carna/ Kilkieran Water Treatment Plant (WTP) through processes including coagulation, flocculation and clarification (CFC), rapid gravity filtration, and disinfection using chlorination.

This audit was carried out to assess the investigation and corrective actions taken by Uisce Éireann following a Boil Water Notice (BWN) on the supply from 19/08/2023 to 29/08/2023. The BWN was imposed to protect public health in response to an incident of elevated turbidity in filtered water occurring overnight on 18/08/2023 to 19/08/2023.

> Supply Zones Areas Inspected

The audit included a tour of on-site treatment processes.



1. Incident Management

	Answer
1.1	Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?
	No
Comment	
<p>1. Turbidity in filtered water at Carna/ Kilkieran WTP was in excess of 0.3 NTU, compromising the barrier to <i>Cryptosporidium</i> entering supply, from approx. 21:00 on 18/08/2023 to approx. 11:00 on 19/08/2023.</p> <p>2. The operations at the water treatment plant were not protected as designed during the incident. (i) The automatic shutdown programmed on filtered water turbidity had been disabled. (ii) The turbidity alarm did not dial out to alert operational staff to continued rising turbidity overnight on 18/08/2023 to 19/08/2023. (iii) An additional complication of shutdowns being over-ridden when the raw water pumps are operated manually was identified in the investigation of the incident.</p> <p>3. There is no run to waste facility at the water treatment plant which complicates operations during a high turbidity incident.</p> <p>4. Issues with the modulating valve on the upper lake source affected the chemical dosing process, contributing to the rising turbidity level. Since the incident, Uisce Éireann has identified that the valve needs to be replaced. Until the valve is replaced, the lower lake source is being used.</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. Chlorine dose verification is not in place at Carna/ Kilkieran WTP as there is no chlorine monitor close to the injection point. This means that low chlorine or a dose failure may not be detected until after the clear water tank at the point where water enters the network.</p> <p>2. Chlorine is monitored continuously at the clear water tank outlet for contact time verification.</p>		



3. Management and Control

		Answer
3.1	Is the plant suitably managed and controlled to maintain the designed log credit on each treatment stage?	No
Comment		
<p>1. Turbidity of combined filtered water and of final treated water is not suitably monitored, trended on SCADA systems, alarmed and inhibited to protect the <i>Cryptosporidium</i> barrier.</p> <p>2. Combined filtered water turbidity is measured separately on Filters 1 and 2, and on Filters 3 and 4. Since the incident, final water turbidity has been added to the local SCADA and alarms and inhibits applied, but the monitor is scheduled for replacement as its accuracy has been questioned by the maintenance contractors.</p> <p>3. There is no run to waste to assist operators in optimising filter backwash effectiveness or in managing the WTP through periods of rising turbidity.</p> <p>4. Filter assessments are planned at Filters 1 and 2, which have been taken out of service due to concerns over loss of sand media during backwash.</p> <p>3. Monthly <i>Cryptosporidium</i> monitoring is carried out at the water treatment plant.</p>		

Recommendations

Subject	Carna/ Kilkieran Audit 06/09/2023	Due Date	30/10/2023
Action Text	<p>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</p> <ol style="list-style-type: none">1. Replace the modulating valve on the upper lake abstraction, to reinstate both sources and allow stable raw water flow.2. Review and test alarms and inhibits on critical treatment processes to verify their operation.3. Make provision for run to waste facilities to be included in the scope of the National Water Treatment Programme upgrade being planned for Carna/ Kilkieran WTP.4. Replace the final water turbidity monitor as planned and connect to county wide SCADA for accessible trend data.5. Provide chlorine dose verification prior to the clearwater tank.6. Progress the filter assessments and remedial works planned at Filters 1 and 2. <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 30/10/2023 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>		