

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	Broadford PWS
Organisation	Uisce Éireann
Scheme Code	0300PUB1027
County	Clare
Site Visit Reference No.	SV27823

Report Detail	
Issue Date	09/06/2023
Prepared By	Orla Harrington

Site Visit Detail			
Date Of Inspection	16/05/2023	Announced	Yes
Time In	11:15	Time Out	12:00
EPA Inspector(s)	Orla Harrington		
Additional Visitors			
Company Personnel	Uisce Éireann: Tommy Roche, Denis Hayes. Clare County Council (Working in partnership with Uisce Éireann): Martin Nugent, Michael McNamara, Sinead McDonnell.		

> Summary of Key Findings

1. On the day of the audit, Uisce Éireann could not confirm if there was a chlorine monitor installed and alarmed in order to verify contact time and to ensure that an immediate response can be made in the event of inadequate levels of chlorine in the final water. There is no dial out chlorine residual alarm in place and there is no automatic shutdown linked to inadequate chlorine levels in the final water.
2. There is no turbidity monitor with alarms and inhibits in place at Broadford Water Treatment Plant to prevent inadequately treated water entering the supply.
3. There is no documented incident response and escalation procedure in place at the Broadford Water Treatment Plant.

> Introduction

Broadford Public Water Supply (PWS) supplies a population of 1,533 with a volume of approximately 569 m³/day (EPA EDEN figures). Raw water is sourced from two onsite boreholes. Treatment of the combined water consists of chlorination disinfection.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the alarms and inhibits at the WTP and the procedures in place to ensure appropriate oversight of the treatment processes.

> Supply Zones Areas Inspected

The audit included an inspection of the water treatment plant and its critical monitoring equipment and controls. The boreholes were also inspected as part of the audit.



1. Management and Control

		Answer
1.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
Comment		
<p>1. An assessment of the protozoal log treatment requirement for the groundwater sources has not been completed by Uisce Éireann. Clare County Council advised that monitoring for <i>Cryptosporidium</i> is carried out twice a year. There have been no detections reported to the EPA.</p>		



2. Alarms, Inhibits & Oversight Audits 2023

	Answer	
2.1	Is there a documented site specific incident response and incident escalation process?	No
Comment		
1. Uisce Éireann's incident escalation flow chart with site specific contacts and trigger levels was not on display at the WTP.		

	Answer	
2.2	Did staff confirm they have received training on the site specific incident response and incident escalation process?	No
Comment		
1. Staff at the WTP confirmed that training on the site specific incident response and incident escalation process had not been received.		

	Answer	
2.3	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
Comment		

1. Uisce Éireann submitted a calculation prior to the audit to show that at a minimum of 0.5 mg/l chlorine in the final water that there is a minimum chlorine contact time of 26.05 mg.min/l achieved. Clare County Council stated that the contact time is achieved at the Violet Hill reservoir located approximately 5 km from the plant. Neither Uisce Éireann or Clare County Council could confirm if there was a chlorine monitor installed and alarmed in order to verify contact time and to ensure that an immediate response can be made in the event of inadequate levels of chlorine in the final water. There are six properties supplied off the main which supplies the Violet Hill reservoir and a total effective contact time was not available at the audit for these properties.

2. Clare County Council stated that there is one chlorine monitor located post dosing (referred to as CL17), where a chlorine residual target of 0.5 mg/l is aimed for before leaving the plant. The chlorine monitor was reading 0.56 mg/l on the day of the audit.

		Answer
2.4	Is suitable continuous monitoring in place to verify treatment performance?	No
Comment		
<p>1. There is no continuous turbidity monitor on the raw or final water at the WTP.</p> <p>2. On the day of the audit, neither Uisce Éireann or Clare County Council could confirm if there was a chlorine monitor installed and alarmed in order to verify contact time and to ensure that an immediate response can be made in the event of inadequate levels of chlorine in the final water.</p> <p>3. Uisce Éireann stated that the plant is to be prioritised under the Uisce Éireann Disinfection Programme, however a timeline for completion was not provided on the day of the audit. Uisce Éireann advised that the upgrade will address the lack of turbidity and chlorine monitors and associated necessary alarms / shutdowns.</p>		

		Answer
2.5	Is continuous monitoring located appropriately to verify treatment performance?	No
Comment		
<p>1. Refer to section 2.4 above.</p>		

		Answer
2.6	Were online monitors within their calibration dates?	No

Comment

1. The calibration sticker on the chlorine dosing pumps stated that it was calibrated in May 2022 and the next service was due in November 2022. Clare County Council stated that the monitor had been calibrated recently but that the calibration sticker was not updated to reflect the correct date of service.

Answer

2.7 Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?

No

Comment

1. There is a chlorine monitor directly after chlorine dosing. The chlorine alarm setpoints at the dose point are 0.21 mg/l (low) and 0.90 mg/l (high). The low chlorine alarm is too low to alert the operator to inadequate levels of chlorine in the water. Clare County Council were unable to confirm who receives the alarms once triggered. There is no dial out to the operator to ensure an immediate response is made in the event of an issue with the chlorine dosing system.

2. There are no turbidity alarms in place to prevent inadequately treated water from entering the supply.

Answer

2.8 Are critical alarms dialled out to operators?

No

Comment

1. Critical alarms are not dialled out to operators.

Answer

2.9 Are dial out arrangements suitable to allow a timely response?

No

Comment

1. There is no cascade system in place at the plant.

Answer

2.10 Has UÉ carried out an alarm and inhibit review at the water treatment plant?

No

Comment

1. The alarm and inhibit review has not been carried out.

		Answer
2.11	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment		
1. There are no shutdowns based on high or low chlorine in the final water or based on high turbidity in the raw and final water.		

		Answer
2.12	Are plant performance trends accessible by operational staff at the water treatment plant?	No
Comment		
1. There is no trend information available to operational staff.		

		Answer
2.13	Is there appropriate oversight of plant performance trends?	No
Comment		
1. On the day of the audit, there was no information available on how the plant performance trend data is reviewed by supervisory staff.		

		Answer
2.14	Is there appropriate oversight of alarm responses?	No
Comment		
1. There are no turbidity and chlorine alarms in place at the Broadford WTP, therefore there is no appropriate oversight of alarm responses.		

Answer

2.15	Is there a documented alarm response procedure?	No
Comment		
1. On the day of the audit, there was no documented alarm response procedure.		

		Answer
2.16	Did staff confirm they have been trained on the alarm response procedure?	No
Comment		
1. Staff did not confirm that they had been trained on the alarm response procedure.		

		Answer
2.17	Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No
Comment		
1. There are no turbidity and chlorine alarms in place at Broadford WTP, therefore there are no procedures covering verification of alarms and inhibits status following maintenance on site.		



3. Site Specific Issues

		Answer
3.1	Is there automatic switchover on chlorine dosing pumps?	No
Comment		
1. There is no automatic switchover of the duty and standby chlorine dosing pumps in place.		

Recommendations

Subject	Broadford PWS - Audit Report	Due Date	10/07/2023
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. Prioritise the Broadford Public Water Supply for upgrade under the Uisce Éireann Disinfection Programme. Provide a scope of works and timeframe for completion. 2. Submit an updated contact time calculation to demonstrate that the target contact is being achieved for all customers on the supply including all customers supplied prior to Violet Hill Reservoir. 3. Undertake an Alarm and Inhibit Review of the plant and submit the findings. 4. Disinfection: (i) install residual chlorine monitors with appropriate alarms / shutdowns to provide continuous verification of contact time; and (ii) install automatic switchover between duty and standby chemical dosing pumps. 5. Install a turbidity monitor with appropriate alarm settings and inhibits. 6. Confirm (i) the protozoal log treatment requirement for the plant and (ii) confirm how any protozoal log treatment deficit will be addressed. 7. Ensure all plant monitors are calibrated in accordance with manufacturers instructions, and clearly labelled to show the date of calibration and the next 'calibration due by' date. 8. Ensure that the Uisce Éireann Incident Communication Response Guidance Form with site specific information including contacts for escalation and relevant trigger levels is in place and displayed at the Broadford water treatment plant and staff are trained on its use. 9. Ensure that (i) there is an appropriate cascade system for responding to alarms generated at the plant which allows for verification that an alarm has been responded to (ii) there are documented site specific alarm response procedures (iii) there are appropriate procedures covering verification of alarms and inhibits status following maintenance of other work at the plant and (iv) training is provided to all relevant staff on the procedures. 10. Ensure that (i) the treatment plant is connected to the county SCADA system (ii) that plant process information and trended performance data are available to operational and supervisory staff at the plant and via SCADA (iii) that there are robust systems of reviews and checks on the water treatment plant performance data which should include regular review of SCADA trends by operational and supervisory staff. <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 10/07/2023 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>		