

# 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>	Buncrana
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	0600PUB1018
<b>County</b>	Donegal
<b>Site Visit Reference No.</b>	SV29681

Report Detail	
<b>Issue Date</b>	26/06/2024
<b>Prepared By</b>	Maria O'Connell

Site Visit Detail			
<b>Date Of Inspection</b>	30/05/2024	<b>Announced</b>	No
<b>Time In</b>	14:00	<b>Time Out</b>	16:05
<b>EPA Inspector(s)</b>	Maria O'Connell		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Eireann: Geraldine Friel, Fionnuala Bonner Donegal County Council (Working in partnership with Uisce Eireann): Shaun P Murphy, Karl King, Stephen Glackin.		

## > Summary of Key Findings

- (1) There were no shutdowns in place to protect water quality and public health in the event of a failure of a critical treatment process.
- (2) There were no alarms to alert operators to deteriorating water quality.
- (3) The chlorine dose monitor was not functioning at the time of the audit and the residual chlorine reading on SCADA was not aligned to the monitor output.

## > Introduction

The Buncrana Public Water Supply serves a population of 3672 and produces on average 1191m<sup>3</sup> of treated water per day. Raw water for the supply is abstracted from Lough Doo (approximately 7km from the plant). Treatment consists of screening, pH correction (Soda ash), coagulation (kibbled alum and polyelectrolyte) clarification, pressure filtration and disinfection is achieved via chlorination using sodium hypochlorite. Uisce Éireann confirmed that a source and sanitary survey had been completed and a 3 log protozoal treatment requirement has been assigned. There are two reservoirs on the supply with the capacity for 24 hours treated water storage. This audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the alarms and inhibits in place at the treatment plant to ensure the appropriate oversight of treatment processes.

## > Supply Zones Areas Inspected

All treatment processes on site were inspected as part of the audit.



## 1. Coagulation Flocculation and Clarification (CFC) Stage

		Answer
1.1	Is the CFC process optimised to respond to changes in raw water quality?	No
<b>Comment</b>		
<p>1. The duty and standby pumps used in the dosing of chemicals for pH correction and coagulation are controlled manually with no automatic switch over in place.</p> <p>2. A raw water turbidity monitor is in place but it is not connected to the SCADA system and there are no alarms or inhibit settings enabled on this monitor.</p>		



## 2. Filtration

2.1

	Answer
Are the filters designed and managed in accordance with EPA guidance?	No
<b>Comment</b>	
<p>1. Pressure filtration is used at this water treatment plant. Although there are monitors in place, alarms and inhibits are not installed or commissioned as per the <i>EPA Water Treatment Manual: Filtration</i>.</p> <p>2. Individual turbidity monitors are in place on each pressure filter and on the final water at the plant. Turbidity trends can be viewed on the SCADA system onsite. No inhibits are in place in the event that turbidity levels fail to meet the requirements of turbidity log credit approach.</p> <p>3. Filter media depth measurements were not taken and/or recorded on a quarterly basis as per the <i>EPA Water Treatment Manual: Filtration</i>. It was not clear at the time of the audit when media replenishment had last taken place or if any detailed assessment had been conducted on the filters in the past 5 years.</p> <p>3. Filter backwashes are undertaken on time only.</p>	



### 3. Disinfection

3.1

Is there a suitable monitoring frequency for residual chlorine in the network with records available?

**Answer**

No

**Comment**

1. There were no network residual chlorine monitoring results available. The site operator confirmed that sampling is not undertaken several times a week at different points of the network to include network extremities so that residual chlorine levels are maintained  $>0.1$  mg/l . Post audit Uisce Éireann confirmed that residual chlorine sampling had commenced in the Buncrana PWS.



## 4. Reservoirs and Distribution Networks

		Answer
4.1	Is treated water in tanks and reservoirs suitably protected against contamination?	No
<b>Comment</b>		
1. No details were available on the date the reservoir was last inspected or cleaning took place. The site operator outlined that the reservoir is partially underground.		



## 5. Treatment Process Chemicals

		Answer
5.1	Are treatment process chemicals appropriately managed and stored?	No
<b>Comment</b>		
1. Chemical residue was noted in bunds and on the piping infrastructure in the chemical mixing/dosing area.		



## 6. Alarms, Inhibits & Oversight Audits 2024

		Answer
6.1	Is there a documented site specific incident response and incident escalation process?	Yes
<b>Comment</b>		
<p>1. A documented site specific incident response and incident escalation process was displayed on site in the form of an Incident Response Procedure - COO-AO-PR-024-FM-01 with the effective date being 10/01/2024. It was noted that the minimum free chlorine (MFC) requirements displayed (0.7mg/l) differed from the chlorine contact time calculation figure submitted pre audit.</p>		

		Answer
6.2	Is suitable continuous monitoring in place to verify treatment performance?	No
<b>Comment</b>		
<p>1. Continuous chlorine residual monitor, pH, turbidity and aluminium monitor were in place at the treatment plant. These parameters are checked daily, seven days per week as part of the routine checks undertaken by operational staff. Such checks are recorded in the plants day log.</p> <p>2. On review of the chlorine residual trend on SCADA it was noted that the reading was not aligned to the output of the monitor. It was not clear when this issue commenced. There was no plan in place to address this issue at the time of the audit.</p> <p>3. A continuous raw water turbidity monitor is in place but the output is not available on SCADA. The site operator makes a written record of the readings from this monitor in the WTP day log.</p>		

		Answer
6.3	Were online monitors operational?	No
<b>Comment</b>		
<p>1. CL001 (chlorine dosing monitor) was in fault at the time of the audit. Uisce Éireann advised that the fault had just occurred on the day of the audit.</p>		

		Answer
6.4	Were online monitors within their calibration dates?	No
<b>Comment</b>		



1. Calibration stickers indicated that all turbidity monitors were operating outside their due calibration date of 26/05/2024.
2. Recent calibration had taken take on the chlorine monitors (04/03/2024).
3. It is understood that calibration and servicing is undertaken in house however no records were available at the time of the audit to demonstrate that calibration is undertaken on a routine periodic basis and also to outline what measures (where necessary) were addressed during calibration and servicing.

		<b>Answer</b>
<b>6.5</b>	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No

		<b>Answer</b>
<b>6.6</b>	Are critical alarms dialled out to operators?	No

		<b>Answer</b>
<b>6.7</b>	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	No

		<b>Answer</b>
<b>6.8</b>	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No

		<b>Answer</b>
<b>6.9</b>	Are plant performance trends accessible by operational staff at the water treatment plant?	Yes

**Comment**

1. Plant performance trends are available on SCADA at the plant, however it was not clear if operational staff use/review trends to assist with plant optimisaiton. Further training should be provided to staff on the use of trends and access provided remotely.

		<b>Answer</b>
<b>6.10</b>	Is there appropriate oversight of plant performance trends?	No

		<b>Answer</b>
<b>6.11</b>	Is there appropriate oversight of alarm responses?	Not Applicable

		<b>Answer</b>
6.12	Is there a documented alarm response procedure?	No

		<b>Answer</b>
6.13	Did staff confirm they have been trained on the alarm response procedure?	Not Applicable

		<b>Answer</b>
6.14	Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	Not Applicable

		<b>Answer</b>
6.15	Is the chlorine contact time calculation correct?	No

**Comment**

1. The chlorine contact time calculation submitted submitted to the EPA stated that a minimum free chlorine level of 1.2mg/l is required at validation point. This was much higher than the reading from the residual chlorine monitor reviewed on site at the time of the audit. Uisce Eireann confirmed that an error had been made on the calculation and that contact time was being achieved.

## Recommendations

Subject	Buncrana OEE Audit 2024	Due Date	29/07/2024
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. Disinfection: (i) install appropriate alarm and inhibits setpoints and time delays on the disinfection system as per the <i>EPA Water Treatment Manual: Disinfection</i> and confirm when such alarm and inhibits have been tested and commissioned. (ii) Investigate why the reading on the chlorine residual monitors (CL002 and CL003) are not displaying correctly on SCADA and provide details of corrective action (iii) submit the updated chlorine contact time calculation (in the Uisce Éireann standardised template). (iv) return the chlorine dosing monitor (CL001) failure to service (v) submit network residual chlorine monitoring results from 31/05/2024 to 31/06/2024 ensuring that such sampling is undertaken several times a week at different points of the network to include network extremities so that residual chlorine levels are maintained &gt;0.1 mg/l.</li> <li>2. Filtration: Uisce Éireann should: (i) install appropriate alarm and inhibits setpoints and time delays on the filtration system as per the <i>EPA Water Treatment Manual: Filtration</i> and confirm when such alarm and inhibits have been tested and commissioned. (ii) confirm how any protozoal log treatment deficit will be addressed. (iii) undertake an assessment on the filter media and carry out any recommended remediation (iv) develop and implement a filter maintenance log on site and ensure it contains criteria as outlined in the <i>EPA Water Treatment Manual: Filtration</i>.</li> <li>3. Ensure that (i) there is a documented procedure for responding to alarms generated at the plant that enables verification of alarm response and timely escalation. The procedure should document the corrective actions and set out responsibilities (ii) there are appropriate procedures covering verification of alarms and inhibits status following maintenance work at the plant and (iv) Uisce Éireann should ensure that all relevant staff are trained in the procedure.</li> <li>4. Ensure that where calibration and servicing of critical treatment and monitoring equipment is undertaken in house that records are maintained to demonstrate the frequency and detail of actions undertaken.</li> <li>5. Carry out periodic reviews of alarm responses and performance trends. Provide remote access and training on SCADA to all staff.</li> <li>6. Review the chemical dosing arrangements (pH correction, alum and Ppoly) to enable optimised response to changes in raw water quality, consider the feasibility of automatic switch over on time and fault. (ii) remove excess residue from the internal bund units/pump structure.</li> <li>7. Ensure that the reservoir for this water treatment plant is included in the Uisce Eireann reservoir cleaning and inspection programme. Provide timelines for the next cleaning and inspection of this reservoir.</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 29/07/2024 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>		