

# 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>	Cooley
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	2100PUB1004
<b>County</b>	Louth
<b>Site Visit Reference No.</b>	SV27709

Report Detail	
<b>Issue Date</b>	24/05/2023
<b>Prepared By</b>	Lorcan Farrell

Site Visit Detail			
<b>Date Of Inspection</b>	24/04/2023	<b>Announced</b>	Yes
<b>Time In</b>	11:30	<b>Time Out</b>	14:40
<b>EPA Inspector(s)</b>	Lorcan Farrell Derval Devaney		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Daniel Behan, Stephen Brennan.  Louth County Council (Working in partnership with Uisce Éireann): Pat Deery, Linda Lynch, John McCooey, Andrew White.		

## > Summary of Key Findings

1. There was no suitably operational turbidity meter in place at the Carlingford Boreholes Water Treatment Plant (WTP) to prevent inadequately treated water from entering supply.
2. Ardtullybeg and Carlingford Boreholes treatment plants have both been included for upgrade under the Uisce Éireann Disinfection Programme. Works are nearing completion at Ardtullybeg WTP but have yet to start at Carlingford Boreholes WTP.
3. There is no documented site specific incident response and escalation procedure at either treatment plant within the supply.

## > Introduction

Cooley Public Water Supply (PWS) serves a population of 4,616 people (EDEN figures) and the treatment plant produces approximately 2,000 - 2,400 m<sup>3</sup>/day depending on demand. The production volume figures given on the day of the audit were higher than those recorded in EDEN (1,751 m<sup>3</sup>/day). The treatment type recorded in EDEN also requires updating.

The Cooley PWS is supplied by two treatment plants (Ardtullybeg and Carlingford Boreholes) which are located approximately 5 kms from each other. Both treatment plants supply Rath Reservoir via independent rising mains. Rath Reservoir supplies the entire Cooley PWS network including two further reservoirs (Lislea and Jenkinstown Reservoirs). Both treatment plants are supplied by boreholes located on-site at their respective locations with treatment consisting of chlorination at both plants.

The 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 and the procedures in place to ensure appropriate oversight of treatment processes.

## > Supply Zones Areas Inspected

The audit included a site tour of Ardtullybeg and Carlingford Boreholes treatment plants.



## 1. Alarms, Inhibits & Oversight Audits 2023

		Answer
1.1	Is there a documented site specific incident response and incident escalation process?	No
<b>Comment</b>		
<p>1. There was no Uisce Éireann Incident Communications Response Guidance Form in place at either plant within the supply. A Louth County Council alarm response procedure was available at both treatment plants with an up to date Louth County Council contact list however it did not contain site specific alarm/inhibit setpoints or Uisce Éireann contact information for escalation of incidents.</p>		

		Answer
1.2	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
<b>Comment</b>		
<p>1. Ardtullybeg WTP is in the process of being upgraded under the Uisce Éireann Disinfection Programme. The works were described by Louth County Council as being substantially complete and were awaiting snag list works to be completed and operational training to be provided before handover is completed. Uisce Éireann confirmed in information received after the audit that these works would be complete by Q4 2023.</p> <p>2. As part of the Disinfection Programme upgrade works, a live CT calculation is in place at Ardtullybeg WTP based on a continuous chlorine monitor at the treatment plant located after a contact column. The system has a number of control options under which it can operate. Louth County Council stated that the system is currently operating in Control Option C which does not include alarms/inhibits based on the live CT value. Louth County Council confirmed that Control Option D does include alarm/inhibits based on live CT and that the plant will commence operation in this control option when upgrade works are completed.</p> <p>3. Carlingford Boreholes WTP does not have a continuous chlorine monitor in place to verify residuals after contact time has been achieved. The plant is due to be upgraded under the Uisce Éireann Disinfection Programme which will include a continuous chlorine monitor to verify adequate contact time has been achieved. Uisce Éireann confirmed that the works at the site under the Disinfection Programme would be subject to land acquisition and planning permission and a timescale for works is not yet available.</p> <p>4. Rath reservoir which is fed by both treatment plants has a continuous chlorine residual monitor located on the outlet of the reservoir. Both high (1.5 mg/l) and low (0.4 mg/l) alarms are in place on this monitor.</p> <p>5. There are chlorine residual monitors (with associated alarm and plant shutdown setpoints) located at both plants post sodium hypochlorite dosing on the rising mains connecting the treatment plants with Rath Reservoir. These settings ensure a suitable shutdown response to a dosing failure.</p>		

		Answer
1.3	Is suitable continuous monitoring in place to verify treatment performance?	No
<b>Comment</b>		
<p>1. There is no suitably operational turbidity meter in place at Carlingford Boreholes WTP to prevent inadequately treated water from entering supply. There is a raw water turbidity and UVT monitor in place at the treatment plant which was installed for advanced monitoring purposes as part of the Uisce Éireann Disinfection Programme but has not been calibrated/maintained since 2021. Uisce Éireann confirmed after the audit that the monitor was connected to the countywide SCADA and that there was potential for this monitor to be returned to service to provide a means of monitoring turbidity at the treatment plant. Uisce Éireann also confirmed that there is no operational monitoring for turbidity in place at Carlingford Boreholes WTP in lieu of an operational online turbidity monitor.</p>		

		Answer
1.4	Were online monitors within their calibration dates?	No
<b>Comment</b>		
<p>1. The post sodium hypochlorite dosing chlorine monitor and the OSEC system at Ardtullybeg WTP had out of date service/calibration stickers in place. Service/calibration certificates submitted by Uisce Éireann after the audit indicated that the last service/calibration of these monitors took place in April 2022 which aligns with the service/calibration stickers in place on the instruments at the treatment plant.</p>		

		Answer
1.5	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	Yes
<b>Comment</b>		
<p>1. An alarm and inhibit review was completed at both treatment plants in January 2023. Uisce Éireann confirmed in information submitted after the audit that recommendations arising from the alarm and inhibit review at Ardtullybeg WTP included: trending of treated water pH and configuration of alarms and inhibits, installation of a new final water turbidity monitor with associated alarms and inhibits, and installation of alarms and inhibits on the chlorine residual monitor on the rising main at the plant. Uisce Éireann also confirmed that recommendations arising from the alarm and inhibit review at Carlingford Boreholes WTP included: the installation of a new final water turbidity monitor and configuration of alarms and inhibits and revision of the chlorine residual shutdown setpoint to 0.36 mg/l.</p>		

		Answer
1.6	Were all findings of the UÉ alarm and inhibit review implemented?	No
<b>Comment</b>		
<p>1. The findings of the alarm and inhibit reviews are to be addressed under the Uisce Éireann Disinfection Programme upgrade works due to be completed at both treatment plants.</p>		

	<b>Answer</b>
<b>1.7</b> Is there a documented alarm response procedure?	Yes
<b>Comment</b>	
<p>1. There is a documented alarm response procedure in place however it does not contain site specific alarm/inhibit setpoints relevant to each treatment plant.</p> <p>2. Alarms are sent out as a group with an informal procedure for checking in between staff that alarms have been responded to. This procedure should be formalised and documented as part of the alarm response procedure at the treatment plant.</p>	

	<b>Answer</b>
<b>1.8</b> Did staff confirm they have been trained on the alarm response procedure?	No
<b>Comment</b>	
<p>1. Staff at the treatment plant confirmed that training on the alarm response procedure had not yet been received.</p>	

	<b>Answer</b>
<b>1.9</b> Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No
<b>Comment</b>	
<p>1. There are informal procedures covering verification of alarms and inhibits status following works carried out at the treatment plant however, there is no formal procedure or system in place such as a tag in/tag out system or alarm/shutdown testing following completion of works on-site.</p>	



## 2. Site Specific Issues

		<b>Answer</b>
2.1	Did treatment process trends demonstrate that data was being captured and recorded on the SCADA system at all times?	No
	<b>Comment</b>	
	1. Turbidity and residual chlorine trends for Ardtullybeg WTP submitted before the audit demonstrated a flat line for a period of time exceeding 24 hours on both sets of trends between 13/04/2023 and 14/04/2023. Louth County Council stated that they occasionally experience a SCADA communications loss leading to the flat line that was observed on the trends. Louth County Council could not confirm if the loss of communications could affect alarms/inhibits on critical plant processes.	
		<b>Answer</b>
2.2	Were all chemical storage bunds empty?	No
	<b>Comment</b>	
	1. The bund that contained the sodium hypochlorite storage tank was almost full with sodium hypochlorite that had leaked from a dosing line connected to the dosing pump located above the bund. The issue was identified during checks over the weekend prior to the audit. Louth County Council staff stated the bund was scheduled to be drained immediately and this was to be completed by close of business on the day of the audit.	
		<b>Answer</b>
2.3	Were borehole wellheads capped appropriately?	No
	<b>Comment</b>	
	1. The wellhead of the borehole supplying Ardtullybeg WTP is located below ground level in a dry concrete chamber. <i>EPA Advice Note 14: Borehole Construction and Wellhead Protection</i> requires a cap on the borehole which was not present.	

## Recommendations

Subject	Cooley - Audit Recommendations	Due Date	26/06/2023
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. Prioritise the Carlingford Boreholes treatment plant for upgrade under the Uisce Éireann Disinfection Programme including the following: (i) verification of chlorine contact time including provision of appropriate alarms/shutdowns base on verified chlorine residuals after contact time has been achieved and (ii) provision of a final water turbidity monitor with appropriate alarms/inhibits present to prevent inadequately treated water from entering supply.</li> <li>2. Carry out monitoring for final water turbidity until an operational final water turbidity meter with appropriate alarms/inhibits is in place at the Carlingford Boreholes treatment plant.</li> <li>3. Complete outstanding works under the Uisce Éireann Disinfection Programme at the Ardtullybeg treatment plant and provide handover training to operational and supervisory staff on the operation of the upgraded systems.</li> <li>4. Assess the data capture capabilities of the HMI/SCADA system to ensure that reliable data is available for alarm and inhibit generation.</li> <li>5. Develop and display the Uisce Éireann Incident Communications Response Guidance Form at both plants. The form should include site specific information including Uisce Éireann and Louth County Council contacts for escalation and relevant trigger levels protecting critical plant processes. Refresher training should be provided to all staff on the use of the updated form.</li> <li>6. Update the alarm response procedure for both plants to include site-specific alarm/inhibit setpoints and develop an appropriate procedure covering the verification of alarms/shutdowns status following maintenance or other works completed at the treatment plant. Provide training to all staff on the updated alarm response procedure and alarm verification procedure.</li> <li>7. Service/calibrate all equipment that is outside its service/calibration timeframe.</li> <li>8. Remove and suitably dispose of the spillage in the sodium hypochlorite bund and repair the original leak.</li> <li>9. Install appropriate caps on boreholes where required within the supply. Uisce Éireann should have regard to EPA <i>Advice Note No. 14: Borehole Construction and Wellhead Protection</i> when carrying out these works.</li> <li>10. Update EDEN with: (i) the correct production volume for the supply and (ii) the correct treatment types that are in place for both treatment plants.</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 26/06/2023 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>		

