

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	Ardpatrick Kilfinnane PWSS
Organisation	Uisce Éireann
Scheme Code	1900PUB2002
County	Limerick
Site Visit Reference No.	SV29587

Report Detail	
Issue Date	28/05/2024
Prepared By	Orla Harrington

Site Visit Detail			
Date Of Inspection	24/04/2023	Announced	Yes
Time In	14:00	Time Out	14:50
EPA Inspector(s)	Orla Harrington		
Additional Visitors			
Company Personnel	Uisce Éireann: Susan Cook Limerick City and County Council (working in partnership with Uisce Éireann): Neal Boyle.		

> Summary of Key Findings

1. The audit found a number of shortcomings at Kilfinnane and Ardpatrick water treatment plants which include the lack of (i) continuous online chlorine residual monitors to verify contact time has been achieved (ii) shutdown linked to the high chlorine alarm setpoint and (iii) an operational turbidity monitor at Kilfinnane water treatment plant.
2. Uisce Éireann were unable to confirm the protozoal log treatment requirement for the Ardpatrick/Kilfinnane public water supply. No monitoring for *Cryptosporidium* in line with *Uisce Éireann's Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies* is currently taking place for the supply.
3. Uisce Éireann plans to rationalise Ardpatrick/Kilfinnane public water supply and connect to Jamestown/Effin public water supply as an alternative source of clean and wholesome drinking water. While pipe laying is at an advanced stage of completion, a timeframe for when this rationalisation would be complete could not be confirmed at the audit.

> Introduction

The raw water for the Ardpatrick/Kilfinnane public water supply (PWS) is obtained from Kilfinnane borehole and Ardpatrick spring source. The Kilfinnane borehole is located in a pump house approximately 2km south west of Kilfinnane village. Treatment includes disinfection by chlorination. The treated water is then pumped directly to the reservoir, located 500m north of the Kilfinnane pump house and then gravity fed to the network.

The Ardpatrick spring source is located approximately 500m uphill behind Ardpatrick village. A separate kiosk is located at the foothill of this spring and treatment includes disinfection by chlorination. The treated water from the Ardpatrick spring supplies Ardpatrick village and the remaining water is combined with the treated groundwater in the reservoir. The Ardpatrick/Kilfinnane PWS produces 389 m³/day and serves a population of 1,284.

The focus of the audit was on alarms and inhibits and oversight of treatment processes.

> Supply Zones Areas Inspected

The treatment processes at Ardpatrick and Kilfinnane water treatment plants were examined.



1. Source Protection

	Answer	
1.1	Is the abstraction source(s) adequately protected against contamination?	No
Comment		
<p>1. The Kilfinnane borehole was not appropriately capped or secured to ensure that it is protected in accordance with <i>EPA Advice Note No. 14: Borehole Construction and Wellhead Protection</i>.</p> <p>2. The Ardpatrik spring was not visited as part of the audit. Limerick City and County Council stated that access is limited to the source due to its isolated location and that security is poor.</p> <p>3. The landuse in the areas is mainly agriculture. At the audit, Limerick City and County Council could not confirm when the landowners within the zones of contribution were written to in relation to the presence of a drinking water supply in proximity to their lands and their obligations under the <i>European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2022 (S.I. No. 113 of 2022)</i>.</p>		



2. Reservoirs and Distribution Networks

	Answer
2.1 Are reservoirs adequately inspected and maintained?	No
Comment	
1. Uisce Éireann were unable to confirm when the reservoir was last cleaned or inspected.	



3. Management and Control

		Answer
3.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
Comment		
<p>1. Uisce Éireann said that a sanitary survey must be completed prior to confirming the protozoal log treatment requirement for the Ardpatrick/Kilfinnane PWS.</p> <p>2. There is no treatment barrier to <i>Cryptosporidium</i> entering the water supply from the borehole and spring serving the supply.</p> <p>3. There is no monitoring for <i>Cryptosporidium</i>, in line with <i>Uisce Éireann's Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies</i>, currently taking place in the supply.</p>		



4. Alarms, Inhibits & Oversight Audits 2024

	Answer	
4.1	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
Comment		
1. There are no residual chlorine monitors to verify contact time is being maintained at all times. There is one residual chlorine monitor at each water treatment plant which verifies the chlorine dose.		

	Answer	
4.2	Is suitable continuous monitoring in place to verify treatment performance?	No
Comment		
1. There was a turbidity monitor installed recently at Kilfinnane water treatment plant. However the wrong probe was delivered so it was not operational on the day of the audit. There are no turbidity alarms and shutdowns in place to prevent treated water with a turbidity in excess of 1 NTU from entering the distribution network. Uisce Éireann advised that a correct probe would be delivered and installed without delay.		
2. There is a turbidity monitor located at the Ardpatrik water treatment plant, with a high turbidity alarm setpoint of 0.8 NTU and plant shutdown setpoint of 1 NTU.		
3. There is no residual chlorine monitor located after contact time to verify contact time is being maintained at all times.		

	Answer	
4.3	Is continuous monitoring located appropriately to verify treatment performance?	No
Comment		
1. There is no residual chlorine monitor located after contact time to verify contact time is being maintained at all times.		

	Answer	
4.4	Were online monitors operational?	No
Comment		
1. The turbidity monitor at Kilfinnane water treatment plant was not operational on the day of the audit.		

	Answer
4.5 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 are no residual chlorine monitors with alarms to validate contact time is being maintained at all times.	

	Answer
4.6 Has UÉ carried out an alarm and inhibit review at the water treatment plant?	Yes
Comment	
1. Uisce Éireann confirmed that an alarm and inhibit review at been carried out at both water treatment plants.	

	Answer
4.7 Were all findings of the UÉ alarm and inhibit review implemented?	No
Comment	
1. Uisce Éireann have undertaken an alarm and inhibit review but the findings have not been implemented to date.	

	Answer
4.8 Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment	
1. There are chlorine residual monitors located after chlorine dosing at both plants. Uisce Éireann confirmed that there are high and low (2 mg/l and 0.55 mg/l) warning alarm setpoints and low (0.50mg/l) plant shutdown setpoints in place. There are no shutdowns based on high chlorine in the final water.	
2. There are no shutdowns based on high turbidity in the final water at Kilfinnane water treatment plant.	

	Answer
4.9 Are plant performance trends accessible by operational staff at the water treatment plant?	No
Comment	

1. It is not possible to view residual chlorine trends on the HMI at either plant. Trends were accessible on the phone via the countywide SCADA during the audit.

		Answer
4.10	Is there a documented alarm response procedure?	No
Comment		
1. There is no documented alarm response procedure to advise operational staff on how specific water quality alarms should be responded to and acted upon.		

		Answer
4.11	Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No
Comment		
1. It was confirmed at the audit that procedures covering verification of alarms following maintenance or other work on site is at an advanced stage of completion. However a timeframe for completion could not be provided at the audit.		

Recommendations

Subject	Ardpatrick/Kilfinnane PWS - Audit Report	Due Date	28/06/2024
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. Disinfection: (i) install residual chlorine monitors with appropriate alarms and inhibits at Kilfinnane and Ardpatrick water treatment plants to verify chlorine contact is achieved and (ii) install a high level chlorine residuals shutdown post contact time. 2. (i) confirm the protozoal log treatment requirement for the borehole and spring sources; (ii) provide details of how the log deficit will be addressed; and (iii) undertake <i>Cryptosporidium</i> monitoring as per <i>Uisce Éireann Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Supplies</i> until any log deficit is addressed. 3. Confirm the final water turbidity monitor at Kilfinnane water treatment plant is operating correctly, linked to SCADA and alarmed appropriately. 4. Confirm that plant performance trends are accessible to operational staff at the water treatment plants. 5. Put in place (i) documented site specific alarm response procedures and (ii) there are appropriate procedures covering verification of alarms and inhibits status following maintenance of other work at the plants. 6. Implement findings of the Alarm and Inhibit review to protect treatment processes and treated water quality. 7. Source Protection: (i) cap and seal the Kilfinnane borehole in accordance with <i>EPA Advice Note 14: Borehole Construction and Wellhead Protection</i>; (ii) ensure the Ardpatrick spring is made secure and spring chambers are adequately sealed and maintained to prevent surface water ingress and (iii) liaise with Limerick City and County Council to ensure that local landowners have been written to in relation to their obligations under the <i>European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022, as amended</i>. 8. Confirm that the reservoir is on Uisce Éireann's inspection and cleaning schedule. <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 28/06/2024 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>		