

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	Frosses-Inver
Organisation	Uisce Éireann
Scheme Code	0600PUB1096
County	Donegal
Site Visit Reference No.	SV29676

Report Detail	
Issue Date	16/01/2025
Prepared By	Veronica Boland

Site Visit Detail			
Date Of Inspection	04/12/2024	Announced	Yes
Time In	14:10	Time Out	17:30
EPA Inspector(s)	Veronica Boland		
Additional Visitors			
Company Personnel	Uisce Éireann: Paul Lyons, Adrian Gillespie, Brendan Gavigan, Geraldine Friel. Donegal County Council (working in partnership with Uisce Éireann): Patrick Haughey, Martin Keeley, Eddie McGrane, Gerry Gallagher.		

> Summary of Key Findings

1. There are no turbidity alarms on the individual rapid gravity filters to protect the protozoal barrier, and there is no turbidity monitor or alarm on the combined filter water to prevent inadequately treated water entering the supply.
2. The SCADA system at the Frosses-Inver WTP is obsolete and does not allow full operational control of the WTP as it does not facilitate any upgrade changes required to be made at the plant such as the installation of inhibits on the filtration system, alarm notifications, and allowing remote access to plant performance trends to inform plant operators of plant operations.

> Introduction

The Frosses-Inver Public Water Supply water treatment plant (WTP) produces approximately 1,800-2,000 m³/day of treated water serving a population of approximately 4,474 people. Raw water is abstracted from two surface water sources Glencoagh Lough and St. Peters Lough. The are two separate treatment streams at Frosses-Inver WTP, both treatment streams comprise of pre pH correction, coagulation, flocculation, clarification, rapid gravity filtration, granulated carbon filtration (only stream 2 from St. Peter Lough), post pH correction and disinfection using chlorine. Treated water is pumped to an on-site reservoir with a storage capacity of 640 m³ and Glencoagh Upper reservoir with a storage capacity of 300m³. A default log 3 treatment requirement is assigned to Frosses-Inver WTP.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the protozoal barriers in place at the water treatment plant (WTP).

> Supply Zones Areas Inspected

The audit included a site visit of the treatment processes at Frosses-Inver water treatment plant. The abstraction sources and treated water reservoirs were not visited as part of the audit.



1. Coagulation Flocculation and Clarification (CFC) Stage

1.1

Are the CFC processes appropriately controlled?

Answer

No

Comment

1. Staff advised that both raw water sources contain manganese concentrations of approximately 250-300 mg/l. Chlorine is dosed pre the clarifiers on both treatment streams 1 and 2 for manganese removal. There is no monitoring for manganese in the raw water or final water at Frosses-Inver WTP.

2. At the audit, staff advised that they often observe shear floc in the S2 clarifier and that run to waste can take up to 6 to 7 hours before compliant water is achieved.

1.2

Were the CFC tanks, channels and weirs observed to be clean, level and well maintained during the audit?

Answer

No

Comment

1. The channels within the S1 clarifier were not level. The channels should be level across the tanks to permit an even flow of clarified water and minimize the potential for floc carryover.



2. Disinfection

2.1

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

Answer

No

Comment

1. Network chlorine residuals are monitored in the Frosses-Inver water supply. Records reviewed showed that there were some weeks where chlorine monitoring was not undertaken in the network several times a week. A suitable monitoring frequency of at least 2-3 times per week is recommended to verify that there is a minimum chlorine residual of 0.1 mg/l throughout the network.



3. Sludge Management

3.1

Is sludge arising from the treatment processes adequately managed?

Answer

No

Comment

1. The Frosses-Inver WTP has no sludge treatment. The sludge generated by on-site treatment processes within the clarifier system, and the washwater from backwashes of the filters, is discharged directly to a rivulet that flows to the River Eany.



4.1

Did UÉ confirm whether *Cryptosporidium* monitoring under the Rationale for Determining the Frequency of *Cryptosporidium* in Public Water Supplies is being carried out?

Answer

Yes

Comment

1. *Cryptosporidium* monitoring is carried out on a monthly basis.

4.2

Are the filters designed and managed in accordance with EPA guidance?

Answer

No

Comment

1. There are two separate treatment streams at Frosses-Inver WTP (Stream 1 treats water from St Peters Lough, Stream 2 treats water from Glencoagh Lough). Four rapid gravity filters (RGFs) are in place at the WTP, two RGFs on each separate treatment stream.

2. There are no filter media depth gauges in place to visually assess filter media depth. Filter media was replaced in all 4 RGFs in October 2024 and media depths were all above 1100 mm.

3. There are no alarms or inhibits on the individual filter turbidity monitors to take a filter out of service if turbidity exceeds 0.3 NTU. There is no combined filtered water turbidity monitor, alarm or inhibit.

4. There is a final water turbidity alarm of 0.3 NTU (5 minute time delay) and an inhibit setpoint of 1 NTU (3 minute) linked to the turbidity monitor on the outlet of the onsite reservoir.

5. Manual backwashing of filters is undertaken on a timed basis and visual observation. Backwash is not triggered by turbidity or headloss setpoint as per the *EPA Water Treatment Manual: Filtration*.

6. While filter operation and filter backwashes are visually assessed by staff, there are a number of regular operational checks outlined in Table 5.4 of the *EPA Water Treatment Manual: Filtration* that are not being completed regularly at the treatment plant including media depth check, media coring, filter media integrity assessment.

7. At the audit, it was observed that water entering the inlets to Stream 1 RGFs 1 and 2 (from the Stream 2 Clarifier) was bubbling intensely. This intense bubbling water entering the RGFs may have an impact on the even distribution of media within each RGF and impact the filtration process.

4.3

Are online monitors operational?

Answer

No

Comment

1. Stream 1 Filter 2 (S1 F2) turbidity monitor was not operating correctly on the day of the audit. Staff advised that a new turbidity monitor photocell was ordered and due to be installed upon delivery. The S1 F2 turbidity monitor is not linked to any treatment processes.

4.4

		Answer
Are there suitable plant controls to prevent inadequately treated water entering the distribution network?		No
Comment		
<p>1. The SCADA system at Frosses-Inver is obsolete and the PLC unit does not facilitate changes to be made such as alarms, inhibits, automatic triggers for backwash. Staff also advised that they have issues with meters communicating to SCADA and this impacts alarm notifications to staff.</p> <p>2. The on-site SCADA terminal is not connected to the county SCADA system. This limits the accessibility of plant process information and trended performance data by operational and supervisory staff.</p>		

Subject	Frosses-Inver PWS Audit Recommendations	Due Date	17/02/2025
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. Upgrade the current SCADA system at Frosses-Inver WTP and link to the county wide SCADA to provide access to critical plant process information and trended performance data for both operational and supervisory staff. 2. (i) Undertake works to level the clarifier channels (ii) Investigate the cause and impacts of shear floc in the Stream 2 clarifier and the 'bubbling effect' in the Stream 1 clarifier, and (iii) develop and implement an action programme with timeframes to address the issues identified. 3. Filtration: (i) Investigate the impact of the 'bubbling effect' on the performance of the Stream 1 filtration system (to include preferential flow and loss of sand in section where water enters RGFs from clarifier), and (ii) develop and implement an action programme to address the issues including timeframes, (iii) Install alarms and inhibits on the individual filters and combined filter turbidity to ensure the 0.3 NTU <i>Cryptosporidium</i> barrier is not compromised and is in accordance with <i>EPA Water Treatment Manual: Filtration</i> (iv) Install a media depth gauge in each filter (v) Investigate the feasibility of installing automatic backwash on individual rapid gravity filters on both time and a predetermined turbidity concentration basis, and (vi) Conduct regular operational checks of the filters at the treatment plant as specified in the <i>EPA Water Treatment Manual: Filtration</i>. 4. Undertake a regular monitoring program of raw water, post filters, final water and network manganese to verify compliance with the parametric value. 5. Return the turbidity monitor on Stream 1 Filter 2 to service. 6. The discharge of water treatment sludge to receiving water, where practiced, should cease immediately. Uisce Éireann should submit a sludge management plan for Frosses-Inver WTP to ensure the protection of the Eany River. The plan should include interim management measures until sludge infrastructure is installed and commissioned on-site. 7. Undertake monitoring of residual chlorine several times a week (2 to 3 times) at different locations within the network to include the network extremities. <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 17/02/2025 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>		