

Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This Audit was carried out to assess the performance of Irish Water in providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone	
Name of Installation	Barrow Supply
Organisation	Irish Water
Scheme Code	1400PUB1060
County	Kildare
Site Visit Reference No.	SV25977

Report Detail	
Issue Date	11/10/2022
Prepared By	Lorcan Farrell

Site Visit Detail			
Date Of Inspection	07/09/2022	Announced	Yes
Time In	10:30	Time Out	14:35
EPA Inspector(s)	Ruth Barrington Lorcan Farrell		
Additional Visitors	HSE: Ruth McDermott, Robbie Doyle, Maria Deery		
Company Personnel	Irish Water: Morgan Cox, Andrew Boylan, Edward Haythornthwaite, Paul Cahill, Mark Claffey Veolia (operating under DBO contract to Irish Water): Mark Robinson, Charlotte O'Hare		

> Summary of Key Findings

1. Following the audit, the EPA placed Barrow Regional Public Water Supply on the Remedial Action List (RAL) published on 03/10/2022. This reflects the treatment deficit under which the plant operates.
2. The protozoal barrier at Srowland WTP is not fully protected by suitable alarms, controls and standby equipment. Daily testing for *Cryptosporidium* is in place at the plant as a mitigation of *Cryptosporidium* risk.
3. Irish Water are investigating two main projects to address the treatment deficiencies, focused on the optimisation of CFC processes and on the provision of validated UV treatment. No timeframes for either project were available at the time of the audit.

> Introduction

Srowland WTP is operated by Veolia under a design, build and operate (DBO) contract to Irish Water. The plant has been in production since 2013 and treatment consists of raw water storage, pH correction, coagulation, flocculation, and clarification followed by rapid gravity filtration, disinfection (UV and chlorination) and fluoridation. The plant is designed to produce 40 ML/d but is currently producing approx. 18ML/d due to operational constraints being experienced at the plant.

Srowland WTP supplies water to Barrow Regional Public Water Supply (PWS) and partially supplies Barrow/Poulaphouca Blend PWS, Rathangan PWS and Monasterevin PWS. The total population supplied by the treatment plant is 81,553.

The purpose of the audit was to assess progress with outstanding recommendations from the previous EPA audit carried out at Srowland WTP on 12/10/2021.

> Supply Zones Areas Inspected

This audit comprised of a site visit to Srowland WTP consisting of a meeting to review previous audit recommendations and their ongoing status, a review of SCADA data and a site inspection focusing on the UV system, recently installed UVT monitors and the containerised pilot plant which is not yet in use.



1. Management and Control

		Answer
1.1	Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand?	No
Comment		
<p>1. There is a protozoal log credit requirement of 3.5 log at Srowland WTP. There is currently a log deficit at the WTP due to inadequate coagulation, flocculation and clarification (CFC), filtration and UV disinfection processes. Daily <i>Cryptosporidium</i> testing is in place at the plant as a risk mitigation measure. Results for <i>Cryptosporidium</i> testing carried out since 12/10/2021 were provided at the audit. There have been no detections to date.</p> <p>2. At the audit, two projects were discussed that could assist in achieving the necessary log credits of 3.5 and are outlined below.</p> <p>3. A pilot plant has been installed on-site at Srowland WTP to assess the required process changes to allow the plant to cope with raw water variability. The pilot plant will mimic the CFC stages in the main plant and allows for the trialing of various combinations of pH adjustment and chemical dosing to take place. There are turbidity and pH monitors assessing the performance of the pilot plant at various stages of the treatment process to help ascertain optimum conditions for the main plant. While the pilot plant has been delivered to site and was inspected on the day of the audit, it is not operational and no start date was available.</p> <p>4. An additional option being explored at Srowland WTP is the conversion of an unused process tank on site to enhance CFC capacity. Irish Water stated that this could either be configured to run in parallel with the existing CFC units or be developed to run in series to allow for increased organics removal. No timeframes were available on the day of the audit for the completion of this work.</p> <p>5. Irish Water are currently upgrading raw water monitoring facilities. Ground works are complete and installation of monitoring equipment is planned. When commissioned, alarms and inhibits will be possible on the basis of raw water quality to assist operators in running the plant.</p>		

		Answer
1.2	Is the plant suitably managed and controlled to maintain the designed log credit on each treatment stage?	No
Comment		

1. There are four rapid gravity filters (dual media) operating at the plant with each filter consisting of 0.5m of Silica sand and 1.5m of anthracite. Irish Water described that filters have difficulty maintaining a filter turbidity of <0.3 NTU particularly when raw water quality deteriorates due to inadequate CFC treatment at the plant preceding the filtration stage.
2. The filter shutdown level had been increased from 0.5 NTU to 0.7 NTU on 15/01/2022 and remained at this level until the day before the audit 06/09/2022 when it was reduced to 0.3 NTU. Irish Water stated that raw water quality had been stable with filtered water turbidity of <0.3 NTU being achieved above the 95th percentile over the previous weeks allowing the setpoint to be lowered. However, no process changes had been made since the previous EPA audit (12/10/2021) to improve CFC or filter performance.
3. Irish Water acknowledged at the audit that filter turbidity cannot reliably be maintained below 0.3 NTU and therefore log credits have not been assigned to the CFC and filtration systems at the plant.
4. Irish Water stated that the rapid gravity filters would be assessed in parallel with the CFC pilot project to establish changes required to filtration processes.
5. Filter turbidity trends were examined as part of the audit and were generally found to be <0.3 NTU. On 05/09/2022 Filter No.1 was over 0.3 NTU between 01:00 and 23:46, prior to filter shutdown setpoints being changed on 06/09/2022.
6. The UV system in operation at the plant is a low-pressure UV system with limited flexibility in its validation envelope and with no standby UV reactor. A *Cryptosporidium* barrier cannot be sustainably maintained at the plant with the current UV system.
7. Irish Water stated that there are plans to upgrade the UV system at Srowland WTP. One option is to move an existing Medium Pressure UV system that is no longer required at another WTP operated by Veolia. A feasibility report will assess the suitability of the system for installation at Srowland WTP against the range of operating conditions experienced at the plant. The aim is to maintain a validated dose of 15 mj/cm² down to a minimum UVT of 70% and capable of achieving the full design flow of the plant (40 ML/day). It was indicated at the audit that the feasibility report is due to be completed by early October and that this solution was Irish Water's preferred solution in terms of timeframes, cost, and complexity. Should the feasibility report conclude that this UV system is not suitable for conditions at Srowland WTP then an alternative bespoke solution is to be sought. Timescales for installation of a new bespoke UV system could be extended considerably.

		Answer
1.3	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment		
1. UV disinfection is provided via a Wedeco BX3200 system operating in a duty/duty configuration. There is no standby reactor should there be a fault with either of the duty reactors however, the plant will shut down if this occurs. There is no auto-shutdown present if the UV system is operating outside of its validation envelope.		

		Answer
1.4	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
Comment		

1. A recommendation from the previous EPA audit (12/10/2021) was to install a continuous UVT monitor to demonstrate and verify that the UV system was operating within its validated range. This has been completed with the installation of two UVT monitors that sample water on the outlet of the UV reactors. Both UVT monitors are calibrated weekly by Veolia staff as well as being calibrated by an external contractor every six months. The UVT monitors are trended on SCADA and at the time of the audit were reading 88.3% and 86.7% respectively. Irish Water stated at the audit that there had been no incident this year where UVT had operated below 80%.

2. Irish Water has not implemented actions under Recommendations 2, 3, 4 and 5 from the previous EPA audit of 12/10/2021. The incomplete recommendations were discussed at this audit and while possible solutions have been identified by Irish Water, detailed plans and timescales have yet to be provided.

3. There have been no failures of the Trihalomethanes (THM) parametric in the Barrow supply in 2022 (last exceedance 15/11/21). Recommendation 4 in the previous EPA audit (12/10/2021) has not been implemented to date. The pilot plant trial and the conversion of the unused process to enhance CFC capacity discussed in section 1.1 of this audit report were discussed at the audit as being central to the mitigation of THM formation at the plant.

4. THM formation potential (THM-FP) testing has been ongoing monthly at Srowland WTP since March. Monthly THM-FP testing is to be continued at the plant to assist in developing the scope of upgrades of Srowland WTP.

Recommendations

Subject	Srowland Audit Recommendations	Due Date	11/11/2022
Action Text	<p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues, Irish Water should implement the following recommendations without delay:</p> <ol style="list-style-type: none"> 1. Irish Water should continue appropriate <i>Cryptosporidium</i> monitoring until adequate protozoal barriers have been put in place. 2. Irish Water should provide a Remedial Action List programme with timescales for the upgrade of Srowland WTP, to include (i) the installation of a validated and suitably controlled UV system capable of providing an adequate protozoal barrier; and (ii) the provision of raw water monitoring, dose controls, enhanced CFC and filtration processes, process controls and inhibits for an adequate filtration barrier at Srowland WTP. 3. Irish Water should continue to perform THM formation potential testing monthly as well as conducting water age assessments and follow up actions to minimise THM formation in the network. 4. Irish Water should notify the EPA and consult with the HSE in the event that filtered water turbidity cannot be maintained below 0.3 NTU. <p>Follow-Up Actions required by Irish Water</p> <p>During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised.</p> <p>This report has been reviewed and approved by Ruth Barrington, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 11/11/2022 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.</p> <p>The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.</p>		