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	SRRWSS - Killeglan
Organisation	Uisce Éireann
Scheme Code	2600PUB1004
County	Roscommon
Site Visit Reference No.	SV29550

Report Detail

Issue Date	22/05/2024
Prepared By	Maria O'Connell

Site Visit Detail

Date Of Inspection	16/04/2024	**Announced**	No
Time In	13:30	**Time Out**	15:26
EPA Inspector(s) **Additional Visitors**	Maria O'Connell Ruth Barrington		
Company Personnel	Uisce Eireann: Vincent McGrath and Cathal Furey Representing Glanua (working under contract to Uisce Eireann): John Finn and Shane O Donnell.		

Summary of Key Findings

1. Uisce Eireann are investigating exceedances of the aluminium parametric value in this drinking water supply. The monitoring programme established within this investigation indicates discrepancies in results between different sample methods. A comprehensive plan for establishing aluminium compliance has not yet been put in place.

2. The site operator outlined that the pH correction and coagulant dosing pumps are due for replacement. The post DAF pH alarms were set to zero on the PLC, post DAF pH inhibits were enabled at pH 5 and 8.

Introduction

The SRRWSS Killeglan PWS serves a population of 7341. The drinking water treatment plant has three raw water sources comprising of two boreholes and a spring source however only the spring source is currently in use. The plant produces approximately 4400m3 of treated water daily based on 20 hours production. The design capacity of the plant is 350m3/hour. Treatment consists of chemical conditioning, coagulation, flocculation (DAF), filtration, UV, chlorination, and fluoridation. There is one reservoir serving the plant with a capacity of 2650m3 (6-7 hours storage). The plant is operated by Glanua under contract to Uisce Eireann. The spring source is situated in a highly karstified region which is classified as extremely vulnerable. This audit was conducted to examine all aspects of the treatment plant with a focus on compliance with the aluminium parametric value for drinking water.

Supply Zones Areas Inspected

The audit included a site tour of the abstraction point and treatment processes with site personnel.

1. Coagulation Flocculation and Clarification (CFC) Stage

		Answer
1.1	Are the CFC processes appropriately controlled?	Yes

Comment

1. The CFC processes at this plant consist of chemical conditioning, two tapered flocculation tanks, covered DAF units and four multimedia filters. The site operator outlined that the plant is significantly impacted by heavy rainfall following periods of dry weather particularly in October and November when organic levels increase in the raw water.

2. The pH range for raw water is between pH 6.2 -7 (plant target is pH 6.2). pH adjustment is undertaken with sulphuric acid dosed at 40 -60 l/hr based on a water flow of 200m3/hour (manual control).

3. Duty-standby arrangements are in place on the pH correction dosing equipment with automatic switch over every 12 hours or on fault. The site operator advised that new pumps are to be installed for sulphuric acid dosing.

4. Coagulant (PACL) dose is flow proportional and based on continuously monitored raw water UVT bands and adjustment can also be made manually.

5. Duty-standby arrangements are in place on the coagulant dosing equipment with automatic switch over every 12 hours or on fault. The site operator advised that coagulant dosing pump replacements are due.

6. Continuous raw water monitoring of flow, pH, turbidity, colour and UVT takes place along with monitoring post-dosing pH. Additionally continuous monitoring takes place on individual filter turbidity; pre-UV UVT; treated water turbidity, UVT, colour, chlorine and fluoride.

7. In addition to online monitoring, monthly operational monitoring is coordinated by Uisce Eireann and independent analysis is also arranged the contractor. The site operator outlined that jar tests are conducted periodically.

8. High and low warning alarms are in place on raw water pH, high turbidity, colour, low UVT and conductivity time delays =800 seconds). High and low post DAF pH plant shutdowns are also enabled at pH 5 & 8 (800 seconds time delay) however post DAF pH alarms were set to zero on the PLC. There is a post DAF shutdown on turbidity at 5NTU with a time delay of 600 seconds.

2. Filtration

		Answer
2.1	Are the filters designed and managed in accordance with EPA guidance?	No

Comment

1. There are four rapid gravity filter on site consisting of a base layer of 550mm silica sand (ES 0.5mm) and a top layer of 450mm anthracite (ES 1.0mm). There are no marker posts to determine media depth . The design filtration rate is 7.09m/hr.

2. Backwash triggers are enabled on time (every 28 hours) and turbidity (0.75 NTU). Backwash is not enabled on headloss.

3. A run to waste system is in place (with turbidity monitor). Once turbidity returns to below 0.6NTU for 400 seconds the filters return to service.

4. Individual filters and final treated water have online continuous turbidity monitors which are connected to SCADA. There is an inhibit enabled on high turbidity in the treated water at 0.6NTU with a time delay of 800 seconds however no alarms to alert on deteriorating water quality on the individual filters was noted on the PLC onsite or submitted in preaudit information.

3. Disinfection

		Answer
3.1	Is the disinfection system verified using monitors and alarms?	Yes

Comment

1. The chlorine disinfection system is verified using monitors and alarms however the high and low chlorine alarm were enabled with a time delay of 900 seconds. This does not align with the *EPA Water Treatment Manual: Disinfection*.

4. Reservoirs and Distribution Networks

		Answer
4.1	Is the distribution network adequately maintained to protect drinking water quality?	No

Comment

1. Uisce Eireann outlined that there are issues with leakage and subsequent water pressure in the distribution network which present challenges in terms of flushing of the distribution lines.

2. Details of the Lugboy reservoir cleaning and inspection regime were not available at time of the audit.

5. Treatment Process Chemicals

		Answer
5.1	Are treatment process chemicals appropriately managed and stored?	No

Comment

1. A temporary storage arrangement was in place for sodium hydroxide due to crystallization issues in the main storage tank. The site operator advised that a permitted contractor had been arranged to remove the residue in the main tank.

6. Management and Control

		Answer
6.1	Are instrument calibrations within date?	Yes

Comment

1. The site operator advised that all units were within calibration and servicing requirements. Calibration and servicing records for the online pH and aluminium monitors were not available on site.

7. Drinking Water Quality

		Answer
7.1	Have failures of the parametric values or the detection of pathogenic micro-organisms or parasites in the water supply been adequately investigated?	Yes

Comment

1. As a result of aluminium exceedances in this supply a comprehensive review of processes and sampling methods was undertaken by the site operator in 2016. Actions were undertaken as result of this review however in light of recent repeated aluminium failures in the supply (including failures in the treated water at the plant) a further indepth review is required.

2. Since 2021 there have been nine aluminium parametric exceedances reported in this supply. In 2024 regulatory monitoring highlighted an exceedance of 214ug/l in the network. Accredited sampling of treated water returned a result of 141ug/l for aluminium and a pH value of 6.57 on the 5/03/2024. The continuous aluminium monitoring for treated water indicated levels of 0.01mg/l or below from the 1st to the 5th of March.

3. On the 20/03/2024 operational monitoring highlighted an aluminium parametric exceedance of 242ug/l in the final water at the plant. The continuous aluminium monitoring of treated water indicated levels of 0.03 or below from the 12th to the 23th of March. A grab sample of raw water on this date indicated an aluminium level of 42 ug/l.

8. Sludge Management

		Answer
8.1	Is sludge arising from the treatment processes adequately managed?	No

Comment

1. The site operator outlined that the centrifuge unit for processing sludge on site was not working however the contractor operates a mobile centrifuge unit. No details for the return to service of the centrifuge unit were available.

Recommendations

Subject	SRRWSS Killeglan Audit 2024	Due Date	28/06/2024
Action Text	**Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.** 1. Conduct a review of plant processes and controls to enable sustainable compliance with the aluminium parametric value in this public water supply. This review should incorporate (i) the enhanced frequency of sampling for aluminium in the raw, mid process and treated water, (ii) enhanced operational monitoring for aluminium in the network, (iii) frequent cross checks with grab samples to validate the results of online monitors, (iv) submit the results of the aforementioned sampling on a quarterly basis from the 28/06/2024 and (v) ensure that any exceedances are notified to the EPA as Uisce Eireann are made aware of them. 2. Replace the pH and coagulant dosing pumps as planned and confirm the completion dates for this action. 3. Ensure that pH alarm levels for raw water, mid process and treated water pH are enabled and review pH inhibit settings to better align with the plant pH target of 6.2. 4. Submit the most recent calibration and servicing records for all online pH and aluminium monitors at the plant. 5. Conduct a review of the reservoir and distribution network to identify any issues which are contributing to the reoccuring aluminium levels in the public water supply and confirm if unidirectional flushing has been scheduled in the network. 6. Confirm the Uisce Eireann reservoir cleaning and inspection regime for the Lugboy reservoir. 7. Ensure that the alarms and inhibit time delay settings for chlorine are in alignment with the *EPA Water Treatment Manual: Disinfection.* 8. Provide a timeframe for the return to service of the sludge processing unit for the SRRWSS Killeglan WTP. 9. Provide a timeframe for the return to service of the sodium hydroxide main storage tank. **Actions required by Uisce Éireann** 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. 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. The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies.		