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	Shannon/Sixmilebridge RWSS
Organisation	Uisce Éireann
Scheme Code	0300PUB1040
County	Clare
Site Visit Reference No.	SV29566

Report Detail

Issue Date	24/05/2024
Prepared By	Orla Harrington

Site Visit Detail

Date Of Inspection	24/04/2024	**Announced**	Yes
Time In	10:30	**Time Out**	12:10
EPA Inspector(s) **Additional Visitors**	Orla Harrington		
Company Personnel	Uisce Éireann: Darragh Connelly, Tommy Roche Clare County Council (working in partnership with Uisce Éireann): Tom Floyd, Raymond O'Connor, Martin Kelly.		

Summary of Key Findings

1. Shannon/Sixmilebridge water treatment plant is well operated and managed on a day to day basis.

2. Uisce Éireann installed a new potassium permanganate dosing system on 16/09/2022 for manganese treatment. While the audit found that this upgrade is largely effective in improving water quality for the supply, there were four manganese exceedances in the final water leaving the plant between 17/01/2024 and 10/04/2024. The EPA was not notified of two manganese failures in the final treated water detected on 17/01/2024 (60ug/l) and 08/02/2024 (59ug/l).

3. A number of the previous audit recommendations to improve and optimise treatment processes have not been completed but works are underway to address these as part of the further upgrade works planned. A completion date was not provided on the day of the audit.

Introduction

The Shannon/Sixmilebridge public water supply (PWS) serves a population of 21,623 with approximately 475 m3/hr treated water produced at the plant. Raw water is abstracted from Castle Lake and treated at the plant in two streams referred to as old and new that run parallel through the treatment process. Treatment consists of potassium permanganate dosing, coagulation, clarification, rapid gravity filtration, incorporating powdered activated carbon dosing, chlorination, fluoridation and pH correction using soda ash.

The audit was undertaken as part of the EPA's ongoing assessment of the largest 26 public water supplies. This audit was also carried out to assess Uisce Éireann's progress in restoring manganese compliance, focusing on the treatment upgrades undertaken at the plant and progress with the recommendations from the previous audit undertaken by the EPA on 20/08/2021.

Supply Zones Areas Inspected

The audit included an inspection of the potassium permanganate dosing system and other treatment processes on-site, along with supporting information on alarms, controls and monitoring results.

1. Coagulation Flocculation and Clarification (CFC) Stage

		Answer
1.1	Is the CFC process optimised to respond to changes in raw water quality?	No

Comment

1. There is no programme of jar testing to enable a rapid planned response to raw water changes and assist in the determination of chemical dosing rates.

2. Clare County Council stated that while there are jar testing capabilities on-site, they do not have adequate resources to carry out this work.

2. Management and Control

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

Comment

1. The following recommendations from the previous audit on 20/08/2021 have not been fully completed to date. These being:

No. 5 Review the filtration treatment process to include the following aspects a) investigation of filters to see if media depth can be increased to a minimum of 1000 mm b) provision of a run to waste or slow start facilities on the filters to prevent out of specification water from entering the supply prior to return to service c) automatic triggering of backwash based on elevated turbidity concentrations and head loss in addition to time.

No. 8 Install automatic change over of aluminium sulphate and poly dosing pumps.

No. 9 Review the bulk alum storage arrangement at the treatment plant and undertake a risk assessment of hazards posed by the current storage arrangements. Chemicals must be stored in bunded areas capable of containing at least 110% of the volume of chemicals stored therein. Fill points for storage tanks inside the bunds should be within the bunded area. Refer to EPA guidance document - "IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities".

2. These outstanding recommendations have been included in this audit report. Improvements to the filtration stage have been undertaken since the previous audit which include resanding of the filters, raising of the freeboard and cleaning of the filter laterals. Uisce Éireann stated that the audit recommendation relating to filtration has not been fully completed and that work to progress all remaining recommendations will be completed in due course, however a timeframe was not provided at the time of the audit.

3. Drinking Water Quality

		Answer
3.1	Have relevant failures to comply with the requirements of the European Union (Drinking Water) Regulations 2023 been notified to the EPA?	No

Comment

1. Prior to the audit, Uisce Éireann provided additional data to the EPA in relation to manganese analysis of the raw, clear and final water at the plant from sampling on dates between 05/01/2024 and 10/04/2024. The auditor noted that two exceedances of the parametric value in samples taken from the final water on 17/01/2024 and 08/02/2024 were not reported to the EPA. Failure to notify exceedances of parametric values to the EPA is an offence under the European Union (Drinking Water) Regulations 2023. Uisce Éireann reported the 17/01/2024 failure to the EPA on 25/04/2024 and the second failure has yet to be reported.

		Answer
3.2	Is the the treatment plant optimised for the removal of manganese?	No

Comment

1. The audit verified that treatment processes, controls and operations have been upgraded at Shannon/Sixmilebridge WTP to improve the removal of manganese at the plant. A new potassium permanganate dosing system was installed on 16/09/2022. There are duty and standby pumps with manual switchover. There is a dial out alarm with a cascade system in place for response to a pump failure.

2. Raw water is dosed with potassium permanganate to allow precipitation of manganese in the clarifiers. A dosing matrix has been created with dose rate being adjusted manually based on weekly raw water monitoring for manganese. There is also weekly treated water sampling for assessment of manganese treatment performance.

3. There were four manganese failures in the treated water leaving the plant on 17/01/2024 (60 ug/l), 08/02/2024 (59 ug/l), 26/03/2024 (69 ug/l) and 10/04/2024 (89 ug/l). At the time of the audit, the source of the elevated levels of manganese could not be attributed directly to the operation of the potassium permanganate dosing system but may have coincided with seasonal variations in the raw water quality. In response to this, Uisce Éireann advised that it is planned to increase the monitoring frequency to further improve operational management and control of the manganese treatment processes and facilitate faster reactions to sudden increases in raw water manganese levels.

4. There were no exceedances of the manganese parametric value reported within the supply network and at the plant in 2023.

		Answer
3.3	Is the network adequately managed to prevent exceedances of the manganese parametric value?	No

Comment

1. Uisce Éireann's monitoring of the Shannon/Sixmilebridge public water supply carried out in the distribution network showed two failures to comply with the manganese parametric value taken at Kilmurry network on 04/03/2024 (65 ug/l) and 29/03/2024 (60 ug/l). Uisce Éireann stated that network conditions contributed to these exceedances and that increased monitoring and flushing is required at the Kilmurry portion of the network to ensure the supply remains in compliance with the manganese parametric value of 50 ug/l as set out in the Drinking Water Regulations 2023.

2. Corrective actions undertaken so far by Uisce Éireann have included cleaning of the clear water tank, cleaning of Moygalla and Clonmoney reservoirs, flushing in the network with further cleaning of reservoirs also planned.

4. Sludge Management

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

Comment

1. Uisce Éireann stated that the picket fence thickener is operating at approximately 70% over capacity and sludge is currently being sent to Bunlicky wastewater treatment plant, Co Limerick for disposal. The sludge treatment part of the plant is due for an upgrade. A timeline for completion of this work could not be provided.

2. The centrifuge dewatering unit was not operating on the day of the audit due to issues with the HMI. Clare County Council stated that this would be resolved within the week.

Recommendations

Subject	Shannon/Sixmilebridge PWS -Audit Report	Due Date	24/06/2024

Action Text

Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendation(s) without delay.

1. Progress upgrade works at the Shannon/Sixmilebridge water treatment plant. Provide a scope of works and a timeframe for completion which should include details of the upgrades planned on sludge treatment at the plant.

2. a) Ensure that all exceedances of parametric values are notified to the EPA in accordance with the *European Union (Drinking Water) Regulations 2023* and b) Submit the failure on 08/02/2024 to the EPA via CRM and notify the HSE.

3. Confirm the revised manganese monitoring programme at the plant and in the network and network flushing regime to ensure ongoing compliance with the manganese parametric value.

4. Review the filtration treatment process to include the following aspects a) investigation of filters to see if media depth can be increased to a minimum of 1000 mm b) provision of a run to waste or slow start facilities on the filters to prevent out of specification water from entering the supply prior to return to service c) automatic triggering of backwash based on elevated turbidity concentrations and head loss in addition to time.

5. Install automatic changeover of aluminium sulphate and poly dosing pumps.

6. Review the bulk alum storage arrangements at the treatment plant and undertake a risk assessment of hazards posed by the current storage arrangements. Chemicals must be stored in bunded areas capable of containing at least 110% of the volume of chemicals stored therein. Fill points for storage tanks inside the bunds must be within the bunded area. Refer to EPA guidance document -"IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities".

7. Carry out jar testing in accordance with the EPA Water Treatment Manual: Coagulation, Flocculation and Clarification to determine the optimum chemical coagulant dose and pH for the treatment of the water.

8. a) Confirm the centrifuge dewatering unit is operational and b) Provide timeframe for the upgrade of the sludge treatment plant.

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 24/06/2024 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.