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	South East Regional PWS
Organisation	Uisce Éireann
Scheme Code	1600PUB1093
County	Laois
Site Visit Reference No.	SV29617

Report Detail

Issue Date	18/11/2024
Prepared By	Derval Devaney

Site Visit Detail

Date Of Inspection	27/09/2024	**Announced**	Yes
Time In	10:30	**Time Out**	12:50
EPA Inspector(s)	Derval Devaney Cormac MacGearailt		
Additional Visitors			
Company Personnel	Uisce Éireann (UÉ): Edward Haythornthwaite. Laois County Council (working in partnership with UÉ): Brendan Garry, Michael Fitzgerald, Conor Ryle, Tom O'Carroll.		

Summary of Key Findings

1. The UVI alarm and inhibit settings could not be verified and the UVI trended graph appeared to display an incorrect unit. The chlorine alarm settings were not in line with the *EPA Water Treatment Manual: Disinfection*.
2. There were no procedures on responding to site specific alarms and verifying alarm status following work on-site.
3. Chlorine residual monitoring results were not available for certain areas of the network supplied by the South East Regional PWS.

Introduction

South East Regional Public Water Supply (PWS) produces a maximum of 129 m3/day of treated water from Kyle Water Treatment Plant (WTP) serving a population of 4,746. Raw water is abstracted from a spring enclosed in a shed located next to the water treatment plant. Treatment consists of primary disinfection using ultraviolet (UV) treatment and secondary disinfection by chlorinating the supply with sodium hypochlorite.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on verifying that appropriate alarms and inhibits are in place at the WTP, and procedures are in place to ensure appropriate oversight of treatment processes.

Supply Zones Areas Inspected

The enclosed spring source and Kyle water treatment processes and chemicals stored at the water treatment plant were inspected. The five treated water storage reservoirs located off-site were not inspected.

1. Alarms, Inhibits & Oversight Audits 2024

		Answer
1.1	Is suitable continuous monitoring in place to verify treatment performance?	Yes

Comment

1. CL001 and Cl002 chlorine residual monitors act as dual validation to validate the concentration of chlorine residual post a 30 minute contact time coil loop installed after UV treatment. CL001 and CL002 had differing readings on the day of the audit - 0.5 mg/l and 0.44 mg/l respectively.
2. Two operators take chlorine residual readings in different parts of the public water supply network. Chlorine residual records for the Vicarstown and Moyanna region were unavailable for inspection during the audit.
3. The UVI continuous trends were reviewed on site for UV Reactors 1 and 2. However UÉ agreed the graph unit appeared to be incorrect stating mW/cm2 rather than W/m2.

		Answer
1.2	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No

Comment

1. Primary disinfection is achieved by ultraviolet treatment and chlorination provides secondary disinfection.
2. There is a duty and standby UV reactor (Wedeco Spektron 100) which provides a minimum UV dose of 40mJ/cm2 under the validated operating conditions of a minimum UVT of 92.3%, a maximum flow rate of 129.7 m3/hr, and a minimum UVI of 52.2 W/m2.
3. The WTP alarm panel did not have any UVI alarms enabled. The WEDECO UV panel displayed a UVI limit of 63 W/m2. However, it was unclear if this UVI limit was enabled to alarm and shutdown the WTP.
4. UÉ could not confirm what the manufacturer's recommended lamp run hours were for UV reactor 1 and 2 and if there is an alarm to indicate when the lamps should be changed.
5. The chlorine residual target for secondary chlorination is 0.6 mg/l. The lo lo chlorine residual alarm and shutdown is set at 0.3 mg/l and the hi hi chlorine residual alarm is set at 2 mg/l. The EPA Water Treatment Manual: Disinfection recommends the low level chlorine residual alarm is set at a maximum of 0.1 mg/l below the target concentration and the high level chlorine residual alarm is set at a maximum of 0.2 mg/l above the target concentration.

		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. See Q 1.2 above in relation to the lack of clarity during the audit on the presence and alarm settings in place for the UVI online monitor to ensure the UV treatment system is operating within its validated range at all times.

		Answer
1.4	Is there a documented alarm response procedure?	No

Comment

1. There is no site specific procedure setting out how alarms are responded to in order to protect water quality and public health.

		Answer
1.5	Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No

Comment

1. UÉ did not have a procedure in place to verify the status of the alarm and inhibit settings following any maintenance or other work at the WTP.

Recommendations

Subject	South East Regional PWS - Audit Recommendations 27092024	**Due Date**	18/12/2024
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. i. Review the chloine residual alarm and inhibit settings to ensure critical treatment processes and water quality targets are protected and settings align with the EPA Water Treatment Manual: Disinfection; ii. Provide evidence of the UVI alarm and inhibit settings (including time delays) in place and details of their operation and control of the UV reactors at Kyle WTP; iii. Provide clarification on whether the UV lamp run hours are linked to an alarm; iv. Ensure there is a documented site specific alarm response procedure in place; v. Ensure there is a procedure in place to verify the alarms and inhibits status following maintenance or other work on-site; vi. Ensure training is provided to all relevant staff on the procedures. 2. i. Provide the manufacturer's recommended UV lamp run hours at which the UV lamps at Kyle WTP must be replaced; ii. Ensure routine maintenance checks are in place on lamp run hour status. 3. Ensure the correct unit is displayed for the UVI graph trending at the WTP. 4. Carry out daily handheld checks on the final water chlorine residual and investigate any descrepanices between the handheld readings and those displayed on chlorine monitors CL001 and CL002. 5. Provide chlorine residual results taken in the network since the EPA's audit and include sampling in the Vicarstown and Moyanna areas. **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 the above due date 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.		