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	Inishmore-Oghill
Organisation	Uisce Éireann
Scheme Code	1200PUB1026
County	Galway
Site Visit Reference No.	SV29560

Report Detail

Issue Date	25/07/2024
Prepared By	Maria O'Connell

Site Visit Detail

Date Of Inspection	28/06/2024	**Announced**	Yes
Time In	11:30	**Time Out**	13:30
EPA Inspector(s) **Additional Visitors**	Maria O'Connell		
Company Personnel	Uisce Éireann: Pearse Faherty. Galway County Council (Working in partnership with Uisce Eireann): Brendan Hayes, Enda Gill, Dimetri Zukovs.		

Summary of Key Findings

(1) UV validation certificates for the duty and standby units were not available and only one UV unit was in service at the time of the audit. Although UV alarms and inhibit set points were implemented at the WTP it will not be possible to verify the appropriateness of these settings until validation criteria are submitted.

(2) Chlorine and turbidity alarms and inhibits were not in alignment with the *EPA Water Treatment Manual:Disinfection* and *EPA Water Treatment Manual:Filtration.* The site operator outlined that routine operational oversight of alarm response and trends is currently limited due to resource shortages.

(3) A formally recognised standard and testing certificates for the cartridges filtration unit were not available at the time of the audit. This is necessary to claim log credits for the filtration process.

Introduction

The Inishmore (Oghill) PWS serves a population of 361 and is interconnected with the Kilcarna supply which serves a population of 279. Raw water for the supply is abstracted from a rainwater spring source which is supplemented by three shallow boreholes situated in a turlough adjacent to the plant (approximately 200m). The site operator outlined that the water treatment plant produces on average 418m3 of treated water per day, 60m3/hour. The plant reservoir has a capacity of 9000m3. Uisce Éireann confirmed that a source and sanitary survey was completed and a 3 log protozoal treatment requirement has been assigned. Treatment consists of filtration, UV and chlorination using low sodium hypochlorite. This audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the alarms and inhibits in place at the treatment plant to ensure the appropriate oversight of treatment processes.

Supply Zones Areas Inspected

The audit included a site tour of the treatment processes at the Inishmore (Oghill) WTP with site personnel.

1. Filtration

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

Comment

1. Continuous raw water turbidity monitoring takes place but no alarms on high turbidity were detailed on the HMI system at the time of the audit.

2. Cartridge filtration is used at this water treatment plant with 15 x 40” cartridges in one pressurised housing unit. Cartridges are replaced when the flow rate through the filter drops.

3. There were two service stickers on the cartridge filter housing but one was illegible and the other indicated an overdue service. The site operator advised that the filters are serviced regularly and the cartridges disposed of appropriately however there is no filter maintenance log in place at the water treatment plant. A supply of filter cartridges is kept on site.

4. A formally recognised standard approval document and testing certificates for the cartridges and housing unit was not available at the time of the audit (as per section 7.5.1, page 92 of the *EPA Water Treatment Manual: Filtration*). This is necessary to claim log credits for the filtration process.

2. Disinfection

		Answer
2.1	Are duty and standby chlorine pumps/ UV units in operation?	Yes

Comment

1. Duty and standby UV units have been installed and commissioned at Oghill water treatment plant. UV unit (No. 1) was not in service at the time of the audit. Details on the timeframe required to bring this unit back to service were not available.

2. The site operator outlined that switchover between units takes place regularly on a manual basis. It is understood that an automatic switch over is possible, but this is not enabled.

3. Duty and standby pumps are in place for the chlorine dosing system. Switch over between duty and standby pumps takes place manually and is automatic if a fault occurs.

		Answer
2.2	Is the UV system suitably validated?	No

Comment

1. The UV units were installed as a *Cryptosporidium* barrier at this water treatment plant. The site operator outlined that validation certificates were not available for the units at the time of the audit however calibration certificates undertaken by external contractors were presented for both units (dated 07/11/2023).

2. The units consist of two Wedeco LBX400e FAN models installed in 2018. The serial numbers of the units were noted as: MVA166349.3 and MVA166349.2.

2. The UV plate on unit No 1 displayed the following details: max flow rate: 60m3/hr, min UV dose value: 12 J/m2, min UVT: 60%.

3. Alarms, Inhibits & Oversight Audits 2024

		Answer
3.1	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	Yes
	Comment	
	1. CL001-01 operates on the basis of a contact loop for contact time to enable verification of primary disinfection. This monitor is labelled as a control analyser and not a validation analyser on the WTP HMI.	

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

1. Chlorine alarms and inhibits.

i. The site specific target for chlorine residual is 0.5 mg/l to ensure both adequate disinfection and at least 0.1 mg/l is achieved in the network.

ii. A warning alarm was in place for control analyser CL001-01 as follows: low 0.55mg/l and high 2.0mg/l. The site operator outlined that a contact loop is in place to mimic contact time. Time delay was set at 1800 seconds which is not in line with the *EPA Water Treatment Manual: Disinfection.*

iii.The validation analysers CL002-01, CL003-01 listed on the plant HMI did not have setpoints or time delays and were not enabled at the time of the audit. The site operator outlined that CL002 cannot be enabled on HMI and requires a programmer to enable this functionality. Uisce Éireann confirmed that a request has been referred to the contractors to resolve the issue.

iv. Inhibits were in place on the control analyser CL001-01 at (low) 0.500mg/l and (high) 2.0mg/l (2400 sec). The settings are not aligned with the time delay settings as per the *EPA Water Treatment Manual:Disinfection.* Post audit Uisce Éireann confirmed that the time delays were reset appropriately.

2. Turbidity alarms and inhibits.

i. The turbidity alarm and inhibit settings were not in alignment with *the EPA Water Treatment Manual: Filtration* as time delays were too long. Setpoints for alarms were 0.800NTU (Hi) and 0.980 (Hi Hi) for 900 seconds and inhibits were set at 0.960 NTU (Hi) and 0.990 for 900 seconds.

3. UV alarms and inhibits

i.The UV panel HMI units stipulated different inhibits and alarms settings than the WTP HMI. The plant UV intensity inhibit for UVI analyser (UVI01/2-01) was listed as 7.0mw/cm2 for 900 seconds and the alarm at 1.050 above that value, the UVT (%) alarm set point was 63% for 600 seconds and inhibit at 60% for 900 seconds. Without certified validation criteria it is not possible to assert the appropriateness of the UV alarm and inhibit setpoints.

ii. The flow inhibit on the plant inlet was set at 65m3/h at the time of the audit, the UV plate stated a max flow of 60m3/h and the UV HMI units (Numbers 1 and 2) stated the max design flow of 456m3/hr. Uisce Éireann confirmed post audit that the inhibit setpoint has been adjusted and is now set at 60m³/hr (600 seconds) and the warning alarm at 63m3/hr (900 seconds).

4. pH alarms and inhibits.

i. Plant inlet pH inhibits were set as follows: (low) 6.5 and (high) 8.6 for 600 seconds. The chlorine contact time calculation sheet presented for this site outlines that a pH of <7.5 is required and therefore the high inhibit setting of 8.6 should be reviewed.

		Answer
3.3	Are critical alarms dialled out to operators?	Yes

Comment

1. Critical alarms are issued by text to the duty and standby caretakers. To verify that the alarm has been responded to a test code is issued to the standby caretaker.

		Answer
3.4	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	No

		Answer
3.5	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No

Comment

See 3.2 above.

		Answer
3.6	Is there appropriate oversight of plant performance trends?	No

Comment

1. The site operator outlined that oversight of plant performance trends on a routine basis is limited at this time due to resource shortages. Trends are available for operational staff to review on mobile devices and at the plant. A new software system has been commissioned for the plant in recent months.

2. It was not possible to verify that oversight reviews were conducted.

		Answer
3.7	Is there appropriate oversight of alarm responses?	No

Comment

1.The site operator outlined that oversight of alarm responses on a routine basis is limited at this time due to resource shortages. Records of some alarms are available via the SCADA system.

2. It was not possible to verify that oversight reviews were conducted.

		Answer
3.8	Is there a documented alarm response procedure?	No

Comment

1. There is no detailed alarm response procedure on site apart from the Uisce Éireann Incident Response Procedure chart.

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

Comment

1. There were no written procedures covering verification of alarms and inhibits status following maintenance or other work on site however the site caretaker is present when works are being undertaken.

Recommendations

Subject	Oghill Audit 2024	Due Date	26/08/2024
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. UV: (i) Submit validation certificates for the UV units at the plant outlining the validation criteria necessary to achieve the required dose (refer to the *EPA Water Treatment Manual: Disinfection*) (ii) confirm a timeframe for the return to service of UV unit No. 1 (iii) review the UV switch over arrangements for the duty and standby UV units to ensure that switchover occurs on a frequent periodic basis (iv) ensure that the inlet flow inhibit is in line with the UV validation criteria (v) ensure that alarm and inhibit details are correct and consistent on the UV HMI and WTP HMI. 2. Filtration: (i) install appropriate alarm and inhibits setpoints and time delays on the filtration system as per the *EPA Water Treatment Manual: Filtration* (ii) submit the standard approval document and any testing certificates for the filtration unit (as per section 7.5.1, page 92 of the *EPA Water Treatment Manual: Filtration*) (iv) ensure a filter maintenance log containing criteria as outlined in the *EPA Water Treatment Manual: Filtration* is retained on site. 3. Chlorine: (i) Ensure alarm and inhibits time delays for residual chlorine are in alignment with the *EPA Water Treatment Manual: Disinfection* (ii) confirm the control philosophy for chlorination used at the plant including location and designation of dosing and verification monitoring and alarms (iii) confirm the timeframe required for the external contractor/programmer to attend the site and ensure that that alarms and inhibits are set at appropriate levels, time delays and are appropriately labelled. 4. Implement (i) a documented procedure for responding to alarms generated at the plant that enables verification of alarm response and timely escalation to relevant parties. The procedure should clearly document the corrective actions and set out responsibilities including verification of alarm and inhibit status following maintenance work at the plant, (ii) undertake and keep records of periodic reviews by supervisory staff on alarm responses and performance trends at the plant. 5. Uisce Éireann should ensure that all relevant staff are trained in any amendments made to the plant following alterations to alarm and inhibit settings. **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 26/08/2024 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.		