

# 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	Mulranny PWS
Organisation	Uisce Éireann
Scheme Code	2200PUB1021
County	Mayo
Site Visit Reference No.	SV29593

Report Detail	
Issue Date	31/01/2024
Prepared By	Veronica Boland

Site Visit Detail			
Date Of Inspection	17/01/2024	Announced	Yes
Time In	12:00	Time Out	15:17
EPA Inspector(s)	Ruth Barrington Veronica Boland		
Additional Visitors	HSE: Tim Coffey		
Company Personnel	Uisce Éireann: Vincent McGrath, Pat Collins, Ronan McDonnell Mayo County Council (working in partnership with Uisce Éireann) Martin McGowan		

## > Summary of Key Findings

1. Mulranny WTP does not have a range of alarms and inhibits in place to alert operators to a deterioration in water treatment processes, or to provide a shutdown in the event of a critical process failure. Uisce Éireann is establishing a system of alarms and inhibits as part of the response to the incident.
2. Uisce Éireann's investigation of the incident was hampered by a SCADA outage across Co. Mayo which coincided with the incident, and which only came to light during the investigation. Uisce Éireann does not have a means of verifying at a high level that SCADA systems are operating as intended.
3. Uisce Éireann is carrying out a further investigation into discrepancies between results of samples taken and analysed in-house by Uisce Éireann and by two contact laboratories during the monitoring programme undertaken to assess the impact and duration of the incident.

## > Introduction

Mulranny public water supply serves a population of approx. 710 people. Water from the Bullnahowna River is treated at Mulranny water treatment plant (WTP) with processes including coagulation, flocculation, settlement and pressure filtration, followed by disinfection using chlorination. The soda ash dosing on incoming raw water failed during a period of freezing weather conditions. When the incident was discovered, a Do Not Consume (DNC) Notice was placed on the supply by Uisce Éireann in consultation with the HSE. The DNC Notice was in place from 08/01/2024 to 15/01/2024.

Monitoring of the supply was carried out from 08/01/2024 to 14/01/2024 to assess the impact and duration of the incident. Aluminium above the parametric value of 200 ug/l was detected at the WTP and in the distribution network during the period the DNC Notice was in place.

## > Supply Zones Areas Inspected

The audit focused on the investigation of the soda ash dosing failure, the sequence of events around the Do Not Consume (DNC) Notice and comprised interviews with staff and an inspection of the soda ash dosing room.



1.1

		Answer
	Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	No
<b>Comment</b>		
<p>1. An alarm on high final water turbidity was dialled out to the operator on Sunday night 07/01/2024. An immediate response was not made, as no individual filtered water turbidity alarms were received. It was assumed that the high final water turbidity alarm was an error and linked to earlier maintenance work which had been undertaken at the clarifiers on 05/01/2024.</p> <p>2. When staff arrived on site at Mulranny WTP on Monday morning 08/01/2024, a noise from the malfunctioning pump alerted the operator to a blockage of crystallised soda ash in the dosing pipework. Maintenance work to restore the dosing function was completed at approx. 09:30 on 08/01/2024.</p> <p>3. The incident was escalated via operational and supervisory staff and following a number of operational sample results that afternoon indicating high aluminium, a consultation with the HSE was initiated. On the basis of this consultation a DNC Notice was placed on the Mulranny PWS at approx. 18:00 on Monday 08/01/2024.</p> <p>4. The WTP remained in operation throughout the response to the incident, due to concerns that some consumers on the supply would run out of water if the WTP was manually shut down. Inadequately treated water entered the distribution network without advice to consumers between approximately 17:30 on 07/01/2024 (when turbidity spiked) to 18:00 on 08/01/2024 (when the DNC Notice was imposed). During this time, high turbidity posed a risk to disinfection, with low pH and high aluminium detected at times during this period pointing to a loss of control over treatment processes.</p> <p>5. During the audit staff stated that the heaters in the dosing room had been out of operation for 2-3 weeks prior to the incident. Portable heaters had been sourced to maintain the temperature in the dosing room, but may not have been able to maintain the required temperature during the cold weather on 07/01/2024 to 08/01/2024. The root cause of the incident was identified by Uisce Éireann as low temperatures causing soda ash crystallisation and blockage of dosing pipelines.</p> <p>6. An operational monitoring programme was established on 08/01/2024 to determine the impact and duration of the incident and to inform decisions on the duration of the Do Not Consume Notice to protect public health. The focus of the monitoring programme was on aluminium and disinfection parameters as an indicator of process performance and network compliance, with flushing of the network carried out in parallel with the sampling. Compliant results at consumers' properties were obtained in samples taken on 14/01/2024 and on the following day, Uisce Éireann, in consultation with the HSE, lifted the DNC Notice.</p> <p>7. The operational monitoring programme showed discrepancies between various sets of analysis results. This was being investigated by Uisce Éireann at the time of the audit. Several methods had been used for analysis by both in-house labs and third party accredited lab services and further split samples were planned to establish the most representative method, and whether all recorded results are valid.</p>		



## 2. Reservoirs and Distribution Networks

2.1

Are reservoirs adequately inspected and maintained?

**Answer**

No

**Comment**

1. Tiernaur Reservoir requires additional maintenance. A sample taken on 14/01/2024 at the reservoir remained non-compliant for aluminium although all other sample locations on the same date had returned to compliance. Uisce Éireann stated the reservoir will be cleaned during February 2024.



### 3. Management and Control

3.1

Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?

Answer

No

**Comment**

1. Filter outlet and combined filtered water turbidity is monitored and alarms are programmed at Mulranny water treatment plant. There is no trended pH monitoring on raw water or on the flocculation stage which would alert operational staff to deteriorations in WTP performance.

2. No inhibits are in place to prevent inadequately treated water entering the distribution network. Any process interventions required at the water treatment plant must be done manually and there is no automated dose control, filter backwash or process shutdowns.

3. Trended data, alarms and dial outs are managed via SCADA. There is also an older system programmed on site and linked to HMI, through which alarms for filtered and final water turbidity dial out.

4. During the investigation of the incident, Uisce Éireann discovered that a link in the communications had failed between local systems and the county wide SCADA across Co. Mayo. This resulted in a loss of monitoring data and a failure of SCADA dial out systems between 10:55 on 06/01/2024 and 09:27 on 08/01/2024. The system is managed by a third party contractor and while there is an alarm function on the communications link, the alarm is not routed to the appropriate personnel to act on a SCADA failure.

5. If SCADA data and alarm dial outs had been available during the incident, the final water pH alarm at the reservoir should also have been triggered. However, the lack of suitable continuous process monitoring at Mulranny WTP means that such incidents can be missed until the quality of treated water has been affected.

3.2

Is a suitable cascade system in place for alarm dial outs?

Answer

No

**Comment**

1. Within the SCADA alarm dial outs, alarm texts are generated to a number of operational and supervisory staff. However during the incident on 07/01/2024 to 08/01/2024, coinciding with the SCADA communications link failure, the old system alarm of final water turbidity appeared only to dial out to one person.

3.3

Is there appropriate oversight of plant performance?

Answer

No

**Comment**

1. There is no formal system for supervisory checks of Mulranny WTP performance based on monitoring data, although it is undertaken on an informal basis.

2. The failure of the SCADA communications link was discovered due to the incident investigation. Uisce Éireann does not have a system which recognises and escalates a SCADA failure either at a local level or at the National Oversight and Monitoring Centre.

## Recommendations

Subject	Mulranny Audit Recommendations	Due Date	29/02/2024
Action Text	<p><b>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</b></p> <ol style="list-style-type: none"> <li>1. Establish a means of verifying that SCADA services are online, and that appropriate personnel are alerted if there is a system outage.</li> <li>2. Provide suitable alarms and inhibits to protect treatment processes and treated water quality at Mulranny WTP. While this process may be phased, priority should be given to the flocculation pH inhibit discussed during the audit.</li> <li>3. Investigate and take action on the discrepancies in the analysis results obtained during the operational monitoring programme, to ensure accurate and representative results are available to inform operations at the water treatment plant.</li> <li>4. Carry out cleaning works at Tiernaur Reservoir, with follow up sampling to establish aluminium compliance.</li> <li>5. Ensure that equipment at Mulranny WTP is maintained and available for use (e.g. heating system at the dosing room) with repairs of critical equipment carried out in a timely way.</li> <li>6. Formalise the procedures for oversight of WTP performance, with consideration of a rota for this work, assessment of trends in process performance and interpretation of data and alarms.</li> </ol> <p><b>Actions required by Uisce Éireann</b></p> <p>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.</p> <p>Uisce Éireann should submit a report to the EPA on or before 29/02/2024 detailing the actions taken and planned, with timescales, to close out the above recommendations.</p> <p>The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies.</p>		