

Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This Audit was carried out to assess the performance of Irish Water in providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone

Name of Installation	Glenary
Organisation	Irish Water
Scheme Code	2900PUB0134
County	Tipperary
Site Visit Reference No.	SV25973

Report Detail

Issue Date	12/10/2022
Prepared By	Criona Doyle

Site Visit Detail

Date Of Inspection	23/09/2022	Announced	Yes
Time In	10:20	Time Out	12:05
EPA Inspector(s)	Criona Doyle		
Additional Visitors			
Company Personnel	Irish Water: Pat Duggan; Colin Cunningham. Tipperary County Council (acting under service level agreement to Irish Water): Brid O'Hehir; Fintan Collins; Eoin Lawlor; John Fogarty; James Whelan.		

> Summary of Key Findings

1. The installation of automatic plant shutdown linked to the turbidity and chlorine alarms is due to be completed by the end of 2022 to prevent against the discharge of inadequately treated water into the supply.
2. Irish Water have undertaken an assessment of the coagulation stage following the turbidity incident which lead to the placing of a Boil Water Notice (BWN) from 13/09/22 to 07/10/22. Irish Water are currently reviewing the options for further process optimisation at the treatment plant.
3. A major plant upgrade is planned to improve the resilience of the supply to ensure a safe and secure supply into the future. No details of the timeframe for the completion of the upgrade were provided by Irish Water at the audit.

> Introduction

The Glenary Water Treatment Plant (WTP) serves a population of 11,020 and supplies 3,690m³ /d of water (EDEN figures) to the town of Clonmel and the surrounding area. Treatment at the plant includes coagulation, flocculation, clarification, filtration, disinfection and fluoridation.

The audit was carried out in response to elevated turbidity levels at the plant which resulted in the issuing of a Boil Water Notice (BWN) by Irish Water on 13/09/2022. The BWN was lifted on 07/10/2022.

> Supply Zones Areas Inspected

The audit focused on the Irish Water response to the turbidity incident and the placing of a boil water notice on the supply. The coagulation and filtration stage of the treatment process were also inspected.



1. Incident Management

Answer

1.1	Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	No
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Comment

Incident: On the night of 12/09/22 to 13/09/22 the raw water colour dropped from a high colour to a low colour and impacted on the coagulation stage at the Glenary WTP. The colour of the raw water was very low and there was difficulty achieving the correct soda ash dose rate for pH correction. Soda ash dosing at the WTP is undertaken manually while automatic coagulant dosing (aluminium sulphate) takes place based on the raw water colour bands.

On 12/09/22 the turbidity in the individual filters and the final filtered water went above 0.3NTU at approximately 10pm and remained above 0.3 NTU overnight. Irish Water reported that the maximum turbidity in each filter was 0.74NTU (Filter 1), 0.65NTU (Filter 2) and 0.91NTU (Filter 3). There is no automatic plant shutdown linked to the turbidity alarm setpoints (0.28 NTU) on the individual filters or the combined final filtered water therefore the WTP remained in operation overnight. While the turbidity in the filtered water remained below the 1 NTU parametric limit it was above 0.3 NTU and therefore the *Cryptosporidium* barrier was compromised

Response: In response to the turbidity alarms Tipperary County Council operational staff were on site at 05:30am on 13/09/22 to adjust the treatment process and continued to work on the WTP throughout the day. As the turbidity remained above 0.3 NTU following operator intervention it was decided to cease supplying the water into the supply and the WTP was run to waste from 11am to 5:45pm. Following consultation between Tipperary County Council, Irish Water and the HSE (13/09/22) it was agreed at 5pm that water should be reintroduced into supply under a BWN to protect public health as the reservoir had dropped to a critically low level and the turbidity had remained elevated (> 0.5 NTU).

The audit found that the lack of automatic shutdown in response to the elevated final water turbidity put consumers at risk of receiving inadequately treated water overnight on 12/09/22 to 13/09/22. In the absence of the automatic plant shutdown the incident had been responded to by operational staff outside of normal working hours. Once operational staff attended the site the incident was appropriately escalated and public health was protected by the placing of a BWN on the supply.

The criteria agreed with the HSE for the lifting of the BWN were (i) water treatment plant operating satisfactorily (ii) receipt of 1 no. compliant sample for *Cryptosporidium* and (iii) 3 no. compliant microbiological samples. Monitoring of *Cryptosporidium* undertaken on 14/09/22 and 20/09/22 returned clear results. The network monitoring for chlorine, turbidity and microbiological samples on 14/09/22, 15/09/22 and 19/09/22 returned compliant results.

On the day of the audit the BWN remained in place. The plant had returned to producing compliant water and network monitoring results confirmed a return to compliance for the final treated water. Remedial works on the relining of the soda ash dosing tanks was due to commence and a decision was made to keep the BWN in place on the supply until the soda ash dosing system was confirmed to be operating satisfactorily.

Further Actions Proposed: The installation of automatic plant shutdown linked to the chlorine and turbidity alarm setpoints is expected to be completed by end of 2022. Raw water samples were taken during the incident to facilitate further process optimisation and the development of soda ash dose bands to respond to periods of low colour in the raw water.

2. Coagulation Flocculation and Clarification (CFC) Stage

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

Comment

Soda ash dosing at the Glenary WTP is undertaken manually while automatic coagulant dosing (aluminium sulphate) takes place based on the raw water colour bands. Tipperary County Council outlined at the audit that issues are experienced with the soda ash dosing at the WTP during periods of low raw water colour following high water colour incidents particularly after dry periods.

During the turbidity incident Tipperary County Council undertook raw water sampling to facilitate jar testing off site to determine if further process optimisation of the soda ash dose rates linked to raw water colour would benefit the coagulation stage. The draft report is currently being reviewed by Tipperary County Council and Irish Water. The process change to the raw water pH correction may require the introduction of a final water pH correction treatment stage at the Glenary WTP which would require a major plant upgrade.

2.2	Were the CFC tanks, channels and weirs observed to be clean, level and well maintained during the audit?	Answer
		No

Comment

A build-up of material was visible on the walls of the settlement tanks and on the lamella plates. It was reported that a major clean of the tanks including the walls and lamella plates had been undertaken in July 2022. Clumps of floc were observed to be collecting on the v notches of the settled water outlet channels. No carry over of floc was observed into the channels. Tipperary County Council indicated the settlement tanks would be cleaned by the end of October 2022.



3. Filtration

Answer

3.1	Are the filters designed and managed in accordance with EPA guidance?	No
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Comment

Filter media depth marker posts have been installed in the filters and weir plates have been added to increase the freeboard and prevent loss of filter media in response to recommendations in the previous audit (06/09/2018).

The filter media is to be topped up to 820mm sand depth. This work is expected to be completed by the end of 2022. Irish Water indicated that 820mm is the maximum depth that the sand layer can be increased to based on the current plant design. This increased depth of filter media will not meet the 1,000mm minimum recommended depth as per the *EPA Water Treatment Manual: Filtration*

There is no run to waste or delayed start following filter backwashing.



4. Management and Control

Answer

4.1	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
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Comment

Actions to address the following audit recommendations from the previous EPA audit on 12/09/2018 are ongoing.

- Irish Water should submit a report demonstrating that effective out of hours alarm response procedures are in place to provide safe and secure drinking water on a 24 hour basis taking into account the vulnerability of the supply in the absence of storage. Auto shutdown should be considered in the response. The EPA's Advice Note. No. 3 on E. coli in Drinking Water requires an immediate response in the event of inadequate levels of chlorine in the final water.*

Status: The installation of automatic plant shutdown linked to the residual chlorine and turbidity alarm setpoints is in progress. On the day of the audit delivery of the HMI was awaited and the works were expected to be completed by end of 2022. Subsequent to the audit on 30/09/22 Irish Water confirmed that contractors were on site to carry out preliminary IT works for the installation of the auto shutdown.

- Irish Water should assess the depth of sand in the rapid gravity filters. The assessment should also look at remedial options to prevent the loss of media during backwashing operations. A depth gauge should be installed to facilitate monitoring of the depth of the filter media.*

Status: On the day of the audit the installation of depth gauges and weir plates had been completed. The filter media had been procured to top up the sand layer. Irish Water and Tipperary County Council confirmed that the sand depth cannot be topped up to 1,000mm as per the recommendation of the *EPA Water Treatment Manual: Filtration*. The maximum depth that can be achieved is 820mm based on the plant design.

- Irish Water should ensure that following backwashing that the filters are run to waste for an appropriate period of time or that there is a slow start when a filter is brought back into use.*

Status: At present the delivery timeline to facilitate the installation of a filter run to waste facility at the Glenary WTP has not been confirmed. Irish Water confirmed that this will require a major capital upgrade to the Glenary WTP.



5. Site Specific Issues

5.1

Is there automatic switchover between the duty and standby dosing pumps for all water treatment chemicals used at the Glenary Water Treatment Plant ??

Answer

No

Comment

There is no automatic switchover between the duty and standby chemical dosing pumps (soda ash, aluminium sulphate or polyelectrolyte).

Recommendations

Subject	Glenary Audit 23/09/22	Due Date	12/11/2022
Action Text	<p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues Irish Water should implement the following recommendations without delay.</p> <ol style="list-style-type: none">1. Irish Water should complete the installation of automatic shutdown linked to the chlorine and turbidity alarm setpoints.2. Irish Water should provide an update on the outcome of the investigation into optimisation of the coagulation stage and planned interim remedial works with timeframes for completion.3. Irish Water should (i) provide an update on progress with the works that are currently underway for the replacement of the filter media (ii) examine the feasibility of increasing the depth of the filter media, to meet the requirements of <i>EPA Water Treatment Manual: Filtration</i>, as part of any future filter upgrade works.4. Irish Water should provide details of the planned major upgrade works and estimated timeframe for completion.5. Irish Water should ensure automatic switchover is installed on the duty / standby chemical dosing pumps.6. Irish Water should ensure that the settled water outlet channels and clarifiers are cleaned on a regular basis to prevent build up of algae on the weirs and walls of the clarifiers.7. Irish Water should ensure that following backwashing the filters are run to waste for an appropriate period of time or that there is a slow start when the filter is brought back into use. <p>Follow-Up Actions required by Irish Water</p> <p>During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised.</p> <p>This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 12/11/22 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.</p> <p>The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.</p> <p>Please quote Compliance Plan DW20220134 in any future correspondence in relation to this Report.</p>		