

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	Cootehill PWS
Organisation	Irish Water
Scheme Code	0200PUB0110
County	Cavan
Site Visit Reference No.	SV25878

Report Detail	
Issue Date	20/09/2022
Prepared By	Ruth Barrington

Site Visit Detail			
Date Of Inspection	17/08/2022	Announced	Yes
Time In	11:23	Time Out	15:53
EPA Inspector(s)	Ruth Barrington Lisa Noone		
Additional Visitors			
Company Personnel	Irish Water: Yvonne McMonagle, Peter Gallagher, Fionnuala Bonner, John Crowe Cavan County Council (working under Service Level Agreement to Irish Water): Vincent Craig, Ciaran Fitzpatrick, Elizabeth Doherty, Regina Burke		

> Summary of Key Findings

1. Compliance with the manganese parametric value has improved since July 2022, with the Do Not Consume Notice lifted on 14/07/2022. However, manganese compliance is not yet under control, with further exceedances of the parametric value detected in the week prior to the audit and on four dates since the audit. Irish Water should continue the programme of optimisation of treatment and cleaning/ scouring of raw, process, and treated water tanks, pipelines and network to return manganese levels to compliance.
2. An upgrade of Cootehill Water Treatment Plant is almost complete with final commissioning underway. Irish Water should ensure that all process controls, alarms and shutdowns are enabled as intended and their operation verified.

> Introduction

The Cootehill Public Water Supply (PWS) serves a population of over 2,000 people with water taken from Coragh Lake and treated at Cootehill Water Treatment Plant (WTP).

The audit was carried out to follow up on corrective actions taken by Irish Water in response to high manganese levels in treated water and in the network, including manganese results in excess of both the *European Union (Drinking Water) Regulations 2014 as amended* limit of 50 ug/l and the health linked guidance limit of 120 ug/l. As a result of the exceedances over 120 ug/l, a Do Not Consume (DNC) Notice was in place on the supply from 04/07/2022 to 14/07/2022 to protect public health. Cootehill Water Treatment Plant (WTP) is also in the final stages of a treatment upgrade, which was also examined during the audit.

> Supply Zones Areas Inspected

The main focus of the audit was the manganese removal processes and the new infrastructure provided as part of the water treatment plant upgrade. The site tour also included the raw water abstraction at Coragh Lake source.



1. Source Protection

		Answer
1.1	Is the abstraction source(s) adequately protected against contamination?	No
Comment		
<p>1. The abstraction pipe is located in open water in Coragh Lake. The depth of the pipe intake was not known by Cavan County Council or Irish Water staff, and so the potential for the abstraction to be influenced by seasonal manganese changes in the lake water or lake sediments could not be determined.</p>		



2. Management and Control

		Answer
2.1	Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand?	No
Comment		
<p>1. Completion of the CFC upgrade at Cootehill Water Treatment Plant will enhance the resilience of the supply in relation to volume supplied, CFC, filter, and backwash controls and alarm settings, and contact time. The physical works have been completed but programming of controls still remains to be activated.</p> <p>2. The infrastructure for the CFC upgrade is in place and was in the commissioning phase when manganese levels started to rise in the raw water in early July 2022. As the new clarifier was being operated by the installing contractor during this period, the decision was made to bring the old clarifier back into service on 04/07/2022, operated by Cavan County Council on behalf of Irish Water. This meant that interventions in response to raw water conditions could be made by the WTP caretaker and not through a third party. The old clarifier remained in service at the time of the audit.</p> <p>3. The new flocculation tank and clarifier was included in the site tour during the audit. While not in service, it was noted that the tanks are of stainless steel construction, whereas the old clarifier tank was concrete. There is a drop of approximately 3m in the pipe from the floc tank outlet to the clarifier inlet. Irish Water and Cavan County Council representatives were unable to confirm whether this drop poses a risk of the floc being broken up prior to entry into the clarifier, which would be a potential risk to clarifier operation. The potential for temperature rise on a stainless steel tank as opposed to the old concrete clarifier was also unknown, and may affect the stability of the sludge blanket.</p> <p>4. Management of the manganese removal processes is dealt with in Section 3.1 of this report.</p>		

		Answer
2.2	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
Comment		
<p>1. Media depth in the rapid gravity filters could not be verified during the audit. The installation of a means of measuring filter depth (such as depth gauges) had formed part of the recommendations of the previous EPA audit on 12/08/2021.</p>		



3. Site Specific Issues

3.1

	Answer
Have manganese levels been returned to compliance in the Cootehill Public Water Supply?	No
Comment	
<p>1. The number and concentration of manganese exceedances at Cootehill WTP and in the Cootehill PWS network have decreased since the Do Not Consume Notice was in place. At the time of the audit, results since 12/07/2022 had been below the health linked guidance level of 120 ug/l and the Do Not Consume Notice was lifted on 14/07/2022.</p> <p>2. During the week prior to the audit, exceedances of the parametric value of 50 ug/l were detected in samples taken on 08/08/2022, 10/08/2022 and 12/08/2022. Four samples exceeded the limit during these dates, three of which were in the network and one at the treatment plant.</p> <p>3. Since the audit but prior to issue of this report, exceedances of the parametric value of 50 ug/l were detected in samples taken on 29/08/2022, 02/09/2022, 12/09/2022 and 13/09/2022. Ten samples exceeded the limit during these dates, nine of which were in the network and one at the treatment plant. One of the network samples exceeded the health linked guidance level of 120 ug/l.</p> <p>4. While manganese levels have decreased overall since July 2022, compliance has not reliably been achieved with the <i>European Union (Drinking Water) Regulations</i> parametric value of 50ug/l.</p> <p>5. Irish Water and Cavan County Council have adjusted the process at Cootehill to improve the oxidation of manganese ahead of the filtration stage, by increasing the rate of potassium permanganate dosing and lowering the oxidation pH to a more appropriate level (pH 8.4). This enhances the removal of manganese in the sludge. Additional manganese dioxide or Green Sand was also added to the filters to improve the removal of manganese which may have carried over to the filters.</p> <p>6. Cavan County Council staff noted during the audit that potassium permanganate dosing could not be increased much further due to pump capacity, and concerns that carry over would lead to visual impacts on water quality, pink water being caused by excessive potassium permanganate dose.</p> <p>7. A number of actions remain to be completed by Irish Water, which will further assist compliance with the manganese parametric value. (i) The final works on commissioning of the CFC upgrade will enhance the controls over these processes, but may require further optimisation to deal with the range of raw water manganese levels experienced seasonally in Coragh Lake. (ii) Cleaning of raw water mains, WTP tanks, reservoir and network flushing will assist in removing sediment build up but have not yet been carried out due to water shortages and demand pressure within the supply over late summer of 2022.</p> <p>8. A formal assessment of the manganese removal efficiency of the Green Sand in the filtration stage has not yet been undertaken.</p>	

Recommendations

Subject	Cootehill Audit 17/08/2022	Due Date	20/10/2022
Action Text	<p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water in the Cootehill PWS. 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 commissioning and optimisation of the CFC upgrade at Cootehill WTP. Alarms and inhibits should be tested and verified as part of this process. An update on the commissioning phase, including commentary on the design of the tanks and pipework as referred to in Section 2.1 of this report, should be provided to the EPA.2. Irish Water should progress the cleaning and scouring of pipelines, process tanks, reservoir and network to remove manganese sedimentation.3. Irish Water should investigate the level of the raw water abstraction pipe within the lake to establish whether it is contributing to raw water manganese levels.4. Irish Water should evaluate the effectiveness of the filters in the removal of manganese through the Green Sand layer.5. Irish Water should provide an update to the EPA on progress to restore compliance with the manganese parametric value in the Cootehill PWS on the basis of the work done in response to Recommendations 1 to 4 above.6. Irish Water should provide a means of filter media depth measurement, as recommended in the previous EPA audit. <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 Michelle Minihan, Drinking Water Senior Inspector.</p> <p>Irish Water should submit a report to the Agency on or before 20/10/2022 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>		