

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	Ballymagroarty
Organisation	Irish Water
Scheme Code	0600PUB1132
County	Donegal
Site Visit Reference No.	SV25654

Report Detail	
Issue Date	27/06/2022
Prepared By	Ruth Barrington

Site Visit Detail			
Date Of Inspection	03/06/2022	Announced	Yes
Time In	09:18	Time Out	11:30
EPA Inspector(s)	Ruth Barrington Lisa Noone		
Additional Visitors			
Company Personnel	Irish Water: Yvonne McMonagle, Hugh Kerr, Martin Temple Donegal County Council (working under a Service Level Agreement to Irish Water): Paul Lyons, Martin Gallagher, Seamus Delahunty, Eddie McGrane		

> Summary of Key Findings

1. The upgrade works fulfilling the RAL Action Programme have been completed at Ballymagroarty Water Treatment Plant and monitoring results to date show compliant, very low levels of THM. The supporting control philosophy for the operation of the GAC rapid gravity filters, and additional results of verification monitoring remain to be supplied by Irish Water, to support a request for removal of the supply from the RAL.
2. Results of chlorine testing in the network dated 02/06/2022 showed a result below the recommended minimum 0.1 mg/l. The potential link between this result and a low chlorine alarm at Ballymagroarty WTP on the same day did not appear to have been investigated at the time of the audit. Inadequate chlorine levels in the network may pose a risk to public health and should immediately be investigated.

> Introduction

The Ballmagroarty Public Water Supply (PWS) supplies treated water to a population of approximately 800 people. Water is abstracted from Lough Gorman and the existing pressure filtration, UV and chlorination treatment has been upgraded with the addition of Granular Activated Carbon rapid gravity filters for the removal of natural organic matter from the water.

The supply is on the EPA's Remedial Action List (RAL) due to persistent failures to comply with the trihalomethanes (THM) limit specified in the *European Union (Drinking Water) Regulations 2014 as amended*. This audit was carried out to assess the upgrade following completion of the RAL Action Programme works on-site.

> Supply Zones Areas Inspected

The audit included an inspection of the filtration, UV and chlorination processes on-site, along with supporting information on alarms, controls and monitoring results.



1. Disinfection

	Answer
1.1	Is the UV system suitably validated?
	Yes
Comment	
1. The UV system provides primary disinfection at the Ballymagroarty WTP. While the audit was primarily focused on the RAL Action Programme, it was noted that the UV units are appropriately validated under USEPA protocols and operated within their validation.	



2. Management and Control

2.1

	Answer
Is the data obtained from sampling and monitoring used to actively inform the processes on site and in the distribution network?	No
<p>Comment</p> <ol style="list-style-type: none">1. Secondary disinfection for water in the distribution network is achieved by chlorination.2. The daily log book showed a result for a manual free chlorine residual test in the network on 02/06/2022 of 0.05 mg/l. This is below the minimum recommended 0.1 mg/l (<i>EPA Water Treatment Manual- Disinfection</i>) and may pose a risk to public health if disinfection is compromised.3. Donegal County Council representatives stated that a chlorine pump airlock had occurred on the 02/06/2022 and that a low chlorine alarm had been generated at 16.27 p.m. on 02/06/2022.4. The residual chlorine trend on the HMI is not informative as it has no scale or dates applied to the trend information. It was not possible to use this trend to assess the duration of low chlorine during the audit, and therefore it could not inform any required corrective actions at the time.5. Subsequent to the audit, Irish Water provided further information on the incident as requested by the auditors. The duty chlorine pump airlocked and was not dosing for an unknown period of time between the evening of 01/06/2022 and the morning of 02/06/2022. The duration is unknown as it coincided with a SCADA outage. The automatic duty/ standby switchover between chlorine pumps did not occur as there was no pump malfunction- the system believed the pump to be operational, but due to the airlock it was not. There is no WTP shutdown on the basis of low chlorine, and the low-low chlorine alarm did not dial out, possibly linked also to the SCADA outage.6. While the airlocked pump was returned to service, the lack of cross checking between all the operational checks carried out routinely meant that the full implications of the dose failure were not recognised. The potential link between an airlocked chlorine pump, low chlorine alarm and low residual chlorine in the network did not appear to have been investigated fully by Donegal County Council or Irish Water.7. Subsequent to the audit, Irish Water confirmed planned corrective actions to provide a WTP shutdown on low residual chlorine, programmed on the site PLC to eliminate any SCADA communications issues, and replacement of dose pumps with a new model which can detect and eliminate air locks.	



3. Supply on the Remedial Action List

3.1

	Answer
Do the audit findings support progress made with the Remedial Action List upgrades?	Yes
Comment	
<p>1. Works under the RAL Action Programme have been completed at Ballymagroarty WTP. The supply is on the RAL due to persistent exceedances of the THM parametric value specified in the <i>European Union (Drinking Water) Regulations 2014</i> as amended, caused by inadequate processes at the WTP for the removal of natural organic matter from the raw water.</p> <p>2. Irish Water have provided Granular Activated Carbon (GAC) filtration as an additional treatment process to remove THM precursors. The filtration is arranged across three new rapid gravity filters which operate in duty- duty- standby arrangement, and which were brought into service on 23/02/2022. The outlet UVT on each filter is monitored and these results are used to control the filter changeover periods, acting as an indicator for THM compliance. Trials have shown that at least 87% UVT is required to maintain the THM Formation Potential within compliance.</p> <p>3. Some further work is required on the identification of trigger levels for backwash (currently done on a time basis), and for filter changeover, and replacement of media on UVT basis. These levels should be provided as part of Irish Water's request for removal of the supply from the RAL.</p> <p>4. The results of samples taken at the WTP and at three network locations on six dates since the GAC filters were brought into service were available at the audit. All results were in compliance with the THM parametric value, and those in the network ranged from 2 ug/l to 23.8 ug/l in the period 03/03/2022 to 14/04/2022. Results from March and April 2021 by contrast were 68.1 ug/l and 79.34 ug/l.</p> <p>5. Additional samples had been taken prior to the audit and the results were awaited by Donegal County Council and Irish Water. The results of all samples taken should be provided to the EPA as part of Irish Water's request for removal of the supply from the RAL.</p>	

Recommendations

Subject	Ballymagroarty Audit Report 03/06/2022	Due Date	27/07/2022
Action Text	<p>Recommendations</p> <ol style="list-style-type: none">1. Irish Water should provide finalised UVT trigger values for the GAC filter changeovers and media replacement and any changes to the backwash frequency, along with the results of the remaining verification samples, as part of the request for removal of the Ballymagroarty PWS from the RAL.2. Irish Water should install the proposed automatic shutdown of the treatment plant triggered by low chlorine residual at the water treatment plant, and the replacement chlorine dosing pumps.3. Irish Water should ensure that results of operational chlorine monitoring in the network are used as necessary to inform plant processes. <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 27/07/2022 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>		