



Drinking Water Audit Report

County:	Donegal	Date of Audit:	18 th January 2018
Plant(s) visited:	Gortahork Falcarragh Drinking Water Treatment Plant	Date of issue of Audit Report:	30 th January 2018
		File Reference:	DW2009/168 (Aluminium//RAL) & DW2011/20 (THMs)
		Auditors:	Ms Derval Devaney
Audit Criteria:	<ul style="list-style-type: none">The European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended.The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7).The recommendations specified in the EPA Drinking Water Report.EPA Drinking Water Advice Notes No's 1 to 15.The recommendations from previous audit reports.		

MAIN FINDINGS

- i. THM and aluminium levels in Gortahork-Falcarragh Public Water Supply (PWS) continue to breach the limits in the Drinking Water Regulations 2014, as amended, and it is expected to be the case until the new water treatment plant is commissioned and in service.
- ii. The new water treatment for the Gortahork-Falcarragh PWS is substantially complete and it is anticipated treated water from it will go into supply by mid-February 2018.
- iii. The new treatment plant and its operating controls should ensure a safe and secure drinking water supply for the consumers on the Gortahork-Falcarragh PWS.

1. INTRODUCTION

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 drinking water and to determine progress with the EPA's Regulation 10(4) Direction issued to Irish Water on 11th December 2014 and subsequent Action Programme approved by the EPA on 11th February 2015 in accordance with Regulation 10(6) regarding compliance with the trihalomethanes (THMs) parametric value by the 31st December 2016.

The Gortahork Falcarragh Public Water Supply (PWS) is on the EPA's Remedial Action List (RAL), as the supply has continuous THMs failures dating back to March 2011 and aluminium failures since December 2010. The source of the supply is Lough Lagha. The raw water passes through a screen at source for the removal of coarse material. Treatment at the plant consists of coagulation, flocculation, clarification (via a hopper tank upflow clarifier), filtration (via 6 pressure filters), chlorination, fluoridation and pH correction. Irish Water reported that the raw water entering the plant is split with 55% of the raw water by-passing the clarification process to optimise the performance of the clarifiers. The eight pressure filters were installed in the 1960's and 1970's, with two decommissioned currently due to operating difficulties. The filters have not been inspected since 2010 due to H&S concerns regarding safe access and each filter is lacking a turbidity monitor.

The opening meeting commenced at 1 pm at Gortahork Falcarragh Water Treatment Plant. The scope and purpose of the audit were outlined at the opening meeting. The audit process consisted of interviews with staff, review of records and observations made during an inspection of the treatment plant. The audits observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water:

Yvonne McMonagle, Compliance and David Mc Loone, Infrastructure Regional Lead.

Representing Donegal County Council:

Hugh Kerr, Chief Technician; Hugo Gallagher, Waterworks Inspector and Paul McCloshey.

Representing EPS Ltd:

Denis Mc Elligott

Representing the Environmental Protection Agency:

Derval Devaney, Inspector.

2. AUDIT OBSERVATIONS

The audit process is a random sample on a particular day of a facility's operation. Where an observation or recommendation against a particular issue has not been reported, this should not be construed to mean that this issue is fully addressed.

1.	<p>Interim Solution</p> <p>An interim solution was outlined in Irish Water's progress report dated 30th June 2016 which included:</p> <ul style="list-style-type: none">a. Contract award scheduled in Q3, 2016 with construction works to commence during Q4 2016;b. The contract includes for early intervention on THM reduction in the contract period with the provision of a temporary WTP for TOC removal to be installed and commissioned within the first 3 months of the contract. <p>During the EPA's audit on 4th April 2017 it was confirmed that the contract was awarded to EPS Ltd. and works commenced on site in December 2016. The contractor had been shadowing the Local Authority caretaker from January 2017 and assumed full responsibility for operating the treatment plant on 28th February 2017. The contractor stated that jar tests and additional tweaks to the coagulation process were made to optimise the treatment process and work continues to refine the optimal alum dosing rate and pH to react better to the variance in raw water quality. That audit confirmed that there was no additional treatment installed as part of an interim measure at the plant since the EPA's Direction was issued in December 2014.</p> <p>Since that audit THM and aluminium failures continue to occur in the supply.</p>
2.	<p>Long-term Solution</p> <p>The long-term solution as outlined in the approved Irish Water Action Programme dated 11th February 2015 included the upgrading of the WTP at Gortahork to be completed in Q4, 2016.</p> <p>In accordance with Regulation 10(6), the Action Programme submitted by Irish Water dated 30th January 2015 was approved by the EPA on 11th February 2015 and directed Irish Water to complete the proposed upgrade works to ensure compliance with the THM parametric value in the Gortahork Falcarragh PWS as soon as possible but no later than the 31st December 2016.</p> <p>It was evident during the audit that the upgrade works (a new water treatment plant next to the existing water treatment plant (WTP) at Ardsbeg, Co Donegal) was substantially complete on-site. The existing WTP at Ardsbeg will be made redundant once the new plant is commissioned. Irish Water presented a drawing during the audit which illustrated the new water treatment plant consisting of a twin DAFF unit,</p>

	<p>UV and chlorination, a wash water recovery tank, a clear water storage reservoir (under the new control room), sludge treatment facilities, an on-site covered final water reservoir and chemical storage rooms. These treatment stages have been installed on-site and were inspected during the audit.</p> <p>Irish Water stated during the audit that the new process is now in the commissioning phase and it is expected that works will be complete with water being delivered from the new plant within 2-3 weeks. (mid-February 2018). Validation of the process (hydraulic and compliant tests including THMs and aluminium monitoring in the network) and decommissioning the old plant will then commence with a view to taking the supply off the RAL at the end of March 2018.</p> <p>It is expected that the upgrade will address the THMs, aluminium and water pressure issues in the Gortahork Falcarragh PWS.</p>
3.	<p>Treatment</p> <ul style="list-style-type: none"> a. The raw water is sourced from Lough Lagha at a rate of 1,800 m³/day and has consistent water quality. Sodium hydroxide is dosed in-line upon entering the plant to address the low alkalinity and achieve a target pH of 6.2. Alum is then dosed in-line and mixed with a static mixer. b. The flow is then split evenly between two DAFF units (each receiving 50 m³/hr) and consists of a two-stage filter media (sand and anthracite). Each DAFF unit is designed to take up to 100 m³/hr. The filtration rate is 3.5 m³/m²/hr. Backwash is on a 5-minute air and 8-minute water cycle and can be triggered by turbidity levels, head loss, time or by the operator on a manual basis. c. There is scope to use a polymer to aid the coagulation process as such dosing equipment and storage tanks have been installed, but current jar tests indicate that there is no requirement for this chemical. Similarly, ortho-phosphate dosing equipment has been installed at the plant should the need arise to use it to mitigate lead in drinking water arising from any lead pipework that may exist in the distribution network. d. Treated water flows from the DAFF unit to the underground clearwater tank which also provides the filters with its backwash water. e. There is a duty and standby Trojan UV reactor which has yet to be validated on-site. A UVT monitor will be present on-site. Sodium hypochlorite is dosed after UV to ensure a residual chlorine remains in the network and the final water is also adjusted using sodium hydroxide to increase the pH. f. Water then enters an on-site covered and baffled reservoir of 476 m³ capacity.
4.	<p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. THMs continue to fail to comply with the parametric value of 100 µg/l as set out in the <i>European Union (Drinking Water) Regulations 2014, as amended</i>. b. THMs are monitored monthly by Irish Water and the most recent results reported for 2017 are 102 µg/l on 09/10/17 and 109 µg/l on 13/11/17. The highest level of THMs during 2017 was 209 µg/l on 09/05/17. c. Aluminium also continues to persistently fail to comply with the parametric value of 200 µg/l as set out in the <i>European Union (Drinking Water) Regulations 2014, as amended</i>. d. Aluminium is generally monitored monthly by Irish Water and the most recent aluminium results reported for 2017 are 306 µg/l on 18/09/17 and 580 µg/l on 13/11/17. The highest result for 2017 was 688 µg/l which was sampled on 27/02/17.
5.	<p>Management and Control</p> <ul style="list-style-type: none"> a. There are extensive monitoring and treatment controls in place which aim to capture potential problems at each stage of the treatment process from the raw water intake right through to the final treated water stage. This is enabled with the presence of online monitors and alarm systems from start to finish of the treatment process. For example, raw water is monitored for ammonia by an online monitor and pH is monitored in each flocculation tank, and if outside the pH target of 6.2, the process is inhibited. Similarly, there is a turbidity monitor and alarm on the clarified water before it delivers water to the filters which shuts down the process if outside its control settings. There is also a UVT and aluminium monitor on the clarified water pre-filters. Filtered water is also monitored and alarmed with a shutdown if outside its predetermined turbidity/UVT value. All readings

	<p>from online monitors are linked to SCADA which enables remote access to the system.</p> <p>b. There are pre and post reservoir online monitors for pH, chlorine and turbidity. There is dual validation for the final water chlorine residual concentration (via the presence of two online chlorine residual monitors for the same water sample on the water exiting the storage reservoir). The reservoir has eight hours' storage.</p> <p>c. There is a standby generator on-site which is fully automated with 48 hours' fuel storage.</p>
6.	<p>Sludge Management</p> <p>a. Sludge is drawn from the DAFF and backwash water is sent to the washwater tank. There is a 55 m³ capacity picket fence thickener on-site which is dosed with poly to aid sludge thickening before it is sent to the on-site sludge storage tank which has 30 days' storage.</p>

3. AUDITORS COMMENTS

The EPA issued a Direction to Irish Water on 11th December 2014 requesting it to submit an Action Programme to address the persistent THM failures in the Gortahork Falcarragh PWS.

In accordance with Regulation 10(6), the Action Programme submitted by Irish Water dated 30th January 2015 was approved by the EPA on 11th February 2015 and directed Irish Water to complete the proposed upgrade works to ensure compliance with the THM parametric value in the Gortahork Falcarragh PWS as soon as possible but no later than the 31st December 2016.

Irish Water's most recent progress report dated 21st December 2017 states the new treatment plant for Gortahork Falcarragh PWS is substantially complete and it was stated during the audit that it is expected to be fully commissioned and in service by mid-February 2018.

It is noted however that the completion date for the proposed works goes beyond the Direction deadline of 31st December 2016. Irish Water's monitoring reports show THMs continuing to fail to comply with the parametric value of 100 µg/l as set out in the *European Union (Drinking Water) Regulations 2014, as amended*, and it is expected these non-compliances will continue until the new water treatment plant is in place.

4. RECOMMENDATIONS

1. Irish Water shall carry out the proposed upgrade works as soon as practicable to ensure that the final water is compliant with the THM parametric value of 100 µg/l as set out in the *European Union (Drinking Water) Regulations 2014, as amended*, and shall notify the EPA when complete.
2. Irish Water shall carry out monitoring for THMs and aluminium in the network following the upgrade of the Gortahork-Falcarragh PWS to verify the effectiveness of the actions undertaken and submit the results to the EPA.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

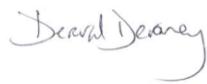
During the audit Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised. This report has been reviewed and approved by Aoife Loughnane, Drinking Water Team Leader.

Irish Water is recommended to put such measures in place as are necessary to implement the recommendations listed in this report. The actions by Irish Water to address the recommendations taken will be verified by the Agency during any future audits.

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.

Please quote the File Reference Number in any future correspondence in relation to this Report.

Report prepared by:



Date:

Derval Devaney

Inspector

30th January 2018