



Drinking Water Audit Report

County:	Wicklow	Date of Audit:	18 th September 2015
Plant(s) visited:	Tinakilly Water Treatment Plant and Aughrim Reservoir (Aughrim Annacurra PWS)	Date of issue of Audit Report:	29 th September 2015
		File Reference:	DW2008/429
		Auditors:	Mr Darragh Page
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>. • <i>The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i> • The recommendations specified in the <i>EPA Drinking Water Report</i>. • The recommendations in any previous audit reports. 		

MAIN FINDING

- i. The main recommendations of the previous EPA audit of 29th May 2014 have not been implemented. In the interim, the chlorine dosing system continued to be operated inadequately putting consumers at risk. This may have been a contributory factor in the detection of *E. coli* on 14th September 2015. Irish Water need to upgrade the disinfection system in the Aughrim Annacurra PWS without any further delay.

1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* 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 in response to the notification by Irish Water dated 16th September 2015 of the failure to meet the *E. coli* parametric value (as specified in Table A of Part 1 of the Schedule of the Regulations) and the subsequent imposition of a boil water notice in the Aughrim Annacurra PWS.

The treatment plant at Aughrim-Annacurra consists of ozonation of the raw water from the Three Wells River followed by slow sand filtration and chlorination. However, at the time of the audit the ozonation plant was not in operation.

Photographs taken by Darragh Page during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 14:00 at the Aughrim Annacurra 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:

Andrew Boylan – Regional Water Compliance Monitoring Liaison Specialist, Irish Water

Francis Glancy – Water Compliance Monitoring Liaison Analyst, Irish Water

Agnes Wojdasle – Process Optimisation, Irish Water

Tselophile Tlou – Water Engineer, Irish Water

Tom Griffin – Senior Executive Chemist, Wicklow County Council

Mary Cahill – Resident Engineer, Wicklow County Council

Kevin McAvoy – Caretaker, Wicklow County Council

Representing the Environmental Protection Agency:

Darragh Page – Senior 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.	Source Protection a. The source of the Aughrim Annacurra PWS is the Three Wells Stream. The source was not examined during the audit.
2.	Filtration a. There are 6 no. new slow sand filters in addition to the 2 no. existing ones. On the day of the audit only one of the new filters and one of the old filters were operational. These were not examined during the audit.
3.	Chlorination and Disinfection a. The previous EPA audit on 29 th May 2014 found that the chlorine residual on the SCADA fluctuated significantly from 0.3 mg/l to 1.5 mg/l within a short space of time. The audit report recommended that Irish Water should review the chlorine dosing arrangements and in particular the variability of the chlorine residual in the final water. It also recommended that Irish Water should consider flow proportional dosing in tandem with residual based dosing to ensure that a stable residual is present in the final water supplied to consumers. b. A summary of the actions following the audit of 29 th May 2014 is as follows: i. IW process optimisation audit of 12 th June 2014 identified improvements required to disinfection system as well as problems in controlling pH ii. IW response to audit of 9 th July 2014 stated that IW was “in discussions with WCC about the immediate introduction of an appropriate disinfection system”. iii. An Assets Needs Brief was submitted to IW by WCC in September 2014. iv. IW confirmed on 2 nd December 2014 that new chlorination system was proceeding and would be complete by Q1 2015. v. Further updates by IW on 18 th May and 27 th July 2015 indicated that IW had implemented a county wide disinfection programme for Wicklow where all plants were being upgraded and Aughrim was in the programme with a completion date of Q3 2015.

	<ul style="list-style-type: none"> c. During the audit IW stated that the works for the upgrade of the disinfection system had gone to tender and a suitable contractor was in place to complete the works at the end of 2014. Subsequently, IW stated that they took a decision to include the upgrade of the disinfection system in the Aughrim Annacurra PWS in the county wide disinfection programme that had commenced in Wicklow at that time. The works in the Aughrim Annacurra PWS were not prioritised within this programme. d. The SCADA printout for the period 17-18th September 2015 (Photo 1) shows that the fluctuations observed in the previous audit were still occurring. This may result in pulses of inadequately disinfected water entering supply. e. WCC stated that they have now introduced a labelling system for drums which states the date manufactured, date delivered and use by date. The latter is determined as 3 months after the manufacture date. WCC stated that they have been refusing delivery of product that was delivered a significant time after manufacture.
<p>4.</p>	<p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. The initial sample taken from a property in St. Martins Drive on 14th September 2015 was found to contain 12 <i>E. coli</i>, >200 Coliforms and 15 <i>Enterococci</i>. b. Resampling was carried out on 15th and 16th September 2015 at various properties on St. Martins Drive and in the raw, filtered, reservoir inlet and final water at the Aughrim WTP. All sampling in properties in St. Martins Drive were compliant but the sample at Aughrim WTP Final Water was found to contain >200 Coliforms. The sample tap was noted to be located close to the ground (Photo 2) with vegetation nearby. c. Further sampling carried out on 17th September 2015 of various locations in the network found 6 Coliforms in one location on St. Martins Drive in the pre-sterilisation of the tap sample. All other results were compliant. d. Investigations into the cause of the failure are ongoing and a conclusion as to the cause has not been reached by WCC or IW.
<p>5.</p>	<p>pH Correction</p> <ul style="list-style-type: none"> a. IW has carried out extensive investigations into the pH issues identified during the previous audit. These investigations have found that the water is extremely aggressive and pH correction may not be possible.
<p>6.</p>	<p>Remedial Actions</p> <ul style="list-style-type: none"> a. IW stated that the Aughrim Annacurra PWS was included in the Wicklow Disinfection Programme and was scheduled to have an upgrade of the disinfection system complete by November 2015. The remedial works include: <ul style="list-style-type: none"> i. New chlorine dosing pumps ii. A new static mixer iii. A new chlorine residual monitor iv. A new HMI PLC v. An online UVT monitor vi. An upgrade of the telemetry system and alarm system vii. pH correction <p>IW stated that these works will proceed as planned.</p> b. Investigations into the cause of the failure are ongoing and a conclusion as to the cause has not been reached by WCC or IW. c. The longer term plan is to replace the Aughrim Annacurra PWS with water supplied from the Vartry Reservoir. These works are scheduled for completion by Q4 2018.

3. AUDITORS COMMENTS

The main recommendations of the previous EPA audit of 29th May 2014 have not been implemented. Following this audit Irish Water had outlined its intention to upgrade the disinfection system to deal with the serious issues identified. These works were scheduled for completion by Q1 2015. However, a decision by Irish Water to delay completion of these works and include them in the Wicklow Disinfection Programme resulted in delaying the planned completion date until Q3 2015. In the interim the chlorine dosing system continued to operated inadequately putting consumers at risk. This may have been a contributory factor in the detection of E. coli on 14th September 2015.

While the EPA welcome a strategic approach at a national, regional and county level to resolving historical treatment deficiencies, where urgent remedial measures have been identified as being necessary to reduce the risk of contamination by the EPA, HSE or Irish Water these works should be carried out in the shortest possible timeframe and the solution should not be put on hold pending completion as part of a national strategy.

4. RECOMMENDATIONS

Disinfection

1. Irish Water should upgrade the disinfection system in the Aughrim Annacurra Public Water Supply in accordance with Section 2 of the [EPA Drinking Water Advice Note No.3 – E. coli in Drinking Water](#) no later than 30th November 2015.
2. Irish Water should ensure that the final water supplied to consumers in the Aughrim Annacurra Public Water Supply has a reliable and consistent disinfectant dose of chlorine that ensures that water supplied is adequately disinfected no later than 30th November 2015.

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 Ms Yvonne Doris, Drinking Water Team Leader.

A direction has issued by the Agency under a separate cover legally requiring specific recommendations to be implemented by Irish Water.

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: 29th September 2015

Darragh Page
Inspector

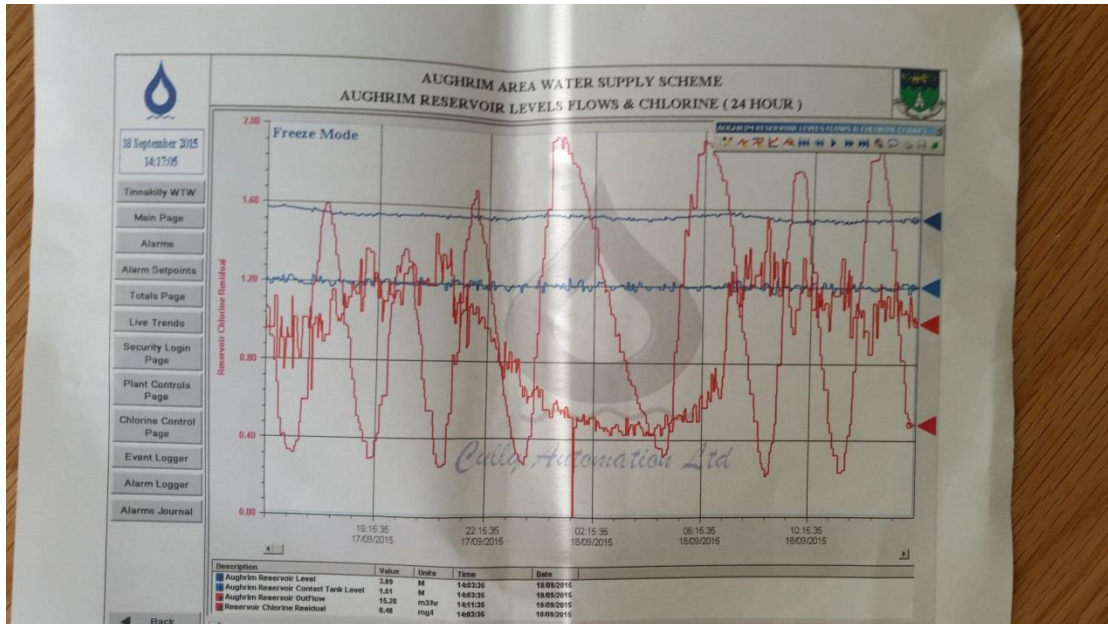


Photo 1. SCADA screenshot of the Chlorine Monitor in the Aughrim Annacurra PWS.



Photo 2. Sample location for Aughrim WTP Final Water (lower tap).