Drinking Water Audit Report

County:	Wicklow	**Date of Audit:**	12th February 2015
Plant(s) visited:	Tinahely PWS	**Date of issue of Audit Report:**	18th February 2015
		File Reference:	DW2015/9
		Auditors:	Mr Darragh Page Ms Aoife Loughnane
Audit Criteria:	• The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).* • *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. • The recommendations in any previous audit reports.		

MAIN FINDINGS

i. The Tinahely water treatment plant is operated and maintained to a very high standard and in particular the hygiene and cleanliness at the plant is exemplary. The caretaker has an excellent knowledge of the plant and is operating the plant to a very high standard.

ii. Low chlorine residuals were reported in the distribution network in 2012 and 2013. Further investigations are necessary to determine whether low residuals observed in 2012/2013 remain a problem in the extremities of the distribution network. Arising from these investigations it may be necessary to review the disinfection policy in the supply to ensure that all consumers are receiving water that has at least 0.1 mg/l residual chlorine.

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 to assess the performance of Irish Water in providing clean and wholesome drinking water.

The Tinahely PWS supplies the areas of Tinahely, Shillelagh and surrounding areas. The plant produces 750-800 m^3/d and serves approximately 3,000 persons. Treatment at the plant consists of coagulation, rapid gravity filtration, chlorination, fluoridation and pH correction.

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

The opening meeting commenced at 10.00 am at Tinahely 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: (* indicates that person was also present for the closing meeting) Mr John Leamy, Operations, Irish Water* Mr Tselophile Tlou – Water Engineer, Irish Water* Mr Tom Griffin, Senior Executive Chemist, Wicklow County Council* Mr Michael Whelan, Caretaker, Wicklow County Council* Representing the Environmental Protection Agency: Mr Darragh Page, Inspector Ms Aoife Loughnane, 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 Tinahely PWS is the Derry River. Activities in the catchment include low density agriculture and forestry. b. The river is subject to sudden changes in flow and quality linked to heavy rainfall. There is a turbidity and ammonium monitor on the intake to alert the caretaker to any deterioration in raw water quality. c. The turbidity of the raw water was reported to be generally low (<1 NTU) and colour levels are normally 50 Hazen but can rise to 300 Hazen.
2.	**Coagulation, Flocculation and Clarification** a. The plant is run intermittently producing 100 m^3/hr when operational. The max capacity of the plant is 2,400 m^3/hr although the abstraction licence only permits a maximum abstraction of 1,800 m^3/hr. b. The raw water is dosed with aluminium sulphate (kibble) and polyelectrolytes. Soda ash is used on occasions when required. There is a streaming current monitor which is used to alert the caretaker when the dose of the coagulant needs to be adjusted. This is used on a manual basis. c. The clarifiers appeared to be operating well on the day of the audit and there were no problems visually observed with the clarifiers. d. The clarifiers are drained and cleaned once per year and it was reported that this was due to take place in one months' time. Notwithstanding this the clarifiers appeared to be clean, free of algae and well maintained.
3.	**Filtration** a. The clarified water is filtered in 2 no. rapid gravity filters. b. The filters are generally backwashed after 50 hours of active service or when the head loss exceeds 1 metre and is run to waste for 10 minutes before being brought back into service. c. A backwash of the filter was observed and appeared to be even with no obvious issues. d. The turbidity of the filtered water on the SCADA was observed to be very low (generally <0.04 NTU).

4.	**Chlorination and Disinfection** a. Filtered water is chlorinated using sodium hypochlorite. b. Duty, trim and standby pumps are in place and there is a chlorine residual monitor on the final water before the water enters the two on-site reservoirs and on the final water leaving the water treatment plant. c. The chlorine residuals for 2015 were observed and appeared to be stable. The inlet monitor and the outlet monitor were alarmed at 0.5 and 0.25 ppm respectively. A documented procedure for responding to alarms (dated January 2012) was on the wall of the water treatment plant. d. There is a chlorine booster station at Tomacork Reservoir (which supplies water to the Carnew area).
5.	**Fluoridation** a. Fluoride is dosed into the final water. b. The bulk storage tank for fluoride was located in a locked area. There is a drain at the rear of the bunded area which drains to an underground storage tank. It was not clear if the base of the bund (which appeared to be concrete) was acid resistant though there did appear to be a liner underneath. Approximately 2 inches from the base of the bund was brickwork which was not acid resistant (see Photo 1).
6.	**Treated Water Storage** a. Disinfected water enters 2 no. circular treated water storage tanks in the grounds of the Tinahely water treatment plant. b. It was reported that these tanks are cleaned every five years and that the next cleaning was due in two years' time.
7.	**Monitoring and Sampling Programme for treated water** a. Weekly sampling results in the distribution network for 2015 were observed and appeared to be all above 0.1 mg/l residual chlorine. The check and audit samples for 2014 were also observed and were all >0.1 mg/l, however, all samples were in Tinahely and none were in the extremities of the network. b. Monitoring results for 2012 and 2013 indicated that several results were below 0.1 mg/l residual chlorine with 4 of the 8 samples analysed in 2012 and 2 of the 5 samples analysed in 2013 below 0.1 mg/l.
8.	**Hygiene and Housekeeping** a. The Tinahely water treatment plant was maintained and managed very well and the standard of hygiene and cleanliness in the plant was very high.

3. AUDITORS COMMENTS

The Tinahely water treatment plant is operated and maintained to a very high standard and in particular the hygiene and cleanliness at the plant is exemplary. The caretaker has an excellent knowledge of the plant and is operating the plant to a very high standard.

However, further investigations are necessary to determine whether the low residuals observed in 2012 and 2013 remain a problem in the extremities of the distribution network. Arising from these investigations it may be necessary to review the disinfection policy in the supply to ensure that all consumers are receiving water that has at least 0.1 mg/l residual chlorine.

4. RECOMMENDATIONS

Coagulation, Flocculation and Clarification

1. Irish Water should investigate the feasibility of automating the chemical coagulant dosing based utilising the streaming current monitor.

Disinfection

2. Irish Water should review the use of disinfectants at the Tinahely PWS and all other public water supplies to ensure that all disinfectants are authorised in accordance with the EU Biocides Products Regulation (528/2012) and associated Irish regulations (*European Union (Biocidal Products) Regulations, 2013*.

3. Irish Water should carry out an investigation into the residual chlorine levels in the distribution network of the Tinahely PWS to determine if there are any parts where the residual chlorine levels are <0.1 mg/l.

Chemical Storage and Bunds

4. Irish Water should review chemical storage arrangements at the treatment plant for the fluoride bulk storage tank to determine if the walls and floor of the storage compound are acid resistant and capable of containing any possible spills.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

During the audit Irish Water's 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.

Irish Water should submit a report to the Agency within one month of the date of this audit report detailing how it has dealt with the issues of concern identified during this audit. The report should include details on the action taken and planned to address the various recommendations, including timeframe for commencement and completion of any planned work.

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:** 18th February 2015

Darragh Page

Inspector

Photo 1. Fluoride Bulk Storage Tank.