Drinking Water Audit Report

County:	Cork	**Date of Audit:**	16/11/18
Plant(s) visited:	Dromore Bantry Drinking Water Treatment Plant (Scheme Code 0500PUB4109)	**Date of issue of Audit Report:**	04/12/18
		File Reference:	DW2018/197
		Auditors:	Ms Criona Doyle
Audit Criteria:	• 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 in any previous audit reports.		

MAIN FINDINGS

i. **Irish Water should undertake a review to determine a suitable turbidity alarm setting and time delay to ensure appropriate alarm levels and response procedures are in place in the event that the raw water quality is compromised.**

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.

The raw water for the supply is obtained from a borehole. The maximum volume of treated water produced is 30m^3/d. Treatment at the plant includes manganese removal and disinfection by chlorination and UV treatment.

The opening meeting commenced at 3:45pm at the Dromore Bantry 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 audit observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water: Deirdre O'Loughlin, Compliance Specialist Salvador McNamara, Water Engineer **Representing Cork County Council:** Michael Russell, Acting Senior Executive Engineer Pauline McAree, Executive Engineer Seamus Sutton, Executive Engineer Michael Russell, Water Curator **Representing the Environmental Protection Agency:** Criona Doyle, 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 current supply borehole is located in an above ground protective chamber. The well head was adequately sealed. b. A copy of the borehole log was available on site. c. A *Cryptosporidium* Risk Assessment was undertaken in 2016 with a final risk score of 31 (low risk). A score of 78 is indicated on EDEN. d. Farm inspections in the buffer zones were undertaken by Cork County Council in February 2018 and no issues were identified. e. Cork County Council contacted the 2 no. landowners with lands within the buffer zones in 2008 and informed them of their obligations under the European Union (Good Agricultural Practice for Protection of Waters) Regulations. A map with the buffer zones was available on site. The landuse within the buffer zones is 80% grassland and 20% forestry.
2.	**Filtration** a. The level of manganese in the raw water is naturally elevated with levels of up to 1.71mg/l being measured. Ion exchange is undertaken to remove manganese. Two ion exchange units are provided. b. Monitoring of manganese is undertaken in the raw water and treated water on a weekly frequency (at the inlet, outlet of reservoir and end of network). The operational monitoring results indicate treated water levels at the plant are less than the drinking water limit but levels on the outlet from the reservoir and at the end of the line are occasionally above the drinking water limit. It was outlined at the audit that there is an issue with manganese coating in the distribution mains. Records confirm that a regular programme of network flushing is in place. c. Regeneration of the ion exchange units is undertaken by automatic backwashing with a brine solution after every $8m^3$ throughput. d. Turbidity monitoring takes place before the reservoir and after manganese removal. There is no alarm or shut down linked to elevated turbidity in the raw water. Turbidity was 0.36 NTU on day of audit. Subsequent to the audit six months of turbidity trend data was provided indicating similar levels. The trend data indicated consistent trends for May, June, July and August 2018 with turbidity < 0.5 NTU. The trend for September and October 2018 indicated considerable variation in the turbidity levels with frequent peaks >1 NTU. This has been reported to be due to the development of a pin hole on the inlet line which introduced air and

	subsequently skewed the readings. This issue has been resolved.
3.	**Disinfection** a. Disinfection consists of chlorination using 10-11% ultra low bromate sodium hypochlorite (25 litre drums) with a production date of 23/10/18. b. Duty and assist chlorine dosing pumps are installed on site. Dosing is flow proportional and linked to the residual chlorine monitor. The pumps automatically switch over every 3 hours. Both pumps are capable of providing the full dose. New chlorine dosing pumps were installed on 10/11/18. c. The target residual chlorine level is 1.0 to 1.1 mg/l and was 1.27 mg/l on the day of the audit. Monitoring of the residual chlorine level takes place in the reservoir. The continuous online monitoring trends are reviewed daily in the Skibbereen office. Subsequent to the audit three months of residual chlorine trend data was provided. As outlined at the audit there are gaps in the data due to signal issues. d. The low level chlorine alarm is set at 0.45mg/l and the high level alarm 2.2 mg/l with 20 minutes delay which triggers shut down of the supply. e. Monitoring of residual chlorine levels is undertaken daily at the end of network. f. The UV disinfection system (Trojan Pro 20 UV) was installed in 2012 due to inadequate contact time. The contact time issue was subsequently resolved with the installation of the 2 no. reservoirs. A contact time of 37.8mg.min/l is now being achieved. g. Duty and standby UV units are provided and were within the calibration date (next calibration due July 2019). The UV unit operates in accordance with the UV intensity setpoint method. A copy of the validation cert was not available at the WTP. h. There is an alarm which triggers auto shut down of the supply when UV unit drops below a dose of 40 mJ/cm^2. The unit immediately shuts down if switch over to the standby unit fails. The dose reading on the day of the audit was 43.29mJ/cm^2. i. Subsequent to the audit a copy of the NSF / ANSI validation cert was provided. The certificate indicates that Trojan Pro 20 is validated for a flow up to 109m^3/d (20 gpm). Three months of trended UV dose data was provided. The trend data provided for August, September and October 2018 indicates a UV dose > 40 mJ/cm^2. There are signal issues with the UV dose trends.
4.	**Treated Water Storage and Distribution Network** a. There are two above ground treated water storage reservoirs each with capacity 23m^3. The reservoirs were last cleaned on 22/05/18.

3. AUDITORS COMMENTS

The Dromore Bantry Water Treatment Plant was found to be well run and managed. The Plant Operational Manual was detailed and good record keeping was observed. All of the recommendations from the audit in 2009 have been implemented.

There is currently no turbidity alarm in place to provide a warning in the event the raw water quality is compromised.

Some signal issues are being experienced at the site in relation to the monitoring of residual chlorine levels, UV dose and turbidity. Irish Water has provided the results of SCADA operational data which demonstrates that the plant is operating satisfactorily.

Irish Water should continue to review the results of the weekly manganese operational monitoring and notify the EPA in the event of persistent exceedances and ensure corrective measures are in place to ensure the levels in the network are within the manganese parametric value.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should update the data on the EPA's EDEN portal with respect to the *Cryptosporidium* final risk score.

Filtration

2. Irish Water should undertake a review to determine suitable turbidity alarm settings and time delays to ensure appropriate alarm levels and response procedures are in place in the event that the raw water quality is compromised. Irish Water is requested to provide two months of turbidity monitoring data following the repair of the pin hole on the inlet line to demonstrate that the issue with the turbidity monitor has been resolved.

3. Irish Water should continue to review manganese results for the supply in accordance with Section 6, sub section 4.3 of the EPA Public Water Supplies Handbook and notify persistent exceedances to the EPA. Irish Water should put corrective measures in place to ensure the levels in the network are within the manganese parametric value.

Disinfection

4. Irish Water should investigate if the signal issues being experienced at the site can be resolved to ensure the recording of trends such as residual chlorine, UV dose and turbidity can be improved.

5. Irish Water should undertake a review of the time delay on the chlorine alarm.

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 Regina Campbell, 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: Fiona Doyle **Date:** 04/12/18

Inspector