Drinking Water Audit Report

County:	Cork	**Date of Audit:**	02/04/19
Plant(s) visited:	Adrigole Drinking Water Treatment Plant (Scheme Code 0500PUB4201)	**Date of issue of Audit Report:**	15/04/19
		File Reference:	DW2016/92
		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. **The purpose of the audit was to assess the suitability of the Adrigole Public Water Supply for removal from the EPA's Remedial Action List (RAL). The Adrigole PWS is on the EPA's RAL since January 2017 due to treatment and management issues identified at the EPA audit in November 2016.**
ii. **A containerised pressure filtration and UV disinfection system has been installed to address the treatment issues. Irish Water have provided verification data to demonstrate the effectiveness of the works.**
iii. **Adrigole PWS will be recommended for removal from the RAL to be published at the end of April 2019.**

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. The Adrigole public water supply (PWS) has been on the EPA's Remedial Action List (RAL) since January 2017 due to treatment and management issues which were identified at the EPA audit in November 2016. This audit was carried out to assess the remedial works undertaken to determine if the supply can be removed from the RAL.

The raw water for the supply is abstracted from the Clashduff River. According to the EPA's EDEN system the current Adrigole PWS supplies a population of 235 with a volume of approximately 237m^3/d. Treatment includes pressure filters and disinfection (UV and chlorination).

The opening meeting commenced at 9:50am at the Adrigole 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:
Tommy Roche, Drinking Water Compliance Analyst
Oliver Harney, Water Engineer
Representing Cork County Council:
Michael Russell, Acting Senior Executive Engineer
Seamus Sutton, Executive Engineer
Con O'Sullivan, Caretaker
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. In response to the recommendation from the previous audit (29/11/16) Cork County Council revisited all farms in the buffer zones during January 2017 and issued letters to landowners to inform them of their obligations under the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (S.I. No. 31 of 2014). b. A turbidity monitor is being installed on the raw water intake. These works have not been completed to date. The monitor will trigger automatic shutdown of the raw water intake when the turbidity exceeds the alarm level. Currently a level of 1.5 NTU (15 minutes delay) is being considered.
2.	**Filtration** a. Two pressure filters have been installed which operate in parallel to treat a maximum combined design capacity of 40m^3/hr. On the day of the audit the plant was operating at a capacity of 23m^3/hr. The filter media is composed of 16/30 Filter Sand and Grade 2 Anthracite. b. Turbidity and UVT are measured on the outlet of each filter. On the day of the audit Filter No.1 turbidity was reading 0.2 NTU. c. The filters are set to automatically backwash either on a timed basis (every 23 hours), head loss or turbidity (0.7 NTU) whichever occurs first. There is also the facility to undertake a manual backwash if required. d. The backwash sequence is 5 minutes up wash followed by air scour for 60 seconds. This is followed by a 3 minute run to waste. There is a 10 minute delay prior to the filter going back into supply after backwashing. e. A backwash holding tank (15.9m^3) provides the filtered water for backwashing. A sludge holding tank (volume 23m^3) and decanting tank (volume 23m^3) are also provided. Desludging of the sludge holding tank will be undertaken by a contractor under an Irish Water framework. f. There is a warning alarm at a turbidity set point of 0.7 NTU (after 10 minutes) after the pressure filter which generates a SMS alert to the caretaker, relief caretaker and executive engineer. g. There is auto shutdown of the plant if the turbidity of the filtered water remains at 0.95 NTU (2 minutes delay).

3.	**UV Disinfection** a. A UV disinfection system has been installed to provide a barrier against *Cryptosporidium*. The units are LBX 90e reactors validated to USEPA UVDGM Calculated Dose Approach. The validated operating range of the UV system was provided to the EPA in advance of the audit. b. Duty and standby UV reactors are provided with automatic switchover (12 hour changeover). c. Plates are attached to both reactors indicating the validation criteria for the units. d. The UV unit is linked to a continuous UVT and dose monitor. The HMI displayed the following at the time of the audit: UVI 107.3 W/m^2; RED Dose 63.52 mJ/cm^2; Power 50%, Flow 40.0m^3/hr; UVT 70.0%. e. The UV units are validated to operate at a flow of 40 m^3/hr and deliver a dose of 40 mJ/cm^2 at 70% UVT. f. The UV disinfection system was operating within its validated range during the audit. g. The dose rate is maintained within the validated range and the plant is alarmed and programmed to shut down if the UV unit drops outside of its validated range. h. The Adrigole WTP has been reviewed under the County Cork Disinfection Programme and upgrades works are to be completed in Quarter 4 2019.
4.	**Treated Water Storage and Distribution Network** a. The reservoir was cleaned on 11th of February 2019. b. The former slow sand filter has been converted to a covered partially treated water storage tank. This provides additional water storage post UV treatment and prior to chlorination. c. Sampling kiosks have been installed at Reenabulliga and Traflask to provide accessible sampling points for monitoring the residual chlorine levels at the end of the network as access to occupied properties in the area was difficult. Monitoring is undertaken on a daily basis.
5.	**Management and Control** a. Training on the UV units and pressure filters has been provided by the UV system contractor to the plant staff. b. At present alarms are being received by both the UV contractor and plant staff until the works are handed over. c. The trends for the UV units are not currently available to view on site on the HMI but are available on the countywide SCADA. A copy of two months of trend data was provided by Irish Water in advance of the audit and demonstrates that the UV units are operating effectively.

3. AUDITORS COMMENTS

The purpose of the audit was to assess the suitability of the Adrigole PWS for removal from the RAL. The audit confirmed that the installation of the containerised pressure filtration and UV disinfection system has been completed. The verification data indicates that the plant is operating effectively.

Adrigole PWS will be recommended for removal from the RAL to be published at the end of April 2019.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should provide confirmation of the completion of the installation of the raw water turbidity monitor to the Agency along with confirmation of the alarm level and time delay.

Treated Water Storage and Distribution Network

2. Irish Water should ensure that a regular programme of reservoir inspection, cleaning and maintenance is in place, in accordance with EPA Drinking Water Advice Note No. 10. Irish Water should confirm that the supply is on the Irish Water reservoir cleaning programme.

Management and Control

3. Irish Water should ensure the trends for the UV units are available to view on site and provide an update to the Agency when the issue has been resolved.

4. Irish Water should ensure that there are standard operating procedures in place for routine and periodic check and maintenance activities to be undertaken by the plant operator on the UV system.

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:** 15/04/19

Inspector