



Drinking Water Audit Report

County:	Kerry	Date of Audit:	09/04/2019
Plant(s) visited:	Caherdaniel Public Water Supply (1300PUB1051)	Date of issue of Audit Report:	08/05/2019
		File Reference:	DW2009/204
		Auditors:	Cliona Ní Eidhin
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended.</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> • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. The Caherdaniel Public Water Supply (PWS) has been on the EPA's Remedial Action List (RAL) since 2009 due to inadequate treatment for *Cryptosporidium* and elevated levels of trihalomethanes (THMs) above the standard in the Drinking Water Regulations. The audit found that significant upgrading works have been completed at the Caherdaniel treatment plant to prevent further *Cryptosporidium* detections and THM exceedances, that all treatment processes had been fully commissioned and that there were no operational issues. There have been no exceedances of the parametric value for THMs in the Caherdaniel Public Water Supply since September 2016 and no *Cryptosporidium* detections since August 2016. In view of upgrading work completed and compliance verified by sampling, the Caherdaniel Public water Supply was removed from the RAL in the Q1_2019 review.
- ii. On the day of the audit, the pressure filtration and UV treatment processes were powered by generator; a temporary arrangement which will remain in place until connection is made to 3-phase power supply. This connection was scheduled to be made one week after the audit date.

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 suitability of the Caherdaniel Public Water Supply (PWS) for removal from the EPA's Remedial Action List (RAL).

The Caherdaniel PWS serves a population of approximately 215, producing 14 m³ / hour. The main raw water source is the Coomnahorna River East which is supplemented occasionally by a second upland stream; Coomnahorna River West. Treatment consists of pH adjustment, coagulation and

flocculation, clarification, rapid gravity filtration, pressure filtration, ultra violet treatment and chlorination.

The opening meeting commenced at 14:30 at Caherdaniel DWTP. 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 Sections 2 and 4 of this report. Photographs taken by Cliona Ní Eidhin are referred to in Section 2 and included in Appendix 1.

The following were in attendance during the audit.

<p>Representing Irish Water: Kian Guihen – Drinking Water Compliance Analyst Ian O’Mahony – Water Lead Oliver Harney – Water Engineer</p>
<p>Representing Kerry County Council: John Horgan - Technician John- Paul O’Sullivan – Caretaker Seamus O’Mahony – Executive Engineer Kathleen McSweeney Casey – Senior Executive Technician Brian Lennon – A/Senior Executive Engineer Niall O’Connor - LAPM</p>
<p>Representing the Environmental Protection Agency: Cliona Ní Eidhin – Inspector</p>

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>Raw Water Quality</p> <p>a. The Coomahorna rivers and intakes were not inspected as part of this focussed audit. Irish Water informed the auditor that raw water quality is consistently good with turbidity typically < 0.50 NTU and UV transmissivity typically at 97%. Raw water turbidity at the time of the audit was 0.30 NTU.</p>
2.	<p>Coagulation, Flocculation, Clarification</p> <p>a. No observations of concern were recorded during an inspection of the coagulation, flocculation and clarification treatment stages.</p> <p>b. It was reported by Irish Water that the raw water is consistently of good quality and, consequently, floc formation and sludge blanket formation is minimal. This could not be verified visually as lamellae plates are in place in the clarifiers. It was verified that there was no visible floc carryover into the decanting channels.</p>
3.	<p>Rapid Gravity Sand Filtration</p> <p>a. Two rapid gravity sand filters are in place with dual media; sand and anthracite. A continuous turbidity monitor is in place on the outflow from each rapid gravity sand filter. They were reading 0.024 NTU and 0.028 NTU on inspection during the audit.</p>
4.	<p>Pressure Filtration</p> <p>a. Containerised pressure filtration was installed in autumn 2018 to allow for operational flexibility in the event of any repairs necessary to upstream processes.</p>
5.	<p>Ultra Violet Treatment</p> <p>a. Duty and standby Wedeco LBX90e UV reactors have been operational at Caherdaniel since November 2018. The units are validated to the USEPA approach to treat water with a minimum UVT of 70% and to deliver a dose of 40 mJ/cm³. The</p>

	<p>maximum flow rate treatable by an individual unit is 40 m³/hr. (See Photograph 1) Irish Water advised that the actual maximum flow is 22 m³/hr. Irish Water advised that the design UV dose of 40mJ/cm² is to provide secondary treatment for protozoa and bacteria inactivation.</p> <p>b. The UV units have UVT and UVI monitors in place which are alarmed. Automatic run to waste and automatic shut-down are triggered at set-points as set out in correspondence submitted to the EPA on 08/04/2019. Alarm set-points were not visible on the control panel and could not be verified as active by the auditor. These set-points were verified as active to the auditor by Irish Water following the audit. The auditor highlighted that visibility of alarm set-points by the plant operator is critical to the management of the UV disinfection units. These should be available on site for verification by the operator at all times.</p>
6.	<p>Chlorination</p> <p>a. The audit confirmed that the disinfection criteria for chlorination as set out in EPA guidance are met at the Caherdaniel Drinking Water Treatment Plant.</p>
7.	<p>Management and Control</p> <p>a. Shutdown based on final water turbidity is in place.</p> <p>b. All monitors were verified to be calibrated with next calibration due dates clearly indicated by labels.</p> <p>c. At the time of the audit, the containerised pressure filtration and UV treatment processes were powered by generator. Irish Water explained to the auditor that this temporary arrangement will remain in place until connection is made to 3-phase power supply. This connection was scheduled to be made one week after the audit date. The generator is supplied to Irish Water by a contractor with replacement in the event of breakdown guaranteed within 2-3 hours.</p> <p>d. An operating manual and standard operating procedures governing the treatment processes in place at Caherdaniel was not inspected as part of the audit.</p>

3. AUDITORS COMMENTS

The Caherdaniel PWS benefits from a consistently good quality raw water source. Significant upgrades have been completed and commissioned at the Caherdaniel plant to ensure adequate treatment for *Cryptosporidium* and for the prevention of trihalomethane formation. Connection to 3-phase power was imminent on the day of the audit and will mark the end of the commissioning phase. There have been no exceedances in water produced by the Caherdaniel plant since 2016. In light of upgrading work completed and verified compliance, the supply was removed from the EPA's Remedial Action List in the Q1 2019 review. Key to ensuring continued compliance and the security of this supply will be effective management of the processes in place, facilitated by the necessary maintenance and operational duties and interventions.

4. RECOMMENDATIONS

Disinfection

1. Irish Water should ensure that the UV disinfection units' operating parameters and alarm set points are available on the relevant HMI control panel at all times and in real time for regular verification and oversight by the plant operator.

Management and Control

2. Irish Water should secure connection to 3-phase power as discussed during the audit and confirm to the EPA when complete. Any issues that may arise associated with the changeover from generator to the new power supply should be communicated to the EPA.
3. Irish Water should ensure that:

- a. A Water Treatment Plant manual is compiled for the Caherdaniel Drinking Water Treatment Plant detailing technical specifications for all plant, structures, materials and consumables relevant to the plant's operation; and that
- b. Standard operating procedures are developed for routine and periodic check and maintenance activities required to be undertaken by the plant operator. Template record sheets should be developed and maintained to record completion of daily/weekly/monthly (etc.) checks required in the operation of the plant.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

During the audit Irish Water representatives were advised of the audit findings. This report has been reviewed and approved by 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 DW2009/204 in any future correspondence in relation to this Report.

Report prepared by:

CNE

Date:

08/05/2019

Inspector

Photograph 1: UV Reactor specification plate

