Drinking Water Audit Report

County:	Kerry	**Date of Audit:**	23/01/2019
Plant(s) visited:	Kilgarvan Public Water Supply (1300PUB1059)	**Date of issue of Audit Report:**	25/01/2019
		File Reference:	DW2008/563
		Auditors:	Cliona Ní Eidhin
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)* • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports.		

MAIN FINDINGS

i. **Remedial actions to address THM exceedances in the Kilgarvan Public Water Supply were confirmed to have been completed and commissioned. Monitoring results submitted to the EPA and reviewed during the audit verified the effectiveness of in-tank aeration in achieving compliance with the THM Total parametric value since its commissioning.**

ii. **The purpose of the audit was to assess the suitability of the Kilgarvan Public Water Supply for removal from the EPA's Remedial Action List (RAL). The audit findings, along with monitoring results submitted to the EPA, will be considered when revising the next RAL at the next review.**

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 and to verify that remedial actions pertaining to the inclusion of the Kilgarvan Public Water Supply (PWS) on the EPA's Remedial Action List for elevated levels of trihalomethanes had been completed.

The Kilgarvan public water supply sources raw water from Coomclogherane Lake, an upland corrie lake located to the south of Kilgarvan village. Treatment consists of three slow sand filters, chlorination and recently commissioned in-tank aeration for removal of THMs. The plant produces approximately 400 m^3/day which is distributed to serve a population of almost 800 in Kilgarvan village and the surrounding areas.

The opening meeting commenced at 10.30am at the Kilgarvan drinking 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:
Patrick Duggan - DW Compliance Specialist Kian Guihen – Drinking Water Compliance Analyst
Representing Kerry County Council:
Paul Cassidy – Technician Pádraig Moynihan - Technician Brian Lennon – A/Senior Executive Engineer Kathleen Casey – Senior Executive Technician Raymond Lyne – AE Capital Seán O'Sullivan – Water Services Capital Maurice Fitzgerald - Water Services Caretaker Networks Seamus O'Mahony – OCS Engineer
Representing the Environmental Protection Agency:
Cliona Ní Eidhin – 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. Coomclogherane Lake, the source of the Kilgarvan PWS, was not visited during this audit. Recent photographs of the intake from the lake were provided by Kerry County Council for review. It was confirmed that no landuse changes have taken place in the lake's catchment since the last EPA audit in 2016. b. The Cryptosporidium risk score is calculated as 27 (low risk). c. Kerry County Council reported that the lake level dropped slightly during the drought of 2018 but not to levels of concern in terms of source security. It was also reported to the auditor that no element of the treatment process was adversely impacted by extreme cold conditions.
2.	**Raw water monitoring** a. Continuous ultra violet transmissivity (UVT) monitoring of the raw water and treated water is ongoing. At the time of inspection, the UVT monitor display panel read 80.20% for raw water with filtered water UVT reading 83.12%. Kerry County Council reported that UVT trending shows very little variability.
3.	**Filtration** a. All three slow sand filter units were in operation during the audit. The filtration rate across the filters was reported by the plant operator to be 0.15 m/hr which is within the rate range recommended in current EPA guidance. b. Each filter unit is cleaned or 'skimmed' approximately twice per year in accordance with a documented procedure maintained at the site. Skimming is triggered when maximum headloss across an individual filter is observed by the plant caretaker. A filter bed cleaning log is maintained by the caretaker and was reviewed by the auditor. Sand depth gauges are not in place as recommended in the last EPA audit report but a documented procedure is in place for measurement and recording of sand depth following skimming which is acceptable. c. After cleaning, filters are run to waste for approximately 2 days to ripen the schmutzdecke.

	Turbidity is the determinand for returning a filter to service following cleaning. d. There remains only one turbidity monitor on the filters measuring turbidity on rotation across the three filters. Turbidity is measured for 5 minutes at a time on each filter's filtrate before moving to the next filter. The adequacy of this monitoring arrangement was queried at the last EPA audit, with Irish Water subsequently concluding that this system is used throughout Kerry in all existing slow sand filtration sites. Manual verification using a portable turbidity meter takes place on a regular basis and is recorded by the caretaker. The auditor noted that, while the historic dataset of verification checks would appear to demonstrate that this turbidity monitoring arrangement delivers representative readings, having one monitor for three filters is not in accordance with current EPA guidance. Individual turbidity monitors should be installed if any future upgrading works are scheduled for this site. e. At the time of inspection, the turbidity monitor display was reading 0.041 NTU.
4.	**Disinfection** a. It was confirmed to the auditor that there has been no change to the chlorination system in place at Kilgarvan since the last EPA audit in 2016. b. Chlorine is dosed at 2 mg/l with a residual of 1.4 mg/l strived for in final water leaving the treatment plant for distribution. On inspection, the final water chlorine monitor display was reading 1.38 ppm. c. Chlorine residuals are checked in the network by Kerry County Council approximately once per month with levels of 0.2 mg/l typically recorded at the end of the network. The auditor remarked that the frequency of checks at the end of the network should be increased. d. A chlorine monitor is in place and alarmed with a low-level set point of 1.1 mg/land a high-level set point of 2.2 mg/l.
5.	**Treated Water Storage and Distribution Network** a. Following disinfection, water is pumped to a new 500m^3 reservoir located within the site compound. This tank was purpose-built to accommodate a new in-tank spray aeration (PAX) system to address elevated THMs. This system was inspected as part of the audit. b. A second turbidity monitor is in place on final water and is alarmed at 0.35 NTU as recorded at the last EPA audit of the plant.
6.	**Monitoring and Sampling Programme for treated water** a. No cryptosporidium detections were made during 2018. One sample is scheduled for 2019 in accordance with Irish Water's Cryptosporidium monitoring rationale.
7	**Chemical storage and bunds** a. The sodium hypochlorite storage tank was bunded and labels on drums indicated that the chemicals in use were within date.
8.	**Hygiene and Housekeeping** a. The plant was clean, tidy and well maintained. Some site works relating to the recent upgrading were to be completed at the time of the audit but these have no impact on the operation of the plant or on water quality. b. Vents on the new reservoir were confirmed to have integrated, insect-proof mesh in place. Inspection and access hatches were sealed.
9.	**Management and Control** a. All elements of the treatment plant, from tanks to pumps and monitors, were noted to be very clearly labelled. b. All pumps and monitors were clearly badged with calibration due dates and were confirmed to be within date. c. The plant control panel relays to central SCADA. d. It was reported that access to this relatively remote and upland site can be challenging during extreme weather events.

3. AUDITORS COMMENTS

The Kilgarvan Public Water Supply has a good quality, stable raw water source which was not adversely impacted by the extreme weather conditions which occurred during 2018. The supply has a barrier to *Cryptosporidium* in place and now has a further in-tank aeration treatment process in place specifically for the control of THMs which has been demonstrated to be effective in maintaining compliance with the THM total parametric value to-date. The treatment plant has all the necessary infrastructure in place to produce drinking water to a high standard and in compliance with the parametric values of the Drinking Water Regulations.

4. RECOMMENDATIONS

General

1. Irish water should update the particulars for the Kilgarvan Public Water Supply on the EPA's EDEN portal as appropriate.

Disinfection

2. Irish Water should ensure that the chlorine residual is routinely and frequently checked (several times a week) at different points on the network, to include the network extremities, to verify that free residual chlorine levels are maintained at 0.1mg/l at all times.

Management and Control

3. Irish Water should include provision for the installation of individual turbidity monitors in any future upgrading works scheduled for this site.

4. Irish Water should identify any routine treatment plant duties that may be compromised should site access be impossible during any future extreme weather events. Contingency or emergency plans should be developed to deal with extreme weather events to mitigate the potential vulnerability of the remote plant during such events when access may be difficult or precluded.

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. Irish Water is recommended to put such measures in place as are necessary to implement the recommendations listed in this report.

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 DW2008/563 in any future correspondence in relation to this Report.

This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.

Report prepared by: CNE **Date:** 25/01/2019

Inspector