



Drinking Water Audit Report

County:	Co. Kerry	Date of Audit:	20/09/2016
Plant visited:	Kilgarvan Drinking Water Treatment Plant. (1300PUB1058)	Date of issue of Audit Report:	07/10/2016
		File Reference:	DW2008/563
		Auditors:	Mr Niall Dunne Ms Criona Doyle Ms Pauline Gillard
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</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. On the 08/03/2016 there was a *Cryptosporidium* exceedance (0.02 oocysts per 10 litres) detected in the Kilgarvan public water supply. Irish Water investigated the exceedance but could not identify the cause. A monitoring programme for *Cryptosporidium* has commenced on this supply.
- ii. Kilgarvan Water Treatment plant is on the RAL for elevated levels of THMs above the Drinking Water Standard. Current treatment at the plant, slow sand filtration, is unable to fully remove organic matter and therefore is inadequate to deal with the THM risk in this supply. Irish Water must ensure that remedial works to remove this supply from the RAL are progressed without delay.

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

Treatment at the Kilgarvan Drinking Water Treatment Plant consists of three slow sand filters and chlorination. The supply serves approximately 1,680 people and produces approximately 290 m³/day. The raw water source is the Coomclogherane Lake. The plant serves Kilgarvan village and the surrounding areas.

Kilgarvan Water Treatment plant is on the RAL for elevated levels of THMs above the Drinking Water Standard. Current treatment at the plant, slow sand filtration, is inadequate to deal with the THM risk.

The opening meeting commenced at 2.00 pm at the Kilgarvan 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:

- Mr Caomhin Curran, Compliance Analyst, Irish Water.
- Ms Siobhan Clifford, Compliance Analyst, Irish Water.
- Ms Kathleen Casey, Senior Executive Technician, Kerry County Council.
- Mr John Ahern, Acting Senior Executive Engineer, Kerry County Council.
- Mr Stephen O’Sullivan, Network Caretaker, Kerry County Council.
- Mr Frank Sheehan, Plant Caretaker, Kerry County Council.

Representing the Environmental Protection Agency:

- Mr Niall Dunne, Inspector.
- Ms Cliona Doyle, Inspector.
- Ms Pauline Gillard, 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.	<p>Source Protection</p> <ul style="list-style-type: none"> a. The source of the Kilgarvan PWS is an upland lake, Coomclogherane. The source was not visited during this audit. b. The main land-use activity within the catchment is agriculture and forestry. Wild goat and deer are also present in the catchment. c. The <i>Cryptosporidium</i> risks score is calculated as 27 (low risk). d. The UVT of the raw water and treated water is monitored continuously. During the audit, the observed UVT of the raw water was 71.88%.
2.	<p>Filtration</p> <ul style="list-style-type: none"> a. Filtration consists of three slow sand filters. The filtration rate across the filters, based on information supplied on the day, is calculated as 0.12 m per hour which satisfies the recommended filtration rate of 0.1 to 0.2 m per hour. b. Only two filters were in operation at the time of the audit, filters one and three. Filter two was out of service for operational reasons. c. The filters are cleaned every four to five months. A filter cleaning procedure manual and a filter bed cleaning log were observed on site, (see photograph 1). d. The plant operators, on the day, were unable to supply the effective size or the uniformity co-efficient of the sand. The depth of sand within the filters is approximately 1m. There was no sand depth gauge within the filters. e. After cleaning, the filters are left to stand for six days ripening period before being brought back into service. Turbidity readings are used to determine whether the filter can be brought back into service, and no microbiological sampling is undertaken to assist in the determination. f. There is only one turbidity monitor on the filters, which measures turbidity alternatively from each filter for a period of 5 minutes at a time. Turbidity on filter one and three was 0.087 NTU and 0.086 NTU respectively. There is no alarm on the filter turbidity monitor.

	<p>g. There is a turbidity monitor on combined filtered water and the alarm level is set at 0.35 NTU. On the day of the audit, the combined filtered water turbidity monitor was reading 0.116 NTU.</p>
3.	<p>Disinfection</p> <p>a. The residual chlorine set point leaving the plant is 1.2 mg/l. On the date of the audit the residual chlorine level was 1.11mg/l on the online monitor.</p> <p>b. The low level chlorine alarm is set at 0.7 mg/l which triggers an alarm to alert the caretakers. There is no automatic plant shut off when the low chlorine alarm is activated.</p> <p>c. Chlorine is dosed within a baffled contact tank; the contact time within the tank is calculated as 74.32 mg.min/l, which is adequate to ensure proper disinfection.</p>
4.	<p>Exceedances of the Parametric Values</p> <p>a. <i>Cryptosporidium</i> was detected in a sample on the 08/03/2016 at a concentration of 0.02 oocysts in 10L. No genotyping was available on the sample. On the 15/03/2016 follow up samples were clear. All <i>Cryptosporidium</i> sampling since this exceedance have been clear. The cause of the exceedance could not be determined.</p> <p>e. <i>Cryptosporidium</i> is sampled at the plant 4 to 6 times a year. There was a <i>Cryptosporidium</i> sampling unit in place at the plant; this is to be operational one month from the date of the audit.</p> <p>f. 2016 monitoring data for treated water was presented during the audit (hard copies provided to the agency). On observation of the data the treated water quality appeared to be of good quality.</p> <p>g. The only 2016 THM data presented on the day of the audit was a result of 71 µg/l taken on 21/03/16. The reason more THM samples had not been taken was that the laboratory was in the process of obtaining INAB certification. Further samples are scheduled to be taken in 2016 and these are to be forwarded to the EPA.</p> <p>h.</p>
5.	<p>Chemical storage and bunds</p> <p>a. The Sodium Hypochlorite drums were banded, and the bund appeared adequate.</p> <p>b. The labels on the Sodium Hypochlorite drums indicated they were in date.</p>
6.	<p>Hygiene and Housekeeping</p> <p>a. The plant was well run.</p> <p>b. The perimeter of the treatment plant is fenced and the site secure. It was clean and tidy on the day of the audit.</p> <p>c. All inspection tanks were sealed and secured with lockable hatches.</p>
7.	<p>Management and Control</p> <p>a. The plant control alarms are set on the SCADA system.</p> <p>b. There is routine servicing of the plant and technicians are available between servicing to deal with issues. All monitors are calibrated and the date was indicated on each individual monitor. Instrument compliance certificates were available during the audit.</p> <p>c. Irish Water proposes to install a DAF plant as a remedial measure to deal with the THM risk. A water management plan of the region, which includes Templenoe and Kenmare, is also to be undertaken.</p>

3. AUDITORS COMMENTS

The cause of the *Cryptosporidium* exceedance on the 08/03/2016, could not be determined. Follow up *Cryptosporidium* sampling has been clear and a sampling programme introduced. Irish Water should continue to monitor for *Cryptosporidium* in the treated water and should inform the HSE and the EPA of any *Cryptosporidium* detections.

There is only one turbidity monitor on the filtered water, working in rotation every 5 minutes, between the three sand filters. Irish Water should ensure that this is adequate to determine water quality.

Subsequent to the audit, on the 19/09/2016, there was a 120 ug/l THM exceedance on this supply. Kilgarvan PWS is on the remedial action list due to elevated levels of THMs above the standard in the Drinking Water Regulations, the proposed date for removal from the RAL is December 2017. Irish Water must ensure that remedial measures to remove this supply from the RAL are progressed without delay and that interim remedial measures are also considered in the meanwhile.

Overall this was plant found to be well run with good management practices in place. Process documentation was up to date and available at the plant and record keeping was of a good standard.

RECOMMENDATIONS

1. Irish Water should investigate whether one filtered water turbidity monitor, working on a 5 minutes rotation, on the slow sand filters is adequate in the determination of filtered water quality.
2. Irish Water should install an appropriate alarm on the filtered water turbidity monitor, to ensure that the caretakers are given adequate notification to any potential issues.
3. Irish Water should install depth gauges on the slow sand filters for checking the media depth, and identifying the minimum sand level (and thus the requirement for replacement of sand media).
4. Irish Water should continue to undertake *Cryptosporidium* and THM monitoring and submit results to the EPA on a quarterly basis. If any *Cryptosporidium* oocysts are detected during the monitoring programme, then Irish Water should immediately contact the Health Service Executive.
5. Irish Water should ensure that remedial measures are progressed without delay to ensure compliance with THMs parametric value. Irish Water should also examine whether interim remedial measures to ensure THM compliance could be installed until final works are complete.

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 Aoife Loughnane, 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 other 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.

Please quote the File Reference Number DW2008/563 in any future correspondence in relation to this Report.

Report prepared by:

ngill

Date:

07/10/2016

Pauline Gillard
Inspector

Photograph 1: Slow sand filter cleaning log.

