



Drinking Water Audit Report

County:	Wexford	Date of Audit:	30/04/18
Plant(s) visited:	Kiltealy water treatment plant (WTP) and spring sources Scheme Code: 3300PUB1548	Date of issue of Audit Report:	22/05/18
		File Reference:	DW2018/80
		Auditors:	Ms Pauline Gillard Ms Ruth Barrington
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014, as amended</i>. • The <i>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. 		

MAIN FINDINGS

- i. *Clostridium perfringens* was detected in the Kiltealy public water supply on 17th April 2018 and a precautionary Boil Water Notice (BWN) was issued by Irish Water on 20th April 2018 following HSE concerns regarding Cryptosporidiosis cases in the community. The sickness was related to private wells but the HSE could not rule out a link to the public water supply.
- ii. This audit was carried out to assess the performance of Kiltealy water treatment plant. The audit found that there is no treatment barrier to *Cryptosporidium* entering the water supply from the spring sources serving Kiltealy water treatment plant, and the chlorine disinfection system does not meet the minimum EPA criteria.
- iii. The future of the supply should be reviewed by Irish Water as a matter of urgency to ensure that the public water supply is safe and secure.

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 in response to the notification by Irish Water dated 23/04/18 of the failure to meet the *Clostridium perfringens* parametric value (as specified in Table C of Part 1 of the Schedule of the Regulations) and a subsequent imposition of a precautionary BWN in the Kiltealy public water supply.

The Kiltealy public water supply is part sourced by springs (water treated at Kiltealy WTP) and part by a borehole source (treated at Ballycrystal WTP, which was not visited as part of the audit). The water from the two plants is not mixed and the *Clostridium perfringens* exceedance was detected in a location served by the Kiltealy WTP. The raw water is sourced from springs at two locations close to the water

treatment plant. Treatment comprises of disinfection by chlorination using sodium hypochlorite. Facilities are in place for pH adjustment but this has not been in use for some time. The treatment plant produces approximately 50 m³ /day and serves a total population of 285 people the Killealy supply area.

The opening meeting commenced at 10.40 a.m. at Killealy WTP. 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:

Siobhan Clifford – Compliance Analyst
Colin Cunningham –Operations

Representing Wexford County Council

Paul Delahunty – Executive Engineer
Fionnuala Callery – Senior Executive Engineer
Tadhg O’Corcora – Senior Executive Engineer
Mike Murphy – Caretaker
Terry Moore - Senior General Services Supervisor

Representing the Environmental Protection Agency:

Pauline Gillard – Inspector
Ruth Barrington - 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. Killealy WTP is located at the edge of the town with the land-use in the immediate area as agricultural. b. Killealy WTP perimeter is fenced and the site is secure. c. A Drinking Water Safety plan is not in place for Killealy public water supply. d. Killealy WTP is fed by two springs. Spring No. 1 is located on private property. The spring was covered, with a locked concrete chamber. There were tree roots growing up in the middle of the spring chamber, and the spring overflow, which was constant during the audit, was flooding the area beside the chamber. These two elements would increase the risk of contamination of the raw water. e. Water is conveyed by gravity to the second spring and mixing chamber. The second spring was covered by a concrete chamber which was locked.
2.	<p>Disinfection</p> <ul style="list-style-type: none"> a. Disinfection at Killealy WTP consisted of chlorination using sodium hypochlorite. b. There are duty and standby chlorine dosing pumps. A chlorine monitor and alarm are in place. The low chlorine alarm set point is 0.15 mg/l and high level alarm is 0.8 mg/l.

	<ul style="list-style-type: none"> c. There is no automatic changeover on the chlorine pumps, or automatic shutdown of the supply, if the alarm is triggered. This presents a risk of undisinfecting water entering supply in the period between alarm trigger and alarm response. d. Access to SCADA is available from Bunclody WTP. e. When the chlorine alarm is triggered there is a documented cascade system in place for responding to the alarm. f. The audit team noted from the Ct calculation provided at the audit that there is adequate chlorine contact time of 33.49 mg.min/l minutes in accordance with EPA Advice Note 3, but that a minimum free chlorine of 0.5 mg/l is required to give that contact time. This free chlorine level may not be provided at all times as the low chlorine alarm is set at 0.15 mg/l as noted above. g. Irish Water stated that both the chlorination and pH control facilities at Killealy WTP will be upgraded under the National Disinfection Programme.
<p>3.</p>	<p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. On 23rd April 2018 the EPA was notified of the detection of <i>Clostridium perfringens</i> (51/100ml) in an audit sample taken on 17th April in Killealy. Upon the advice of the HSE, a boil water notice was issued to the whole supply as a precaution, since the HSE were aware of illness (Cryptosporidiosis) in the community. Although these incidents were in relation to private wells, the HSE could not rule out a link between the illness in the community and the public water supply. b. Investigations by Irish Water and Wexford County Council identified the cause of the <i>Clostridium perfringens</i> exceedances as a failure of the disinfection system at the treatment plant due to a blockage of the chlorine injection point. The chlorine alarm was activated and the caretaker responded. The blocked injection point was fixed on 17th April 2018. c. Chlorine residual levels, both manual tests and monitor read outs, at the treatment plant are recorded daily in the plant logbook by the caretaker. d. <i>Cryptosporidium</i> sampling has been carried out at the plant since the <i>Clostridium perfringens</i> detection on 17th April 2018. 2 samples were clear with no <i>Cryptosporidium</i> detected, but a sample taken on 25/04/18 was positive with a result of 1 Oocyst per 1050 Litres. e. Further microbiological (including <i>Cryptosporidium</i>) sampling is due to be carried out with a view to lifting the boil water notice, subject to HSE agreement.
<p>4.</p>	<p>Management and Control</p> <ul style="list-style-type: none"> a. Staff were unsure when the reservoir was last cleaned and Irish Water stated that this will be reviewed under the Reservoir Cleaning Programme.

3. AUDITORS COMMENTS

Irish Water should review the future of the spring source at Killealy WTP having regard to its lack of a barrier to *Cryptosporidium* entering supply and the risk this poses to the safety and security of the public water supply. The *Cryptosporidium* monitoring should continue as per HSE request in response to the *Clostridium perfringens* exceedance. The audit team noted that the feasibility of expanding the borehole source of this supply (Ballycrystal WTP) is to be examined by Irish Water and consider that this investigation should be prioritised.

The audit team also found that the disinfection system is inadequate because there is no automatic changeover between the chlorine dosing pumps and the contact time should be reviewed with the alarm settings to ensure that disinfection is not compromised.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should ensure that the source protection and catchment risk assessment score for the *Cryptosporidium* risk assessment is reviewed in detail and appropriate measures implemented to reduce the risk of contamination of the source, particularly to address the flooding around Spring No. 1 caused by the spring overflow.

Disinfection

2. Irish Water should review the future of the spring source at Killealy WTP having regard to its lack of a barrier to *Cryptosporidium* entering supply and the risk this poses to the safety and security of the public water supply. The review should address the provision of a suitable *Cryptosporidium* barrier at Killealy WTP or the replacement of the spring source by the Ballycrystal borehole source(s).
3. Irish Water should review the chlorine alarm settings to ensure that an alarm is triggered in the event of water being inadequately disinfected. This review should include consideration of the maintenance of effective contact time (Ct of 15mg.min/l). Irish Water should submit a calculation of the revised effective contact time to the Agency.
4. Irish Water should install automatic switch over on the duty and standby chlorine dosing pump to activate in the event of the failure of one of the pumps.
5. Irish Water should continue the planned microbiological monitoring programme in conjunction with HSE consultation on continuation of the Boil Water Notice.

Treated Water Storage

6. Irish Water should ensure that the service reservoir is inspected and cleaned out on a regular basis and any maintenance and repairs completed as soon as possible after the need has been identified.

Management and Control

7. Irish Water should ensure that hazard mitigation plans, with timeframes, are in place for all hazards identified as high risk in the Drinking Water Safety Plan. Records of progress on these hazard mitigation plans should be kept updated and maintained for inspection by the EPA.

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 Aoife Loughnane, Drinking Water Team Leader

Irish Water should submit a report to the Agency within two weeks 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:



Date:

22/05/18

Pauline Gillard

Inspector