

	<h1>Drinking Water Audit Report</h1>
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County:	Cork	Date of Audit:	04/05/18
Plant(s) visited:	Mogeely Drinking Water Treatment Plant (Scheme Code 0500PUB2508)	Date of issue of Audit Report:	15/05/18
		File Reference:	DW2018/51
		Auditors:	Ms Criona Doyle Ms. Regina Campbell
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</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. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. ***Cryptosporidium* has been detected in the Mogeely Water Supply. Irish Water should provide details on the proposed remedial works, including timeframes, to ensure an adequate barrier to *Cryptosporidium* is provided.**
- ii. **Irish Water should undertake a review of the current turbidity alarm and shutdown settings and time delays to ensure appropriate alarms levels and response procedures are in place in the event that the raw water quality is compromised.**

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 following the detection of *Cryptosporidium* in the Mogeely Public Water Supply (PWS) on the 13th of March 2018 and 25th April 2018.

The raw water for the supply is obtained from an infiltration gallery located adjacent to the Kiltha River. On average the volume of treated water produced at the water treatment plant is 800m³/d. Treatment includes disinfection by chlorination, fluoridation and pH correction. Two storage reservoirs (545m³ each) are provided at the treatment plant site. The supply serves the area of Mogeely, Castlemartyr and Ladysbridge.

The opening meeting commenced at 10am at the Mogeely 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:

Aine Butler, Water Compliance Monitoring Analyst, Irish Water.

Salvador Mc Namara, Water Engineer, Irish Water.

Representing Cork County Council:

Liam Lynch, Senior Executive Engineer, Cork County Council.

Ken O'Keefe, Executive Engineer, Cork County Council.

Thomas Arnott, Caretaker, Cork County Council.

Representing the Environmental Protection Agency:

Regina Campbell, Inspector

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.	Exceedances of the Parametric Values <ol style="list-style-type: none"> On the 22/03/18 the EPA was notified of the detection of <i>Cryptosporidium</i> (0.005 / 10 L) in the treated water at Mogeely from a sample taken on the 13/03/18. On the instruction of the HSE weekly monitoring of <i>Cryptosporidium</i> and <i>Giardia</i> has been taking place. A resample taken on the 28/03/18 was clear. A further exceedance was detected in a sample taken on 25/04/18. The <i>Cryptosporidium</i> risk score for the supply is 105 which is classed as very high risk.
2.	Source Protection <ol style="list-style-type: none"> The infiltration gallery and pump house are located on the east side of the Kiltha River. The perimeter of the site is fenced and secure. Landuse in the immediate vicinity of the site is agricultural. Cork County Council reported that the Zone of Contribution for the infiltration gallery has been delineated. Sampling for <i>Cryptosporidium</i> is scheduled to take place twice per year. There have been no previous detections of <i>Cryptosporidium</i> in the treated water. There has been no programme of raw water monitoring for the supply since 2013. Online monitoring of the raw water turbidity takes place. An alarm is generated when the turbidity exceeds 0.8 NTU. The caretaker, duty caretaker, engineer and Glashaboy control room are notified via SMS of alarm. Auto shut down of the intake is triggered after 30 minutes exceedance of the 1 NTU limit. Irish Water propose to install an online UVT monitor which will be linked to the SCADA in the next month. The area of the infiltration gallery is susceptible to flooding. The pump house is reported to be above historic flood levels. No construction details were available for the infiltration gallery which is reported to be approximately 50 years old.
3.	Disinfection <ol style="list-style-type: none"> Disinfection consists of chlorination using 15% sodium hypochlorite. Duty, standby and trim chlorine dosing pumps are installed on site. Dosing is linked to the

	<p>residual chlorine monitor at the outlet from the reservoir. The duty and standby pumps have automatic switchover. The target residual chlorine level is 0.8 mg/l leaving the reservoir.</p> <p>c. The low level chlorine alarm is set at 0.45mg/l and the high alarm is set at 2.5 mg/l. The caretaker, relief caretaker, engineer and Glashaboy control room receive a text alert in the event of the alarm being triggered. The supply is automatically shut down if a chlorine level of 0.4 mg/l is reached and a manual restart of the supply is required.</p> <p>d. The sodium hypochlorite day tank is filled once a week.</p> <p>e. The contact time calculation was not available on site.</p>
4.	<p>Treated Water Storage and Distribution Network</p> <p>a. Two above ground treated water storage reservoirs are provided on site (545m³ each). One is reported to be approximately 40 years old and the second reservoir was constructed in 2007. The older reservoir was last inspected in 2007. The reservoirs have been emptied but have not been cleaned.</p> <p>b. There is a portion of cast iron main in the network. Flushing is regularly carried out and the residual chlorine levels monitored at end of the network.</p> <p>c. pH levels are also monitored in the network.</p>
5.	<p>Chemical Storage and Bunds</p> <p>a. The chlorine day tank, fluoride and caustic soda day tank were adequately banded.</p> <p>b. Liquid was visible in the bund of the chlorine day tank.</p> <p>c. 3 no. 1,000 litre bulk storage tanks are provided on site for the storage of sodium hypochlorite, hydrofluorosilicic acid and caustic soda.</p> <p>d. pH correction is carried out and a new dosing system was installed in 2017.</p>

3. AUDITORS COMMENTS

Cryptosporidium was detected in the supply on the 13/03/18 with a further exceedance on the 25/04/18. The *Cryptosporidium* risk score indicates the supply is classed as very high risk.

At present the auto shut of the supply is triggered in the event that the raw water turbidity exceeds the level of 1 NTU for a 30 minute duration. Irish Water should undertake a review of alarm set-points and the length of the time delay prior to auto shut down.

Irish Water should undertake raw water characterisation to determine the degree of treatment and controls required to provide an adequate barrier against *Cryptosporidium* to ensure the safety and security of the Mogeely public water supply.

4. RECOMMENDATIONS

General

1. *Cryptosporidium* has been detected in the Mogeely Water Supply. Irish Water should provide details on the proposed remedial works, including timeframes, to ensure an adequate barrier to *Cryptosporidium* is provided.
2. Irish Water are requested to keep the EPA informed of any changes to the HSE advice.

Source Protection

3. Irish Water should carry out characterisation of the raw water quality under different weather conditions. The raw water characterisation should include monitoring for turbidity, UVT and E. Coli bacteria, as an indicator of trends in assessing raw water quality and to determine the degree of treatment and controls required to provide an adequate barrier against *Cryptosporidium*.

4. Irish Water should liaise with Cork County Council to ensure that all landowners are made aware of the setback distances in the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No. 31 of 2014) for the source of the supply. Irish Water should provide details on the most recent inspections undertaken on the catchment.

Disinfection

5. Irish Water should submit details of the effective contact time calculation for chlorine disinfection to the Agency.

Treated Water Storage

6. 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.

Chemical storage and Bunds

7. Irish Water should ensure that the bund on the chlorine day tank is cleaned out and any build up of liquid in the bund is removed.

Management and Control

8. Irish Water should undertake a review of the current turbidity alarm and shutdown settings and time delays to ensure appropriate alarms levels and response procedures are in place in the event that the raw water quality is compromised.
9. Irish Water should provide any available construction details for the infiltration gallery.

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:

Críona Doyle

Date:

15/05/18

Inspector