



Drinking Water Audit Report

County:	Cork	Date of Audit:	21/09/17
Plant(s) visited:	Mitchelstown North PWS (Scheme Code 0500PUB1506)	Date of issue of Audit Report:	05/10/17
		File Reference:	DW2017/125
		Auditors:	Ms. Criona Doyle
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. ***Cryptosporidium* has been detected in the Mitchelstown North Water Supply. The slow sand filters were last resanded during 2009. The level of the sand layer had reduced to < 400mm. Resanding is due to commence during the last week of September 2017. It is expected to take up to 3 months to complete the works.**
- ii. **Continuous monitoring and recording of turbidity is taking place on the outlet of each slow sand filter but no alarm is generated when the treated water turbidity deviates from the acceptable operating range of the filters.**

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 Mitchelstown North Public Water Supply on the 9th of August 2017.

The raw water for the supply is obtained from the Behanagh River. The plant is designed to produce up to 1,650m³/d and the current average daily production volume is 1,304m³/d. Treatment at the plant includes filtration via slow sand filters, disinfection by chlorination and fluoridation.

The opening meeting commenced at 10:30am at the Mitchelstown North 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:

Deirdre O'Loughlin, Compliance Specialist, Irish Water.
Pat Duggan, Water Compliance Monitoring Analyst, Irish Water.
Jim Fitzgerald, SLA Lead, Irish Water
Pat Walsh, Senior Executive Engineer, Cork County Council.
Mary Hickey, Executive Scientist, Cork County Council.
Patrick Kelly, Water Liaison Officer, Cork County Council.
Vincent Strand, Executive Engineer, Cork County Council
Paudie Quinn, Caretaker, Cork County Council.

Representing the Environmental Protection Agency:

Criona Doyle, Inspector.

Representing the HSE:

Stephen Ryan, Senior Environmental Health Officer, HSE.

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 a. On the 17/08/17 the EPA was notified of the detection of <i>Cryptosporidium</i> (0.009 / 10L) in the treated water in the Mitchelstown North Public Water Supply from a sample taken on the 09/08/17. b. On the instruction of the HSE weekly monitoring of <i>Cryptosporidium</i> and Giardia has been taking place since the notification of the initial exceedance. A further exceedance took place on the 05/09/17. No <i>Cryptosporidium</i> was detected in samples on the 22/09/17; 29/08/17 and 12/09/17. c. The <i>Cryptosporidium</i> risk score for the supply is 70 which is classed as a moderate risk.
2.	Filtration a. 8 no. slow sand filters are provided at the water treatment plant. The caretaker reports that due to the rapidly varying raw water quality in response to rainfall there can be difficulties in providing sufficient maturation time after skimming of the filters. This leads to difficulties in taking a filter out of service. b. Since 2002 / 2003 a roof has been in place over the slow sand filters to prevent algal growth. Cork County Council reported that there is an issue with birds roosting inside the roofing structure on occasion. Gale breakers have been installed on the side walls of the roof structure to prevent bird entry however birds can still gain access. c. The filters were last resanded during 2009. The sand layer in the filters has reduced to < 400mm. d. It is proposed to replace the sand layer bring it back up to 800mm thickness. The sand is due to be delivered to site on 22/09/17 and works are due to commence on the 25/09/17. The

	<p>work to replace the sand on all 8 no. filters is expected to take up to 3 months to complete.</p> <ul style="list-style-type: none"> e. It is proposed to commence with the resanding of Filter No. 5 as the trend data for this filter shows the most variation in turbidity. f. The slow sand filter log for 2017 indicates that the frequencies between skimming were 3 to 6 months. g. There were no documented procedures maintained on site in relation to filter maturation following skimming or resanding operations. The caretaker records the maturation time after skimming operation in the Slow Sand Filter Log Book. A copy of the Slow Sand Filter Bed Cleaning Procedure is maintained at Cork County Council Offices and had been brought to the audit. h. Online monitoring and recording of filtered water turbidity takes place on each individual filter. There is no monitoring of the combined filtered water turbidity. No alarm is generated when the turbidity deviates from the acceptable range of turbidities on the filtered water.
<p>3.</p>	<p>Disinfection</p> <ul style="list-style-type: none"> a. Disinfection consists of chlorination using 10-11% sodium hypochlorite. b. Duty, standby and assist chlorine dosing pumps are provided on site. Dosing is linked to the residual chlorine monitor. The pumps automatically switch over every 15 minutes. The target level leaving the reservoir is 1.5mg/l. c. There are two booster chlorination stations on the network at Garrylea Water Tower and Ballyarthur Pumping Station. d. The low level chlorine alarms are set at 0.4mg/l out of the reservoir, 0.6mg/l at Garrylea Water Tower and 0.2 mg/l at Ballyarthur Pumping Station. The caretaker and relief caretaker receive a text alert in the event of the low level chlorine alarm being triggered and the supply is automatically shut down. The high level chlorine alarm level is 2.2mg/l. A copy of the SOP Response to Chlorine Alarms on a Public Water Supply (28/08/15) was provided by Cork County Council. This indicated that the automatic shutdown operates after 30 minutes if the curator / caretaker does not acknowledge the alarm while on site it was outlined that the automatic shutdown was immediate. e. The day tank is filled once a week and recorded in the site diary. f. A summary of the contact time was available on site but the calculation details were not available.
<p>4.</p>	<p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. Approximately 4 hours storage is provided on site (reservoir 362m³). Additional storage is provided at Garrylea Water Tower (30 hours storage). The Garrylea Water Tower cannot serve all of the supply area. Irish Water reported that sites where < 12 hours storage is provided are being reviewed.
<p>5.</p>	<p>Source Protection</p> <ul style="list-style-type: none"> a. There is continuous monitoring of the raw water turbidity with automatic shutdown of the inlet works when the turbidity exceeds 3 NTU for 30 minutes. The shutdown remains in place until the turbidity at the inlet reduces to 1 NTU. A text alert is sent to the caretaker when a level of 3 NTU is exceeded and again when the plant is shutdown. b. A significant portion of the catchment upstream of the intake is occupied by forestry. There are no farmyards on the eastern side of the Behanagh River. There has been some housebuilding in the area in recent years. The <i>Cryptosporidium</i> Risk Assessment has not been updated in recent years. c. The catchment area of the source is within the jurisdiction of Limerick County Council. Cork County Council Environment Section has been liaising with Limerick County Council regarding the monitoring of activities within the catchment. d. Monitoring of <i>Cryptosporidium</i> is undertaken 4 times per year on this supply. e. There is no raw water monitoring programme taking place in 2017. Monitoring results from 2014 and 2016 were provided.
<p>6.</p>	<p>Chemical storage and bunds</p>

	<ul style="list-style-type: none"> a. The chlorine day tank is adequately bunded. b. 25 litre drums of sodium hypochlorite 10-11% are stored in a bunded area and were within the use by date of 06/03/18. A one month supply is stored on site. c. 2 no. bulk storage tanks (3890 litres) for fluorosilicic acid are provided on site in a secure unit. Delivery operations are supervised by the caretaker. The fill point is not located within a bunded area.
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3. AUDITORS COMMENTS

Cryptosporidium has been detected in the treated water on 09/08/17 and 05/09/17. The reduction of the sand layer to < 400mm and the fact that the filters have not been resanded for over 8 years is of concern. In advance of the audit Irish Water had ordered the sand for resanding of the 8 no. slow sand filters. The works were scheduled to commence during the last week of September. It is expected that the resanding operations will be completed within 3 months.

Irish Water should ensure that resanding of the filters is completed as soon as possible and that the procedure for bringing the filters back on line following maturation are followed. At present there is no alarm linked to the online monitoring of the filtered water turbidity.

4. RECOMMENDATIONS

General

1. Irish Water are requested to forward details of any further advice from the HSE following the Irish Water/HSE review meeting scheduled to take place before the end of September.

Filtration

2. Irish Water should ensure that, following the resanding operations, the filters are run to waste for an appropriate period of time. This period of time should be determined on the basis of predetermined water quality criteria specific to the plant.
3. Irish Water should ensure that, following skimming (i.e. removal of the schmutzdecke), the filters are run to waste for an appropriate period of time. This period of time should be determined on the basis of predetermined water quality criteria specific to the plant. Documented up to date procedures should be maintained on site in relation to skimming and running the filters to waste for the appropriate time period.
4. Irish Water should investigate the feasibility of installing an alarm linked to the filtered water turbidity. The alarm settings should take into account Section 3.2 of the EPA Advice Note No. 5 Turbidity in Drinking Water.

Disinfection

5. Irish Water should submit a calculation of the effective contact time to the Agency.
6. Irish Water should review the chlorine alarm response procedures including the current cascade system and confirm if there is a time delay on the auto shutdown in the event of low or high level chlorine alarm being triggered.

Source Protection

7. 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.
8. Irish Water should liaise with the Limerick County Council Environment Section and provide

an update to the Agency on the status of Catchment Inspection, Farm Surveys and Septic Tank Inspections in the catchment area and confirm if landowners have been informed of their obligations under the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No. 31 of 2014)*.

Chemical Storage and Bunds

- 9. Irish Water should ensure that the filling point for the fluorosilicic acid storage tanks is within the bunded area.

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:

05/10/17

Inspector