



Drinking Water Audit Report

County:	Kilkenny	Date of Audit:	15/11/2018
Plant(s) visited:	Bennettsbridge Regional PWS (Scheme Code1500PUB1002)	Date of issue of Audit Report:	29/11/2018
		File Reference:	DW2017/13
		Auditors:	Ms. Regina Campbell
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended.</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. Irish Water is progressing upgrade works at Bennettsbridge Water Treatment Plant including installation of a filtration system and UV disinfection system in order to provide an effective barrier for *Cryptosporidium*. Irish Water have advised that the Projected Date of Completion (installation, testing and validation) is December 2018 with a further period necessary to undertake verification work to support removal of this supply from the EPA’s Remedial Action List (RAL) in Q1 2019. Irish Water should progress the works without delay in order to meet these deadlines.
- ii. Irish Water should undertake the necessary works to ensure that new Borehole No. 4 is constructed, sealed and protected in accordance with EPA Drinking Water Advice Note No. 14: Borehole Construction and Wellhead Protection.
- iii. Irish Water should prioritise the inspection, cleaning and maintenance of the two reservoirs on this supply as soon as possible after the filtration and UV systems are commissioned. This is order to reduce the potential for any contamination from the reservoirs.

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.

Cryptosporidium was detected in the Bennettsbridge Regional Public Water Supply (PWS) on 07/02/2017 and the PWS was subsequently included on the EPA’s Remedial Action List (RAL). This audit was undertaken to assess Irish Water’s progress in completing remedial actions.

The Bennettsbridge PWS produces on average of 2,800m³/day currently. It serves a population of 4,619. The supply has two main raw water sources, an infiltration gallery and four groundwater boreholes.

Water from the infiltration gallery and boreholes is pumped to a sump where it is mixed. It is then disinfected using chlorine gas and pumped to a reservoir.

Photographs taken by Regina Campbell during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 10.20am at Bennettsbridge 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:

Tommy Roche, Drinking Water Compliance

Michael Tuohy, Water/Wastewater Engineer

Representing Kilkenny County Council:

Philip Dunne, Caretaker

Ken Boland, SEE

Joe Scully, EE

Representing the HSE:

Marion O' Neill, SEHO

Representing the Environmental Protection Agency:

Regina Campbell, 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

The supply has two main raw water sources, an infiltration gallery (supplying approximately 40%) and four groundwater boreholes (supplying the remaining 60%).

Infiltration Gallery

The infiltration gallery is located on a floodplain approximately 10m from the River Nore. It is approximately 220m in length and water is collected in a pipe and flows by gravity to the water treatment plant. According to the EPA Groundwater Monitoring Programme Site Information Report (August 2011), the infiltration gallery was constructed in the 1960's into the sands and gravels alongside the River Nore. The estimated Zone of Contribution (ZOC) is 2.53 km². Groundwater vulnerability within the ZOC is high. The risk assessment section of the report says that pressures are diffuse with nitrates and phosphates listed as typical contaminants.

Groundwater Boreholes

There are four active groundwater boreholes at the site. Three boreholes are located in the area of the infiltration gallery and the fourth is located near to the plant. All boreholes are raised above ground level in order to protect them from floodwaters. The inspection chambers for the boreholes were locked.

During the summer drought, water restrictions came into play due to reducing yields from the infiltration gallery and from one of the boreholes in particular.

	<p>Irish Water drilled a new trial borehole (referred to in this report as Borehole No. 4) during the summer 2018. The borehole underwent testing prior to going into production on 12/10/18. It is producing 30m³/hr at the moment. Irish Water said that Borehole No. 4 was being modified in its existing location to become a permanent borehole (see Photos 1 and 2). Irish Water advised in correspondence to the EPA (dated 09/11/18) that the geology at the site will only facilitate construction of a borehole to G2 or G3 standard. Irish Water advised that manganese levels in the new borehole are high but mixing with water from the other sources ensures that concentration in the final water is below the manganese parametric value.</p> <p>Raw water from the boreholes and infiltration gallery are mixed together in a sump prior to chlorination.</p> <p>I was advised by the caretaker that there are turbidity monitors on Boreholes 1, 2 and 3, on the infiltration gallery and on the final water. The turbidity monitors are not alarmed. There is no turbidity monitor currently on new Borehole No. 4. The caretaker also takes regular turbidity readings of the combined sources at the plant. The caretaker advised that the combined water turbidity readings are generally < 0.4 NTU. On the day of the audit, the HMI display showed a final water turbidity reading of 0.115 NTU.</p> <p>It was observed that cattle had been recently grazing on the field running parallel to the infiltration gallery and well-field. The field was fenced off to prevent animal access to the area where the boreholes and infiltration gallery are located. Irish Water were not able to verify when landowners were last written to in relation to the requirements of the <i>European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)</i>.</p>
<p>2.</p>	<p>Disinfection</p> <ul style="list-style-type: none"> a. The water is disinfected using chlorine gas. Irish Water said that it is likely that the use of chlorine gas will be discontinued at this site as part of Disinfection Programme upgrade works that will take place following installation of the filtration and UV systems. b. There are duty and standby chlorine dosing arrangements in place and dosing is based on the target residual chlorine level of 0.5mg/l leaving the reservoir. c. There are alarmed chlorine monitors at both reservoirs on the supply, the Rathduff and Cherrymount reservoir. <ul style="list-style-type: none"> -<i>Rathduff Reservoir</i>: Low chlorine alarm 0.4mg/l and high chlorine alarm 1.0mg/l -<i>Cherrymount Reservoir</i> Low chlorine alarm 0.2mg/l and high chlorine alarm 0.6mg/l d. Chlorine readings on the day of the audit were 0.59mg/l at the Rathduff reservoir and 0.43mg/l at the Cherrymount reservoir. e. There is a procedure in place for responding to chlorine alarms. f. Irish Water were unable to confirm the effective chlorine contact time calculation for the supply during the audit.
<p>3.</p>	<p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. There are two reservoirs on the supply, the Rathduff and Cherrymount reservoirs. The Rathduff reservoir feeds the Cherrymount reservoir. Both reservoirs were constructed in 1959-1960. The Cherrymount reservoir was visited during the audit. There was vegetation growing around the edges of the inspection hatches and it was noted that there were small holes in the hatches that could allow the ingress of contamination into the reservoir (see Photo 3). b. The caretaker outlined that residual chlorine levels are monitored several times a week on the network and are logged.
<p>4.</p>	<p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. There was a <i>Cryptosporidium</i> detection for a sample taken on 07/02/2017. There has been no <i>Cryptosporidium</i> detection since then.
<p>5.</p>	<p>Management and Control</p> <ul style="list-style-type: none"> a. The caretaker was very knowledgeable and helpful about the management and control of the water treatment plant

6.	<p>Progress in relation to Construction Works</p> <p>a. EPS (site contractors) gave an outline of progress in relation to the upgrade works. A total of six pressure filters are to be installed at the treatment plant. Four are in storage on the site in one container and have come from another water treatment plant and two more filters are currently under construction off-site and are due to arrive at the site in February. The media in the filters will comprise of crushed glass. UV units are also in storage at the site. It is intended that sludge from the media backwashing will be sent to a holding tank prior to removal off-site. I was informed that it is intended to have the filtration and UV systems installed by the end of December 2018 with verification to take place in Quarter 1 2019.</p>
----	--

3. AUDITORS COMMENTS

This audit was undertaken to assess progress in relation to upgrade works required to put an effective *Cryptosporidium* barrier in place. Construction works are ongoing and Irish Water should complete the construction, commissioning and verification work without delay. Once the filtration and UV units are installed and commissioned, Irish Water should progress upgrade works at this supply under the Disinfection Programme.

The audit also provided an opportunity to inspect the new Borehole No. 4 drilled during summer 2018. Irish Water should undertake the necessary works to ensure that the final borehole is constructed, sealed and protected in accordance with EPA Drinking Water Advice Note No. 14: Borehole Construction and Wellhead Protection.

It is important that the reservoirs on this supply are prioritised for inspection and repair in order to reduce the risk of any contamination entering the water from these structures.

4. RECOMMENDATIONS

General

1. Bennettsbridge PWS is on the EPA's Remedial Action List (RAL) for inadequate treatment for *Cryptosporidium*. Irish Water is progressing upgrade works at Bennettsbridge Water Treatment Plant including installation of a filtration system and UV disinfection system in order to provide an effective barrier for *Cryptosporidium*. Irish Water have advised that the Projected Date of Completion (including installation, testing and validation) is December 2018 with a further period necessary to undertake verification work to support removal of this supply from the EPA's Remedial Action List (RAL) in Q1 2019. Irish Water should progress the works without delay in order to meet these deadlines.

Source Protection

2. Irish Water should undertake the necessary works to ensure that Borehole No. 4 is constructed, sealed and protected in accordance with EPA Drinking Water Advice Note No. 14: Borehole Construction and Wellhead Protection.
3. Irish Water should confirm the Irish Water classification of Borehole No. 4.
4. Irish Water should liaise with Kilkenny County Council and confirm that landowners have been written to in relation to the requirements of the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)*.
5. Irish Water should ensure that there is a continuous turbidity monitor on each of the raw water sources for this supply. These monitors should be linked to a recording device and generate an alarm in the event of a deviation from the acceptable turbidity levels.

Disinfection

6. Irish Water should confirm the effective contact time to the first consumer.
7. Irish Water should provide a timeframe for the Disinfection Programme upgrade works of this supply.

Treated Water Storage

8. Irish Water should prioritise the Rathduff and Cherrymount Reservoirs on the inspection and maintenance programme to ensure that there is no ingress into the reservoir. This work should be done as soon as possible after the completion of the filtration and UV upgrade works.

9. Irish Water should ensure that all hatches on the reservoirs are secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism.

Distribution System

10. Irish Water should confirm the volumes and population supplied by the Bennettsbridge supply and update EDEN.

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 Dr. Michelle Minihan, Senior Inspector, Drinking Water Team.

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:

Regina Campbell

Date:

29/11/18

Regina Campbell

Inspector

Appendix 1 Photos

Photo 1 New Borehole No. 4



Photo 2: Partially completed Borehole No. 4 well head.



Photo 3 Inspection hatch on Cherrymount Reservoir

