



Drinking Water Audit Report

County:	Clare County	Date of Audit:	11/02/2016
Plant(s) visited:	Carron Public Water Supply (0300PUB1031)	Date of issue of Audit Report:	02/03/2016
		File Reference:	DW2015/210
		Auditors:	Mr Niall Dunne
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. **This supply was audited as the EPA was informed that the chlorine residual contact time was inadequate. As there is UV disinfection in place a residual chlorine contact time is not deemed necessary, as chlorine only provides a residual disinfectant within the network. The main finding of the audit is that the UV system, the primary disinfectant, is operating outside its validation zone and is not in compliance with the *EPA Drinking Water Advice Note Number 3: E. coli in Drinking Water*. Therefore there is a potential for consumers to receive inadequately disinfected water.**
- ii. **The chlorine disinfection system is inadequate and does not meet the standards set out in *EPA Drinking Water Advice Note Number 3: E. coli in Drinking Water*, as there is no auto switch over between the duty standby chlorine dosing pumps and there is no dial out chlorine residual alarm in place.**
- iii. **There is insufficient water capacity at the treatment plant during periods of high demand.**

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.

The Carron water treatment plant is served by two springs. The supply serves a population of approximately 120 with a daily output of 63 m³/day. Treatment at the plant consists of chlorination and UV only.

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

The opening meeting commenced at 12.15 pm at Carron 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: (* indicates that person was also present for the closing meeting)

Deirdre O'Loughlin* - Compliance Specialist;

Patrick Duggan* - Compliance Analyst;

Duane O'Brien* - IW operations;

Kevin Murphy *- Water Engineer;

Representing the Local Authority:

Anthony McNamara *- Senior Executive Engineer;

John Strand* - Engineer;

Maeve Lait *- Senior Executive Technician;

Maura Mc Nulty *- Executive Scientist;

Roisin Breheny* - Executive Technician;

Martin Carkhill* - Caretaker.

Representing the HSE

Rory O'Dea* - Senior EHO;

Representing the Environmental Protection Agency:

Niall Dunne *- 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

- a. This supply is fed by two spring sources, (only one was visited during the audit).
- b. The spring, that was audited, is located adjacent to a farm as well as to the treatment plant, cattle were observed adjacent to the spring, (see photograph 1). The spring is fenced off and covered.
- c. Clare County Council (CCC) stated that farmers within the vicinity of the springs have been written to as required under the GAP regulations.
- d. The Crypto risk assessment score is moderate (66).
- e. *Cryptosporidium* samples taken on 15/05/2015 returned results of < 0.01 /10 L.
- f. IW proposes to sample for *Cryptosporidium* every quarter, samples previously were taken once a year.
- g. Raw water bacteriological samples taken in 2015 and 2016, by Clare County Council (CCC), were clear of *E.coli*.
- h. IW is proposing to undertake a UVT monitoring programme on raw water.
- i. CCC stated that during periods of high demand, tankered chlorinated water is pumped into the raw water storage tank to meet demand.

<p>2.</p>	<p>Chlorination and Disinfection</p> <p>a. According to CCC there is no auto switch over between the duty standby chlorine dosing pumps and there is no dial out chlorine residual alarm in place. CCC stated that the caretaker visits the plant three to four times a week.</p> <p>b. During the day, 8 am - 12 am, treated water is pumped to the reservoir and then back fed to consumers. The storage capacity of the reservoir is approximately two days. However, according to CCC, during the night time hours of 12am – 8am, while the plant is not operational, water is not pumped to the reservoir and consumers receive their drinking water directly from the standing water within the rising main. Hence, according to CCC, there is a potential that 8 households and 5 farms do not receive adequately disinfected water. Veolia calculated this night time Ct as being 1.79 mg.min/l. It was observed that the treatment plant was also not operational at the start of the audit. The plant was switched on for the purposes of the audit.</p> <p>c. CCC stated that they have not issued any written health advice to consumers regarding inadequately disinfected water.</p> <p>d. The reading on the chlorine residual monitor, at the time of the audit, was 1.47 mg/l, once the plant was switched on. Chlorine residual readings taken at the end of the network, observed in the caretaker’s diary, were in the region of 0.1 mg/l.</p> <p>e. CCC stated that the plant does not start pumping to the reservoir until the UV lamps have reached operating temperature, approximately 6 minutes.</p> <p>f. There are duty standby UV units in place but there is no automatic switchover between the units. The UV system is connected to a UVI monitor and not a UVT monitor. There are no dial out alarms in place.</p> <p>g. IW stated that the UV units operate outside their following validation ranges: UVI 46 W/m², UVT 94.7% @ flow of 7.18 m³/hr. The observed UVI was 32 W/m² and raw water monitoring samples show the UVT range varies between 84.1 % to 96.5%.</p>
<p>3.</p>	<p>Monitoring and Sampling Programme for treated water</p> <p>a. CCC stated that four check and one audit samples are carried out annually.</p>

3. AUDITORS COMMENTS

Veolia calculated the residual chlorine contact time as 1.79 mg.min/l. These calculations relate to night time hours, 12am - 8am, when the treatment plant is not operational; when consumers receive their drinking water directly from the standing water within the rising main. CCC stated that during the day consumers receive adequately disinfected water. However, the main issue with disinfection on this supply is not the residual chlorine contact time, but the fact that the UV units, which are in effect the primary disinfectant, are operating outside their validation range. Once a fully functioning UV system is in place, which meets the requirements of *EPA Advice Note No. 3: E.coli in Drinking Water*, it is not necessary that a residual chlorine contact time is achieved, as the chlorine only serves to provide a residual disinfectant within the network, 0.1 mg/l should be achieved at the extremities of the network. It is the inadequacy of the UV unit, the primary disinfectant, in this instance which is of particular concern, as this could result in consumers receiving inadequately disinfected water.

There are further issues with the UV and the chlorine disinfection systems; there is no auto switch over between the UV units or between the duty standby chlorine doing pumps and there are no UV or residual chlorine alarms in place. Neither the UV system nor the chlorine dosing systems are in compliance with *EPA Advice Note No. 3: E.coli in Drinking Water*.

IW stated that upgrade works to this plant are included in the Clare disinfection programme. Proposed works include upgrades to the UV system, the chlorination system and to the rising main. IW estimate that these works will take approximately 12 months to complete. Both the UV and the chlorine disinfection systems should be upgraded as a priority, to ensure compliance with EPA standards and to guarantee that consumers receive adequately disinfected water.

Another serious concern is the lack of a chlorine residual alarm, as the caretaker does not visit the plant daily and there is no auto-switch over in place there is a potential for any issues with the chlorine

dosing system to go undetected for prolonged periods. The installation of a chlorine residual alarm will be dealt with separately under a direction.

There is also a storage capacity issue at this plant. During periods of high demand water has to be tankered in to supplement demand. IW must ensure that storage capacity at the plant is increased to meet periods of high demand.

4. RECOMMENDATIONS

1. Irish Water should submit a program of works, with timeframes, for each of the following remedial works;
 - a. The installation of a UV system to ensure compliance with the *EPA Advice Note No 3: E.coli in Drinking Water*.
 - b. The upgrade of the chlorine disinfection system to ensure compliance with the *EPA Advice Note no 3: E.coli in Drinking Water*.
 - c. The upgrade of the rising main.
 - d. Works to increase the capacity of the treatment plant, to ensure supply can be maintained during periods of high demand.

2. Irish Water should consult with the HSE, to determine whether and what advice should be given to consumers on this supply, regarding inadequately disinfected water.

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 Mr. Darragh Page, Senior Inspector.

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.

A direction has issued by the Agency under a separate cover legally requiring specific recommendations to be implemented by Irish Water.

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 DW2015/210 in any future correspondence in relation to this Report.

Report prepared by:



Date:

02/03/2016

Niall Dunne
Inspector

Photograph 1: Spring source adjacent to water treatment plant and farm. Cattle observed in the field adjacent to spring.

