



Drinking Water Audit Report

County:	Kilkenny	Date of Audit:	19/6/2014
Plant visited:	Castle Hill, Coan, County Kilkenny	Date of issue of Audit Report:	4/7/2014
		File Reference:	DW2014/259
		Auditors:	Ms Yvonne Doris
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 EPA Report on <i>The Provision and Quality of Drinking Water in Ireland</i>. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

The Castle Hill supply disinfection system is inadequate and Irish Water is required to upgrade the disinfection system to meet the appropriate criteria set out in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water* without delay.

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. Where the text refers to the Water Service Authority this refers to Irish Water in accordance with Section 7 of the Water Services (No. 2) Act 2013.

The Castle Hill supply serves about ten houses in Coan, County Kilkenny. The source is a well of unknown age. Volume supplied is 8-10m³/day. Treatment includes manganese removal and UV disinfection. There is no storage in the network. Kilkenny County Council Water Services took the supply in charge in January 2014.

Photographs taken by Yvonne Doris during the audit are attached to this report and are referred to in the text where relevant. The audit commenced at 10.50am at the Castle Hill supply. The scope and purpose of the audit were outlined. 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)

Name – Job Title

Liam Brett, Water Engineer, Irish Water*

Eamonn Morrissey, Kilkenny County Council*

Representing the Environmental Protection Agency:

Name – Job Title

Yvonne Doris, 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. The age of the well is unknown and is located within the pumphouse in front of the houses it serves. b. No records of the source were available at the audit (depth, drill logs, details of casing). c. The wellhead was unsealed and the top of the wellhead was below ground level (photograph 1). d. Kilkenny County Council Environment Section is undertaking catchment work under the Good Agricultural Practice Regulations. e. No raw water monitoring has been carried out on the Castle Hill source.
2.	<p>Filtration</p> <ul style="list-style-type: none"> a. Two phylox vessels (manufacture date: 2012) remove manganese from the raw water prior to disinfection. No records or readings from these filters were available at the time of the audit (photograph 2). b. A fabric filter was located after the phylox manganese removal vessels and prior to the UV system. No records were available on the function or performance of this filter were available at the time of the audit (photograph 3).
3.	<p>Disinfection</p> <ul style="list-style-type: none"> a. The disinfection system consists of duty and standby UV units (photograph 4). There is no automatic switchover in place. No UVT monitor was in place. No certificate of validation of the UV units was available at the time of the audit. No records of the maintenance of the UV units were available at the time of the audit.
4.	<p>Monitoring and Sampling Programme for treated water</p> <ul style="list-style-type: none"> a. No <i>Cryptosporidium</i> monitoring has been undertaken in the Castle Hill supply. b. One check sample has been taken on the supply since January 2014. Kilkenny County Council stated that this sample complied with the drinking water standards but the results were not available at the time of the audit. Further check and audit and sampling have been scheduled.
5.	<p>Hygiene and Housekeeping</p> <ul style="list-style-type: none"> a. Kilkenny County Council indicated that waste ash had been deposited adjacent to the pumphouse.
	<p>Management and Control</p> <ul style="list-style-type: none"> a. Kilkenny County Council plan to carry out upgrade works on the supply to include raising and capping the wellhead, yield testing, confirmation of number of connections, installation of flow meter, new manganese filters, new duty and standby UV units with automatic switchover, on online UVT monitor with auto-shutoff on failure of both duty and standby units, alarm and dial out on UVT monitor with response procedures to the alarm, new wiring, source protection works, <i>Cryptosporidium</i> risk scoring and audit and check sampling. b. There was no turbidity monitor on the supply. c. There was no evidence of flushing and scouring of the network at the time of the audit. d. No records were available at the pumphouse for inspection during the audit. e. Kilkenny County Council had not received any complaints from consumers in 2014.

3. AUDITORS COMMENTS

The Castle Hill supply disinfection system is inadequate and Irish Water is required to upgrade the disinfection system to meet the appropriate criteria set out in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water* without delay. An appropriate disinfection system where UV Treatment is in place is one where the following is in exists:

- i. A validated UV treatment system that operates within its validated range at all times;
- ii. A continuous monitoring device recording UVI or UVT. The monitor should be alarmed to notify Irish Water in the event of a drop below the validated range;
- iii. Duty/standby UV units in place with automatic changeover, in the event of failure of one of the UV disinfection units, or alternatively automatic shutdown if the UVT drops below its validated range.

4. RECOMMENDATIONS

Source Protection

1. The Water Services Authority should implement the requirements of the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)* to ensure, unless an alternative setback distance has been set as per Article 17 that:
 - i. Organic fertiliser or soiled water is not applied to land within 25 m of the abstraction point; and
 - ii. Farmyard manure held in a field prior to landspreading is not placed within 50 m of the abstraction point.
2. The Water Services Authority should examine the appropriateness 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. The Water Services Authority should have regard to the EPA guidance on alternative setback distances.
3. The Water Services Authority should characterise the variability in raw water quality and compile a source water safety plan in order to mitigate any risks to the abstracted water (http://whqlibdoc.who.int/publications/2009/9789241562638_eng_print.pdf). Trends in raw water quality should be analysed and used to determine the optimum treatment conditions for the water at the plant. Data should be used to identify whether rapid variations in raw water quality give rise to problems with the treatment process.
4. The Water Services Authority should install a continuous automatic turbidity monitor to alert plant operators of any changes in raw water quality.
5. The Water Services Authority should ensure that the wellhead is raised above ground level, borehole linings and seals are maintained and a lockable cover is installed.

Disinfection

6. The Water Services Authority should ensure that the UV disinfection system is validated in accordance with an appropriate internationally accepted validation system.
7. The Water Services Authority should ensure that the UV disinfection system operates within its validated range at all times
8. The Water Services Authority should ensure that there are duty and standby UV disinfection arrangements with automatic changeover in the event of failure of one of the UV disinfection units.
9. The Water Services Authority should install a continuous UVI or UVT monitor at the point of disinfection and this monitor should be alarmed and linked to a recording device to ensure that any deviation of the quality of water outside the validated range for the UV treatment system or a failure of the UV disinfection system is immediately detected.

Distribution System

10. The Water Services Authority should investigate whether flushing and scouring of the mains is required and commence a programme of flushing and scouring if required.

Management and Control

11. A Drinking Water Safety Plan approach to the operation of all treatment plants should be developed by the Water Services Authority and to provide safe and secure drinking water the water supplier must have in place a management system that has identified all potential risks and implemented reduction measures to manage these risks.
12. The Water Services Authority 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.
13. A documented system of regular internal auditing and supervision of the treatment plant by Senior experienced personnel in the Water Services Authority should be implemented and copies of quality assurance checks and audits records kept on site for inspection by the Agency.

Monitoring and Sampling Programmes for Treated Water

14. The Water Services Authority should prepare a programme of monitoring for *Cryptosporidium* in the raw and treated water.
15. If there has been an event in the catchment that may significantly increase the possibility of *Cryptosporidium* oocysts entering the raw water supply, or in the event of significant increases in the turbidity of the treated water, then continuous sampling of the final water for *Cryptosporidium* shall be undertaken by the Water Services Authority in accordance with the guidelines in the *EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies* (ISBN: 978-1-84095-349-7).

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

During the audit the Water Services Authority representatives were advised of the audit findings and that action must be taken as a priority by the Water Services Authority to address the issues raised. This report has been reviewed by Mr Nigel Hayes, Drinking Water Inspector.

The Water Services Authority 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:

Yvonne Doris
Yvonne Doris
Inspector

Date:

4th July 2014



Photograph 1: Wellhead at Castle Hill, Coan supply



Photograph 2: Phyllox vessels for manganese removal



Photograph 3: Fabric filter



Photograph 4: UV duty and standby units