Drinking Water Audit Report

County:	Waterford	**Date of Audit:**	15/05/2017
Plant(s) visited:	Clonea - Power WTP (3100PUB1031)	**Date of issue of Audit Report:**	02/06/2017
		File Reference:	DW2015/78
		Auditors:	Mr Niall Dunne
Audit Criteria:	• The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).* • *The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)* • The recommendations specified in the EPA *Drinking Water Report.* • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports.		

MAIN FINDINGS

i. **Irish Water proposes to decommission the Clonea-Power Public Water Supply (PWS) by Q2 2018 and connect it to the Rathgormack PWS. In the interim Irish Water is undertaking remedial measures such as replacing the filter media. Irish Water should continue to progress the interim works, monitor the effectiveness of the new filter media and continue to progress the connection of the Clonea- Power PWS to the Rathgormack PWS.**

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 in response to the notification by Irish Water dated 15/05/2017 of the failure to meet the manganese parametric value (as specified in Table C of Part 1 of the Schedule of the Regulations) in the Clonea Power PWS.

The Clonea-Power Public Water Supply serves a population of approximately 140 people. The scheme demand is approximately 36 m^3/day. The borehole source is located adjacent to the treatment building. Treatment for manganese removal consists of oxidation via chlorine followed by pressure filtration. Disinfection is via chlorine dosing, which is separate to the oxidation process.

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 10:30 am at the Clonea-Power water treatment plant (WTP). 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 the Local Authority and Irish Water: Deirdre O'Loughlin, Compliance Specialist, Irish Water. Siobhan Clifford, Compliance Analyst, Irish Water. Paul Carroll, Scientific Officer, Waterford County Council. Alan Kirwan, Area Engineer, Waterford County Council. John Fitzgerald, Acting ESS, Waterford County Council.
Representing the EPA: Niall Dunne, Inspector, EPA.

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. The land surrounding the source is residential; WCC stated that there are no septic tanks within the vicinity of the borehole. b. The scheme is fed from a borehole located adjacent to the treatment plant. c. According to Waterford County Council (WCC) the borehole is approximately 35 m deep and the borehole is lined with an internal casing. d. The head of the borehole was adequately sealed. e. Results show that manganese in the raw water ranges between 550 - 780 ug/l. f. Raw water monitoring is undertaken weekly. g. No raw water iron results were available at the time of the audit.
2.	**pH adjustment, Oxidation - Prechlorination and Filtration** a. At this plant manganese is brought out of solution via oxidation. Oxidation is achieved by chlorinating the water prior to filtration. The chlorine dosing pumps are set to a duty/assist, flow proportional dosing arrangement, (see photograph 1), however, only one of the pumps is continually set as the duty pump i.e. duty dosing is not altered between the pumps. Auto switchover between the pumps is in place but the system is not alarmed or linked to a monitor or a recording device, (see photograph 1). b. Prior to oxidation pH is adjusted with sodium hydroxide. The sodium hydroxide is dosed via a single duty dosing pump (see photograph 1). The target pH is 8.5. The reading on the pH monitor at the time of the audit was 8.82. The pH monitor is not linked to a recording device. c. After oxidation water passes into a contact tank which has a retention time of approximately one hour. d. According to WCC the tank is scoured once a fortnight and very little manganese residue is visible during scouring. e. Two pressure filters are located on site, only one is currently operational. The filter media in the operational filter was changed on 08/05/2017 to PYROLOX. PYROLOX requires a specific pH range to be effective, hence pH adjustment prior to oxidation. It is proposed that once the second filter is operational, an estimated timeframe of 3- 4 weeks from date of the audit that the two filters will be set up in a duty/standby arrangement. f. The filter is set to backwash automatically every night; backwash water drains to a nearby stream. g. It was noted that since the new media was installed that there was an increase in manganese levels in the treated water. The highest result on the 12/05/2017 was 658 µg/l compared with 50 µg/l on the 02/05/2017. According to WCC this is due to build-up of manganese within the lines and should clear after time.

3.	**Disinfection** a. Chlorine is used as the main disinfectant. (This process is separate to the oxidation process). There are duty/standby chlorine dosing pumps in place, these are set to duty/assist with auto switch over if one pump fails. One pump is continually set as the duty pump. b. The chlorine residual monitor is alarmed with a dial out alarm and the chlorine residual set point is 0.5 mg/l. The reading on the monitor at the time of the audit was 0.5 mg/l. A reading taken with the hand held monitor on the day of the audit returned a result of 0.57 mg/l. WCC stated that the chlorine monitor is recalibrated if there is a difference of 0.1 mg/l between the handheld monitor and the chlorine residual monitor. c. Chlorine is dosed into a sump which has a retention time of approximately 180 minutes. d. The caretaker takes chlorine readings at the plant and within the network on a daily basis. e. It was noted that the residual chlorine readings taken at the end of the network on the 12/05/2017 were 0.56 mg/l.
4.	**Management and Control** a. According to WCC the network is scoured every second week. Iced pigging, scouring with ice, was undertaken in February 2016. b. There was no calibration sticker on the caretaker's handheld chlorine residual monitor and no calibration strikers were visible on any of the other monitors. Maintenance, calibration and servicing records were observed to be logged within the caretaker's notes. c. WCC stated that a manganese film builds up within the chlorine and pH monitors. According to WCC the chlorine and the pH monitors are recalibrated and serviced regularly but there is no scheduled maintenance programme in place. d. It is proposed to connect this supply to the Rathgormack supply by Q2 2018, at which time the Clonea- Power PWS will be disconnected. According to Irish Water the contract for the works has been awarded but Irish Water is awaiting approval for a road opening licence before commencing.
5.	**Monitoring** a. Two check and one audit samples are taken annually; manganese is to be included in the check monitoring program.

3. AUDITORS COMMENTS

The first manganese exceedance of 160 ug/l was notified to the EPA on the 29/04/2015, since this there have been regularly manganese exceedances on this supply. The highest exceedance, on the 25/04/2017, was 1,890 ug/l (versus the Drinking Water Parametric Value of 50 ug/l).

It is proposed to decommission this supply and to connect it to the Rathgormack PWS by Q2 2018. In the interim, remedial works are ongoing and these include the following; the replacement of the filter media; the proposal to install a duty/standby filter arrangement; regular network scouring and ice pigging. The EPA recommends that the installation of the second filter is progressed and that regular network scouring and manganese monitoring is continued.

4. RECOMMENDATIONS

1. Irish Water should continue to monitor the performance of the pressure filter with regard to the removal of manganese and should progress the installation of the second pressure filter.

2. Irish Water should continue to submit monthly manganese monitoring results and updates on the decommissioning of the plant on a quarterly basis.

3. Irish Water should install a monitor on the pre-chlorination oxidation systems and link this and the pH monitor to a recording device with dial out alarms.

4. Irish Water should ensure that the duty chlorine dosing is regularly altered between the chlorine dosing pumps.

5. Irish Water should ensure that calibration stickers are placed on all the monitoring equipment including the caretaker's handheld chlorine residual monitor.

6. Irish Water should investigate what impact the backwash water is having on the stream it is being discharged to.

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 DW2015/78 in any future correspondence in relation to this Report.

Report prepared by:  **Date:** 02/06/2017

Niall Dunne

Inspector

Photograph 1: Oxidation / pre chlorination dosing via duty/standby pumps. This dosing system is not connected to a chlorine residual monitor. Sodium Hydroxide (pH adjustment) is dosed via a duty pump there is no standby dosing pump. Neither system is alarmed or connected to a recording device.