Site Visit Report

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 water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone

Name of Installation	Burncourt Ballylooby
Organisation	Irish Water
Scheme Code	3700PUB1040
County	Tipperary
Site Visit Reference No.	SV22429

Report Detail

Issue Date	10/06/2021
Prepared By	Criona Doyle

Site Visit Detail

Date Of Inspection	28/05/2021	**Announced**	Yes
Time In	11:00	**Time Out**	12:11
EPA Inspector(s) **Additional Visitors**	Criona Doyle		
Company Personnel	Irish Water: Pat Duggan, Catherine Rice, Duane O Brien. Tipperary County Council: Sharon O'Dwyer, Joe Burke, Christopher Kidawa, Flan Real* *Attended conference call only.		

Summary of Key Findings

(1) There is no treatment barrier in place at the Burncourt Ballylooby Water Treatment Plant to prevent *Cryptosporidium* entering the public water supply. Irish Water should install a barrier against *Cryptosporidium* to ensure the water supply is adequately treated at all times.

(2) The supply will be added to the EPA Remedial Action List on 31/07/21 under the category inadequate treatment for *Cryptosporidium*.

(3) The audit found that the incident was suitably escalated and managed to protect public health.

Introduction

The Burncourt Ballylooby Public Water Supply (PWS) serves a population of 1,752 and produces 1,059m3/d (EDEN figures) and is supplied by Kilroe reservoir. The audit was undertaken to assess the performance of Irish Water in providing clean and wholesome drinking water following the detection of *Cryptosporidium* in the Burncourt Ballylooby Public Water Supply (PWS) on the 10/03/21 (0.00426 count / no. per 10L).

On average 50% of the treated water is provided by the Burncourt Ballylooby Water Treatment Plant (WTP) and pumped to the Kilroe reservoir prior to distribution to the network. Two boreholes located on the treatment plant site provide the raw water for the supply. The boreholes were commissioned in July 2020 replacing a previous spring source. Treatment includes chlorination and fluoridation.

The remaining 50% of treated water is supplied from the adjacent Burncourt Regional PWS which is connected to the Burncourt Ballylooby PWS via the Kilroe Reservoir. A separate audit of the Burncourt Regional WTP was also undertaken on 28/05/21 and is provided in a separate report.

Supply Zones Areas Inspected

The audit consisted of a video conference call with Irish Water and Tipperary County Council staff on the 27/05/21 and an on site inspection of the water treatment plant on 28/05/21. All areas of the treatment process were inspected during the audit including the boreholes, chlorine dosing, fluoride dosing, chemical storage and the storage reservoir at Kilroe.

1. Incident Management

		Answer
1.1	Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	Yes

Comment

On 15/03/21 Tipperary County Council received confirmation that *Cryptosporidium* had been detected in a final treated water sample taken at the Burncourt Ballylooby WTP on 10/03/21 (0.00426 count / no. per 10L). Irish Water and Tipperary County Council consulted with the HSE on the 15/03/21. On the 16/03/21 Irish Water notified the EPA of the *Cryptosporidium* detection.

Following the *Cryptosporidium* detection Irish Water and Tipperary County Council undertook an investigation of the operation of the water treatment plant and no specific issues or incidents were identified as having occurred prior to the sample date that would result in *Cryptosporidium* being present.

Following consultation with the HSE the agreed outcome was for Irish Water and Tipperary County Council to proceed with further monitoring. The EPA requested weekly monitoring until 3 no. consecutive clear samples were obtained.

There have been no further *Cryptosporidium* detections in the follow up sampling taken on 17/03/21; 26/03/21; 31/03/21; 13/04/21. The results of the analysis of the May round of sampling had not been received at the time of the audit. Irish Water propose to undertake monthly sampling 9 times per annum as per the Irish Water Cryptosporidium monitoring rationale.

The current treatment provided at the Burncourt Ballylooby WTP does not provide a barrier against *Cryptosporidium*. Irish Water stated at the audit that currently there are no proposals to upgrade the water treatment plant.

The EPA intend to add the Burncourt Ballylooby PWS to the EPA's Remedial Action List on 31/07/21, under the category inadequate treatment for *Cryptosporidium*.

2. Source Protection

		Answer
2.1	Is the abstraction source(s) adequately protected against contamination?	Yes

Comment

The supply is fed from 2 no. boreholes that were commissioned in July 2020. The boreholes were constructed in accordance with EPA Advice Note 14: Borehole Construction and Wellhead Completion. The wellheads are sealed and located within above ground steel kiosks.

Landuse in the vicinity of the borehole is agricultural. On the day of the audit cattle were grazing in adjacent fields and large numbers of rabbits were observed on the access road to the treatment plant.

Irish Water submitted the raw water monitoring data for 2020 and 2021 prior to the audit. The data indicates low level E. coli detections in the raw water. The highest E. coli result was 12 MPN/100mls on 19/03/20. Based on the microbiological raw water quality the boreholes are not classed as G1 boreholes.

It was outlined at the audit that Tipperary County Council are scheduled to undertake inspections in September 2021 in the vicinity of the sources in relation to the requirements of the European Union (Good Agricultural Practice for the Protection of Water) Regulations 2014 (SI No. 31 of 2014). These inspections could not be undertaken at the time of the *Cryptosporidium* detection due to lack of available resources. There are 4 no. landowners with land within the setback distances. Landowners were last contacted in 2013.

Both boreholes are pumped on a 24 hour continuous basis. There is a raw water turbidity monitor on each individual borehole and a monitor on the combined raw water turbidity. There is a raw water run to waste facility in place which operates on high high turbidity (> 0.90 NTU) on each individual borehole. The run to waste is set for a duration of 30 minutes on BH1 and 40 minutes on BH2. If the turbidity remains high after these time periods the plant automatically shuts down and requires a manual restart by the Caretaker. There is also a high turbidity warning alarm at 0.6 NTU which generates a text alert to the Caretaker. The final water turbidity monitor was displaying higher turbidity levels than the raw water monitors and should be investigated.

There is also monitoring of the raw water pH with automatic plant shutdown in the event the low low (6.5 pH units) or high high (9 pH units) alarm set points are exceeded.

3. Disinfection

		Answer
3.1	Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible?	Yes

Comment

The Caretaker reviews the residual chlorine trends daily on the plant SCADA. Trends are also available on the INTS system. Tipperary County Council can also view trends on the PMAC system from Kilroe reservoir.

Treated water from the Burncourt Ballylooby WTP is pumped to the Kilroe reservoir. Residual chlorine trends were reviewed for (a) Burncourt Ballylooby supply on inlet to reservoir (b) Burncourt Regional supply on inlet to reservoir and (c) outlet from Kilroe reservoir. The trend data indicates stable trends.

Details of the alarms are provided below.

At the audit Irish Water could not confirm if the Burncourt Ballylooby WTP is progressing under the Irish Water Disinfection Programme.

		Answer
3.2	Are monitors and alarms operational via dial out and being responded to with a suitable cascade system in place?	Yes

Comment

There is automatic shutdown of the WTP on high high and low low chlorine alarms. Restarting of the WTP requires manual restarting by the Caretaker on site. In the event the high or low alarms setpoints are exceeded a text alert is sent to Caretaker. The following chlorine alarm setpoints are in place:

(1) Residual chlorine monitor after static mixer and prior to contact tank (03 - CL01) – low 0.3mg/l, low low 0.2 mg/l, high 1.2 mg/l and high high 1.5 mg/l.

(2) Residual chlorine monitor after contact tank on rising main to Kilroe reservoir (05-CL01) - low 0.3 mg/l, low low 0.2 mg/l, high 1.1mg/l and high high 1.2 mg/l.

(3) PMAC alarm system at Kilroe reservoir: Inlet from Burncourt Ballylooby WTP low 0.21 mg/l and high 2.0mg/l. Inlet from Burncourt Regional (Glengarra) WTP low 0.53 mg/l and high 2.0 mg/l. Kilroe reservoir outlet low 0.21 mg/l and high 2.0mg/l.

		Answer
3.3	Are duty and standby chlorine pumps/ UV units in operation?	Yes

Comment

Duty / standby chlorine dosing pumps are in place with automatic switchover. 5% sodium hypochlorite is used for disinfection. Dosing is flow proportional but is not linked to the residual chlorine monitor.

		Answer
3.4	Is the residual chlorine monitored at a suitable sample location after contact time has been completed?	No

Comment

A residual chlorine monitor (05-CL01) is provided after the contact tank on the rising main to Kilroe reservoir. Based on the contact time calculation provided prior to the audit the low and low low alarm levels at this location are not sufficiently low to warn of an issue with inadequate contact time at the Ct validation point based on a minimum free chlorine concentration of 0.8 mg/l being required at the established Ct validation point. The trends provided do not confirm that the 0.8mg/l chlorine concentration is being maintained at this monitoring location.

		Answer
3.5	Is there a suitable monitoring frequency for residual chlorine in the network with records available?	Yes

Comment

Monitoring of the residual chlorine being undertaken twice per week at the end of the network and confirmed levels being maintained > 0.1 mg/l

4. Reservoirs and Distribution Networks

		Answer
4.1	Is treated water in tanks and reservoirs suitably protected against contamination?	Yes
	Comment	
	The kilroe reservoir was inspected. Secure sealed hatches were present on the reservoir and insect proof mesh was present on the vents. The reservoir is checked on a daily basis.	

5. Treatment Process Chemicals

		Answer
5.1	Are treatment process chemicals appropriately managed and stored?	Yes

Comment

5% sodium hypochlorite is used for chlorination at the WTP. There are 2 no. sodium hypochlorite bulk storage tanks installed in the WTP building. Tipperary County Council reported that there is an issue getting these filled as the minimum delivery volume than can be delivered to the site is 1,000 litres. The current usage at the site is approximately 5 litres per day. This would result excessive storage time on site if the bulk tanks were to be filled.

25 litre drums are currently being used to top up one of the bulk storage tanks which is being used as a day tank. A transfer pump is used to pump the sodium hypochlorite from the 25 litre drum to the bulk storage tank.

The expiry date was 19/10/21 and the PCS number was displayed on the drum.

6. Management and Control

		Answer
6.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No

Comment

Irish Water indicated that the source score calculation for the supply has not been finalised yet under the updated Irish Water methodology. At present the boreholes are conservatively classed as requiring a protozoal log credit requirement of Log 3 removal. A sanitary survey has not been completed to date to finalise the score. Irish Water propose to undertake monitoring in accordance with the Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies.

		Answer
6.2	Are instrument calibrations within date?	Yes

Comment

The residual chlorine monitors and chlorine dosing pumps had been serviced on 19/05/21 at Burncourt Ballylooby WTP and chlorine monitors on 28/05/21 at Kilroe reservoir. Stickers were not present on all equipment (chlorine dosing pumps) to display the next service due date.

7. Drinking Water Quality

		Answer
7.1	Is Cryptosporidium monitoring being carried out in accordance with Irish Water's 'Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies'?	Yes

Comment

Irish Water propose to undertake monitoring in accordance with the Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies.

8. Fluoridation

		Answer
8.1	Is the fluoridation dosing system appropriately controlled?	No

Comment

Duty / standby fluoride dosing pumps are installed with automatic switchover.

The continuous fluoride monitor has not been working for the last two months. Quotations are being obtained for repairs but the date for repair could not be confirmed at the audit. Monitoring of the fluoride concentrations is being undertaken on a daily basis based on the weight / usage calculations and recorded in the daily log book.

The continuous fluoride monitor is stuck on a reading of 0.8mg/l and cannot be disabled from the alarm panel. To prevent the generation of continuous alarms, which would lead to plant shutdown, the high high fluoride alarm level has been reset to 0.9 mg/l to prevent ongoing plant shutdowns as a temporary measure until the monitor is repaired.

Recommendations

Subject	Burncourt Ballylooby Audit 27th & 28th May 2021	Due Date	10/07/2021
Action Text	***Recommendations*** 1. Irish Water should install a suitable barrier against *Cryptosporidium* on the Burncourt Ballylooby PWS to ensure the water supply is adequately treated. 2. Irish Water should confirm the protozoal log treatment requirement for the plant and identify how any log deficit will be addressed. 3. Irish Water should undertake monitoring in accordance with the Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies. 4. Irish Water should ensure that suitable chlorine alarm set points are provided after contact time has been achieved to ensure the minimum free chlorine concentration is being maintained at the CT validation point for the Burncourt Ballylooby PWS at all times. 5. Irish Water should liaise with Tipperary County Council to ensure that all landowners are made aware 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. 6. Irish Water should ensure the continuous fluoride monitor is repaired and the fluoride alarm set points are reinstated. 7. Irish Water should provide update on whether the Burncourt Ballylooby PWS is to be assessed under the Irish Water Disinfection Programme. 8. Irish Water should ensure that calibration and service due dates are displayed on all equipment. 9. Irish Water should identify the issue that is resulting in the raw water turbidity monitor displaying lower turbidity levels than the treated water turbidity monitor. 10. Irish Water should undertake regular checks of the calculated fluoride concentration being obtained from the weight volumetric method, against an alternative method, such as a manual colorometric test or the continuous fluoride monitor. **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 Michelle Minihan, Senior Inspector Drinking Water Team. Irish Water should submit a report to the Agency on or before 10/07/21 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 time frame 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 Action Reference Number DW20210030 in any future correspondence in relation to this Report.		