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	Ballyragget PWS
Organisation	Irish Water
Scheme Code	1500PUB1001
County	Kilkenny
Site Visit Reference No.	SV20118

Report Detail

Issue Date	30/03/2020
Prepared By	Regina Campbell

Site Visit Detail

Date Of Inspection	18/02/2020	**Announced**	Yes
Time In	11:00	**Time Out**	13:00
EPA Inspector(s) **Additional Visitors**	Regina Campbell HSE: Veronica Meaney, Senior EHO		
Company Personnel	Irish Water: Catherine Rice, Colin Cunningham Kilkenny County Council: Michael Shortall, John Ormond, Andrew Flood, Kevin Hogan		

Summary of Key Findings

1. A Boil Water Notice was placed on the Ballyragget Public Water Supply (PWS) on 11/02/20 due to the risk of inadequate disinfection as a result of elevated turbidity in the raw water. The elevated turbidity in the raw water was caused by heavy rains which resulted in flooding in the area of the infiltration gallery which is located adjacent to the River Nore. In view of the risk of elevated turbidity in the raw water caused by flooding, either a temporary or permanent upgrade to the treatment processes is required to ensure security of supply.

2. The audit found that alarms and shutdowns in place for the treatment processes are working satisfactorily and that relevant bodies were notified promptly of the incident. At the audit, turbidity in the raw water had returned to normal levels, however there was an ongoing risk that turbidity might rise again due to heavy rains forecast and ongoing flooding of the area of the infiltration gallery.

Introduction

The Ballyragget Public Water Supply (PWS) produces 386m3/day and serves a population of 1,282 according to figures supplied by Irish Water. The source of the water is an infiltration gallery adjacent to the River Nore. Treatment at the plant consists of nitrate removal, UV disinfection followed by chlorination. The audit was carried out in response to the imposition of a Boil Water Notice on the supply on 11/02/20 due to the risk of inadequate disinfection as a result of elevated turbidity in the raw water. The Boil Water Notice was rescinded on 05/03/2020.

Supply Zones Areas Inspected

The audit included an inspection of the nitrate removal units, UV and chlorination disinfection stages at the treatment plant. The area of the infiltration gallery and collection chamber are located beside the River Nore and were inaccessible during the audit due to flooding.

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

1. A Boil Water Notice was placed on the Ballyragget Public Water Supply (PWS) on 11/02/20 due to the risk of inadequate disinfection as a result of elevated turbidity in the raw water. The rise in turbidity was caused by flooding in the area where the infiltration gallery (source of the supply) is located, adjacent to the River Nore. Raw water is gravity pumped from the infiltration gallery to a concrete collection chamber beside the old Water Treatment Plant.

2. On the 09/02/20 the turbidity in the raw water rose to 1.5 NTU and this in turn caused the plant to shutdown at the 1 NTU shutdown setpoint. The plant ran to waste during the night of 09/02/20 and into the early hours of 10/02/20. The turbidity level reduced to approximately 0.6 NTU which enabled the plant to go back into production on 10/02/20. However, turbidity levels rose again on 11/02/20 which in turn caused the plant to shutdown. Due to falling levels in the reservoir, a decision was taken to return the supply to production under a Boil Water Notice following consultation with the HSE at about 5.30pm on 11/02/20.

3. At the time of the audit, the Boil Water Notice remained in place. The turbidity in the raw water had remained generally < 1NTU except for a couple of hours on 13/02/20 when it rose to 1.2 NTU. On the day of the audit the turbidity of the treated water was 0.187 NTU.

4. The Boil Water Notice was rescinded on 05/03/20 following consultation with the HSE.

2. Source Protection

		Answer
2.1	Is the abstraction source(s) adequately protected against contamination?	No

Comment

The source of the water is an infiltration gallery adjacent to the River Nore. Raw water is gravity pumped from the infiltration gallery to a concrete collection chamber beside the old water treatment plant. On the day of the audit the land where the infiltration gallery is located was badly flooded by the River Nore and was inaccessible. Access to the old water treatment plant and collection chamber was impeded by standing water in the access field. As a result of its location and design, the infiltration gallery is vulnerable to flooding by the adjacent River Nore.

It was noted that there is a low pH alarm setpoint of 5 which is too low to provide protection to drinking water quality as the lower parametric value is pH 6.5. On the day of the audit the pH was 6.97. Irish Water said the low setpoint would be raised.

Kilkenny County Council could not confirm if all relevant landowners had been written in relation to the requirements of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014).

3. Disinfection

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

Comment

Disinfection is provided by UV followed by chlorination. High and low chlorine alarm and shutdown setpoints are in place and trended data is recorded and accessible at the plant.

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

Comment

Duty and standby UV units and duty and standby chlorine pumps are in operation at the plant.

		Answer
3.3	Is the UV system suitably validated?	Yes

Comment

The UV units installed are model Visades T860F and are ONORM/DVGW certified with continuous UVI monitors in place. The warning UVI setpoint is 73.8 W/m2 with UVI shutdown setpoint of 68.8 W/m2.

		Answer
3.4	Is the UV disinfection system operating within its validated range?	Yes

Comment

On the day of the audit, the duty UV unit was operating within its validated range.

		Answer
3.5	Is the chlorine dosed appropriately?	Yes

Comment

Following UV disinfection, chlorine is dosed flow proportionally with residual trim. The chlorine pumps are changed over every 24 hours and in the event of a failure will change over automatically.

		Answer
3.6	Is the residual chlorine monitored at a suitable sample location after contact time has been completed?	Yes

Comment

The residual chlorine monitor is located after the reservoir at the water treatment plant.

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

Comment

Residual chlorine checks are carried out in the network several times a week with results recorded in the log book. Results viewed were satisfactory.

		Answer
3.8	Is there a chlorine residual ≥0.1 mg/l throughout the network?	Yes

Comment

Records viewed showed that a chlorine residual of ≥ 0.1 mg/l is maintained throughout the network.

4. Reservoirs and Distribution Networks

		Answer
4.1	Are reservoirs adequately inspected and maintained?	Yes
	Comment	
	The reservoir has a capacity of 225 m3 which is equivalent to 10-12 hours storage. Kilkenny County Council advised that the reservoir was inspected and cleaned in 2019.	

5. Treatment Process Chemicals

		Answer
5.1	Are treatment process chemicals appropriately managed and stored?	No

Comment

10-11% sodium hypochlorite is used as disinfectant. A manufactured date of 20/01/20 was displayed on the 25L drums inspected but no expiry date was displayed.

		Answer
5.2	Are chemicals appropriately produced/ approved and suitable for use in drinking water treatment?	No

Comment

There was no PCS number as required under the Biocidal Products Regulations available on-site for the sodium hypochlorite in use at the plant.

6. Management and Control

		Answer
6.1	Are relevant alarms dialled out via a cascade system to allow a timely response by plant operators?	Yes
	Comment	
	There is an alarm cascade system in place.	

		Answer
6.2	Are instrument calibrations within date?	Yes
	Comment	
	All instruments viewed had stickers displaying calibrations within date.	

7. Site Specific Issues

		Answer
7.1	Does monitoring indicate that the nitrate removal unit is operating satisfactorily?	Yes

Comment

A Drinking Water Restriction Notice for infants under 6 months of age was placed on the Ballyragget PWS in February 2018 due to elevated levels of nitrates above the parametric value in the final water. In response to this issue, Irish Water installed nitrate removal units at the plant in 2018. Kilkenny County Council said that that the levels of nitrate in the raw water have very rarely exceeded the Drinking Water parametric value of 50 mg/l since the units were installed. There is a continuous nitrate monitor on the inlet and outlet of the nitrate removal unit. On the day of the audit the nitrate level in the raw water was 24.57 mg/l and in the treated water was 8.9 mg/l. The filters are backwashed every 100m3 of water treated and there are duty and standby units in place which operate in rotation. Backwash water goes to sewer.

Recommendations

Subject	Ballyragget PWS Audit Report Recommendations	**Due Date**	30/04/2020
Action Text	**Recommendations** 1. Irish Water should submit an action programme for the upgrade of the treatment processes at the Ballyragget PWS to ensure that future occurrences of elevated turbidity in the raw water will not impact on security of supply. 2. Irish Water should liaise with Kilkenny County Council and ensure that all relevant landowners have been written to in relation to the requirements of the European Union (Good Agriculture Practice for the Protection of Waters) Regulations 2014 (S.I. No. 31 of 2014). 3. Irish Water should put a system in place to ensure stocks of sodium hypochlorite on-site are regularly checked to see if they are in date. 4. Irish Water should confirm that the disinfectant used at the plant is approved for use under the Biocidal Products Regulation. 5. Irish Water should review and adjust the low pH alarm setpoint. **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 Leader. Irish Water should submit a report to the Agency on or before 30/04/20 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 DW2020/16 in any future correspondence in relation to this Report.		