# Drinking Water Audit Report

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| **County:** | Kilkenny | **Date of Audit:** | 15/02/2018 |
| **Plant(s) visited:** | Ballyragget Public Water Supply<br>1500PUB1001 | **Date of issue of Audit Report:** | 26/02/2018 |
| | | **File Reference:** | DW2009/276 |
| | | **Auditors:** | Regina Campbell<br>Criona Doyle |
| **Audit Criteria:** | • The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended*.<br>• *The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)*<br>• The recommendations specified in the EPA *Drinking Water Report*.<br>• EPA Drinking Water Advice Notes No.s 1 to 15.<br>• The recommendations in any previous audit reports. | | |

**MAIN FINDINGS**

i. **A Drinking Water Restriction Notice for infants under 6 months of age was placed on the Ballyragget public water supply on 08/02/18 due to elevated levels of nitrates above the parametric value in the final water. At the time of the audit this Drinking Water Restriction Notice was still in place.**
ii. **An investigation is underway into the cause of the nitrate contamination. Irish Water, in conjunction with Kilkenny County Council, should complete this investigation in order to identify any potentially polluting activities in the catchment of the raw water source.**
iii. **During the audit, Irish Water indicated that long-term and interim options are being reviewed. Irish Water should submit an action programme with timeframes to ensure compliance with the nitrate parametric value.**

## 1. INTRODUCTION

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 in response to the notification by Irish Water of the failure to meet the nitrate parametric value and the issuing of a Drinking Water Restriction Notice for infants under 6 months of age in the Ballyragget PWS on 08/02/2018.

The source of the raw water source is an infiltration gallery adjacent to the River Nore. Raw water is pumped from the infiltration gallery to a collection chamber/pump sump beside the Water Treatment Plant, approximately 100m away (see Photo 1).

Treatment consists of UV disinfection and chlorination. The plant currently produces a volume of approximately 400m$^3$/day. The population served by the supply is 1,316.

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

The opening meeting commenced at 2.50pm at Ballyragget 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.

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| Representing Irish Water:<br>Deirdre O' Loughlin, Compliance Specialist<br>Colin Cunningham, Water Engineer<br><br>Representing Kilkenny County Council:<br>Eamon Mahon, Executive Engineer<br>Michael Shortall, Water Caretaker<br><br>Representing HSE:<br>Marion O' Neill, SEHO<br>Representing the Environmental Protection Agency:<br>Regina Campbell, Inspector<br>Criona Doyle, 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.*

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| **1.** | **Exceedances of the Parametric Values**<br><br>a. Irish Water notified the EPA of an exceedance of the 50 mg/l nitrate parametric value in the treated water from Ballyragget Drinking Water Treatment Plant on 02/02/18. The sample had been taken on 15/01/18 and the result was 59.7 mg/l nitrate. Further exceedances were detected on 02/02/18 (70 mg/l nitrate) and 06/02/18 (69 mg/l nitrate). Following the advice of the HSE, Irish Water issued a Drinking Water Restriction Notice on 08/02/18 for infants under 6 months of age due to nitrate exceedances.<br>b. Follow up investigative sampling has recorded further nitrate exceedances in the distribution network on 08/02/18 and 12/02/18. Samples taken on 14/02/18 were below the nitrate parametric value.<br>c. Irish Water reported that the lands where the infiltration gallery is located was covered with flood water at the time of the exceedances.<br>d. Two nitrate exceedances have previously been recorded since 2000 on this supply (53.4 mg/l in December 2006 and 55.9mg/l in November 2011). On both previous occasions the levels dropped below 50 mg/l nitrate and did not repeat. A review of final water results since 2012 indicate that nitrate levels are generally between 20-40mg/l which are elevated. Occasional spikes in nitrate have been recorded (48.1 mg/l in November 2012 and 48.7 mg/l in January 2014).<br>e. A number of samples were analysed by both Kilkenny County Council and a private laboratory in February 2018 for nitrate and differences in results have been observed. The reasons for the difference in results has not been identified to date. |
| **2.** | **Source Protection** |

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| | a. The source of the raw water is an infiltration gallery adjacent to the River Nore. Raw water is pumped from the infiltration gallery (Photo 1) to a pump sump housed in a collection chamber with a hatch beside the Water Treatment Plant (Photo 2). The distance between the infiltration gallery and the pump sump is approximately 100m. It was not possible to inspect the area around the infiltration gallery as the land around it was flooded. Irish Water have reported that the River Nore has been in flood or high water for the majority of January and to date in February. The infiltration gallery was constructed in 1945. No information was available on the integrity of the collection chamber.<br>b. According to the EPA Groundwater Monitoring Programme Site Information Report (August 2011), the infiltration gallery is situated in sand and gravel deposits. The estimated Zone of Contribution (ZOC) is 0.61km$^2$. Groundwater vulnerability within the ZOC is high to extreme. The risk assessment section of the report says that pressures are diffuse with nitrates listed as a typical contaminant.<br>c. Since the exceedance in January 2018, Kilkenny County Council staff have carried out inspections at a number of farms and commercial premises. Kilkenny County Council said no issues have been identified through these inspections to date.<br>d. Raw water sampling undertaken on 14/02/18, indicates higher levels of nitrate in the pump sump (37.4 mg/l nitrate) compared to the infiltration gallery (22.4 mg/l nitrate).<br>e. The water treatment plant is surrounded by perimeter fencing and it was noticed during the inspection that the land outside of the fence is being farmed. No information was available on fertiliser application in this immediate area. Silage bales were also stored up against the perimeter fencing of the water treatment plant and the wrapping was damaged on a number of bales.<br>f. Irish Water indicated that the preferred solution is to replace the current source with a new groundwater source. Exploratory drilling has begun. Interim treatment options for the existing source are also being reviewed. |
| **3.** | **Monitoring and Sampling Programme for Raw Water**<br>a. An online turbidity monitor is in place for the raw water. A reading of 0.36 NTU was observed during the audit.<br>b. No recent microbiological results were available during the audit for the River Nore, infiltration gallery and pump sump. |
| **4.** | **Disinfection**<br>a. Primary disinfection is by UV treatment. It was installed in 2013. There is a duty and standby UV unit and alarms are in place with automatic shutdown of the supply in the event the UVI drops below the validated range.<br>b. Secondary disinfection takes place using chlorine gas. The chlorine gas room was not visited during the audit. A chlorine monitor continuously monitors chlorine in the final water and high and low chlorine alarms are in place |
| **5.** | **Monitoring of Treated Water**<br>a. The treated water quality monitor was displaying1.52mg/l chlorine and 7.06 pH during the audit. |
| **6.** | **Treated Water Storage and Distribution Network**<br>a. There is a 225m$^3$ capacity water tower in the Ballyragget PWS and this provides approximately 10 hours storage for the supply. It was not visited or examined as part of the audit.<br>b. The water tower reservoir, was constructed in 1945 and Irish Water said it is on a programme for repair.<br>c. Routine residual chlorine tests are undertaken at various points on the network and results are recorded by the caretaker in the logbook. |
| **7.** | **Management and Control**<br>a. SCADA is in place but there was no computer available at the plant to view historic trends. |

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| | b. The population served has been reported as 1,063 on the notifications to the EPA whereas the population served reported in the drinking water returns on EDEN is listed as 1,316. |

## 3. AUDITORS COMMENTS

The raw water source for the Ballyragget public water supply is very vulnerable to nitrate contamination. The source of the contamination has not been identified to date. Irish Water and Kilkenny County Council should take action to protect the source from contamination and prioritise a solution to ensure the safety and security of the water supply.

At the time of issue of this audit report, the Drinking Water Restriction Notice for infants remains in place until Irish Water can demonstrate to the satisfaction of the EPA and the HSE that the remedial actions have been effective in restoring the public water supply to compliance with the nitrate parametric value.

## 4. RECOMMENDATIONS

### General

1. Irish Water should submit an action programme with timeframes to ensure compliance with the nitrate parametric value at the Ballyragget Public Water Supply. The action programme should consider either the provision of nitrate removal treatment at Ballyragget water treatment plant, or the use of an alternative raw water source.
2. Irish Water should keep the EPA informed of any changes to the advice from the HSE regarding risk to public health.

### Source Protection

3. Irish Water in conjunction with Kilkenny County Council should investigate the land use in the immediate vicinity of the collection chamber/water treatment plant and identify any potentially polluting activities.
4. Irish Water should undertake an investigation into the integrity of the collection chamber to ensure that there is no ingress into the raw water collected there.
5. Irish Water should put in place a programme of raw water monitoring (including microbiological and nitrate monitoring) from the River Nore, infiltration gallery and pump sump. This programme is necessary to characterise the variability in raw water quality, and to determine the degree of treatment and controls required in the supply. Monitoring should be undertaken during a variety of wet and dry conditions.
6. Irish Water should liaise with Kilkenny County Council in relation to the requirements of Part 3 (Nutrient Management) and Part 4 (Prevention of Water Pollution from Fertilisers and Certain Activities) of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014) to ensure appropriate nutrient management and set-back distances for the protection of the drinking water source. Irish Water and Kilkenny County Council shall have regard to EPA Drinking Water Advice Note No. 11: Technical Assessments and Prior Investigations.

### Disinfection

7. Irish Water should ensure that the UV disinfection system operates within its validated range at all times. Irish Water should submit trend graphs for the previous two months of UVI, flow and turbidity.

### Treated Water Storage

8. Irish Water should ensure that the service reservoir is inspected and cleaned out on a regular basis and any maintenance and repairs completed as soon as possible after the need has been identified.

### Management and Control

9. Irish Water should investigate the differences in monitoring results reported by Kilkenny County Council and the private laboratory and take steps to ensure that the results reported are accurate and accredited.
10. Irish Water should ensure that the annual Drinking Water Returns data is up-to-date in EDEN and reflects any changes in population, volume figures and the level of treatment provided for this supply.

## 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 Aoife Loughnane, Drinking Water Team Leader.

**Irish Water should submit an action programme with timeframes to ensure compliance with the nitrate parametric value at the Ballyragget Public Water Supply to the Agency by 05/03/18**. 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 remaining recommendations 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:** Regina Campbell **Date:** 26/02/2018

Regina Campbell

Inspector

**Photo 1: View of infiltration gallery from the water treatment plant. Land is flooded around infiltration gallery.**


**Photo 2: Raw water collection chamber adjacent to water treatment plant.**