# 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

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| **Name of Installation** | Rosenallis PWS |
| **Organisation** | Irish Water |
| **Scheme Code** | 1600PUB1094 |
| **County** | Laois |
| **Site Visit Reference No.** | SV26110 |

## Report Detail

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| **Issue Date** | 02/12/2022 |
| **Prepared By** | Lorcan Farrell |

## Site Visit Detail

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| **Date Of Inspection** | 04/11/2022 | **Announced** | Yes |
| **Time In** | 13:30 | **Time Out** | 15:45 |
| **EPA Inspector(s)**<br><br>**Additional Visitors** | Michelle Roche<br>Lorcan Farrell | | |
| **Company Personnel** | Irish Water: Andrew Boylan, Joseph Moran, James O'Toole.<br><br>Laois County Council: Desmond Byrne, Larry Gittens and William Clooney. | | |

## Summary of Key Findings

(1) A Boil Water Notice (BWN) was imposed on Rosenallis Public Water Supply on 04/11/2022 following this audit. The BWN was required due to elevated turbidity levels in the final water and an inability to demonstrate adequate chlorine contact time, resulting in a risk of inadequate disinfection of the drinking water. The BWN affects the full supply and remains in place at the time of issuing this audit report.

(2) The EPA audit noted a number of deficiencies in the management and control of the supply: (i) Raw water characteristics are unknown for each of the three sources. (ii) Turbidity alarms were not responded to appropriately or escalated in line with Irish Water's incident response procedure and (iii) Continuous online monitors (residual chlorine and turbidity) were not accurately representing water quality at all times.

(3) Irish Water should prioritise Rosenallis water treatment plant for upgrade under the Irish Water Disinfection Programme.

## Introduction

Rosenallis Public Water Supply (PWS) serves a population of 202 (191 on EDEN) and produces between 24-42m3/day depending on demand. The plant sources its water from three boreholes. Two of the boreholes are located at the Water Treatment Plant (WTP) and a third is located approximately 300m away on the verge of a main road. Treatment at the plant consists of chlorination of the combined water from the three boreholes.

The audit was undertaken to assess Irish Water's performance in producing clean and wholesome water. On the day before the audit, Irish Water provided information indicating there had been elevated turbidity above the regulatory limit of 1 NTU in the final water leaving the treatment plant for a period of time between 24/10/2022 and 03/11/2022. This incident was investigated at the audit.

## Supply Zones Areas Inspected

The audit comprised of a site visit to Rosenallis WTP and involved an inspection of the three sources for the supply and the treatment processes at the plant.

## 1. Incident Management

| | | Answer |
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| 1.1 | Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health? | No |

**Comment**

(1) On 03/11/2022 Irish Water contacted the EPA via telephone indicating that turbidity levels in final water leaving the treatment plant had exceeded 1 NTU between 24/10/2022 and 26/10/2022 after which daily spikes in turbidity above 1 NTU occurred between 27/10/2022 and 03/11/2022. Irish Water stated that this information had come to light in preparation for the EPA audit.

(2) On the day of the audit the plant was not in production pending consultation with the HSE. A Boil Water Notice was imposed on the evening of the 04/11/2022 and production of water resumed at the plant on 05/11/2022. The Boil Water Notice to protect public health against the risk of inadequate disinfection is still in place at the time of issuing this audit report.

(3) The high turbidity alarm setpoint for the plant is set at 0.9 NTU. This generates an alarm which is sent to an operational staff phone number. Laois County Council outlined that spikes in turbidity occur regularly when borehole pumps start. This causes a high turbidity reading initially but returns to <1NTU shortly thereafter.

(4) During the period of elevated turbidity it was stated that while high turbidity alarms were responded to, there was no escalation of this to Irish Water as per the Irish Water incident response procedure. This did not allow Irish Water to inform the HSE and therefore the protection of public health was put at risk as turbidity levels over 1NTU can impact on the effectiveness of disinfection.

(5) Prior to the week before the audit, no plant shutdown based on turbidity existed at the plant. This inhibit would have prevented untreated water entering the supply. A shutdown limit of 0.9 NTU (after a period of 3 mins) was installed a week before the audit took place.

(6) At the time of the high turbidity event all three sources were in production. Information submitted after the audit confirmed that Borehole No. 3 (BH3) has since been taken out of production.

## 2. Source Protection

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

**Comment**

(1) Rosenallis WTP is fed from three boreholes. BH1 is located approximately 300m away on the side of a road, BH2 Is located in the pumphouse of the treatment plant, and BH3 is located beside the treatment plant.

(2) BH1 was drilled in 2008 and according to borehole logs is both lined and sealed. A stainless-steel kiosk is in place to protect the wellhead. The kiosk has no access doors for inspection purposes and needs to be removed with lifting equipment to gain access to the wellhead for inspection. On the day of the audit there was no facility to lift the kiosk to gain access for a visual inspection.

(3) BH2 is the oldest well on site and is located inside the treatment plant building. No borehole logs were available for this borehole. The well head is located below the surface of the ground and is covered by a wooden board. A pressure gauge attached to the well head protruded through a hole in the wooden board and could be considered a trip hazard. The well was not visibly capped.

(4) BH3 was drilled in 2017 according to borehole logs and is lined and sealed. It was outlined at the audit that this well is considered a backup well and that it was mostly used in the summer to supplement the other wells at the plant. This well was in production during the period of elevated turbidity. In information supplied by Irish Water after the audit it was confirmed that this well was taken out of production on 03/11/2022. BH3 does not have a kiosk and is open to the elements. Upon visual inspection a hole in the cap of the well was observed which facilitates access for wires.

(5) On the day of the audit Irish Water or Laois County Council could not provide dates of when landowners were contacted concerning setback distances.

## 3. Disinfection

| | | Answer |
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| 3.1 | Is the residual chlorine monitored at a suitable sample location after contact time has been completed? | No |

**Comment**

(1) On the day of the audit, no contact time calculation was available to confirm adequate contact time had been achieved. In correspondence received after the audit, Irish Water provided a copy of a validated contact time calculation which indicates that the minimum free chlorine concentration required is 0.2mg/l at the outlet of the Rosenallis reservoir to ensure adequate contact time.

(2) There is a continuous chlorine monitor at the outlet of the reservoir after contact time where treated water enters supply however there are no alarms or plant shutdowns linked to this monitor.

(3) There is also an additional continuous chlorine monitor located on the rising main leaving the treatment plant. This monitor has an alarm level of 0.6mg/l and a shutdown level of 0.5mg/l. However, while this alarm and shutdown level gives some indication to the operator that an issue with low chlorine residual may be present, the sample point is located before contact time has been achieved.

(4) In correspondence received from Irish Water after the audit, it was confirmed that a chlorine contact loop was installed on the rising main at the treatment plant on 14/11/2022 for verification of contact time. Irish Water also advised that Rosenallis WTP would be prioritised for inclusion in the Irish Water Disinfection Programme to ensure that the plant is configured to automatically control and demonstrate adequate contact time.

| | | Answer |
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| 3.2 | Is there a suitable monitoring frequency for residual chlorine in the network with records available? | No |

**Comment**

(1) Records of free residual chlorine levels within the network were examined as part of the audit and were found to be above the minimum necessary level of 0.1mg/l at the extremities of the network. However, sampling frequency was not adequate with sampling taking place once per month.

## 4. Reservoirs and Distribution Networks

| | | Answer |
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| 4.1 | Are reservoirs adequately inspected and maintained? | No |
| | **Comment** | |
| | (1) It was stated at the audit that reservoir inspection and cleaning had not taken place in at least 10 years. | |

## 5. Management and Control

| | | Answer |
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| 5.1 | Has the protozoal compliance log treatment requirement been identified for the water treatment plant? | No |

**Comment**

(1) The protozoal log treatment requirement for the supply has not been assessed and no monitoring in line with Irish Water's '*Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies*' is taking place. In correspondence received after the audit, it was advised that a monitoring programme to assess *Cryptosporidium* risk for the supply is to be implemented.

| | | Answer |
|---|---|---|
| 5.2 | Is the data obtained from sampling and monitoring used to actively inform the processes on site and in the distribution network? | No |

**Comment**

(1) There has been no raw water characterisation of any kind at the plant and there is no raw water monitoring program in place for any of the sources.

(2) Caretakers have access to SCADA to inform their duties however at the audit it was stated that neither Laois County Council or Irish Water routinely review SCADA trends.

(3) Incident response training had been completed by the majority of the Laois County Council staff present. There was a Laois County Council incident response chart present on the wall of the treatment plant however it was stated that it was out of date and that Laois County Council were in the process of replacing it. There were no site-specific contact details present at the treatment plant.

(4) Daily manual chlorine tests are completed to verify the readings of the continuous chlorine monitor at the outlet of the reservoir. Chlorine residual trends submitted after the audit indicate that the continuous chlorine analyser on the outlet of the reservoir was not reading accurately from 16/10/2022 until 07/11/2022 (trend data shows a flat line).

(5) Manual chlorine tests are completed weekly to verify the readings of the continuous chlorine monitor on the final water at the treatment plant.

## Recommendations

| Subject | Rosenallis PWS Audit Recommendations [02/11/2022] | Due Date | 02/01/2023 |
|---|---|---|---|

**Action Text**

**Recommendations**
**Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues Irish Water should implement the following recommendations without delay.**

1. Irish Water should prioritise Rosenallis water treatment plant for inclusion in the Irish Water Disinfection Programme and provide details of the scope of the works to be undertaken including timescales. This should include the provision of appropriate alarms/shutdowns on verified chlorine residuals after contact time.

2. Irish Water should: (i) confirm the log treatment requirement for the plant; (ii) confirm how any log deficit will be addressed and (iii) commence *Cryptosporidium* monitoring in accordance with the Irish Water *Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies*.

3. Irish Water and Laois County Council should ensure there are robust systems of reviews and checks on water treatment plant performance to identify deteriorations in water quality and act on them to protect public health and maintain drinking water quality. This should include: (i) regular review of SCADA trends and (ii) daily manual checks to confirm accuracy of critical online monitors.

4. Irish Water should: (i) ensure that the incident response procedure at the plant is updated, (ii) ensure that refresher training on the updated incident response procedures is undertaken and (iii) ensure that an updated site-specific contact list is present at the treatment plant.

5. Irish Water should carry out works at the boreholes to provide the following: (i) replacement of the kiosk at BH1 with a kiosk that enables regular inspection of the wellhead, (ii) installation of a kiosk at BH3 to protect the wellhead, (iii) the hole in the well cap at BH3 should be sealed or the cap replaced and (iv) a cap should be installed on BH2. Irish Water should have regard to *EPA Advice Note No. 14: Borehole Construction and Wellhead Protection* when carrying out these works.

6. Irish Water should liaise with Laois County Council to ensure that local landowners have been written to in relation to their obligations under the *European Union (Good Agricultural Practice for the Protection of Waters) 2022*, as amended.

7. Irish Water should monitor residual chlorine in the network, including extremities, several times per week to ensure a minimum residual chlorine of > 0.1 mg/l is maintained.

8. Irish Water should ensure that the reservoir is included in the Irish Water Reservoir Inspection and Maintenance Schedule.

9. Irish Water should consider installing continuous turbidity monitors on each source to alert plant operators of changes in raw water turbidity.

10. Irish Water should consider moving the pressure gauge on BH2 to eliminate trip hazard.

**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 Ruth Barrington, Drinking Water Team Leader. Irish Water should submit a report to the Agency on or before 02/01/2023 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.