



# Drinking Water Audit Report

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| <b>County:</b>           | Limerick   | <b>Date of Audit:</b>                 | 02/08/2018       |
| <b>Plant(s) visited:</b> | Galbally Public Water Supply<br>(1900PUB1028)  | <b>Date of issue of Audit Report:</b> | 27/08/2018       |
|                          |  | <b>File Reference:</b>                | DW2014/12        |
|                          |  | <b>Auditors:</b>                      | Cliona Ní Eidhin |
| <b>Audit Criteria:</b>   | <ul style="list-style-type: none"> <li>• The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended.</i></li> <li>• The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i></li> <li>• The recommendations specified in the <i>EPA Drinking Water Report.</i></li> <li>• EPA Drinking Water Advice Notes No.s 1 to 15.</li> <li>• The recommendations in any previous audit reports.</li> </ul> |                                       |                  |

## MAIN FINDINGS

- i. **Irish Water confirmed the intention to decommission the current Galbally source by Q4\_2019 and to serve its network from the Galtee Regional Public Water Supply. Interim measures proposed by Irish Water in January 2017 to protect consumers during elevated turbidity events have not been progressed.**
- ii. **There is no continuous monitoring of turbidity on the Galbally supply. Sampling results reviewed during the audit show frequent occurrences of elevated turbidity. Irish Water should install a continuous turbidity monitor with an alarm and automatic shutdown to protect consumer health during elevated turbidity events when the risk of *Cryptosporidium* being present is highest.**

## 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 to assess progress achieved by Irish Water in the execution of measures following the detection of *Cryptosporidium* in the Galbally PWS on 07/02/2014.

The Galbally Public Water Supply sources water from 2 No. boreholes located close to the village and serves a population of 387. The boreholes are located immediately adjacent to one another. Borehole 1 is used as the primary source; Borehole 2 is used when work is necessary on Borehole 1. A volume of 170-180 m<sup>3</sup> / day is abstracted. Treatment comprises pH correction using soda ash and chlorination using sodium hypochlorite. From the treatment plant, final water enters a nearby reservoir prior to distribution. The distribution network is small in extent, with the extremity being only 2km south of Galbally village.

Photographs taken by Cliona Ní Eidhin during the audit are attached to this report (see Appendix) and are referred to in the text where relevant.

The opening meeting commenced at 10.30am at the Galbally 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.

**Representing Irish Water:**

Patrick Duggan – Irish Water

Salvador McNamara – Asset Operation Water Engineer, Irish Water

**Representing Limerick County Council**

Peter McEvoy – Assistant Scientist, Limerick County Council

Diarmuid O’Dea – Engineer, Limerick County Council

Sinéad Kennedy – A/Senior Executive Engineer, Limerick County Council

Willie Hurley – Foreman, Limerick County Council

**Representing the Environmental Protection Agency:**

Cliona Ní Eidhin - 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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| <p><b>1.</b></p> | <p><b>Source Protection</b></p> <ul style="list-style-type: none"> <li>a. The zone of contribution (ZOC) has been delineated for this supply. The majority of the ZOC has been classified as extremely vulnerable.</li> <li>b. Land cover within the area mapped is rough pasture and it is used for cattle grazing. Land within the ZOC boundary is in the ownership and management of a single landowner. The landowner has been written to in the past advising of his obligations under the Good Agricultural Practice Regulations but the date of the last letter issued was not available at the time of the audit.</li> <li>c. The caretaker enforces a 200m land spreading buffer zone and completes daily checks for any evidence of slurry spreading within this zone. A daily record of this check is maintained in the plant management folder.</li> <li>d. Both boreholes are enclosed within elevated chambers of block construction with locked access covers. Borehole 1, the primary source for the Galbally supply, was inspected during the audit. The wellhead was sealed and no risk of ingress at the wellhead was noted. Borehole 2 was not accessible for inspection due to a locked hatch cover. A photograph of the wellhead was submitted subsequent to the audit confirming that it was of near identical construction and capping to Borehole 1 and appeared to be adequately sealed also.</li> <li>e. The Cryptosporidium Risk Assessment score for the supply is 61 indicative of moderate risk.</li> </ul> |
| <p><b>2.</b></p> | <p><b>Monitoring and Sampling Programme for Raw Water</b></p> <ul style="list-style-type: none"> <li>a. Raw water sampling is undertaken by Limerick City and County Council (on behalf of Irish Water) in Spring and September each year. Results for the years 2014 to 2018 were reviewed during the audit. The auditor noted that events of elevated turbidity had been detected over the course of the sampling history. The maximum turbidity detected in raw water samples during the period reviewed was 3.44 NTU. Levels in excess of 1 NTU were detected in approximately half of all samples. There was 1 No. <i>E.coli</i> detection, 4 No. Enterococci detections and 10 No. coliform bacteria detections in the period reviewed.</li> <li>b. Water is sampled 6-7 times per year for Cryptosporidium. No detection has been made since 2014.</li> </ul>   |

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| <p><b>3.</b></p> | <p><b>Disinfection</b></p> <ul style="list-style-type: none"> <li>a. pH correction, using sodium carbonate, takes place prior to disinfection to address the raw water pH of 6.2 towards optimal disinfection. The auditor observed that some of the dosing pipework and instrumentation was at floor level and in the pathway to the bulk storage area for soda ash (see Photograph 1).</li> <li>b. Sodium hypochlorite is the disinfectant used at the plant. Duty and standby dosing pumps are in place with automatic switchover in the event that the duty pump fails.</li> <li>c. A chlorine monitor is in place and operational. It was reading 0.6mg/l on inspection and displayed little or no fluctuation when observed during the audit. The monitor is alarmed with a low set point of 0.2 mg/l and a high level of 1.2 mg/l. Automatic shutdown of the supply occurs if the low-level alarm is triggered. The monitor and alarms are linked to SCADA and can be queried at any time by the caretaker or area foreman.</li> <li>d. A chlorine contact tank is in place and the chlorine monitor measures chlorine at the outflow from this contact tank.</li> <li>e. One daily check is undertaken in the network by the caretaker using a hand held chlorimeter. It was noted that the same premises are used each day for this check and it was not known if this was representative of the extremity of the network. The auditor advised that the sampling point should be varied and that network sampling for chlorine residual should capture the network extremity.</li> </ul> |
| <p><b>4.</b></p> | <p><b>Chemical storage and bunds</b></p> <ul style="list-style-type: none"> <li>a. 25 l drums of sodium hypochlorite are brought to site from an area depot in Kilmallock. None were present for inspection during the audit. The chlorine day tank was adequately bunded.</li> <li>b. Sodium carbonate is brought to site on a pallet and loaded by hand into the soda ash dosing house. Only the date of manufacture was provided on soda ash bags; no use by date was provided.</li> </ul>   |
| <p><b>5.</b></p> | <p><b>Treated Water Storage and Distribution Network</b></p> <ul style="list-style-type: none"> <li>a. A single reservoir is located adjacent to the treatment plant and was inspected externally during the audit. There were no vents and the inspection hatches were securely locked.</li> <li>b. The auditor was informed that the reservoir had been cleaned out by a robotic cleaning machine in 2010.</li> <li>c. Some ivy growth was visible on the outer walls of the structure which should be kept in check.</li> <li>d. Steep ground downslope of the structure provides security on that approach to the reservoir, however some improvement to fences on other sides was noted to be necessary to ensure stock proofing (see Photograph 2).</li> </ul>  |
| <p><b>6.</b></p> | <p><b>Monitoring and Sampling Programme for treated water</b></p> <ul style="list-style-type: none"> <li>a. Treated water is sampled 4 times per year for check monitoring purposes and one audit sample is taken per year. Results for the years 2014-2018 were reviewed by the auditor and no exceedances that had not been notified to the EPA were noted. An elevated turbidity result of 5.15 NTU was noted in a sample taken on 03/02/2014. This was the same month in which <i>Cryptosporidium</i> was detected in this supply. All other results for turbidity in treated water were below 1 NTU.</li> </ul>  |
| <p><b>7.</b></p> | <p><b>Hygiene and Housekeeping</b></p> <ul style="list-style-type: none"> <li>a. The Galbally drinking water treatment plant was generally tidy, clean and well maintained. Some spillage of sodium carbonate in the soda ash dosing house was observed but there was no accumulation of foreign debris (See Photograph 1).</li> </ul>  |
| <p><b>8.</b></p> | <p><b>Management and Control</b></p>  |

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|  | <ul style="list-style-type: none"> <li>a. The Galbally drinking water treatment plant compound is fenced off and very secure from intruders.</li> <li>b. The treatment plant is visited once or twice a day by the duty caretaker.</li> <li>c. Alarms are directed to the mobile phones of three members of Limerick City and Council staff and to SCADA on a continuous basis.</li> <li>d. A template “Daily Report” records sheet is retained on-site in a plant management folder and is completed by the caretaker daily.</li> <li>e. Regarding the decommissioning of the supply, Irish Water informed the auditor that approximately 1km of connecting pipework is required with some associated works also necessary to engineer the merging of the two networks. The estimated date for completion of the connection and decommissioning of the current sources is Q4_2019.</li> </ul> |
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### 3. AUDITORS COMMENTS

The Galbally Public Water Supply has many attributes with the potential to be advantageous to its management; a delineated ZOC, a single landowner and small distribution network. These attributes, combined with good standards of management, frequency of caretaker visits, a high level of oversight via mobile phone and SCADA have optimised the safety and security of the supply in recent years. The zone of contribution, however, is classified, for the most part, as extremely vulnerable and, in the absence of a treatment barrier, confers an inherent vulnerability to the security of the supply. Galbally’s raw water displays a tendency for relatively frequent elevated turbidity events. Irish water has assessed that, long term, the most sustainable means for ensuring wholesome and clean water for consumers is the decommissioning of the current sources and rationalisation with a neighbouring larger scheme. Irish Water should expedite the plan to connect this supply to the Galtee Regional public water supply. In the interim, close monitoring and management of elevated turbidity events is critical to ensuring the safety and security of the supply towards the protection of consumers’ health.

### 4. RECOMMENDATIONS

#### General

1. Irish Water should provide a progress update on the connection of the Galbally distribution network to the neighbouring Galtee Regional Public Water Supply.

#### Source Protection

2. Irish Water should liaise with Limerick City and County Council requesting that the landowner is written to in relation to the requirements of the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)*.

#### Raw Water Monitoring

3. Irish Water should install a continuous turbidity monitor on the Galbally supply. The monitor should be alarmed to alert plant operators of any changes in raw water quality. Automatic shut-down should be installed to protect consumers during elevated turbidity events.

#### Disinfection

4. Irish Water should ensure that pipework and dosing apparatus in the soda ash house are made safe from any potential damage.
5. Irish Water should ensure that the premises sampled for chlorine residual is varied to represent different localities of the network, including the network extremity.

#### Treated Water Storage

6. Irish Water should ensure that the site boundary surrounding the treated water reservoir is made secure and stock-proof.



Photograph 1: Soda ash dosing pipework – potentially vulnerable to damage.





**Photograph 2:** Reservoir: ivy on side of structure and perimeter fence not stock proof.

