

# 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	
<b>Name of Installation</b>	Teeranea/Lettermore PWS
<b>Organisation</b>	Irish Water
<b>Scheme Code</b>	1200PUB1046
<b>County</b>	Galway
<b>Site Visit Reference No.</b>	SV20093

Report Detail	
<b>Issue Date</b>	13/02/2020
<b>Prepared By</b>	Aoife Loughnane

Site Visit Detail			
<b>Date Of Inspection</b>	03/02/2020	<b>Announced</b>	Yes
<b>Time In</b>	13:00	<b>Time Out</b>	15:45
<b>EPA Inspector(s)</b>	Aoife Loughnane		
<b>Additional Visitors</b>	HSE (Public Health Medicine): Emer O'Connell, Treasa Kelleher, Andrew Bowe, Ciara Kelly  HSE (Environmental Health): Seamus Mitchell		
<b>Company Personnel</b>	Irish Water: Pat O'Sullivan, Thomas Gibbons, Tim O'Connor, Eoin Hughes  Galway County Council: Michael Timmons, Tony Kelly, Jim O'Connell, Brendan Hynes, Paraic Griffin		

## > Summary of Key Findings

1. Teeranea water treatment plant was not performing satisfactorily from mid November 2019 to the end of January 2020, when the plant was intermittently producing inadequately treated water with aluminium levels above the 200 microgram per litre (ug/l) standard in the Drinking Water Regulations. The cause of the plant performance issues has been attributed to operational issues with the dissolved air flotation and filtration (DAFF) plant and chemical dosing. The audit found that these issues have been addressed by remedial works completed on 27/01/20.
2. There was a delay between Galway County Council and Irish Water in the communication, escalation and reporting of the operational issues at Teeranea water treatment plant. The aluminium failures recorded in daily testing at the plant in November and December were not escalated by Galway County Council to Irish Water, and not reported to the EPA until 03/01/20. As a result, the EPA and the HSE were not notified of the water quality issues in a timely manner.
3. The UV disinfection system failed to automatically shutdown when the operating conditions deviated outside the validated range between 05/01/20 and 09/01/20.
4. Irish Water issued a Boil Water Notice on 15/01/20 due to the operational issues which resulted in elevated turbidity levels at Teeranea water treatment plant, which meant that adequate disinfection of the water supply could not be verified. The Boil Water Notice will remain in place until Irish Water demonstrates to the satisfaction of the EPA and the HSE that the chlorination and UV disinfection systems are operating satisfactorily, and monitoring results clearly demonstrate that the water supply meets the requirements of the Drinking Water Regulations.

## > Introduction

The source of Teeranea/Lettermore public water supply is Lough Illauntrasna. The water abstracted from the lake undergoes treatment by pH correction, coagulation, flocculation, dissolved air flotation and filtration (DAFF) followed by disinfection using UV treatment and chlorination, and final pH correction before entering the distribution network. The plant produces 524 m<sup>3</sup>/day and serves a population of 911.

Irish Water issued a Boil Water Notice on 15/01/20 following elevated levels of turbidity due to operational issues at Teeranea water treatment plant.

## > Supply Zones Areas Inspected

The audit covered the raw water abstraction and treatment processes and controls at Teeranea water treatment plant.

The audit found that the treatment plant was performing satisfactorily, with a DAFF pH of 5.91, UVI of 28.87 W/m<sup>2</sup> and UVT of 90.9%.



## 1. Incident Management

1.1

	Answer
Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	No
<b>Comment</b>	
<p>1. The EPA has been notified of the following aluminium exceedances in the distribution network of Teeranea/Lettermore public water supply:</p> <ul style="list-style-type: none"> <li>• 340 ug/l in a sample taken on 02/12/194;</li> <li>• 4 exceedances ranging from 340 - 460 ug/l in samples taken on 11/12/193;</li> <li>• 3 exceedances ranging from 280 - 450 ug/l in samples taken on 09/01/20;</li> <li>• 4 exceedances ranging from 380 - 1,100 ug/l in samples taken on 15/01/20.</li> </ul> <p>No samples were taken in the distribution network between 11/12/19 and 09/01/20 following the initial aluminium exceedances in early December 2019. This caused a delay in investigating the cause of the exceedances and taking remedial action to restore compliant drinking water quality.</p> <p>2. Following the aluminium exceedances in the distribution network, Galway County Council and Irish Water identified operational issues with the DAFF plant and chemical dosing at Teeranea water treatment plant. The following issues were identified and remedial actions taken:</p> <ul style="list-style-type: none"> <li>• Faulty pH probe on the DAFF inlet which is the critical control for caustic dosing to achieve optimum coagulation conditions. A new pH probe has been installed and there is now daily checks of instrument readings against a handheld pH meter.</li> <li>• Malfunction of the alum dosing pumps which has been fixed by replacement parts and calibration.</li> <li>• Depletion of approximately one quarter of filter sand from the DAFF plant. The filter bed has been replenished with 3 cubic metres of sand and the backwash regime has been readjusted to prevent further excessive loss of filter sand.</li> <li>• Replacement of caustic and alum dosing lines.</li> <li>• Cleaning of static mixer prior to DAFF plant.</li> <li>• Cleaning of flocculation tank in DAFF plant.</li> </ul> <p>3. The records of daily testing at Teeranea water treatment plant in November, December and January show that levels of residual aluminium in the treated water were unstable and non-compliant, with 33 out of 90 results exceeding the 200 ug/l parametric value (maximum recorded result of 327 ug/l). The residual aluminium levels have been restored to compliance since 27/01/20 following remedial works carried out on the DAFF plant.</p> <p>4. The aluminium failures recorded in daily testing at the plant in November and December were not escalated by Galway County Council to Irish Water, and not reported to the EPA until 03/01/20 when Irish Water was investigating the aluminium exceedances in the distribution network.</p>	



## 2. Disinfection

		Answer
2.1	Are duty and standby chlorine pumps/ UV units in operation?	No
<b>Comment</b>		
There was only one chlorine dosing pump in operation during the audit. The standby dosing pump was broken and in need of replacement to ensure that chlorine will continue to be dosed in the event of failure of the duty pump.		

		Answer
2.2	Is the UV disinfection system operating within its validated range?	No
<b>Comment</b>		
The UV disinfection system operated below the required UV intensity set-point of 24 W/m <sup>2</sup> between 05/01/20 and 09/01/20. The UV system should automatically shutdown when the operating conditions deviate outside the validated range, however it failed to shutdown on that occasion. Irish Water is investigating why the UV system failed to shutdown, and had not established the cause of this malfunction by the day of the audit.		



### 3. Management and Control

		Answer
3.1	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
<b>Comment</b>		
<p>The UV disinfection system failed to automatically shutdown when the UV intensity dropped below the minimum requirement of 24 W/m<sup>2</sup> between 05/01/20 and 09/01/20. This presented this risk of inadequately disinfected water being supplied to consumers.</p> <p>Irish Water is investigating why the UV system failed to shutdown, and had not established the cause of this malfunction by the day of the audit.</p>		



## 4. Drinking Water Quality

4.1

	Answer
Have failures of the parametric values or the detection of pathogenic micro-organisms or parasites in the water supply been adequately investigated?	Yes
<b>Comment</b>	
<p>1. E.coli (1 per 100ml) and coliform bacteria (3 per 100 ml) were detected in an operational sample taken at Lettermore National School on 09/01/20. There was a residual chlorine level of 0.76 mg/l in the sample, meaning that the water supply was adequately disinfected at that location.</p> <p>2. A possible cause of the microbiological failures was inadequate sterilisation of the tap, which was sprayed rather than flamed before sample collection. The sampler was not given consent to flame the tap because of concerns about damaging the plastic insert in the tap.</p> <p>3. The follow up samples returned 3 clear results, with no further microbiological failures detected.</p> <p>4. The follow up investigations have identified that the tap at Lettermore National School may be fed from a storage tank within the school premises, so this sample location may not be truly representative of water quality in the public supply. In accordance with Regulation 6 of the Drinking Water Regulations, the owner of the premises where water is supplied for human consumption as part of a commercial or public activity, is required to maintain the domestic distribution system of the premises in such condition that it doesn't give rise to a risk of non-compliant drinking water quality. Galway County Council and Irish Water confirmed they will follow up with the school on this matter.</p>	

## Recommendations

Subject	Teeranea/Lettermore Audit Recommendations	Due Date	13/03/2020
<b>Action Text</b>	<p data-bbox="272 398 517 427"><b>Recommendations</b></p> <ol data-bbox="300 456 1433 1503" style="list-style-type: none"><li data-bbox="300 456 1433 539">1. Irish Water should ensure that operational incidents at Teeranea water treatment plant are escalated in a timely manner and managed appropriately, in order to maintain drinking water quality and protect public health.</li><li data-bbox="300 568 1433 689">2. Irish Water should ensure there is a documented communications protocol in place for the reporting of incidents which could potentially impact the quality of water produced at Teeranea water treatment plant, so the relevant parties involved (Galway County Council, Irish Water, the HSE and EPA) are alerted in a timely manner.</li><li data-bbox="300 719 1433 840">3. Irish Water should ensure that plant and equipment is maintained, serviced and calibrated in accordance with the manufacturers' instructions, and that records of maintenance / servicing / calibration works are kept up-to-date at the plant. In particular, the filter sand depth should be checked regularly and results recorded at the plant.</li><li data-bbox="300 869 1433 1010">4. Irish Water should verify that all alarms, including those that automatically shutdown the plant, are operating satisfactorily, to prevent inadequately treated water being supplied to consumers. In particular, Irish Water should confirm that the UV disinfection system automatically shuts down when the operating conditions deviate outside the validated range.</li><li data-bbox="300 1039 1433 1122">5. Irish Water should replace the standby chlorine dosing pump as soon as possible, to ensure that chlorine will continue to be dosed in the event of a failure of the duty chlorine pump.</li><li data-bbox="300 1151 1433 1391">6. In relation to the sample location at Lettermore National School, Irish Water or Galway County Council should exercise their powers under Regulation 6 of the <i>European Union (Drinking Water) Regulations 2014 as amended</i>, which requires the owner of a premises where water is supplied for human consumption as part of a commercial or public activity, to maintain the domestic distribution system of the premises in such condition that it doesn't give rise to a risk of non-compliant drinking water quality. Irish Water should submit the results of resampling at this location, given the significantly elevated aluminium result (1,100 ug/l) recorded on 15/01/20.</li><li data-bbox="300 1420 1433 1503">7. Irish Water should undertake 3 days of verification monitoring to confirm compliant drinking water quality in the distribution network, and submit the results to the EPA and HSE as soon as available.</li></ol> <p data-bbox="272 1585 810 1615"><b>Follow-Up Actions required by Irish Water</b></p> <p data-bbox="272 1644 1433 1704">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.</p> <p data-bbox="272 1733 1433 1794">This report has been reviewed and approved by Michelle Minihan, Senior Inspector, Drinking Water Team.</p> <p data-bbox="272 1823 1433 1883">Irish Water should submit a report to the Agency on or before 13/03/20 detailing how it has dealt with the issues of concern identified during this audit.</p> <p data-bbox="272 1912 1433 1973">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.</p> <p data-bbox="272 2002 1433 2063">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.</p> <p data-bbox="272 2092 1433 2152">Please quote the Action Reference Number in any future correspondence in relation to this Report.</p>		

