

# 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>	Drimoleague
<b>Organisation</b>	Irish Water
<b>Scheme Code</b>	0500PUB4103
<b>County</b>	Cork
<b>Site Visit Reference No.</b>	SV19200

Report Detail	
<b>Issue Date</b>	20/01/2020
<b>Prepared By</b>	Criona Doyle

Site Visit Detail			
<b>Date Of Inspection</b>	06/01/2020	<b>Announced</b>	Yes
<b>Time In</b>	10:30	<b>Time Out</b>	11:30
<b>EPA Inspector(s)</b>	Criona Doyle Orla Harrington		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Irish Water: Deirdre O'Loughlin, Oliver Harney.  Cork County Council: Michael Russell, Seamus Sutton, Michael Russell.		

## > Summary of Key Findings

1. The audit confirmed that interim remedial works have been completed and the upgraded treatment process has been commissioned to reduce the potential for the formation of trihalomethanes and to reduce the *Cryptosporidium* risk.
2. Irish Water is undertaking a programme of verification monitoring to provide 3 rounds of compliant trihalomethanes results across the distribution network to allow the supply to be removed from the remedial action list.
3. Irish Water intend to decommission the Drimoleague Water Treatment Plant and complete connection to the Skibbereen Water Supply by end of June 2020.

## > Introduction

The Drimoleague Public Water Supply (PWS) was added to the EPA's Remedial Action List in Q3 2014 due to persistent trihalomethanes failures in the supply. *Cryptosporidium* was detected in the supply in 2018 (26/04/18) and 2019 (12/03/19 & 08/10/19).

Interim works have been completed at the water treatment plant which reduce potential for the formation of trihalomethanes and reduce the risk of *Cryptosporidium*. The treatment plant has been upgraded with the addition of 2 no. Granular Activated Carbon (GAC) filters and a UV disinfection system in addition to the pre-existing infrastructure (2 no. slow sand filters and chlorination disinfection system) which has been retained.

## > Supply Zones Areas Inspected

The purpose of the audit was to verify if the Drimoleague Public Water Supply can be removed from the EPA's Remedial Action List following the completion of the interim works at the site to address the formation of trihalomethanes in the supply. The audit covered the treatment plant processes to determine progress with the remedial works.

## > 1. Filtration

		Answer
1.1	Are the filters designed and managed in accordance with EPA guidance?	Yes
<b>Comment</b>		
<p>A 'plug and play' granular activated carbon (GAC) filtration system has been installed to address the elevated trihalomethanes in the supply. The system consists of 2 no. GAC filters with Aquasorb 5,000 media. Backwashing of filters or run to waste is not required as the GAC filter units are replaced when a UVT set point is reached.</p> <p>It was outlined at the audit that a level of 85% UVT post GAC would instigate replacement of the GAC filter units. Data provided at the audit indicated that the UVT post GAC was &lt; 85% on the following dates 20/11/19; 25/11/19; 28/11/19 and 12/12/19. Irish Water indicated that they would confirm the proposed UVT level post GAC that would instigate the replacement of the GAC filter units.</p> <p>On the day of the audit the UVT was 84.5%.</p> <p>The 2 no. slow sand filters remain in operation prior to the GAC filters. There is an alarm warning level of 0.4 NTU on the filtered water turbidity which generates a text alert. There is automatic shutdown of the filtered water (15 minutes delay) if turbidity exceeds 0.8 NTU. If the filtered water turbidity reaches 0.9 NTU there is no time delay and the plant automatically shuts down immediately.</p>		

		Answer
1.2	Does monitoring indicate that the filters are operating effectively?	Yes
<b>Comment</b>		
<p>The monitoring data since commissioning took place indicates THMs monitoring results less than the drinking water parametric value of 100 ug/l on 12 out of 13 sampling dates. A sample taken on the 28/11/19 indicated a Trihalomethanes level of 101 ug/l and 82% UVT post GAC. The 2 no. GAC filters were being operated in parallel (water being treated by passing through a single GAC vessel) during this monitoring period at an output of 20m<sup>3</sup>/hr which is the normal operating regime.</p> <p>As a result of the THMs exceedance on 28/11/19 pipe modifications were completed to allow the 2 no. GAC units to be operated in series (water being treated by passing through both GAC vessels) during periods of low UVT at a lower flow rate of 12.5m<sup>3</sup>/hr. Irish Water outlined at the audit that confirmation would be provided of the UVT% post GAC set point that instigates switch over of the operation of the GAC filtration process from parallel (treatment via single vessel) to series (treatment via both vessels in series) for short periods of time.</p> <p>Irish Water propose to submit verification data, 3 no. compliant samples on different dates, post pipework modifications to allow the supply to be assessed for removal from the EPA's Remedial Action List.</p>		



## 2. Disinfection

	Answer
2.1 Are duty and standby chlorine pumps/ UV units in operation?	Yes
<b>Comment</b>	
<p>A separate day tank and set of chlorine dosing pumps is provided for (a) the supply to the Castledonovan Reservoir and (b) supply to the Drimoleague Reservoir. Each set of pumps operate on a duty and assist basis. The assist pump can provide 100% of the dose if required.</p> <p>A single UV unit has been installed to provide a barrier against <i>Cryptosporidium</i> as an interim measure. 1 days storage is provided at the site for the Drimoleague supply and 5 to 6 hours storage for the Castledonovan supply. It is proposed this site will be decommissioned in June 2020.</p>	

	Answer
2.2 Is the UV system suitably validated?	Yes
<b>Comment</b>	
<p>The plate on the UV unit indicated the LBX90e is validated for a maximum flow rate of 40m<sup>3</sup>/hr, a minimum UV dose of 36.7 mJ/cm<sup>2</sup> and a minimum UVT of 70% at the max flow rate.</p> <p>The validation criteria, operating envelope, alarm set points and plant shut down levels for the UV unit were provided by Irish Water subsequent to the audit (email dated 06/01/2020). The unit is validated to USEPA UVDGM Calculated Dose Approach.</p>	

	Answer
2.3 Is the UV disinfection system operating within its validated range?	Yes
<b>Comment</b>	
<p>On the day of the audit the UV unit readings were dose 90 mJ/cm<sup>2</sup>, UVT 84.4% and turbidity 0.04 NTU. Irish Water submitted 1 months verification data following the audit (email on 06/01/20) which indicated the UV unit had been operating within its validation range.</p> <p>Irish Water outlined at the audit that while the UV and GAC trends could be viewed at the water treatment plant works had not been completed to allow trends to be viewed on the countywide SCADA.</p>	



### 3. Management and Control

		Answer
3.1	Are instrument calibrations within date?	No
<b>Comment</b>		
The turbidity monitors on the outlets from the slow sand filters are calibrated on a six month frequency and were last calibrated on 14/05/19. The calibration was overdue since 14/11/19.		



## 4. Supply on the Remedial Action List

		Answer
4.1	Is the Action Programme on track to meet the Remedial Action List completion date?	Yes
<b>Comment</b>		
<p>The remedial action list indicates June 2020 as the proposed date of completion of the action programme for the Drimoleague public water supply.</p> <p>The supply is expected to be removed from the RAL in advance of the RAL completion date of June 2020.</p>		

		Answer
4.2	Do the audit findings support progress made with the Remedial Action List upgrades?	Yes
<b>Comment</b>		
<p>The audit confirmed the interim works to improve the treatment process have been completed on site and include the addition of a granular activated carbon filtration stage and UV disinfection.</p> <p>Irish Water are gathering verification data to demonstrate that the actions undertaken have been adequate to address the elevated levels of trihalomethanes above the standard set in the Drinking Water Regulations.</p> <p>Irish Water confirmed that the works to facilitate the decommissioning of the Drimoleague WTP and connection to the Skibbereen and Environs Water Supply Scheme are on track to be completed in June 2020. This will facilitate the decommissioning of the Drimoleague WTP. The works completed to date include the construction of 11km of watermain to connect Ballyhilty WTP to the Drimoleague Reservoir and the construction of new treated water storage tanks at Castledonovan.</p>		

		Answer
4.3	Is further information needed to assess completion of the Remedial Action List upgrade?	Yes
<b>Comment</b>		
<p>Verification data is required to demonstrate the actions undertaken have been adequate to achieve compliance with the trihalomethanes parametric value. Following the submission of the verification data the Drimoleague supply will be assessed for removal from the EPA's remedial action list.</p>		



## 5. Site Specific Issues

	Answer	
5.1	Have the interim remedial works been completed to provide an adequate barrier against <i>Cryptosporidium</i> ?	Yes
<b>Comment</b>		
A UV disinfection unit has been installed on site to provide a barrier against <i>Cryptosporidium</i> .		

	Answer	
5.2	Have the procedures in the plant manual been updated to include the additional treatment stages ?	No
<b>Comment</b>		
The procedures in the plant manual have not been updated to include the additional treatment stages of GAC filtration and UV disinfection.		

	Answer	
5.3	Has EDEN been updated to include the improvements to the treatment process ?	No
<b>Comment</b>		
EDEN has not been updated to include the additional treatment stages provided at the Drimoleague water treatment plant and the revised <i>Cryptosporidium</i> risk score.		

## Recommendations

<b>Subject</b>	Drimoleague Audit 06/01/20	<b>Due Date</b>	20/02/2020
<b>Action Text</b>	<p><b>Recommendation(s)</b></p> <ol style="list-style-type: none"> <li>1. Irish Water should submit verification data to demonstrate that the actions undertaken have been adequate to address the non compliance with the trihalomethanes parametric value. The verification data should include at least 3 consecutive compliant samples for THMs on different dates from various locations in the network.</li> <li>2. Irish Water should confirm the proposed UVT level post GAC filtration that would instigate (i) replacement of the GAC filter media and (ii) switch over of operation of GAC filtration process from parallel (treatment via single filter) to series (treatment via both GAC filters).</li> <li>3. Irish Water should confirm that the works have been completed to allow trends from the GAC filters and UV unit to be viewed on the countywide SCADA</li> <li>4. Irish Water should update the procedures in the plant manual to include the additional treatment stages installed at the treatment plant and ensure all staff are trained on the updated procedures in relation to the operation of the treatment plant and monitoring of alarms for the GAC filters and UV unit.</li> <li>5. Irish Water should update the treatment details and <i>Cryptosporidium</i> risk score on EDEN as a result of the plant upgrades.</li> <li>6. Irish Water should provide 2 months verification data to confirm the UV unit is operating within its validation range.</li> <li>7. Irish Water should ensure that the turbidity monitors are within calibration dates.</li> </ol> <p><b>Follow-Up Actions required by Irish Water</b></p> <p>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>This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 20/02/20 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>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>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>Please quote the Action Reference Number DW2009/350 in any future correspondence in relation to this Report.</p>		