



Drinking Water Audit Report

County:	Wicklow	Date of Audit:	9 th May 2018
Plant visited:	Kiltegan (scheme code 3400PUB1031)	Date of issue of Audit Report:	22 nd May 2018
		File Reference:	DW2018/89
		Auditors:	Aoife Loughnane Michelle Minihan
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended.</i> • <i>The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i> • The recommendations specified in the <i>EPA Drinking Water Report.</i> • EPA Drinking Water Advice Notes No.s 1 to 15. 		

MAIN FINDINGS

- i. **A Drinking Water Restriction was placed on the Kiltegan public water supply on 01/05/18. The “Do Not Consume” Notice states that the water supply is not suitable for consumption for all consumers, especially by bottle fed infants, due to elevated levels of nitrate in the water.**
- ii. **An investigation is underway into the cause of the nitrate contamination. Irish Water, in conjunction with Wicklow County Council, should complete this investigation in order to identify any potentially polluting activities in the catchment of the borehole source.**
- iii. **Irish Water should continue to monitor nitrate levels in the water supply, and identify an action programme to ensure compliance with the nitrate parametric value at all times.**

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 on 27/04/18 of the failure to meet the nitrate parametric value (as specified in Table B of Part 1 of the Schedule of the Regulations) and the imposition of a “Do Not Consume” Notice on Kiltegan public water supply on 01/05/18.

Kiltegan water treatment plant is operated by EPS Group Ltd. on behalf of Irish Water. The raw water source is a borehole located at the treatment plant. Treatment is provided by disinfection using sodium hypochlorite, pH correction using sodium hydroxide and radon removal by aeration. The plant produces 58 m³/day and serves a population of 269 consumers.

The opening meeting commenced at 3 pm at Kiltegan water 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.

Representing Irish Water:

Andrew Boylan – Drinking Water Compliance Specialist
 Aoife Lambe – Drinking Water Compliance Analyst
 Peter Thornton – SLA Lead
 Ger Brady - Engineer

Representing Wicklow County Council:

Tom Griffin – Senior Executive Chemist
 Tom O’Leary – Senior Executive Engineer

Representing EPS Group Ltd:

Padraic Dunne – Plant Manager

Representing the Environmental Protection Agency:

Aoife Loughnane – Inspector
 Michelle Minihan – Senior 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.

1. Exceedances of the Parametric Values

- a. On 27/04/18 Irish Water notified the EPA of a nitrate exceedance of 52.693 mg/l in an operational sample taken at Kiltegan Reservoir on 18/04/18. A follow up sample taken on 27/04/18 detected a further exceedance of 51.64 mg/l at Kiltegan WTP.
- b. Following consultation with the HSE, Irish Water issued a “Do Not Consume” notice for all consumers on the Kiltegan PWS on 01/05/18. The notice states that the water is unsuitable for consumption, especially by bottle fed infants, due to elevated levels of nitrates in the water.
- c. An investigation is underway into the cause of the nitrate contamination. There were no issues reported by the DBO operator at the treatment plant prior to the exceedance. Wicklow County Council undertook a site visit and found no evidence of activity in the catchment which may have contributed to the exceedance.
- d. At the time of the audit, Irish Water were reviewing the options to deal with nitrates in this supply, including the design and costing of a nitrate removal system.
- e. The sampling programme undertaken since the initial exceedance on 18/04/18 shows that nitrate levels are gradually reducing (see table below). The most recent samples taken on 10/05/18 and 14/05/18 are below the 50 mg/l nitrate parametric value.

Date	Location	Result (mg/l)
18.04.2018	Treated – Reservoir	52.693
27.04.2018	Treated – Reservoir	51.641
30.04.2018	Treated – Network	44.2
02.05.2018	Raw	50.71
02.05.2018	Contact Tank	50.688
02.05.2018	Treated – Reservoir	51.295
04.05.2018	Raw	50.134

		04.05.2018	Treated – Reservoir	50.687	
		08.05.2018	Raw	49.957	
		08.05.2018	Treated – Reservoir	49.988	
		09.05.2018	Raw	50.431	
		09.05.2018	Treated – Reservoir	49.718	
		10.05.2018	Treated – Network	46.7	
		14.05.2018	Raw	46.112	
		14.05.2018	Treated – Reservoir	46.214	
2.	<p>Source Protection</p> <p>a. The borehole is located in an underground chamber at the treatment plant. Wicklow County Council representatives stated that the borehole was installed in 1997, is 60m deep and produces 57 m³/day. The borehole construction log was not available during the audit.</p> <p>b. There is no cap on the borehole (see photo 1) and it could not be confirmed if it is lined and grout sealed in accordance with the requirements of EPA <i>Drinking Water Advice Note 14: Borehole Construction and Wellhead Protection</i>.</p> <p>c. The land use surrounding the treatment plant is mainly agricultural. There are a number of houses served by septic tanks. A sawmill is located adjacent to the plant.</p> <p>d. Monthly sampling of raw water quality is carried out. All results have been compliant with the nitrate parametric value with the exception of an exceedance of 52.287 mg/l on 22/04/15 which was deemed to be a once-off elevated result, and not typical of historical water quality.</p>				
3.	<p>Disinfection</p> <p>a. Sodium hypochlorite (14/15%) is used as the disinfectant in the water supply.</p> <p>b. The chlorination system meets the criteria in EPA <i>Drinking Water Advice Note 3: E.Coli in Drinking Water</i>.</p> <p>c. The label on the spare drum of sodium hypochlorite showed a manufacture date of 07/04/18 and an expiry date of 07/10/18. The auditors advised that the storage of sodium hypochlorite at the plant for up to 6 months presents a risk of disinfection by-product formation in the final water due to the decay of sodium hypochlorite. The plant manager confirmed that drums of sodium hypochlorite delivered to the plant are generally used within 2 months of the manufacture date.</p>				
4.	<p>Treated Water Storage</p> <p>a. Kiltegan reservoir provides 90m³ storage capacity of treated water. The reservoir was not visited during the audit.</p>				

3. AUDITORS COMMENTS

This audit was carried out in response to elevated levels of nitrates in Kiltegan public water supply and the imposition of a “Do Not Consume” Notice on the supply on 01/05/18. Irish Water, in conjunction with Wicklow County Council, should complete the investigation into the cause of nitrate contamination. Irish Water should continue to monitor nitrate levels in the water supply, and identify an action programme to ensure compliance with the nitrate parametric value at all times.

4. RECOMMENDATIONS

1. Irish Water should continue the investigative sampling programme to monitor nitrate levels in Kiltegan public water supply.
2. Irish Water should identify an action programme with timeframes to ensure compliance with the nitrate parametric value in Kiltegan public water supply.
3. Irish Water, in conjunction with Wicklow County Council, should complete the investigation into the root cause of the nitrate contamination, in order to identify any potentially polluting activities and any necessary remedial measures within the zone of contribution to the borehole source.
4. Irish Water should ensure that the borehole is lined, sealed and capped in accordance with *EPA Drinking Water Advice Note No. 14: Borehole Construction and Wellhead Protection*.
5. Irish Water should review the labelling system for chemicals at the plant, to minimise the risk of disinfection by-product formation in the final water caused by excessive storage of sodium hypochlorite.

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 Michelle Minihan, Senior Inspector, Drinking Water Team.

Irish Water should submit a report to the Agency **within two weeks of the date of this audit report** 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 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.

Report prepared by: Aife Laghuane Date: 22nd May 2018
Inspector

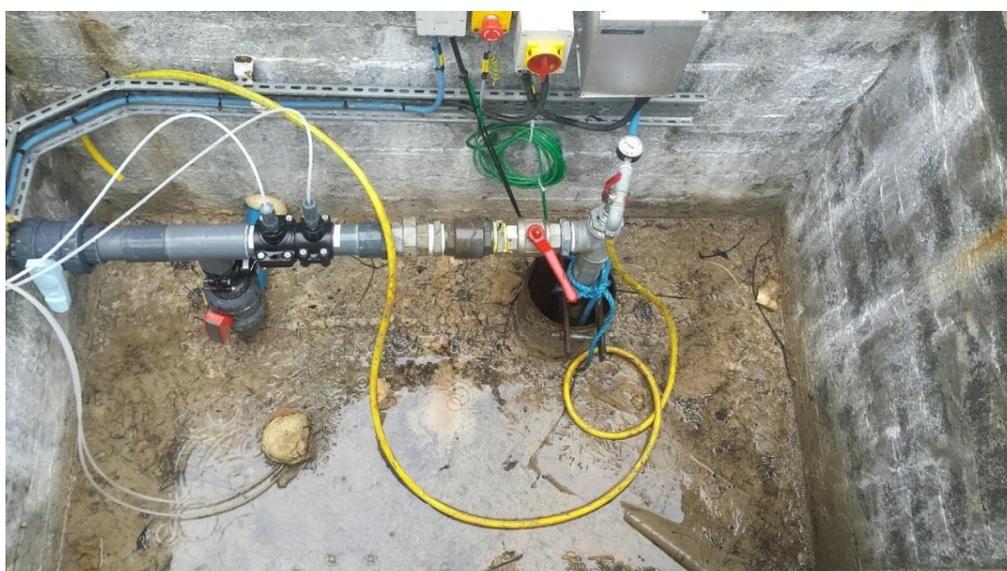


Photo 1: Uncapped borehole at Kiltegan water treatment plant