Drinking Water Audit Report

County:	Longford	**Date of Audit:**	20th August 2014
Plant(s) visited:	Ballymahon PWS Scheme Code 2000PUB1005 Abbeyshrule WTP and Richmond Reservoir	**Date of issue of Audit Report:**	22nd August 2014
		File Reference:	DW2011/35
		Auditors:	Ms Ruth Barrington Ms Aoife Loughnane
Audit Criteria:	• The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).* • *The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)* • The recommendations specified in the EPA Report on *The Provision and Quality of Drinking Water in Ireland.*		

MAIN FINDINGS

i. **The quality of the raw water source (River Inny) is changeable based on water level fluctuations. The dosing control at the plant should be optimised to deal with this variability.**
ii. **Monitoring in respect of disinfection by-product formation is ongoing in Ballymahon Public Water supply including at the treatment plant, raw water, reservoirs and network. The results of this work should be reported to the EPA.**
iii. **Source protection work is carried out by Co. Longford Environment Section and maintained at Council Head Office. Information on catchment pressures and risks should be available at the plant to inform the operators.**

1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* 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 drinking water.

Where the text refers to the Water Service Authority this refers to Irish Water in accordance with Section 7 of the Water Services (No. 2) Act 2013.

The Abbeyshrule water treatment plant serves Ballymahon public water supply with approximately 3,500 m3/day of water. The plant, which is 30 years old, was upgraded within the last two years, and treats water abstracted from the River Inny. The upgrade included a changeover to liquid sodium hypochlorite disinfection from chlorine gas, improvements in disinfection control, filter media replacement and enhanced sludge management.

Photographs taken by Aoife Loughnane during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 10.30 a.m. at Abbeyshrule 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 audit observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water:

Mr Barnard Kroon – Senior Executive Engineer, Longford County Council
Mr Noel Madden – Executive Engineer, Longford County Council
Mr Bernard Naughton – Technician, Longford County Council
Mr Shane Tynan – Water Engineer, Irish Water
Mr John Byrne- Caretaker, Longford County Council

Representing the Environmental Protection Agency:

Ms Ruth Barrington – Inspector
Ms Aoife Loughnane – 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.	**Source Protection** a. The River Inny is the abstraction source for the Ballymahon public water supply. The river level can rise rapidly after heavy rainfall with accompanying deterioration in water quality. b. The neighbouring land use is mainly agricultural, although the privately owned Abbeyshrule Aerodrome is directly across the river from the abstraction point. c. Information on catchment investigation or protection activities was not available on-site. This work is undertaken by the Environment Section of Longford County Council and the information is held in the Council offices.
2.	**Coagulation, Flocculation and Clarification** a. Coagulation, using Chemifloc 101, is currently manually controlled. The dose rate is varied by the caretaker on the basis of predicted deteriorations in water quality. b. A buildup of algae/ weed growth was noted on the clarifier channels (refer to photographs Ref. 009.jpg and 010.jpg). The channel length cannot currently be cleaned fully as there are walkways on only one side of each of the two clarifier tanks. c. Some of the clarifier channels are out of level, apparently due to freezing and thawing in winter weather. d. Works are planned on the coagulation/ clarification stage to include installation of additional walkways, levelling of channels and possibly provision of automatic dosing.
3.	**Filtration** a. There are three rapid gravity filters at the plant. These were refurbished in 2012, including replacement media in all three filters, and replacement pipework/ nozzles in Filter No. 1. b. Filters are normally backwashed on a time basis, but are triggered additionally if turbidity on the filter outflow rises above 1.5 NTU. c. Filter 2 was backwashed during the audit on request. The backwash in general proceeded well, with the exception of an area towards the back right hand side of the filter which

	showed slight boiling (refer to photograph Ref. 013.jpg) and some sand carryover on the weir. However overall the media level had not visibly decreased since the media replacement.
4.	**Chlorination and Disinfection** a. Primary disinfection is achieved using sodium hypochlorite (10-15%) at the water treatment plant. Dosing is flow proportional, there is duty/standby dosing by two bulk tanks and alarmed chlorine residual monitoring. b. There is booster chlorination at the reservoirs, also using sodium hypochlorite. Only the Richmond Hill Reservoir was visited as part of the audit. There are residual chlorine monitors and alarm facilities at the reservoirs. c. Chlorine alarms are sent to the caretaker, relief caretaker and a cascade list by text and email. d. The current chlorine alarm response procedure covers initial call out to the alarm, but has not been fully outlined, for example to cover escalation of an alarm in an emergency situation where there is a risk of un-disinfected water entering supply. e. The sodium hypochlorite is supplied by Brenntag, which is not on the list of authorised suppliers of biocides (refer to http://www.pcs.agriculture.gov.ie/biocides/Biocidal%20Product%20Register%20-%2012%20May%202014.pdf) therefore Irish Water are not in compliance with the EU Biocidal Products Regulations (528/2012) and associated Irish regulations (the European Union (Biocidal Products) Regulations, 2013).
5.	**Treated Water Storage** a. The Richmond Hill Reservoir was visited as part of the audit. The reservoir is located inside a gated and fenced area and there is a secure building for chlorine storage, dosing and monitoring equipment. b. The reservoir comprises two cells and is due for cleaning. This is done on a scheduled basis every four years. c. The grass on the top of the reservoir has grown up above the level of the reservoir vents. The vent examined (there are 18 in total) would not exclude the entry of vermin into the reservoir. d. The reservoir access hatch examined, while lockable, was unlocked at the time of the audit.
8.	**Chemical storage and bunds** a. The bund for the hydrofluorosilic acid bulk tanks had been recently refurbished and the bund wall height increased to give more retention capacity but the walls were not lined in impervious material.
10.	**Management and Control** a. The supply is being evaluated for trihalomethane formation under EPA Advice Note No. 4 (Version 2). The operational evaluation has been on-going since 2013. The last update on this monitoring was received by the EPA on 19th March 2014, and on 17th April 2014, the EPA approved Irish Water's proposal for specific monthly monitoring in support of this evaluation. The results were not examined during the audit, but it was noted that the monitoring programme available on-site did not provide for the continuation of this monitoring past November 2014. b. The plant has recently been audited as part of Irish Water's Process Optimisation Programme. The audit findings were not available during the audit. c. The plant currently has the capacity for automatic shut down on the basis of an alarm level of turbidity (>0.5 NTU) in the final treated water. The feasibility of programming a similar shutdown in response to low chlorine residual is also being examined. d. Information on the supply submitted by Longford County Council as part of previous Drinking Water Returns was examined as part of the audit. Information on the population size, volume of treated water produced, and treatment type was out of date and should be updated in future returns.

3. AUDITORS' COMMENTS

The plant in general appeared clean and well managed, and has had aspects of its infrastructure upgraded within the last two years. There are a number of improvements which were evident during the audit that could optimise the operations of the plant, as are set out below. The audit team also considered that information on catchment work and potential risks should be more readily available to the plant operators, to enable mitigation measures to be taken where necessary.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should ensure that risks to the abstraction source are identified and suitable mitigation measures put in place to ensure the security of the supply. Activities in the catchment that may be relevant include wastewater treatment discharges upstream, agricultural activities, pesticide use on farms and at the aerodrome. The management of emergency situations should be considered in this exercise, and suitable information should be maintained on site to enable plant operators to address relevant risks to the abstraction in an emergency situation.

2. Irish Water should ensure that farmers are advised of the location of the abstraction point and their responsibilities under the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)* to ensure, unless an alternative setback distance has been set as per Article 17 that:

    i. Organic fertiliser or soiled water is not applied to land within 200 m of the abstraction point; and
    ii. Farmyard manure held in a field prior to landspreading is not placed within 250 m of the abstraction point.

Coagulation, Flocculation and Clarification

3. Irish Water should ensure that the clarifier channels are level, free from blockage and that flow into these channels is even.

4. Irish Water should ensure that the clarifier tanks and channels are cleaned regularly to prevent the build-up of algae/ weed growth. Facilities should be provided to carry out this work safely.

5. Irish Water should ensure that the coagulation / flocculation processes at the water treatment works are regularly checked to determine the optimum chemical coagulant dose and pH for the treatment of the water. The frequency of checks should be appropriate to the nature of supply and changing conditions, and consideration should be given to the provision of an automatic dosing system given the rapid fluctuations described as typical of the abstraction source, having regard to EPA guidance *Advice Note No. 15: Optimisation of Chemical Coagulant Dosing.*

Filtration

6. Irish Water should review the filter backwash performance to identify any areas similar to that observed in Filter No. 2 during the audit where a boil in the filter led to sand carry over at the weir. Suitable maintenance should be carried out on areas so identified.

7. Irish Water should review the turbidity trigger level for automatic backwash as the level of 1.5NTU is high.

Disinfection

8. Irish Water should review use of disinfectants in the Ballymahon PWS and all other public water supplies to ensure that all disinfectants are authorised in accordance with the EU Biocides Products Regulation (528/2012) and associated Irish regulations (*European Union (Biocidal Products) Regulations, 2013.*

9. Irish Water should review the chlorine alarm response procedure to ensure that it is adequate to prevent the entry of undisinfected water into the network in the event of an incident of dosing breakdown or high chlorine demand. Emergency contact phone numbers should be kept up to date within this procedure.

Treated Water Storage

10. Irish Water should ensure that all vents and covers on the reservoirs are secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism.

Chemical Storage and Bunds

11. Irish Water should ensure that chemicals are stored in impervious bunded areas capable of containing at least 110% of the volume of chemicals stored therein, having regard to the EPA guidance document *"IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities"*.

Management and Control

12. Irish Water should report to the EPA on the progress since September 2013 with the operational evaluation of the treatment and distribution system in relation to the potential for THM formation. This report should be informed where relevant by the recommendations of Irish Water's process optimisation audit.

13. Irish Water should ensure that information on water supplies submitted as part of the Drinking Water Returns is updated as necessary to reflect population served, volume of water produced and the type of treatment provided.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

During the audit the Water Services Authority representatives were advised of the audit findings and that action must be taken as a priority by the Water Services Authority to address the issues raised. This report has been reviewed and approved by Mr Darragh Page, Drinking Water Team Leader.

The Water Services Authority should submit a report to the Agency within one month 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.

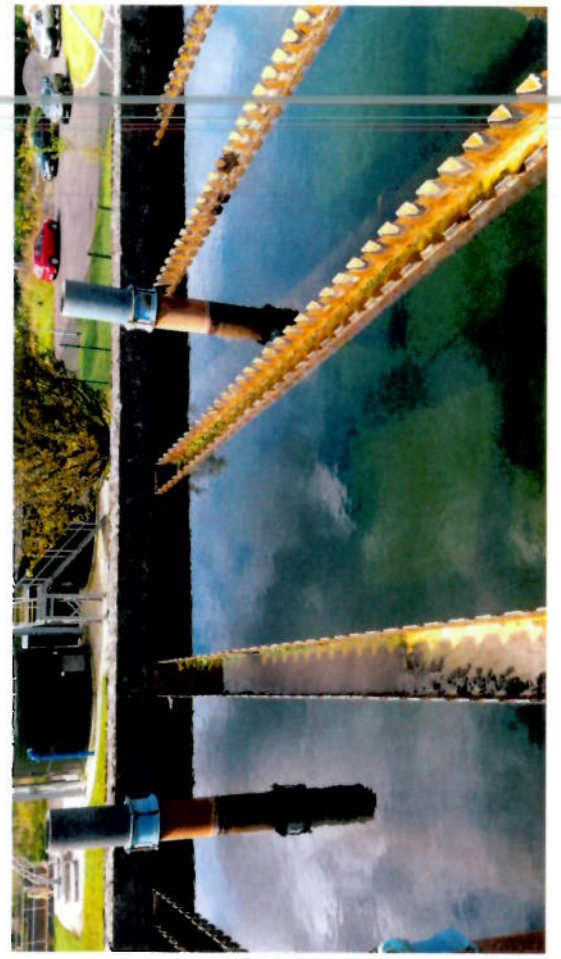
The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.

Please quote the File Reference Number in any future correspondence in relation to this Report.

Report prepared by: **Date:** 22nd August 2014

Ruth Barrington

Inspector



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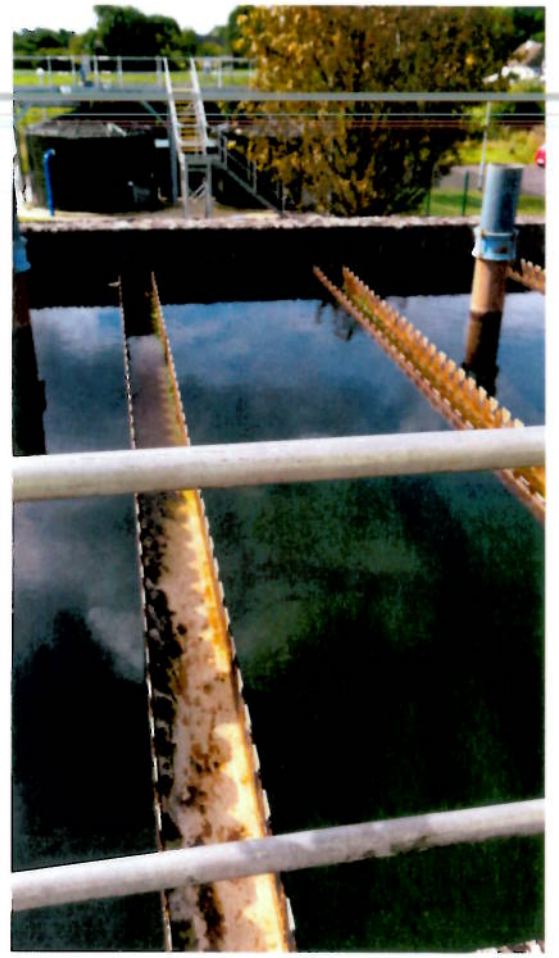

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