



Drinking Water Audit Report

County:	Cavan	Date of Audit:	8 July 2019
Plant(s) visited:	Swanlinbar Water Treatment Plant	Date of issue of Audit Report:	15 July 2019
		File Reference:	DW2013/36
		Auditors:	Derval Devaney Daryl Gunning
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>, as amended. • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies</i> (ISBN: 978-1-84095-349-7). • The recommendations specified in the <i>EPA Drinking Water Report</i>. • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in the previous EPA audit report dated 10th May 2013. 		

MAIN FINDINGS

- There is very poor management and control of the treatment processes at Swanlinbar water treatment plant and as a result, the Swanlinbar public water supply will be added to the EPA's Remedial Action List.
- The recent upgrade of Swanlinbar water treatment plant falls short of what is required to ensure safe and secure drinking water. The main issues include:
 - (a) lack of automated chemical dosing controls, inappropriate filter backwash and inadequate disinfection controls;
 - (b) Lack of appropriate alarms and plant shutdowns to prevent inadequately treated water being supplied to consumers;
 - (c) No SCADA access on-site to allow plant operators review water quality trends, alarms and plant shut-downs.
- There were significant operational difficulties at the water treatment plant in June and early July 2019 which were not communicated promptly by plant operators to supervisors in Cavan County Council and to Irish Water. This potentially presented a serious health risk to consumers on the Swanlinbar public water supply.
- The EPA and HSE were not notified in accordance with EPA guidelines of exceedances in final water quality from samples taken at the water treatment plant throughout June 2019. There was no documented procedure on how plant operators should respond and communicate exceedances or incidents. There was no alarm response cascade system in place to ensure that critical plant alarms are dealt with immediately, to protect the health of consumers on the Swanlinbar public water supply.

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 of the elevated chlorine residual in the network on 02/07/19 and the imposition of a “Do Not Use” Notice that day in the Swanlinbar public water supply (PWS).

Swanlinbar PWS serves a population of approximately 301 people in Swanlinbar village and environs with approximately 93m³ of water per day. The abstraction point is a spring source which was not visited during this audit. Treatment at the plant consists of coagulation, flocculation, clarification, filtration and disinfection using liquid sodium hypochlorite and the pH is automatically adjusted using sodium carbonate (soda ash). Water is then delivered to two reservoirs nearby which individually have 1 day’s storage.

The opening meeting commenced at 12 pm at the Swanlinbar Water Treatment Plant (WTP). 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. Photographs taken by Daryl Gunning during the audit are attached to this report and are referred to in the text where relevant. The following were in attendance during the audit.

Representing Irish Water:

Yvonne Mc Monagle, Compliance Analyst
Peter Gallagher, SLA Lead Cavan

Representing Cavan County Council:

Damien Brady, Plant Operator
Michael Heneghan, Senior Executive Engineer – Operations Manager
Emma Breiden, Executive Engineer Capita Programmes

Representing Coffey Water (contractors for plant upgrade works):

Robert Dillon, Operations Manager
Mohammad Ghafari, Project Manager

Representing the Environmental Protection Agency:

Derval Devaney, Inspector
Daryl Gunning, Inspector

Representing the Health Service Executive:

Kay Casey, Environmental Health Officer, Cavan
Dr Keith Ian Quintyne, Public Health Specialist

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 and Chlorine Incident
a.	Irish Water notified the EPA by phone on the evening of 02/07/19 that a “Do Not Use” Notice was imposed on the Swanlinbar PWS after consultation with the HSE. Elevated chlorine levels of up to 11.6 mg/l were recorded in Swanlinbar distribution network that morning and the WTP was shut-off as a result.
b.	Irish Water arranged for “Do Not Use” Notices to be hand delivered to consumers by 6.30 pm on 02/07/19 and from 7 pm deployed tankers with an alternative water supply for consumers.
c.	On 03/07/19 the EPA received formal notification via the EPA’s Online Drinking Water Notification System (ODWNS) for the elevated chlorine level in the network on 02/07/19 and provided detail on the “Do Not Use” Notice issued to consumers. An aluminium failure (1,395 ug/l vs 200 ug/l) in the network on 18/06/19 was also notified to the EPA via ODWNS on 03/07/19.

	<p>d. On 05/07/19, in response to the EPA's request for additional information on 03/07/19, Irish Water provided final water monitoring data. The data showed the final water at Swanlinbar WTP throughout June 2019 had instances of aluminium exceedances (max. 309 ug/l), elevated colour (max. 129 Hazen), low pH (lowest at 5.35) and low UVT (lowest at 41.1 %). Exceedances were not notified to the EPA in accordance with the EPA's guidelines. The HSE only became aware of these failures while attending the audit on 08/07/19.</p> <p>e. The daily final water readings recorded by the plant operator on-site from the online monitors also showed turbidity exceedances in the final water up to 5 NTU and chlorine residuals were either inadequate or excessive after contact time (ranging from 0 – 4.99 mg/l). The audit found that the results taken from the online monitors may not be reflective of the water leaving the plant because the plant may not have been in production at the time the readings were taken.</p> <p>f. The contact time (Ct) calculations indicate that there is insufficient Ct to ensure adequate disinfection at the plant. It became apparent during the audit that the calculations had not included the two days storage provided by two final water storage reservoirs. It was agreed that a revision of the Ct calculation was required.</p> <p>g. Chlorine Incident – Audit Findings: Investigations into the cause of the elevated chlorine levels in the network on 03/07/19 found that a blockage was discovered in the sample line to the chlorine monitor which may have resulted in the chlorine dosing pumps delivering the maximum dose of 7.5 l/hr rather than 1.7 l/hr to the final water. This blockage was cleared, the chlorine dosing pumps replaced, and the maximum dose setting was reduced to 1.2 l/hr.</p> <p>h. Aluminium exceedances and plant performance issues– Audit Findings: :</p> <ul style="list-style-type: none"> Contract works to upgrade the CFC and filtration process commenced on 06/06/19 and were completed on 24/06/19. The works did not entail an upgrade to the disinfection process which is due to commence at WTPs in County Cavan in three months' time. High rainfall in June affected raw water quality. Colour was elevated in the final water and this was attributed to a fault with the sludge bleed valve on the clarifier. A replacement for a faulty sludge bleed valve was on order since 6th June 2019, and this was outside the remit of the upgrade works. The upgrade works had adjusted the poly and aluminium sulphate dose criteria from mg/l to % from 24th June 2019. It was not clear during the audit if the plant operator was trained in this new approach to chemical dosing. On Friday 28/06/19 the plant was not backwashing due to a fault with the HMI which controlled the backwash pumps. When contractors investigated, they found that the backwash pumps were not apparently operating off the new PLC panel installed by the contractors on 24/06/19 as part of the upgrade and therefore were out of sync. with the rest of the plant's automated systems and instead required backwash to be triggered manually. The contractors connected the backwash pumps to the PLC on 29/06/19. However, the final water quality continued to deteriorate over the weekend. On Monday 01/07/19 the plant operator contacted his supervisor in Cavan County Council, to inform him of the issues with the plant's performance and water quality. The plant was running to waste from 11 am on 01/07/19. The supervisor organised a meeting at the plant on 02/07/19 where the contractors, IW Process Operations staff and Cavan County Council staff were present. It was decided to shut-down the plant at 11 am 02/07/19. Cavan County Council arranged for a boil water notice to be issued via radio and social media on that afternoon. This action was carried out without consultation with Irish Water compliance staff or the HSE and despite the fact that training was provided to Cavan County Council in June 2019 on the communication to Irish Water and the HSE of exceedances and incidents. This Boil Water Notice was subsequently replaced by a "Do Not Use" Notice at 6.30 pm on 02/07/19 upon Irish Water's discovery of the elevated chlorine residuals in the network and following consultation with the HSE. Since 02/07/19, the sludge bleed valve was replaced, the clarifiers were emptied, and repeated backwashing sequences were carried out on the filter until final water turbidity levels met an acceptable level. On 05/07/19 the plant recommenced delivering treated water to the distribution network while the "Do Not Use" Notice remains in place. During the audit, Irish Water staff received notification of a THMs failure in the network on 02/07/19 (344.5 ug/l).
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2.	<p>Source</p> <ul style="list-style-type: none"> a. The spring source originates from karstified limestone bedrock and is located about 1 km from the plant. The spring was not visited during the audit. The plant operator stated that heavy rainfall has a negative impact on the quality of the raw water entering the plant. b. There is an online turbidity, pH and UVT monitor on the raw water. No daily tests are carried out by the plant operator on the raw water. The plant shuts-down when the online turbidity monitor on the raw water entering the plant reads 7 NTU. c. Irish Water stated the protozoal compliance requirements for this source is a log credit of 5. It was stated that the plant currently has a log credit of 3 and once the upgrade is complete and verified a 4-log credit will be met. However, the current log credit of 3 is questionable as the filter backwash is initiated at 0.9 NTU and not at 0.3 NTU as per Irish Water's "Barrier 4 Protozoa Log Credit Compliance Criteria CFC + RFG"
3.	<p>Coagulation, Flocculation and Clarification</p> <ul style="list-style-type: none"> a. Raw water is dosed with aluminium sulphate. An inline static mixer was installed as part of the recent upgrade works to enhance the coagulation process. The upgrade works also included the installation of duty and standby aluminium sulphate dosing pumps which are set to inhibit/shut-down the plant if both pumps fail. However, the aluminium sulphate dose is manually controlled based on visual observation of water in the clarifier rather than being determined by the quality of raw water entering the plant. b. It was stated during the audit that Cavan County Council requested the upgrade works to include automation of the aluminium dosing in response to raw water quality, but this was not approved by Irish Water. c. Jar tests were completed by the contractors in March, April and May 2019 in advance of the upgrade works and an optimum coagulation pH of 6.5 was obtained. Jar tests are not undertaken at the plant in response to changes in raw water conditions to determine the optimum dose of alum or poly. This matter was raised in the EPA's previous audit in 2013. d. The upgrade included the facility to automatically dose sodium carbonate (soda ash) into the raw water to adjust its pH. However, the raw water entering the plant is usually pH 7 and as sodium carbonate acts to increase the pH buffering capacity it could not be used to achieve the optimum pH of 6.5. The contractors stated the design criteria for the plant was already agreed in advance of completion of jar tests and knowledge of the optimum pH for the raw water. e. The clarification stage is in a single vertical tank arrangement. Polyaluminium chloride is dosed as water enters the clarifier to enhance floc settlement and prior to a weir to enhance mixing. The poly dose was via a single orifice at the end of the pipe rather than via a spreader bar to ensure an even poly flow distribution to the water entering the clarifier. f. There was sludge floating on the clarifiers' water surface and the channels were unclean (see Photo 1). There was significant flaking of the internal tank paintwork and rust on the clarifiers internal wall (see Photo 2). This matter was raised in the previous EPA audit in 2013. g. Sludge bleeds were occurring for 20 minutes every 3 hours. This is not in accordance with the <i>EPA Water Treatment Manuals: Coagulation, Flocculation & Clarification</i> which recommends that a sludge bleed should run for 2 or 3 minutes every 30 minutes or so.
4.	<p>Filtration</p> <ul style="list-style-type: none"> a. The filtration process was examined briefly during the audit, as the plant was not in operation at the time. The single rapid gravity filter underwent a refurbishment in October 2018 whereby filter nozzles were inspected and maintained and the media was replaced. b. The recent upgrade works installed a run to waste facility on the filters. Backwash is based on time, head loss or turbidity. A turbidity of 0.9 NTU triggers a backwash and the water is run to waste until a turbidity of 0.3 NTU is obtained. Irish Water's recommended setting of 0.3 NTU triggering a backwash is not currently possible at the plant as the clearwater tank providing backwash water does not have enough capacity to cater for the frequency of backwashes that a lower turbidity setting would require. c. It was stated during the audit that Cavan County Council had requested an additional clearwater tank, but this was not approved by Irish Water as part of the upgrade works. d. It was stated during the audit that there are times when a backwash is triggered, but due to the insufficient water levels in the clear water tank, the plant is shut down until such time as there is sufficient water to enable a backwash. This stop-start effect has a negative impact on the CFC

	<p>process.</p> <p>e. The final water turbidity monitor alarms at 1 NTU which sends a text to the plant operator. Elevated turbidity in the final water does not trigger a plant inhibit/shutdown.</p>
5.	<p>Disinfection</p> <ol style="list-style-type: none"> The disinfectant used is Low Bromate Sodium Hypochlorite 14% / 15% delivered to the filtered water post the onsite clearwater tank. Deliveries are by way of 25 l drums which upon inspection did not appear to have an expiry date or PCS number (See Photo 3). The drum supplying the day tank was not banded (see Photo 4). There are duty and standby chlorine dose pumps that have automated switchover, but it could not be clarified during the audit if the pumps are set to switch automatically on a timed basis, or only when one pump fails or there are issues with the chlorine residual readings on the online final water chlorine monitor. The chlorine dose administered to the final water is based on a Chemtrim system so is partially based on the residual readings from the online chlorine monitor. There were no calibration stickers on the chlorine monitor but it was stated that the next calibration is due in August 2019. The chlorine monitor low alarm is set at 0.3 mg/l and high alarm at 5 mg/l. It was stated that the target chlorine residual leaving the plant is 0.9 mg/l however this contradicted a target of 1.7 mg/l displayed on the PLC panel (see Photo 5). It was stated that the high-level alarm setting was put in place as a lower level would provide false high alarms given that the Chemtrim system initiates a spike in chlorine when the pumps start-up. Chlorine pump failure and no flow in the raw and final water also trigger an alarm. There are no plant inhibits/shut-downs based on inadequate final water quality (e.g. chlorine, turbidity, UVT, pH). The only plant inhibit is a fault on both alum dosing pumps. The plant diary for June 2019 documented many final water chlorine residual readings from the online monitor which were inadequate (0 mg/l on 19/06/19) or elevated (up to 4.99 mg/l on 28/06/19). Upon review of a print-out of chlorine alarms from SCADA presented during the audit, there were a series of low chlorine alarms on 28/07/19 – 30/06/19 but no high-level alarm, despite a high level of chlorine (11.6 mg/l) found in the network the morning of 02/07/19. It was also stated that it was likely these low-level alarms were sent to another plant operator. When plant production ceases (due to sufficient treated water in the reservoir, lack of water for backwash, backwash taking place or a sludge bleed event) it can result in the chlorine monitor reading < 0.3 mg/l, which triggers a low chlorine alarm. From the series of low chlorine alarms on 28/06/19 it could not be determined which alarms were relevant and reflective of water going into production.
6.	<p>Final Water pH Correction</p> <ol style="list-style-type: none"> Treated water leaving the clearwater tank is automatically pH corrected by dosing with sodium carbonate to obtain a target pH of 7. The pH monitor alarms at a low pH of 6 and a high pH of 9. The low pH alarm setting is outside the hydrogen ion concentration parametric range of ≥ 6.5 and ≤ 9.5 pH units.
7.	<p>Treated Water Storage and Distribution Network</p> <ol style="list-style-type: none"> There are two reservoirs located close to the plant with 48 hours treated water storage capacity. The reservoirs were not visited during this audit. There is no chlorine monitor on these reservoirs.
8.	<p>Monitoring and Sampling Programme for treated water</p> <ol style="list-style-type: none"> A diary was used to record raw and final water and network monitoring results rather than a daily log book. A compliant residual aluminium result (22 ug/l) was obtained for the final water on the morning of the audit (08/07/19) and aluminium was 83 ug/l in the network. Chlorine residual concentrations in the final water were not available during the audit as the plant was not in operation but four samples taken at various locations in the network that morning (08/07/19) were satisfactory and ranged from 0.23 mg/l to 0.7 mg/l. Additional final water results recorded on 08/07/19 included pH which continued to be below the parametric range of 6.5 at 6.42, colour 3 Hazen, turbidity 0.098 NTU and UVT was below its expected value at 76.3 %.

9.	Hygiene and Housekeeping <ol style="list-style-type: none"> a. The treatment plant was in an untidy condition, with PVC piping, steel, rubble, cardboard, plastic wrapping, drums etc stored on-site (see Photo 6).
10.	Management and Control <ol style="list-style-type: none"> a. It was not possible for the auditors to review final water quality data from the online monitors as the plant was not in production during the audit. It was also not possible to review trends of the raw and final water quality or alarms and plant shutdowns as there is no access to SCADA at the plant. There is no signal at the plant to enable access to SCADA. SCADA is available to the plant operator remotely and the supervisor via laptop/PC. b. Irish Water confirmed that water treatment plants in Cavan are due a disinfection upgrade in a number of months and the Swanlinbar WTP will be included in these works. This will include SCADA being available at the site and appropriate plant inhibits and alarms being put in place. Currently the plant supervisor can access SACDA at the Council's office and the plant operator can access via his laptop remotely but there is no signal at the WTP to enable access to SCADA at the plant.

3. AUDITORS COMMENTS

The audit found there were significant performance issues with the Swanlinbar water treatment plant throughout June which resulted in exceedances in the treated water leaving the plant that were not reported to the EPA and HSE in accordance with EPA guidelines. This presented a potential serious health risk to consumers of the water supply.

There was no evidence to demonstrate that the plant performance issues were reported, without delay, internally in Cavan County Council or to Irish Water. The plant operator was not provided with documented procedures outlining what should be reported to his superiors and therefore it appears that this failure lies not only with the caretaker but management within Cavan County Council and Irish Water. It was also evident that there was no alarm response cascade in place at the time the chlorine incident occurred and any alarms that signalled were sent to a plant operator who was on leave.

Alarms and inhibits at the plant were lacking. For example, there was no plant inhibit for elevated turbidity or high or low chlorine concentrations in the treated water leaving the plant.

The plant upgrade works completed on 24 June 2019 fall significantly short of what is required to ensure that safe and secure drinking water is provided to the consumers of Swanlinbar Public Water Supply and as a result the EPA is adding this supply to its Remedial Action List.

4. RECOMMENDATIONS

1. Irish Water should ensure there is a documented communications procedure in place for the reporting of exceedances in final water and incidents which could potentially impact the quality of water produced at Swanlinbar water treatment plant, so the relevant persons and parties involved (e.g. Cavan County Council, Irish Water, HSE, EPA) are alerted in a timely manner.

The procedure should cover the responsibilities of water services staff (e.g. plant operator, supervisor and Irish Water staff) and set out criteria where it is necessary to consult with the HSE to determine if there is a potential danger to human health associated with the public water supply.

Irish Water should ensure that relevant water services staff are trained in the procedure and understand the instances in which the procedure is to be used.

2. Irish Water should ensure that plant operators at Swanlinbar Water Treatment Plant are appropriately trained and competent to manage and control the operation of the water treatment plant and records of such training are maintained.
3. Irish Water should undertake the following actions to ensure better management of the clarification process at Swanlinbar water treatment plant:
 - a) ensure the settled water outlet channels in the clarifier are cleaned on a regular basis to prevent build-up of sludge on the channels and internal walls of the clarifier;
 - b) ensure the clarifier's internal walls are maintained to prevent rusting or flaking paint;
 - c) ensure jar testing of the raw and coagulated waters is carried out as outlined in Section 3.3.1 and Appendix C of the EPA publication "*Water Treatment Manual: Coagulation, Flocculation and Clarification*" 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. Results should be recorded at the treatment works and used for control of the treatment plant;
 - d) install pH correction prior to coagulation to reduce the need to add excessive levels of coagulant to bring the pH down to the optimum coagulation pH;
 - e) ensure facilities are in place (e.g. automated dosing of aluminium sulphate and poly) to automatically respond to changes in raw water quality to ensure optimum chemical coagulant dose and pH is achieved;
 - f) ensure there is an even poly flow distribution to the water entering the clarifier;
 - g) investigate the efficiency of the sludge bleeds and establish the optimum regime for sludge draw-off.
4. Irish Water should review the operation of the filters to ensure that the levels of turbidity in the filtered water are as low as possible and no greater than 0.5 NTU. If the plant is a high-risk *Cryptosporidium* plant, then the turbidity of the filtered water should not exceed 0.2 NTU.
5. Irish Water should undertake the following actions to ensure better management of the disinfection process at Swanlinbar water treatment plant:
 - a) clarify the target chlorine residual of the final water and ensure it is met in the final treated water;
 - b) review the contact time calculation for chlorine disinfection to ensure the target effective contact time is achieved and that the first connections are receiving appropriately disinfected drinking water. Irish Water should submit the calculation of the effective contact time to the Agency;
 - c) ensure that a manual residual chlorine test using a handheld chlorine monitor is taken at the plant (after contact time) daily and compared to the reading on the CL17 online monitor and the readings are entered into a daily log book;
 - d) investigate any discrepancy between the residual chlorine readings on the chlorine monitor and the results of the manual residual chlorine test carried out daily at the plant;
 - e) inspect the final water chlorine injection point on a regular basis to ensure the pipeline is free from blockage;
 - f) ensure the label on each drum of chlorine disinfectant contains the date of authorisation, date of expiry and PCS number in accordance with Article 22 and 69 of the Biocidal Products Regulation (EU) No 528/2012;
 - g) review disinfectant chemical storage arrangements at the treatment plant. All chemicals must be stored in bunded areas capable of containing at least 110% of the volume of chemicals stored therein. Fill points for storage tanks inside the bunds should be within the bunded area;
 - h) provide a timeframe for the commencement of the disinfection review and upgrade works at Swanlinbar PWS.
6. Irish Water should undertake the following actions to ensure better management and control of Swanlinbar water treatment plant:

- a) put in place appropriate alarms and plant inhibits/shut-downs to prevent inadequately treated water entering the network;
 - b) revise the treated water pH plant alarm (currently set at 6 pH units) to ensure final water meets the parametric value of ≥ 6.5 and ≤ 9.5 pH units;
 - c) avoid the generation of false alarms (e.g. low chlorine alarms) when the plant is shut-down;
 - d) put a procedure in place to ensure the PLC system controls, inhibits and fail-safes are verified after any works have been carried out. This procedure requires contractors working on site to sign the tag-in/tag-out form, to confirm the PLC system is in proper working order;
 - e) put an alarm response cascade system in place. If an operator fails to respond to an alarm, Irish Water should ensure that the plant automatically shuts down, to prevent inadequately treated water being supplied to consumers.
 - f) provide on-site access for plant operators to SCADA data relating to the performance of the plant. Specifically, access should be provided to raw and treated water quality trends
 - g) ensure water quality monitoring taken at the water treatment plant and network is entered into a dedicated daily log book.
 - h) undertake a complete review of housekeeping and waste storage at the plant and take measures to ensure that the plant is kept well maintained, clean and tidy.
7. Irish Water should confirm that the online continuous water quality monitors at Swanlinbar water treatment plant have been calibrated and calibration stickers are displayed on the monitors and kept up-to-date.
 8. Irish Water should submit details of the protozoal compliance log deficit and how it is to be addressed at Swanlinbar water treatment plant. Irish Water should apply its "*Rational for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies*" in consultation with the HSE consultation and submit the outcome of the monitoring frequency assessment to the EPA.
 9. Irish Water should carry out monitoring on the raw water source and should include monitoring for *E. coli* bacteria, as an indicator of trends in assessing water quality and to determine the degree of treatment and controls required in the supply.

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 Aoife Loughnane, Drinking Water Team Leader and Michelle Minihan, Senior Inspector.

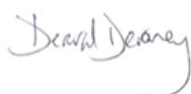
Irish Water should submit a report to the Agency within one month of the date of this audit report detailing how it has dealt with the issues of concern identified during this audit. The report should include details on the action taken and planned to address the various recommendations, including timeframe for commencement and completion of any planned work.

A direction has issued by the Agency under a separate cover legally requiring specific recommendations to be implemented by Irish Water.

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:

Derval Devaney

Inspector

15 June 2019

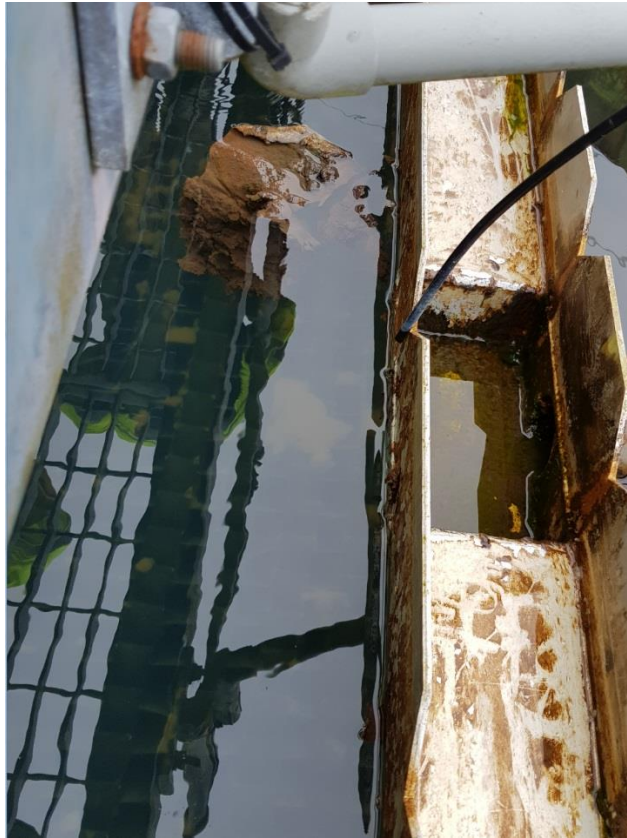


Photo 1 Sludge floating on clarifiers surface and dirty channels



Photo 2 Sludge on channels and surface and rust on clarifier wall



Photos 3 & 4 Drum of disinfectant labelled inappropriately and unbunded

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DOSING SETPOINTS PG2

Chlorine Dosing Pumps Setpoints

Duty Select	Auto	24	hr
Chlorine Dosing Factor	4.0	%	
Duty Select	A - Flow		
Chlorine	1.2	mg/l	
Chlorine Residual Low	0.3	mg/l	6 mins
Chlorine Residual High	5.0	mg/l	6 mins
Chlorine Residual Required	1.7	mg/l	
Chlorine Dosing Rate	0.0	%	
Chlorine Pump No Flow Delay	400	sec	
Chlorine Dosing Pump 1 Flow	0.0	l/h	
Chlorine Dosing Pump 2 Flow	0.0	l/h	
Dosing Enable Setpoints			
Raw Water Flow - Enable Dosing	0.5	m3/h	
Final Water Flow - Enable Dosing	0.5	m3/h	

coffey MENU PREV 13:55:48 NEXT SETPOINTS ALARMS EMCA

Photo 5 Chlorine target dose on PLC set to 1.7 mg/l



Photo 6 Storage of piping and other waste at the water treatment plant