

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	
Name of Installation	DCC Zone 1
Organisation	Irish Water
Scheme Code	0700PUB1001
County	Dublin
Site Visit Reference No.	SV18337

Report Detail	
Issue Date	07/10/2019
Prepared By	Aoife Loughnane

Site Visit Detail			
Date Of Inspection	05/09/2019	Announced	Yes
Time In	10:00	Time Out	13:30
EPA Inspector(s)	Aoife Loughnane Jack Brennan - Student		
Additional Visitors			
Company Personnel	Irish Water: Andrew Boylan, Michael Reilly, Joe O'Reilly, Daniel Mulvey, Morgan Cox. Dublin City Council: Tom Kinirons, Tony Mahon, Ciaran Ball, Sheila Hourigan. Veolia: Ben Heaslip, Catherine Furey. RPS: Michael MacGiollagda.		

> Summary of Key Findings

Main Findings:

1. A major upgrade of the sludge treatment facilities is currently underway at Ballymore Eustace Water Treatment Plant, and is due for completion in November 2019.
2. An incident occurred on 14th August 2019 when a high sludge loading caused the sludge treatment plant to become imbalanced and malfunction, which resulted in an uncontrolled discharge from the sludge supernatant tanks to the spillway which enters the River Liffey. A turbidity alarm was triggered but failed to alert the sludge plant operators to the incident.
3. Mitigation measures have been taken to prevent a reoccurrence of this incident, including the development of a new procedure to deal with high sludge loading, additional operator training using lessons learned, 50% increase in polymer dose concentration to ensure effective sludge thickening, and twice weekly cleaning of the monitoring instruments to ensure alarms activate if conditions deteriorate.

> Introduction

Ballymore Eustace Water Treatment Plant is the largest water treatment plant in the country, which supplies water to over 750,000 people in Dublin City, South Dublin County, Dun Laoghaire-Rathdown and Kildare. The plant currently produces 285 ML/d and has a design capacity of 400 ML/d. Treatment consists of coagulation with alum and poly, clarification, rapid gravity filtration, disinfection using on-site electrolytic chlorination, lime addition for pH correction, and fluoridation.

An upgrade of the sludge treatment facilities is currently underway, involving a combination of centrifuge and thermal drying, and is due for completion in November 2019. Veolia are the contractors for the upgrade works, with responsibility for the design, construction, commissioning and testing of the new sludge treatment facilities. Veolia will hand over the operation and management of the new sludge facilities to Irish Water, working in partnership with Dublin City Council, in November 2019.

> Supply Zones Areas Inspected

The audit focussed on the management of sludge generated at the water treatment plant. A full site tour was conducted to provide an overview of the water treatment and sludge treatment processes.



1. Sludge Management

1.1

	Answer
Is sludge arising from the treatment processes adequately managed?	Yes
<p>Comment</p> <p>There are 12 sedimentation/clarification tanks at the plant. Settled sludge is drawn off each tank at regular intervals by an automated sludge bleed regime. The sludge flows to a sludge balancing tank before it is pumped to the sludge treatment plant on site.</p> <p>The sludge treatment processes involve balancing, thickening (addition of polymer to create a floc, target is to achieve 2-3% dry solids content), storage in three new sludge holding tanks, centrifuging and thermal drying (75-85% dry solids content). The dried sludge is sent off-site for disposal at Corranure Landfill, Co. Cavan. The new sludge centrifuges and dryer are a significant improvement on the previous sludge presses, which produced a final sludge of 25% dry solids. This has reduced the sludge volume sent off-site from 250 tonnes per week, to only 230 tonnes per month.</p> <p>There are two sludge supernatant tanks which receive the supernatant from the sludge thickeners and centrate from the sludge centrifuges. The solids are allowed to settle and the clear supernatant is discharged to the spillway which enters the River Liffey. The settled solids are pumped to the sludge balancing tank.</p> <p>Filter backwash water is sent to two wash water tanks, where the solids are allowed to settle and the clear supernatant is discharged to the spillway which enters the River Liffey. The settled solids are pumped to the sludge balancing tank.</p> <p>There are turbidity monitors on the sludge thickening tanks (30 NTU alarm set-point), sludge supernatant tanks (15 NTU alarm set-point) and wash water tanks.</p> <p>The planning permission for the new sludge treatment plant (PL 09.229575) sets limits for the spillway discharge:</p> <ol style="list-style-type: none"> 1. Colour: 30 degree Hazen at the 95%ile 2. Turbidity: 15 NTU at the 95%ile 3. Aluminium: 6 mg/l (6,000 ug/l) at the 95%ile 4. Suspended solids: 35 mg/l at the 95%ile 5. pH: between 6.8 and 8.3 <p>These five parameters are monitored continuously in the spillway discharge to the River Liffey. The monitors are linked to an alarm which activates if any of the limits are reached. The monitoring data and alarms are currently linked to Veolia's SCADA system, but will be integrated into the main water treatment plant SCADA system upon handover of the sludge treatment facilities in November.</p>	



2. Site Specific Issues

2.1

	Answer
Was the sludge incident suitably alerted to the plant operators?	No
Comment	
<p><u>Sludge Incident</u></p> <p>Sedimentation Tank A was undergoing a full clean on 14th August 2019. The large sludge volume generated from the cleaning activity caused an imbalance and malfunction at the sludge treatment plant. The sludge thickening tanks failed to form a floc, which resulted in sludge decanting into the sludge supernatant tanks.</p> <p>As soon as the malfunction was detected on 14th August, Veolia (sludge plant operators) requested that Dublin City Council plant operators cease the sedimentation tank cleaning activity in order to slow down the flow to the sludge treatment plant. Veolia increased the polymer dose to the sludge thickening tanks in an attempt to form a floc and regain control of the sludge thickening process.</p> <p>When the sludge supernatant tanks could no longer retain the volume of sludge coming from the thickening tanks, the contents overflowed to the spillway which enters the River Liffey. The 15 NTU turbidity alarm on the supernatant discharge was triggered at approximately 10 pm on 14th August. However, during the audit Veolia stated that they did not receive the alarm because the instruments were out of range. Veolia discovered the high turbidity alarm when they arrived to site at 6 am on 15th August. They responded immediately to cease the discharge to the spillway by pumping the contents of the supernatant tanks into the sludge balancing tank.</p> <p>When Dublin City Council plant operators were alerted to the incident by Veolia on the morning of 15th August, they shut off the sludge bleeds from the sedimentation tanks to allow Veolia regain control of the sludge thickening process. The sludge bleeds were re-started on a phased basis after 12 hours. Normal operations were fully restored by 9:30 pm on 15th August.</p> <p>During the audit, Dublin City Council plant operators confirmed that they don't receive alarms from the sludge treatment plant because those monitors and alarms are currently linked to Veolia's SCADA system. If Dublin City Council plant operators had been alerted when the high turbidity alarm was triggered on the discharge to the spillway, they could have shut off the sludge bleeds from the sedimentation tanks immediately to reduce the flow entering the sludge treatment plant. When Veolia hands over the sludge treatment facilities in November, all monitors and alarms will be linked to one SCADA system at the water treatment plant.</p> <p>Irish Water alerted Kildare County Council, the EPA and Inland Fisheries Ireland to the sludge incident on the afternoon of 15th August. Dublin City Council plant operators requested the ESB to release water into the River Liffey from the Golden Falls Reservoir to help disperse the discharge on 15th August. The normal river flow of 1.5 cubic metres per second was increased to 6 cubic metres per second from 1 pm to 5 pm that day.</p> <p>Condition 8 of the planning permission for the new sludge treatment plant specifies a monitoring regime for the spillway discharge from the plant, and ambient monitoring in the River Liffey upstream and downstream of the spillway discharge. These weekly monitoring results are submitted to Kildare County Council. During the audit, Dublin City Council provided a copy of the monitoring results from October 2018 to June 2019, which were all satisfactory.</p> <p>During the audit, Veolia and Dublin City Council provided details of the mitigation measures that have been taken to prevent a reoccurrence of this incident. These measures include the development of a new procedure to deal with instances of high sludge loading, additional operator training using lessons learned, 50% increase in polymer dose concentration to ensure effective sludge thickening, twice weekly cleaning of the monitoring instruments sample lines to ensure alarms activate if conditions deteriorate.</p>	

Recommendations

Subject	Ballymore Eustace Audit Recommendations	Due Date	07/11/2019
Action Text	<p><i>Recommendations</i></p> <p>1. Irish Water should ensure that a standard operating procedure is in place, and that operators are appropriately trained, to deal with instances of high loading to the sludge treatment facilities at Ballymore Eustace Water Treatment Plant.</p> <p>2. Irish Water should ensure that alarms are operating effectively, in order to alert plant operators to any malfunction of the sludge treatment processes at Ballymore Eustace Water Treatment Plant.</p> <p>Follow-Up Actions required by Irish Water</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 Dr. Michelle Minihan, Senior Inspector, Drinking Water Team.</p> <p>Irish Water should submit a report to the Agency on or before 07/11/19 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 Reference Number DW2019/154 in any future correspondence in relation to this Report.</p>		