

Annual Environmental Report

2021



Mucklagh

D0364-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0364-01, Mucklagh, in Offaly in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified reports where relevant are included as an appendix to the AER.

1.1 ANNUAL STATEMENT OF MEASURES

A summary of any improvements undertaken is provided where applicable.

There were no capital works, significant changes or operational improvements undertaken in 2021.

1.2 TREATMENT SUMMARY

The agglomeration is served by a wastewater treatment plant(s)

- Mucklagh WWTP with a Plant Capacity PE of 1100, the treatment type is 2 - Secondary treatment.

1.3 ELV OVERVIEW

The overall compliance of the final effluent with the Emission Limit Values (ELVs) is shown below. More detailed information on the below ELV's can be found in Section 2.

Discharge Point Reference	Treatment Plant	Discharge Type	Compliance Status	Parameters failing if relevant
TPEFF2500D0364SW001	Mucklagh WWTP	Treated	Non-Compliant	ortho-Phosphate (as P) - unspecified mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report

There are no Licence Specific Reports included in this AER.

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 MUCKLAGH WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - MUCKLAGH WWTP

A summary of influent monitoring for the treatment plant is presented below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

Parameters	Number of Samples	Annual Max	Annual Mean
ortho-Phosphate (as P) - unspecified mg/l	8	8.73	2.45
Ammonia-Total (as N) mg/l	8	99	25
Total Nitrogen mg/l	3	126	77
pH pH units	7	7.88	7.65
COD-Cr mg/l	8	701	268.39
Suspended Solids mg/l	8	465	154.22
Total Phosphorus (as P) mg/l	3	12	8.11
BOD, 5 days with Inhibition (Carbonaceous) mg/l	8	308	115
Hydraulic Capacity	N/A	569	156

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 2.1.5 if applicable.

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional 'Operational Performance Summary'.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF2500D0364SW001

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included ^{Note 1}	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	9	N/A	N/A	44	Pass
Suspended Solids mg/l	35	88	N/A	9	N/A	N/A	13	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	25	50	N/A	9	N/A	N/A	4.74	Pass
pH pH units	6.00	9.00	N/A	9	N/A	N/A	7.28	Pass
Ammonia-Total (as N) mg/l	5.00	6.00	N/A	9	N/A	N/A	0.411	Pass
ortho-Phosphate (as P) - unspecified mg/l	5.00	6.00	N/A	9	3	N/A	3.77	Fail
Total Nitrogen mg/l	N/A	N/A	N/A	3	N/A	N/A	44	

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included ^{Note 1}	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
Nitrate (as N) mg/l	N/A	N/A	N/A	3	N/A	N/A	14	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	3	N/A	N/A	5.42	
Nitrite (as N) mg/l	N/A	N/A	N/A	3	N/A	N/A	3.87	
Conductivity @20°C µS/cm	N/A	N/A	N/A	2	N/A	N/A	1285	

Notes:

1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied

2 – For pH the WWDA specifies a range of pH 6 - 9

Cause of Exceedance(s):

Inadequate Operational Procedure/Training (INC1022257)

Significance of Results:

The WWTP is non compliant with the ELV's set in the Wastewater Discharge Licence. The impact on receiving waters is assessed further in Section 2.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF2500D0364SW001

A summary of monitoring from ambient monitoring points associated with the wastewater discharge is provided in the sections below. For discharges to rivers upstream (U/S) and downstream (D/S) location data is provided. For other ambient points in lakes, coastal or transitional waters, monitoring data from the most appropriate monitoring station is selected.

The table below provides details of ambient monitoring locations and details of any designations as sensitive areas.

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	River Station Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Ecological Status
Upstream	230844, 220936	RS25C060340	No	No	No	No	Good
Downstream	231038, 222773	RS25C060360	No	No	No	No	Unassigned

The results for ambient results and / or additional monitoring data sets are included in the **Appendix 7.1 - Ambient monitoring summary**.

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: ortho-Phosphate (as P) - unspecified mg/l.

The ambient monitoring results meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

Based on ambient monitoring results a deterioration in BOD & Ortho-P concentrations downstream of the effluent discharge is noted.

A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.

As per the 3rd Cycle Lower Shannon (Brosna) Catchment Report (HA 25A), there are no significant pressures cited on the Clodiagh (Tullamore)_040 waterbody however the significant pressures on the immediate d/s At Risk Clodiagh (Tullamore)_050 are Hydromorphology & Other (Abstraction). The Mucklagh WWTP although listed on Cycle 2 as a significant pressure has been removed from the list of significant pressures in the Cycle 3 report.

It is unknown if the discharge from the wastewater treatment plant is having an observable negative impact on the Water Framework Directive status. The downstream WFD status is Unassigned.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - MUCKLAGH WWTP

2.1.4.1 Treatment Efficiency Report - Mucklagh WWTP

Treatment efficiency is based on the removal of key pollutants from the influent wastewater by the treatment plant. In essence the calculation is based on the balance of load coming into the plant versus the load leaving the plant. The efficiency is presented as a percentage removal rate.

A summary presentation of the efficiency of the treatment process including information for all the parameters specified in the licence is included below:

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
cBOD	6730	271	96
SS	9020	762	92
TP	328	219	33
COD	15699	2511	84
TN	3108	1761	43

Note: The above data is based on sample results for the number of dates reported

2.1.4.2 Treatment Capacity Report Summary - Mucklagh WWTP

Treatment capacity is an assessment of the hydraulic (flow) and organic (the amount of pollutants) load a treatment plant is designed to treat versus the current loading of that plant.

Mucklagh WWTP	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	743
DWF to the Treatment Plant (m ³ /day)	248
Current Hydraulic Loading - annual max (m ³ /day)	569
Average Hydraulic loading to the Treatment Plant (m ³ /day)	156
Organic Capacity (PE) - As Constructed	1100
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	840
Organic Capacity (PE) - Remaining	260
Will the capacity be exceeded in the next three years? (Yes/No)	No

Nominal design capacities can be based on conservative design principles. In some cases assessment of existing plants has shown organic capacities significantly higher than the nominal design capacity. Accordingly plants that appear to be overloaded when comparing a collected peak load with the nominal design capacity can be fully compliant due to the safety factors in the original design.

2.1.5 SLUDGE / OTHER INPUTS - MUCKLAGH WWTP

'Other inputs' to the waste water treatment plant are summarised in table below

Input type	Quantity	Unit	P.E.	% of load to WWTP	Included in Influent Monitoring (Y/N)?	Is there a leachate/sludge acceptance procedure for the WWTP?	Is there a dedicated leachate/sludge acceptance facility for the WWTP? (Y/N)
There is no Sludge and Other Input data for the Treatment Plant included in the AER.							

3 COMPLAINTS AND INCIDENTS

3.1 COMPLAINTS SUMMARY

A summary of complaints of an environmental nature related to the discharge(s) to water from the WWTP and network is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2021.			

3.2 REPORTED INCIDENTS SUMMARY

Environmental incidents that arise in an agglomeration are reported on an on-going basis in accordance with our waste water discharge licences. Where an incident occurs and it is reportable under the licence, it is reported to the Environmental Protection Agency through their Environmental Data Exchange Network, or in some instances by telephone. Some incidents which arise in the agglomeration are recorded by Irish Water but may not be reportable under our licence for example where the incident does not have an impact on environmental performance.

A summary of reported incidents is included below.

3.2.1 SUMMARY OF INCIDENTS

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	No
Breach of ELV	Inadequate Operational Procedures / Training	1	No	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	2
Number of Incidents reported to the EPA via EDEN in 2021	2
Explanation of any discrepancies between the two numbers above	N/A

4 INFRASTRUCTURAL ASSESSMENTS AND PROGRAMME OF IMPROVEMENTS

4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT

A summary of the operation of the storm water overflows and their significance where known is included below:

4.1.1 SWO IDENTIFICATION

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	Total volume discharged in 2021 (m ³)	Monitoring Status
SW2	231040.999, 222611.996	Yes	Low	Meeting	Unknown	Not Monitored

SWO Summary	
How much sewage was discharged via monitored SWOs in the agglomeration in the year (m ³)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	N/A
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	N/A

4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS

4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Specified Improvement Programmes (under Schedule A and C of WWDL)	Description	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
There are no Specified Improvement Programmes for this Agglomeration.							

A summary of the status of any other improvements identified by under Condition 5 assessments- is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
No additional improvements planned at this time.				

4.2.3 SEWER INTEGRITY RISK ASSESSMENT

The utilisation of multiple capital maintenance programmes and the outputs of the workshops with the Local Authority Operations Staff held under the programme can be used to satisfy the requirements of Condition 5 regarding network integrity. Improvement works identified by way of these programmes and workshops will be included in the Improvements Summary Tables 4.2.1 and 4.2.2.

5 LICENCE SPECIFIC REPORTS

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Licence Specific Report	Required by licence	Year included in AER	Included in this AER
Priority Substances Assessment	Yes	2014	No

5.1 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2014.

6 CERTIFICATION AND SIGN OFF

6.1 SUMMARY OF AER CONTENTS

Parameter	Answer
Does the AER include an Executive Summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Has a Technical amendment/licence review application been submitted to the Agency by IW?	No
List reason e.g. additional SWO identified	N/A
Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc	Yes
List reason e.g. changes to monitoring requirements	Ambient Monitoring Location Changes
Have these processes commenced?	No
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	N/A

I certify that the information given in this Annual Environmental Report is truthful, accurate and complete:

Date: 20/02/2022

This AER has been produced by Irish Water's Environmental Information System (EIMS) and has been electronically signed off in that system for and on behalf of,

Katherine Walshe

Acting Head of Environmental Regulation.

7 APPENDIX

Appendix

Appendix 7.1 - Ambient monitoring summary

Mucklagh Ambient Monitoring Summary 2021

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)			
			Bathing Water	Drinking Water	FWPM	Shellfish
Upstream Monitoring Point	230844, 220936	RS25C060340	No	No	No	No
Downstream Monitoring Point	231038, 222773	RS25C060360	No	No	No	No

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Current WFD Status	cBOD	o- Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	Good	1.003	0.019	0.064
Downstream Monitoring Point	Unassigned	1.190	0.024	0.059
<i>Difference</i>		<i>0.187</i>	<i>0.005</i>	<i>-0.006</i>
EQS		1.500	0.035	0.065
% of EQS		12.449%	15.139%	-8.571%

Ambient Monitoring Data 2021

			Ammonia N	Biological Oxygen Demand	Conductivity @ 20°C	COD Chemical Oxygen Demand	Dissolved Oxygen	Nitrite N	Total Nitrogen N	Dissolved Oxygen % Saturation	Nitrate N	Temperature	Total Phosphorus P	Ortho-Phosphate P	pH	Suspended Solids
Station	Station Refere	Sample Date	mg/l	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	% Sat.	mg/l	Degrees C	mg/l	mg/l	pH units	mg/l
Upstream	RS25C060340	20-Jan-2021	0.106	2.2			9.47			83.6		7.1		0.017	7.8	
Upstream	RS25C060340	5-May-2021	0.046	1			14			114		7.6		0.008	7.95	
Upstream	RS25C060340	21-July-2021	0.067	1			11.82			134.2		21.8		0.087	7.99	
Upstream	RS25C060340	26-Aug-2021	0.021	< 1			9.88			95.3		20.2		< 0.006	8.28	
Upstream	RS25C060340	17-Nov-2021	0.112	< 1			9.8			87.3		9.5		0.01	7.91	
Upstream	RS25C060340	24-Nov-2021	0.049	1.9	492	27	10.3	0.015	1.8	103.3	1.191	5	0.05	0.009	7.96	20
Upstream	RS25C060340	25-Nov-2021	0.044	< 1	492	27	10.4	0.014	2.1	105.8	1.206	4.9	0.05	0.006	7.97	9.5
Upstream	RS25C060340	14-Dec-2021	0.111	1			12.2			95.7		4.9		0.009	7.81	
		Mean	0.064	1.003	492.000	27.000	11.200	0.015	1.950	105.086	1.199	10.557	0.050	0.019	7.981	14.750
		95%ile	0.112	2.095	492.000	27.000	13.370	0.015	2.085	127.130	1.205	21.240	0.050	0.063	8.179	19.475
			Ammonia N	Biological Oxygen Demand	Conductivity @ 20°C	COD Chemical Oxygen Demand	Dissolved Oxygen	Nitrite N	Total Nitrogen N	Dissolved Oxygen % Saturation	Nitrate N	Temperature	Total Phosphorus P	Ortho-Phosphate P	pH	Suspended Solids
Station	Station Refere	Sample Date	mg/l	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	% Sat.	mg/l	Degrees C	mg/l	mg/l	pH units	mg/l
Downstream	RS25C060360	20-Jan-2021	0.127	1.5			10.85			93.6		7		0.023	7.7	
Downstream	RS25C060360	5-May-2021	0.042	< 1			14.1			112.2		7.2		0.021	7.91	
Downstream	RS25C060360	21-July-2021	0.027	< 1			11.6			127.9		20.2		< 0.006	8.09	
Downstream	RS25C060360	26-Aug-2021	0.026	1.1			9.13			88.7		19.9		0.045	8.06	
Downstream	RS25C060360	17-Nov-2021	0.103	< 1			9.93			88.6		9.6		0.023	7.78	
Downstream	RS25C060360	24-Nov-2021	0.059	2.6	493	31	12.4	0.023	1.8	105.6	1.339	4	0.08	0.026	7.96	38
Downstream	RS25C060360	25-Nov-2021	0.046	1.8	494	30	10.4	0.022	1.9	104.5	1.311	4.7	0.07	0.021	7.97	5
Downstream	RS25C060360	14-Dec-2021	0.108	< 1			12.09			94.7		4.9		0.01	7.81	
		Mean	0.059	1.190	493.500	30.500	11.379	0.023	1.850	103.171	1.325	10.071	0.075	0.024	7.940	21.500
		95%ile	0.120	2.320	493.950	30.950	13.505	0.023	1.895	122.405	1.338	20.095	0.080	0.039	8.080	36.350

Note: Where the concentration in the result is less than the limit of detection (LOD), a value of LOD/sqrt(2) was used in calculating the mean and 95%ile concentrations.