Annual Environmental Report

2019

Ferns

D0169-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

This Annual Environmental Report has been prepared for D0169-01, Ferns, in Wexford 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 undertaken in 2019 and none are currently foreseen within next 3 years. Regarding process improvements Ortho-P test strips were introduced onsite for routine monitoring. In Quarter 4 of 2019 flows from RBC were diverted to Reed Bed as a trial regarding improvement of ELV compliance for ammonia (assessment on-going).

1.2 TREATMENT SUMMARY

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

- FERNS SOUTH WWTP with a Plant Capacity PE of 2000, the treatment type is 3P - Tertiary P removal
- Ferns North WWTP with a Plant Capacity PE of 100, the treatment type is 1 - Primary 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
TPEFF3300D0169SW001	FERNS SOUTH WWTP	Treated	Non-Compliant	COD-Cr mg/l ortho-Phosphate (as P) - unspecified mg/l
TPEFF3300D0169SW002	Ferns North WWTP	Treated	Non-Compliant	BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l Suspended Solids mg/l

1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
There are no Licence Specific Reports included in the AER.	

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 FERNS SOUTH WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - FERNS SOUTH 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
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	13	634	292.8
Suspended Solids mg/l	13	1004	405.83
COD-Cr mg/l	13	1630	848.67
Hydraulic Capacity	N/A	1350	200

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 greater than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional ‘Operational Performance Summary’. The design of the wastewater tretament plant allows for peak values and therefore the peak loads have not impacted on compliance with Emission Limit Values.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF3300D0169SW001

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 with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	12	1	1	37.92	Fail
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	N/A	12	N/A	N/A	1.83	Pass
Suspended Solids mg/l	25	50	N/A	12	1	N/A	10.31	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.28	Pass
ortho-Phosphate (as P) - unspecified mg/l	0.5	1	N/A	12	12	12	3.72	Fail
Ammonia-Total (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	7.08	
Visual Inspection Descriptive	N/A	N/A	N/A	13	N/A	N/A	N/A	

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

Cause of Exceedance(s):

Inadequate infrastructure

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 TPEFF3300D0169SW001

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 Status
Upstream	303187, 149384	RS12B010800	No	No	No	No	Moderate
Downstream	302754, 148972	RS12B010900	No	No	No	No	Moderate

The table below provides a summary of monitoring results for designated ambient monitoring points. The upstream and downstream annual mean values are shown (mg/l), and the difference between both monitoring stations is given as a percentage of the Environmental Quality Standard (EQS) where relevant.

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	RS12B010800	1.5	RS12B010900	2	1.5	33.3
BOD - 5 days (Total) mg/l	RS12B010800	0.5	RS12B010900	1.2	1.5	46.7
Ammonia-Total (as N) mg/l	RS12B010800	0.443	RS12B010900	0.065	0.065	-581.7

ortho-Phosphate (as P) - unspecified mg/l	RS12B010800	0.032	RS12B010900	0.055	0.035	67.7
Total Hardness (as CaCO3) mg/l	RS12B010800	64.4	RS12B010900	65.4		
Temperature °C	RS12B010800	9.963	RS12B010900	9.913		
Chloride mg/l	RS12B010800	23.3	RS12B010900	19.82		
Conductivity @25°C µS/cm	RS12B010800	211.2	RS12B010900	200		
True Colour mg/litre Pt Co	RS12B010800	12.6	RS12B010900	12.6		
pH pH units	RS12B010800	7.254	RS12B010900	7.238		
Nitrate (as N) mg/l	RS12B010800	5.5	RS12B010900	5.5		
Alkalinity-total (as CaCO3) mg/l	RS12B010800	33.4	RS12B010900	33		
Suspended Solids mg/l	RS12B010800	9.5	RS12B010900	7.9		
Total Oxidised Nitrogen (as N) mg/l	RS12B010800	5.52	RS12B010900	5.52		
Dissolved Oxygen mg/l	RS12B010800	10.72	RS12B010900	10.94		
Nitrite (as N) µg/l	RS12B010800	19.27	RS12B010900	17.918		
Dissolved Oxygen % Saturation	RS12B010800	95.6	RS12B010900	97.2		

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results does not 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, 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.

Other causes of deterioration in water quality in the area are: Agricultural activities

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - FERNS SOUTH WWTP

2.1.4.1 Treatment Efficiency Report - FERNS SOUTH 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	18528	116	99
SS	25680	652	97
TN	N/A	N/A	N/A
TP	N/A	N/A	N/A
COD	53702	2400	96

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

2.1.4.2 Treatment Capacity Report Summary - FERNS SOUTH 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.

FERNS SOUTH WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1350
DWF to the Treatment Plant (m^3/day)	450
Current Hydraulic Loading - annual max (m^3/day)	1350
Average Hydraulic loading to the Treatment Plant (m^3/day)	200
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	1282
Organic Capacity (PE) - Remaining	718
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 - FERNS SOUTH 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.							

2.2 FERNS NORTH WWTP - TREATED DISCHARGE

2.2.1 INFLUENT MONITORING SUMMARY - FERNS NORTH 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
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	555	269.94
COD-Cr mg/l	12	1243	772.15
Suspended Solids mg/l	12	640	275.62
Hydraulic Capacity	N/A	69	42.89

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 greater than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional ‘Operational Performance Summary’. The design of the wastewater tretament plant allows for peak values and therefore the peak loads have not impacted on compliance with Emission Limit Values.

2.2.2 EFFLUENT MONITORING SUMMARY - TPEFF3300D0169SW002

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 with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	N/A	N/A	20	12	N/A	N/A	223.93	Fail
Suspended Solids mg/l	N/A	N/A	50	12	N/A	N/A	111.71	Fail

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

Cause of Exceedance(s):

Inadequate Infrastructure

Significance of Results:

The WWTP is not compliant with the ELVs set in the WWDL. Slight localised impact only

2.2.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF3300D0169SW002

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 Status
Upstream	301526, 150364	RS12R470360	No	No	No	No	Moderate
Downstream	301750, 150274	RS12R470650	No	No	No	No	Moderate

The table below provides a summary of monitoring results for designated ambient monitoring points. The upstream and downstream annual mean values are shown (mg/l), and the difference between both monitoring stations is given as a percentage of the Environmental Quality Standard (EQS) where relevant.

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Temperature °C	RS12R470360	12.8	RS12R470650	10.35		
Ammonia-Total (as N) mg/l	RS12R470360	0.673	RS12R470650	0.337	0.065	*-0.336*
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	RS12R470360	2.667	RS12R470650	1.333	1.5	*-1.334*
Suspended Solids mg/l	RS12R470360	11.533	RS12R470650	1.5		
ortho-Phosphate (as P) - unspecified mg/l	RS12R470360	0.17	RS12R470650	0.117	0.035	*-0.053*
pH pH units	RS12R470360	6.92	RS12R470650	6.67		

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results does not meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.

2.2.4 OPERATIONAL PERFORMANCE SUMMARY - FERNS NORTH WWTP

2.2.4.1 Treatment Efficiency Report - Ferns North 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	4219	3499	17
TP	N/A	N/A	N/A
SS	4307	1746	59
TN	N/A	N/A	N/A
COD	12067	10321	14

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

2.2.4.2 Treatment Capacity Report Summary - Ferns North 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.

Ferns North WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	69
DWF to the Treatment Plant (m^3/day)	23
Current Hydraulic Loading - annual max (m^3/day)	69

Average Hydraulic loading to the Treatment Plant (m^3/day)	42.89
Organic Capacity (PE) - As Constructed	100
Organic Capacity (PE) - Collected Load (peak week)[Note1]	269
Organic Capacity (PE) - Remaining	0
Will the capacity be exceeded in the next three years? (Yes/No)	Yes

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.

2.2.5 SLUDGE / OTHER INPUTS - FERNS NORTH 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 is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2019.			

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)
Breach of ELV	WWTP upgrade required to meet ELV	1	Yes	No
Specified % Reduction Value not achieved	WWTP upgrade required to meet ELV	1	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2019	2
Number of Incidents reported to the EPA via EDEN in 2019	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	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2019 (No. of events)	Total volume discharged in 2019 (m3)	Monitoring Status
There are no Storm Water Overflows in this Agglomeration.							

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	N/A
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?	N/A
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 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
D0169-SIP:02	Complete improvements to comply with the total ammonia ELV as specified in Schedule A.1.	C	31/12/2019	No	Not Started		The improvement programme will be reviewed by Irish Water to assess the works required to comply with the licence condition on a prioritised basis

D0169-SIP:01	Complete improvements to comply with ELVs specified in Schedule A.2. Implement, in accordance with Condition 5.6.1, either (a) improvements to the existing waste water works to achieve compliance with the emission limit values specified in Schedule A.2 of this licence, or (b) an alternative discharge point, or (c) connection to another agglomeration.	C	31/12/2019	No	Not Started		The improvement programme will be reviewed by Irish Water to assess the works required to comply with the licence condition on a prioritised basis

A summary of the status of any improvements identified by under Condition 5.2 is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
There are no Improvements Programme for this Agglomeration.				

4.2.3 SEWER INTEGRITY RISK ASSESSMENT

N/A

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 list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER
Drinking Water Abstraction Point Risk Assessment	Yes	2015	No	
Priority Substances Assessment	Yes	2015	No	

5.1 DRINKING WATER ABSTRACTION POINT RISK ASSESSMENT

The Drinking Water Abstraction Point Risk Assessment Report has been included in the AER 2015

5.2 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2015

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
Is there a need to advise the EPA for consideration of a Technical Amendment / Review of the licence?	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	SW1 Change of Location for Downstream ambient monitoring point on ground of safe access SW2 change of location for both Upstream and Downstream Ambient monitoring locations to enable safe access
Have these processes commenced?	No
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	Yes

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

Signed: Date: 04/05/2020

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

There are no Appendices included