Annual Environmental Report

2018

Ferns

D0169-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 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 TREATMENT SUMMARY

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

- Ferns South SW1 with a Plant Capacity PE of 2000
- Ferns North SW2 with a Plant Capacity PE of 100

The treatment process includes the following:

1.1.1 FERNS SOUTH SW1

Treatment type	Yes / No	Details
Preliminary Treatment	Yes	Inlet Macerator
Primary Treatment	Yes	Primary settlement tanks
Secondary Treatment	Yes	Stream 1 reedbed / stream 2 RBC
Nutrient Removal	Yes	P removal dosing Stream 2
Tertiary Treatment	No	

1.1.2 FERNS NORTH SW2

No Treatment

1.2 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 SW1	Treated	Non-Compliant	Ortho-P, suspended solids, BOD
TPEFF3300D0169SW002	Ferns North SW2	Not Treated	Non-Compliant	BOD

1.3 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
No reports are included	

2 TREATMENT PLANT PERFORMAND AND IMPACT SUMMARY

2.1 FERNS SOUTH SW1 - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - FERNS SOUTH SW1

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	2040	755.83
Total Nitrogen mg/l	6	156.1	101.98
Total Phosphorus (as P) mg/l	6	21.6	14.36
Suspended Solids mg/l	12	4850	1318.83
COD-Cr mg/l	12	2760	1287.58
Hydraulic Capacity	N/A	1245.6	311.4

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 - 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)
Ammonia-Total (as N) mg/l	2 (note ELV is not operational until 31/12/2019)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	N/A	12	1	1	18.7	Fail
COD-Cr mg/l	125	250	N/A	12	1	0	42	Pass
pH pH units	6-9	6-9	N/A	12	0	0	7.24	Pass
Suspended Solids mg/l	25	87.5	N/A	12	1	1	17.95	Fail
Ortho-Phosphate (as P) - unspecified	0.5	0.6	N/A	6	6	6	4.5	Fail

Cause of Exceedance(s):

WWTP Upgrade Required

Significance of Results:

The WWTP is not compliant with the ELV's set in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE

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	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Upstream	303196.4, 149409	TPEFF3300D0169SW001	No	No	No	No	Good
Downstream	302747.7, 148980.2	TPEFF3300D0169SW001	No	No	No	No	Good

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

Significance of Results:

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

The ambient monitoring results did not meet the required EQS.

The parameters which exceeded the EQS and may be causing an effect are: BOD, ammonia and ortho-P

A deterioration in water quality has been identified, however it is not know if it or is not caused by the WWTP. Upstream concentrations of BOD and ortho-P are elevated.

The discharge from the wastewater treatment plant has an observable negative impact on the Water Framework Directive status.

Other Potential cause of deterioration in water quality relevant to this area are: local and upstream agricultural and onsite WWTP's

2.1.4 OPERATIONAL PERFORMANCE SUMMARY

2.1.4.1 Treatment Efficiency Report

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)	Comment
SS	154392.36	12384.7	91.98	
TP	1962.36	1212.19	38.23	
cBOD	76932.56	27794.1	63.87	
TN	14157.61	7951.72	43.83	
COD	156070.15	50698.26	67.52	

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

2.1.4.2 Treatment Capacity Report Summary

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 SW1	
Peak Hydraulic Capacity (m3/day) - As Constructed	1350
DWF to the Treatment Plant (m3/day)	450
Current Hydraulic Loading - annual max (m3/day)	1245.6

Average Hydraulic loading to the Treatment Plant (m3/day)	311.4
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)	1384
Organic Capacity (PE) - Remaining	616
Will the capacity be exceeded in the next three years? (Yes/No)	No

2.1.5 SLUDGE / OTHER INPUTS

'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.							

2.1.6 SLUDGE REMOVAL

The amount of sludge removed from the wastewater treatment plant is shown below along with the transported destination of the sludge from the treatment plant.

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
Ferns South SW1	Liquid Sludge	1394.22	Volume (m3)	2.03	Courtown WWTP Sludge Facility

2.2 FERNS NORTH SW2 - UNTREATED DISCHARGE

2.2.1 INFLUENT MONITORING SUMMARY - FERNS NORTH SW2

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
Total Phosphorus (as P) mg/l	6	9	6.1
Suspended Solids mg/l	12	2790	372.86
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	380	246.41
Total Nitrogen mg/l	6	72.1	47.05
COD-Cr mg/l	12	990	557.5
Hydraulic Capacity	N/A	197	49.28

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’.

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% reduction	12			300.3	Fail
Suspended Solids mg/l	N/A	N/A	50% Reduction	12			124.35	Fail

ELVs do not commence until 31/12/2019. %age reduction applies until this time.

Cause of Exceedance(s):

WWTP overloaded

Significance of Results:

The WWTP is not compliant with the ELV's set in the Wastewater Discharge Licence.

2.2.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE

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	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Upstream	301526, 150364	TPEFF3300D0169SW002	No	No	No	No	Good
Downstream	302223, 149931	TPEFF3300D0169SW002	No	No	No	No	Good

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

Significance of Results:

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

The ambient monitoring results did not meet the required EQS.

The parameters which exceeded the EQS and may be causing an effect are: ammonia, ortho-P and BOD. Note upstream ammonia, ortho-P and BOD concentrations exceed EQS.

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

Other Potential cause of deterioration in water quality relevant to this area are: local and upstream agricultural and onsite WWTP's.

2.2.4 OPERATIONAL PERFORMANCE SUMMARY

2.2.4.1 Treatment Efficiency Report

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)	Comment
TP	207.03	127.89	38.23	

cBOD	8116.51	2932.32	63.87	
SS	16288.55	1306.61	91.98	
COD	16465.65	5348.74	67.52	
TN	1493.66	838.92	43.83	

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

2.2.4.2 Treatment Capacity Report Summary

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 SW2	
Peak Hydraulic Capacity (m3/day) - As Constructed	69
DWF to the Treatment Plant (m3/day)	23
Current Hydraulic Loading - annual max (m3/day)	197
Average Hydraulic loading to the Treatment Plant (m3/day)	49.28
Organic Capacity (PE) - As Constructed	100
Organic Capacity (PE) - Collected Load (peak week)	146
Organic Capacity (PE) - Remaining	0
Will the capacity be exceeded in the next three years? (Yes/No)	No

2.2.5 SLUDGE / OTHER INPUTS

'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.							

2.2.6 SLUDGE REMOVAL

The amount of sludge removed from the wastewater treatment plant is shown below along with the transported destination of the sludge from the treatment plant.

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
Ferns North SW2	Liquid Sludge	112.22	Volume (m3)	1.17	Courtown WWTP Sludge Facility

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
3	Blocked Sewer	0	3

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)
Non-compliance	WWTP upgrade required to meet ELV	12	Yes	No
Non-compliance	WWTP upgrade required to meet ELV	12	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2018	2
Number of Incidents reported to the EPA via EDEN in 2018	2
Explanation of any discrepancies between the two numbers above	

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 2018 (No. of events)	Total volume discharged in 2018 (m3)	Monitoring Status
THERE ARE NO SWO WITHIN 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: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 Condition 5 Assessment will be completed by Q1 2019
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		

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	Improvement Source	Expected Completion Date	Comments
There are no Improvements Programme for this Agglomeration.				

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 Table.

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	

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?	
List reason e.g. additional SWO identified	
Is there a need to request/advise the EPA of any modifications to the existing WWDL?	
List reason e.g. changes to monitoring requirements	
Have these processes commenced?	
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	No

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

Signed: Date: 22/05/2019

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 ,

Eleanor Roche

Acting Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Ambient monitoring summary

Station	Ferns SSW1 Upstream		Staion Ref	RS12B010800		Ammonia N	BOD, 5 days with Inhibition (Carbonaceous)	COD Chemical Oxygen Demand	Suspended Solids	Ortho-Phosphate P	pH	Total Kejdahl Nitrogen	Total Nitrogen N	Total Phosphate P	Total Oxidised Nitrogen N	Temperature	Dissolved Oxygen	Visual Inspection	Dissolved Oxygen % Saturation
Entity	Entity Reference	Station Easting	Station Northing	Sample Date	Sample Method	mg/l	mg/l	mg/l	mg/l	mg/l	pH units	mg/l	mg/l	mg/l	mg/l	Degrees C	mg/l	Descriptive	% Sat.
Bann	12B01	303196.4	149409	28-Mar-2018	Grab	0.06	2	5	6	0.02	7.4	1	7.5	0.1	6.62	8.4	11.54	Clear, no floc/sed, N	93.2
Bann	12B01	303196.4	149409	24-May-2018	Grab	0.02	2	13	5	0.02	7.8	3.2	9.2	0.1	6.02	13.5	10.89	Clear, no floc/sed, N	109.7
Bann	12B01	303196.4	149409	17-July-2018	Grab	0.06	1		1	1	7.1					11.5		Clear, some suspended solids	
Bann	12B01	303196.4	149409	5-Nov-2018	Grab	0.1	2		37.6	0.12	7.13					10.5		Clean, Some SS	
				Mean		0.06	1.75	9.00	12.40	0.29	7.36	2.10	8.35	0.10	6.32	10.98	11.22		101.45
				95%ile		0.09	2.00	12.60	32.86	0.87	7.74	3.09	9.12	0.10	6.59	13.20	11.51		108.88
Station	Ferns SW1 Downstream		Staion Ref	RS12B010900															
Bann	12B01	302747.7	148980.2	28-Mar-2018	Grab	0.46	2	13	85	0.07	7.4	1	6.6	0.1	6.45	8.9	11.61	Clear, floc/sed, N	92.7
Bann	12B01	302747.7	148980.2	24-May-2018	Grab	0.02	1	7	5	0.02	7.8	1	6.4	0.1	6.07	12	11.12	Clear, no floc/sed, N	112.1
Bann	12B01	302747.7	148980.2	17-July-2018	Grab	0.08	2		2	0.06	7.2					13.9		Few settled and suspended solids	
Bann	12B01	302747.7	148980.2	5-Nov-2018	Grab	0.08	8		92.6	0.13	7.11					10.8		Clean, Some SS	
				Mean		0.16	3.25	10.00	46.15	0.07	7.38	1.00	6.50	0.10	6.26	11.40	11.37		102.40
				95%ile		0.40	7.10	12.70	91.46	0.12	7.74	1.00	6.59	0.10	6.43	13.62	11.59		111.13

Station	Ferns SW2 Upstream		Staion Ref	Pending		Suspended Solids	COD Chemical Oxygen Demand	Ammonia N	Ortho-Phosphate P	Total Kejdahl Nitrogen	Total Nitrogen N	Total Oxidised Nitrogen N	Total Phosphate P	BOD, 5 days with Inhibition (Carbonaceous)	Visual Inspection	pH	Temperature	Dissolved Oxygen	Dissolved Oxygen % Saturation
Entity	Entity Reference	Station Easting	Station Northing	Sample Date	Sample Method	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	Descriptive	pH units	Degrees C	mg/l	% Sat.
Ferns	TP3300D0169	301526	150364	28-Mar-2018	Grab	5	5	0.21	0.05	1	8	7.63	0.1	2	Clear, no floc/sed, N	6.8	9.9	9.47	76.7
Ferns	TP3300D0169	301526	150364	24-May-2018	Grab	14	6	0.28	0.08	1	7.7	7.56	0.17	1	Clear, no floc/sed, N	6.8	12.6	9.01	90.9
Ferns	TP3300D0169	301526	150364	17-July-2018	Grab	25		0.06	0.03					2	Some settled, few SS	6.5	14.9		
Ferns	TP3300D0169	301526	150364	3-Dec-2018	Grab	3		0.2	0.12					2.79	Clear	6.87	8.9		
				Mean		11.75	5.50	0.19	0.07	1.00	7.85	7.60	0.14	1.95		6.74	11.58	9.24	83.80
				95%ile		23.35	5.95	0.27	0.11	1.00	7.99	7.63	0.17	2.67		6.86	14.56	9.45	90.19
Sation	Ferns SW2 Downstream		Staion Ref	Pending															
Ferns	TP3300D0169	302223	149931	28-Mar-2018	Grab	7	10	0.39	0.07	1	7.9	7.62	0.11	2	Clear, no floc/sed, N	6.8	10.1	10.02	84.1
Ferns	TP3300D0169	302223	149931	24-May-2018	Grab	5	5	0.29	0.08	1	8	7.48	0.14	1	Clear, no floc/sed, N	6.7	12.8	8.91	90.1
Ferns	TP3300D0169	302223	149931	17-July-2018	Grab	2		0.07	0.12					2	Few settled and suspended solids	6.7	15		
Ferns	TP3300D0169	302223	149931	3-Dec-2018	Grab	3		0.19	0.1					2	Clear no SS	6.91	8.4		
				Mean		4.25	7.50	0.24	0.09	1.00	7.95	7.55	0.13	1.75		6.78	11.58	9.47	87.10
				95%ile		6.70	9.75	0.38	0.12	1.00	8.00	7.61	0.14	2.00		6.89	14.67	9.96	89.80