Annual Environmental Report

2024

Inniskeen

D0348-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0348-01, Inniskeen, in Monaghan 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.

1.2 TREATMENT SUMMARY

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

- Inniskeen WWTP with a Plant Capacity PE of 1800, the treatment type is 3P - Tertiary P removal .

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
TPEFF2400D0348SW001	Inniskeen WWTP	Treated	Non-Compliant	Suspended Solids mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 INNISKEEN WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - INNISKEEN 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
Total Nitrogen mg/l	11	194	80
Suspended Solids mg/l	11	7010	2371
BOD, 5 days with Inhibition (Carbonaceo mg/l	11	4584	1004
COD-Cr mg/l	11	11980	3710
Total Phosphorus (as P) mg/l	11	48	16
Hydraulic Capacity	N/A	963	318

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’. The design of the wastewater treatment 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 - TPEFF2400D0348SW001

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	11	N/A	N/A	16	Pass
Suspended Solids mg/l	10	25	N/A	11	4	1	12	Fail
BOD, 5 days with Inhibition (Carbonaceo mg/l	10	20	N/A	11	N/A	N/A	1.65	Pass
pH pH units	9	9	N/A	13	N/A	N/A	7.49	Pass
Total Phosphorus (as P) mg/l	2	2.4	N/A	11	N/A	N/A	0.421	Pass
Ammonia-Total (as N) mg/l	2	2.4	N/A	11	1	N/A	0.186	Pass
ortho-Phosphate (as P) - unspecified mg/l	1.5	1.8	N/A	11	N/A	N/A	0.172	Pass
Total Nitrogen mg/l	N/A	N/A	N/A	11	N/A	N/A	17	

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 NO3) mg/l	N/A	N/A	N/A	11	N/A	N/A	16	
E. Coli MPN/100ml	N/A	N/A	N/A	2	N/A	N/A	5244	
Nitrite (as N) mg/l	N/A	N/A	N/A	11	N/A	N/A	0.009	
Faecal coliforms no./100mls	N/A	N/A	N/A	2	N/A	N/A	2111	
Temperature °C	N/A	N/A	N/A	13	N/A	N/A	7.32	
Enterococci (Intestinal) cfu/100ml	N/A	N/A	N/A	2	N/A	N/A	5721	

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):

Refer to Incident section of the Report

Significance of Results:

The WWTP is non compliant with the ELV's as 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 TPEFF2400D0348SW001

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	293998, 306647	RS06F010650	No	No	No	No	Good
Downstream	293998, 306647	RS06F010670	No	No	No	No	Good

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 (Total) mg/l	RS06F010650	1.57	RS06F010670	2.45	1.50	58.7
Ammonia-Total (as N) mg/l	RS06F010650	0.022	RS06F010670	0.160	0.065	212.7
ortho-Phosphate (as P) - unspecified mg/l	RS06F010650	0.046	RS06F010670	0.055	0.035	26.6
2,4-D ng/l	RS06F010650	4.46	RS06F010670	N/A	N/A	
Temperature °C	RS06F010650	11	RS06F010670	11	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Simazine ng/l	RS06F010650	1.41	RS06F010670	N/A	N/A	
Total Phosphorus (as P) mg/l	RS06F010650	0.105	RS06F010670	0.070	N/A	
Anthracene ng/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Antimony - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Conductivity @25°C µS/cm	RS06F010650	232	RS06F010670	N/A	N/A	
Bifenox µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Fluoranthene ng/l	RS06F010650	2.82	RS06F010670	N/A	N/A	
Barium - filtered µg/l	RS06F010650	28	RS06F010670	N/A	N/A	
Potassium - filtered mg/l	RS06F010650	3.80	RS06F010670	N/A	N/A	
MCPA ng/l	RS06F010650	21	RS06F010670	N/A	N/A	
Dissolved Oxygen % Saturation	RS06F010650	81	RS06F010670	N/A	N/A	
Glyphosate ng/l	RS06F010650	124	RS06F010670	N/A	N/A	
Molybdenum - filtered µg/l	RS06F010650	0.732	RS06F010670	N/A	N/A	
Total Nitrogen mg/l	RS06F010650	1.34	RS06F010670	2.84	N/A	
Vanadium - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Thallium - filtered µg/l	RS06F010650	0.141	RS06F010670	N/A	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Sodium - filtered mg/l	RS06F010650	8.62	RS06F010670	N/A	N/A	
Benzo(g,h,i)perylene ng/l	RS06F010650	1.09	RS06F010670	N/A	N/A	
Boron - filtered µg/l	RS06F010650	8.55	RS06F010670	N/A	N/A	
Calcium - filtered mg/l	RS06F010650	24	RS06F010670	N/A	N/A	
Enterococci (Intestinal) cfu/100ml	RS06F010650	748	RS06F010670	750	N/A	
Calculated Hardness (CaCO3) - Dissolved Components mg/l	RS06F010650	76	RS06F010670	N/A	N/A	
Di(2-ethylhexyl) phthalate (DEHP) µg/l	RS06F010650	0.141	RS06F010670	N/A	N/A	
Perfluorooctane sulfonic acid (PFOS) µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Iron - filtered µg/l	RS06F010650	76	RS06F010670	N/A	N/A	
Dissolved Organic Carbon mg/l	RS06F010650	9.50	RS06F010670	N/A	N/A	
Fluoride mg/l	RS06F010650	0.141	RS06F010670	N/A	N/A	
Mecoprop ng/l	RS06F010650	7.16	RS06F010670	N/A	N/A	
Zinc - filtered µg/l	RS06F010650	6.68	RS06F010670	N/A	N/A	
Benzo(b)fluoranthene ng/l	RS06F010650	1.23	RS06F010670	N/A	N/A	
True Colour mg/litre Pt Co	RS06F010650	41	RS06F010670	N/A	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Diuron ng/l	RS06F010650	4.59	RS06F010670	N/A	N/A	
Magnesium - filtered mg/l	RS06F010650	4.02	RS06F010670	N/A	N/A	
Perfluorooctanoic acid (PFOA) µg/l	RS06F010650	0.001	RS06F010670	N/A	N/A	
Beryllium - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Dissolved Oxygen % O2	RS06F010650	100	RS06F010670	100	N/A	
alpha-Hexabromocyclododecane (HBCDD) µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Total Oxidised Nitrogen (as N) mg/l	RS06F010650	0.953	RS06F010670	N/A	N/A	
Uranium - filtered µg/l	RS06F010650	0.141	RS06F010670	N/A	N/A	
Cadmium - filtered µg/l	RS06F010650	0.022	RS06F010670	N/A	N/A	
Benzo(a)pyrene ng/l	RS06F010650	1.22	RS06F010670	N/A	N/A	
Coliform Bacteria (Total) MPN/100ml	RS06F010650	1508	RS06F010670	N/A	N/A	
Lead - filtered µg/l	RS06F010650	0.141	RS06F010670	N/A	N/A	
Nickel - filtered µg/l	RS06F010650	4.83	RS06F010670	N/A	N/A	
Manganese - filtered µg/l	RS06F010650	20	RS06F010670	N/A	N/A	
Mercury - filtered µg/l	RS06F010650	0.031	RS06F010670	N/A	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Alkalinity-total (as CaCO3) mg/l	RS06F010650	75	RS06F010670	N/A	N/A	
Strontium - filtered µg/l	RS06F010650	83	RS06F010670	N/A	N/A	
C10-C13 Chloroalkanes µg/l	RS06F010650	0.283	RS06F010670	N/A	N/A	
Aluminium - filtered µg/l	RS06F010650	10	RS06F010670	N/A	N/A	
Benzo(k)fluoranthene ng/l	RS06F010650	0.915	RS06F010670	N/A	N/A	
COD-Cr mg/l	RS06F010650	22	RS06F010670	22	N/A	
Dissolved Oxygen mg/l	RS06F010650	9.69	RS06F010670	11	N/A	
Chloride mg/l	RS06F010650	14	RS06F010670	N/A	N/A	
Isoproturon ng/l	RS06F010650	1.41	RS06F010670	N/A	N/A	
Dicofol µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
gamma-Hexabromocyclododecane µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Copper - filtered µg/l	RS06F010650	3.04	RS06F010670	N/A	N/A	
beta-Hexabromocyclododecane (HBCDD) µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Chromium - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Linuron ng/l	RS06F010650	3.54	RS06F010670	N/A	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Selenium - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Suspended Solids mg/l	RS06F010650	3.91	RS06F010670	7.91	N/A	
Terbutryn ng/l	RS06F010650	1.98	RS06F010670	N/A	N/A	
Atrazine ng/l	RS06F010650	1.41	RS06F010670	N/A	N/A	
AMPA ng/l	RS06F010650	141	RS06F010670	N/A	N/A	
Arsenic - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
Cobalt - filtered µg/l	RS06F010650	0.707	RS06F010670	N/A	N/A	
E. Coli MPN/100ml	RS06F010650	647	RS06F010670	1394	N/A	
Cypermethrin µg/l	RS06F010650	N/A	RS06F010670	N/A	N/A	
Indeno(1,2,3-c,d)pyrene ng/l	RS06F010650	1.04	RS06F010670	N/A	N/A	
Faecal coliforms no./100mls	RS06F010650	688	RS06F010670	1120	N/A	
pH pH units	RS06F010650	7.91	RS06F010670	7.87	N/A	

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: Suspended Solids mg/l.

The ambient monitoring results do not meet the required EQS at the upstream and the downstream monitoring locations. 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 ortho-Phosphate (as P), Ammonia-Total (as N) & BOD - 5 days (Total), 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: unknown.

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 - INNISKEEN WWTP

2.1.4.1 Treatment Efficiency Report - Inniskeen 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)
TP	1678	44	97
COD	390471	1726	100
cBOD	105660	174	100
SS	249534	1280	99
TN	8436	1766	79

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

2.1.4.2 Treatment Capacity Report Summary - Inniskeen 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.

Inniskeen WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1226
DWF to the Treatment Plant (m^3/day)	409
Current Hydraulic Loading - annual max (m^3/day)	963
Average Hydraulic loading to the Treatment Plant (m^3/day)	318
Organic Capacity (PE) - As Constructed	1800
Organic Capacity (PE) - Collected Load (peak week)[Note1]	375
Organic Capacity (PE) - Remaining	1425
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 - INNISKEEN 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 2024.			

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 Uisce Éireann 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	Recurring (Y/N)	Closed (Y/N)
Abatement equipment off-line	Plant or equipment breakdown at WWTP	No	No
Breach of ELV	Other (add details)	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2024	2
Number of Incidents reported to the EPA via EDEN in 2024	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	No. of times activated in 2024 (No. of events)	Total volume discharged in 2024 (m3)	Monitoring Status
SW-2	293927, 306700	Yes	Low Significance	Meeting Criteria	Unknown	Unknown	Not Monitored

The contents presented in this table include the most up to date information available at the time of writing. Any TBC SWO(s) were identified as part of the on-going National SWO programme and will be updated in subsequent AER(s) once the information is confirmed.

SWO Summary	
How much wastewater discharge by metered SWOs during the year (m3)?	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?	No

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	Included in this AER
D0348-01-Drinking Water Abstraction Point Risk Assessment	Yes	No
D0348-01-Priority Substances Assessment	Yes	No
D0348-01-Small Stream Risk Score Assessment	Yes	Yes

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	No
List reason e.g. changes to monitoring requirements	N/A
Have these processes commenced?	N/A
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: 21/05/2025

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

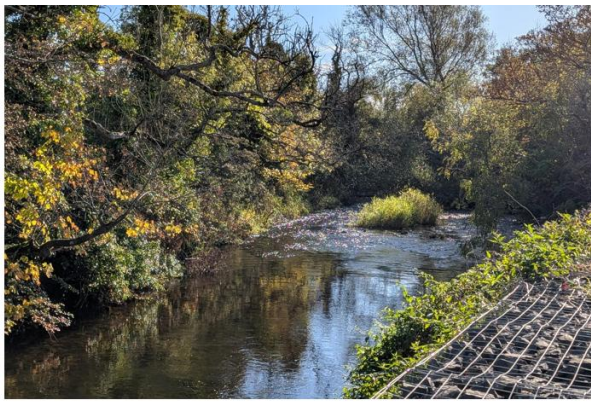
Eleanor Roche

Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

SSRS Compliance Monitoring: *Inishkeen* Waste Water Treatment Plant 2024



Report to Uisce Éireann

Limnos Consultancy, January 2025

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Inishkeen Town WWTP

Introduction

Small Streams Risk Score (SSRS) assessments on the Inishkeen River upstream and downstream of the Inishkeen Town waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 14 October 2024. Limnos Consultancy was contracted by Irish Water to undertake the surveys.

Methodology

Small Streams Risk Score (SSRS)

Samples were taken using an ISO compliant kick-sampling method compatible with the Environmental Protection Agency (EPA) Standard Operating Procedure for sampling aquatic macroinvertebrates. Samples were taken upstream and downstream of the discharge from the WWTP. SSRS results were assigned based on the macroinvertebrate fauna.

The author was the main initiator of the SSRS system developed by the Western River Basin District and the EPA under his supervision in 2005–2006 (McGarrigle 2014). He has undertaken SSRS training of local authority and other professional staff at the Local Government Water Services Training Centres around the country for over 100 personnel.

The SSRS was calculated based on selected sub-groups of the macroinvertebrates recorded. The score is calculated based on the number of taxa and their relative abundance in four main invertebrate groups as follows:

Group 1: Ephemeroptera (excluding *Baetis rhodani*)
Group 2: Plecoptera
Group 3: Trichoptera
Group 4: GOlD (Gastropoda, Oligochaeta, Diptera)
Group 5: *Asellus*

The first three groups above, mayflies, stoneflies, and caddis flies, are regarded as pollution-sensitive whereas gastropods, oligochaetes, dipterans and *Asellus* are relatively pollution-tolerant. The maximum score that can be achieved is 11.2 and threshold scores deciding the degree of risk of not being at good ecological status are as follows:

> 7.25 Probably not at risk
- > 6.5 to 7.25 Indeterminate
< 6.5 Stream may be at risk.

Samples were taken with a standard 1 mm mesh pond net. A 3-minute kick sample was combined with a 1-minute stonewash. Samples were placed on a white tray and, once cleaned of debris such as leaves and twigs and excessive sand or gravel by decanting and hand picking, the sample was examined carefully to identify the macroinvertebrates. At least 25 minutes were spent identifying and assigning each taxon found to a relative abundance category. Table 1 gives the definition of the relative abundance terms Few, Common, Numerous, Dominant and Excessive. The numeric code is used in the results tables below.

Table 1. Relative abundance table.

Abundance	Number of Individual Specimens	SSRS Relative abundance numeric code
Few:	1 to 5 individuals	1
Common:	6 to 20	2
Numerous:	21–50	3
Dominant:	51 to 100	4
Excessive:	>100	5

Physico-Chemical Measurements

Physico-chemical measurements were also made for dissolved oxygen, temperature, conductivity and pH using a HACH HQ40d meter with appropriate compatible probes. Probes were calibrated before use.

Location of Sites Sampled

Figure 1 maps the sampling sites and Table 2 gives the details of the locations sampled.

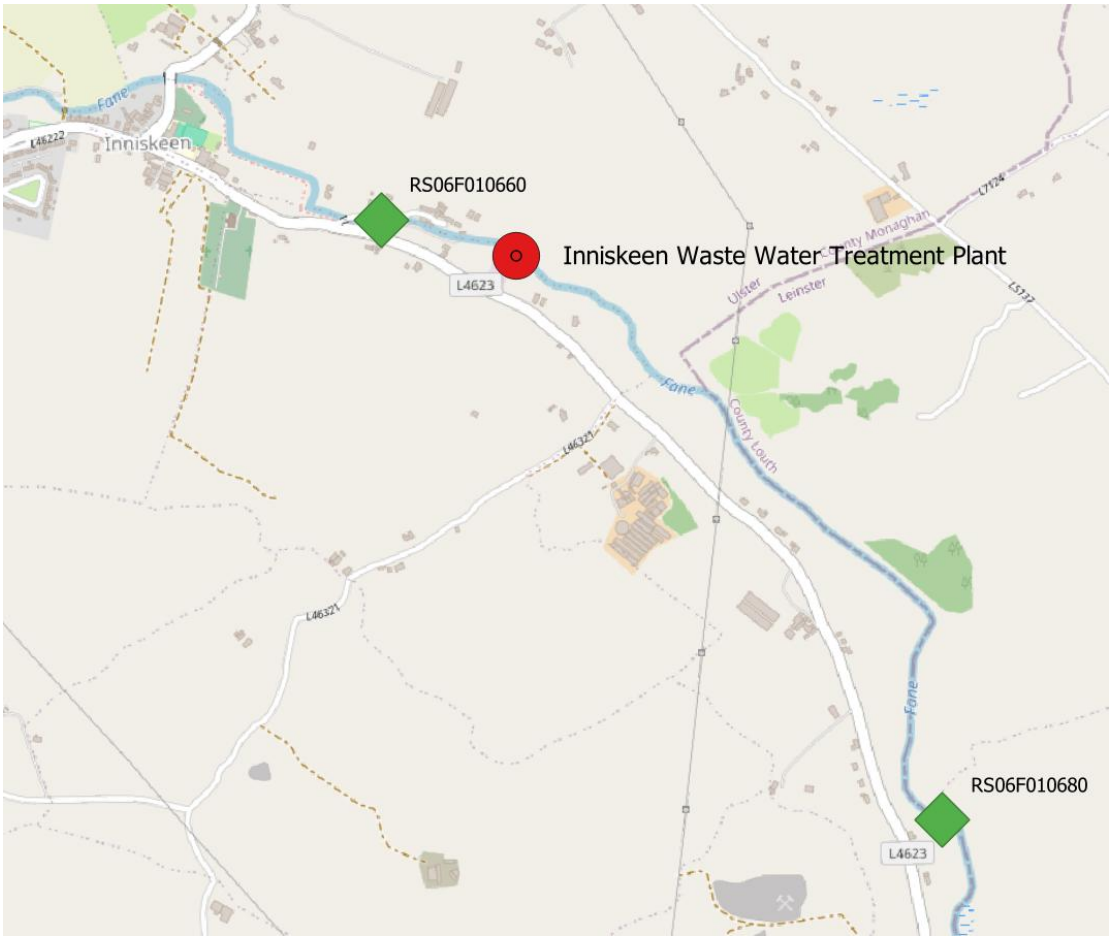


Figure 1. Location of upstream and downstream monitoring sites (green diamonds) for Inishkeen WWTP. River flows south. ©OpenStreetMap contributors.

Table 2. Location of sites sampled upstream and downstream of Inishkeen Town WWTP.

Location	Inishkeen Town WWTP Upstream	Inishkeen Town WWTP Downstream
EPA Code	RS06F010660	RS06F010680
Station	Bridge in Inishkeen	East of Deerpark (Roadside)
River	Fane	Fane
Easting	293601	294867
Northing	306756	304781

Results

Site Photographs

Figure 2 shows photographs taken when sampling at Site 1 and Site 2 upstream and downstream of the Inishkeen WWTP on 14 October 2024.

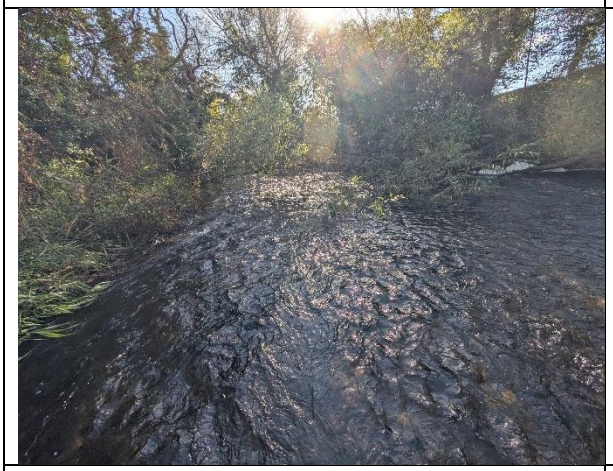
	
U/S Inishkeen WWTP looking downstream	U/S Inishkeen WWTP looking upstream
	
D/S Inishkeen WWTP looking downstream	D/S Inishkeen WWTP looking upstream

Figure 2. Upstream (U/S) and downstream (D/S) of Inishkeen Town WWTP.

Macroinvertebrates – SSRS

Table 3 gives the recorded macroinvertebrate taxa for the standard kick samples taken at these sites. The taxa are arranged with the more sensitive taxa first and grouped by their SSRS group. Not all taxa recorded are included in the SSRS calculations and these are shown at the bottom of the table.

The upstream site had 19 different taxa and the downstream site had 15. The SSRS scores of 8 and 9.6 suggest that neither site is at risk of failing to achieve good ecological status based on the macroinvertebrates. Both samples had good numbers of *Ecdyonurus* and *Heptagenia* was also recorded at both sites. The stonefly *Leuctra* was present at both sites and five trichopteran taxa were noted: with two at the upstream site, Philopotamidae and *Rhyacophila* and four at the lower site, Hydropsyche, Limnephilidae, *Polycentropus* and *Rhyacophila*. It was noted that the Hydropsyche at the downstream site had a bacterial infection. This is often associated with moderate status sites where there is some pressure on the system. None of the more tolerant GOlD taxa were very abundant and, although *Asellus* was recorded at the upper site in low numbers, the overall scores are good. Both sites were assessed as being of good quality and probably quite close to high quality if a similar result was obtained during the summer months. Typically, however, three Group A Q-Value taxa are required to bring a site to Q4 or Q4-5 and here *Ecdyonurus* and *Heptagenia* are the only Group A taxa in these samples.

The substratum at the upstream site had the algae *Cladophora* at about 2% cover. This is an indicator of high nutrient levels particularly phosphorus. *Phormidium* mats were also noted and these are often associated with catchment disturbance such as breaking of the iron pan or discharges from water treatment works. Examination of the EDENIreland dataset shows some quite high ortho-phosphate concentrations even upstream of the WWTP. The 2024 results seem satisfactory, however. The lower site is over 1.5 km downstream of the WWTP – access closer to the plant was not possible on the day of sampling, but nonetheless it suggests that the WWTP is not having a major impact on the river. The EPA assigned a Q4-5* to the River Fane in Inishkeen in 2020. The asterisk signified that while the fauna were good, there was a siltation issue. The upper site in Inishkeen was silted, slight to moderate, in October 2024. The next regularly EPA sampling site is Stephenstown Bridge, RS06F010900, approximately 10 km further downstream and it has been rated Q4 consistently from 2003 to 2020.

Table 3. Macroinvertebrates recorded upstream and downstream of Inishkeen Town WWTP discharge point.

			Upstream Inishkeen WWTP	**Downstream Inishkeen WWTP**
		River	**Fane**	**Fane**
		EPA Code	**06F010650**	**06F010680**
		Location	**Lower Bridge in Inishkeen**	**East of Deerpark roadside**
		Date of Sample	**14/10/2024**	**14/10/2024**
Group No.	**SSRS/SSIS**	**Taxon**		
1	Ephem	*Alainites muticus*	Few	-
1	Ephem	*Caenis rivulorum*	Few	-
1	Ephem	*Ecdyonurus*	Common	Numerous
1	Ephem	*Heptagenia*	Few	Few
2	Plec	*Leuctra*	Few	Few
3	Trich	*Hydropsyche*	-	Common
3	Trich	Limnephilidae	-	Few
3	TRICH	Philopotamidae	Few	-
3	Trich	*Polycentropus*	-	Few
3	Trich	*Rhyacophila*	Few	Few
4	GOlD	Ancylidae	Few	Few
4	GOlD	Chironomidae	Few	Few
4	GOlD	*Eiseniella*	Few	-
4	GOlD	*Limnophora*	Few	-
4	GOlD	Lumbriculidae	-	Few
4	GOlD	Simuliidae	-	Common
4	GOlD	Tubificidae	Common	-
5	Asellus	*Asellus aquaticus*	Few	-
	n/a	*Baetis rhodani*	Numerous	Numerous
	n/a	*Elmis aenea*	Common	Few
	n/a	*Gammarus*	Dominant	Dominant
	n/a	Haliplidae	Few	-
	n/a	Hydraenidae	Few	-
	n/a	*Limnius volckmari*	Common	-
	n/a	Planaria	-	Few
		Number Taxa	19	15
		SSRS	8.0	9.6
		Q-Value	Q4	Q4

Physico-Chemical Results

Table *4* gives the physico-chemical results for the two sites. These appear to be normal and as expected for the River Fane.

Table 4. Physico-chemical results for the River Fane, 14 October 2024.

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Inishkeen WWTP	101.3	11.26	10.50	225	7.91
Downstream Inishkeen WWTP	99.9	11.29	9.80	256	7.80

Summary

The River Fane was in good condition at both sites in October 2024. Ideally the lower site should be sampled closer to the discharge point outside the mixing zone but the general condition at the downstream site sampled in October 2024 is good.

Reference

McGarrigle, M. 2014. "Assessment of Small Water Bodies in Ireland." *Biology and Environment* 114B(3). doi: 10.3318/BIOE.2014.15.