Annual Environmental Report

2019

Upper Liffey Valley Sewerage Scheme

D0002-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

This Annual Environmental Report has been prepared for D0002-01, Upper Liffey Valley Sewerage Scheme, in Kildare 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.

The liquid stream of the sludge upgrade works was completed in 2019. Sections of the sludge stream are currently being commissioned.

1.2 TREATMENT SUMMARY

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

- Upper Liffey Valley Sewerage Scheme WWTP Osberstown with a Plant Capacity PE of 130000, 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
TPEFF1400D0002SW001	Upper Liffey Valley Sewerage Scheme WWTP Osberstown	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
Priority Substances Assessment	Yes

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 UPPER LIFFEY VALLEY SEWERAGE SCHEME WWTP OSBERSTOWN - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - UPPER LIFFEY VALLEY SEWERAGE SCHEME WWTP OSBERSTOWN

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	42.7	25.51
COD-Cr mg/l	11	732	472.77
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	49	373	211.4
Total Phosphorus (as P) mg/l	11	8.8	4.97
Hydraulic Capacity	N/A	54802	29968

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 - TPEFF1400D0002SW001

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	100	200	N/A	28	N/A	N/A	16.46	Pass
Suspended Solids mg/l	35	87.5	N/A	28	N/A	N/A	3.87	Pass
Total Nitrogen mg/l	20	24	N/A	28	N/A	N/A	7.27	Pass
Total Oxidised Nitrogen (as N) mg/l	20	24	N/A	28	N/A	N/A	6.61	Pass
Fats, Oils & Greases mg/l	15	18	N/A	5	N/A	N/A	0.53	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	N/A	51	N/A	N/A	2.32	Pass
pH pH units	9	9	N/A	28	N/A	N/A	7.95	Pass
Ammonia-Total (as N) mg/l	0.9	1.08	N/A	28	N/A	N/A	0.13	Pass
Total Phosphorus (as P) mg/l	0.9	1.08	N/A	28	N/A	N/A	0.33	Pass
ortho-Phosphate (as P) -	0.5	0.6	N/A	28	N/A	N/A	0.2	Pass

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)
unspecified mg/l								
Faecal coliforms MPN/100ml	N/A	N/A	N/A	49	N/A	N/A	18165.34	
Kjeldahl Nitrogen mg/l	N/A	N/A	N/A	28	N/A	N/A	0.88	

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):

Not applicable

Significance of Results:

The WWTP is compliant with the ELV's set in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF1400D0002SW001

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	285423, 220755	RS09L011100	No	No	No	No	Moderate
Downstream	286940, 221639	RS09L011200	No	Yes	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 (Total) mg/l	RS09L011100	2	RS09L011300	1.46	1.5	-36
BOD - 5 days (Total) mg/l	RS09L011100	2	RS09L011200	3	1.5	67
Ammonia-Total (as N) mg/l	RS09L011100	0.040	RS09L011300	0.038	0.065	-3.8
Ammonia-Total (as N) mg/l	RS09L011100	0.040	RS09L011200	0.038	0.065	-3.8
ortho-Phosphate (as P) - unspecified mg/l	RS09L011100	0.011	RS09L011300	0.024	0.035	36.9
ortho-Phosphate (as P) - unspecified mg/l	RS09L011100	0.011	RS09L011200	0.023	0.035	31.5
Aluminium - unfiltered mg/l	RS09L011100	0.08	RS09L011200	0.13		
pH pH units	RS09L011100	8.01	RS09L011200	8.06		

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Total Nitrogen mg/l	RS09L011100	1.65	RS09L011200	1.91		
pH pH units	RS09L011100	8.01	RS09L011300	8.06		
Aluminium - unfiltered mg/l	RS09L011100	0.08	RS09L011300	0.12		
Total Nitrogen mg/l	RS09L011100	1.65	RS09L011300	2.13		

Significance of Results:

The WWTP discharge was 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 (RS09L011200) & Ortho-P (RS09L011200 & RS09L011300) 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 - UPPER LIFFEY VALLEY SEWERAGE SCHEME WWTP OSBERSTOWN

2.1.4.1 Treatment Efficiency Report - Upper Liffey Valley Sewerage Scheme WWTP Osberstown

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)
SS	N/A	43339	N/A
TP	65156	3732	94
TN	304217	81403	73
cBOD	2303334	25244	99
COD	5637182	184411	97

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

2.1.4.2 Treatment Capacity Report Summary - Upper Liffey Valley Sewerage Scheme WWTP Osberstown

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.

Upper Liffey Valley Sewerage Scheme WWTP Osberstown	
Peak Hydraulic Capacity (m^3/day) - As Constructed	85500
DWF to the Treatment Plant (m^3/day)	28500
Current Hydraulic Loading - annual max (m^3/day)	54802
Average Hydraulic loading to the Treatment Plant (m^3/day)	29968
Organic Capacity (PE) - As Constructed	130000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	92540
Organic Capacity (PE) - Remaining	37460
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 - UPPER LIFFEY VALLEY SEWERAGE SCHEME WWTP OSBERSTOWN

'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)
Domestic /Septic Tank Sludge	12629.3	Weight (Tonnes)	153	0.12	Yes	Yes	Yes
Industrial / Commercial Sludge	352.88	Weight (Tonnes)	4.2	0	Yes	Yes	Yes
Waterworks Sludge	39689.26	Weight (Tonnes)	483	0.36	Yes	Yes	Yes
Landfill Leachate (delivered by sewer network)	22232	Volume (m3)	270	0.2	Yes	Yes	No

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
49	Blocked Sewer	0	49

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)
Uncontrolled release	EO caused by pump failure	1	No	No
Other	Plant or equipment breakdown at WWTP	1	No	Yes
Spillage	Other	1	No	Yes

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Uncontrolled release	SWO Design not meeting DoEHLG Criteria	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2019	14
Number of Incidents reported to the EPA via EDEN in 2019	14
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
GW1	277366, 208981	Yes	Low	Meeting	Unknown	Unknown	Monitored
GW2	278163, 210420	Yes	Low	Not Meeting	Unknown	Unknown	Monitored
SW10	290045, 221147	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW11	291941, 221574	Yes	Low	Meeting	Unknown	Unknown	Monitored
SW13	288507, 223646	Yes	Low	Meeting	Unknown	Unknown	Monitored
SW14	282887, 227673	Yes	Low	Meeting	Unknown	Unknown	Monitored
SW15	294107, 224006	Yes	Low	Meeting	Unknown	Unknown	Monitored

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
SW16	294120, 223042	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW17	284028, 209975	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW18	288002, 227108	Yes	Low	Meeting	Unknown	Unknown	Monitored
SW19	281851, 211780	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW2	286924, 220613	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW20	279007, 208205	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW21	276223, 206823	No	Low	Meeting	Unknown	Unknown	Monitored
SW22	284952, 221151	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW3	285213, 219831	Yes	Low	Meeting	Unknown	Unknown	Monitored
SW5	281619, 217250	Yes	Low	Not Meeting	Unknown	Unknown	Monitored
SW6	280713, 215376	Yes	Low	Meeting	Unknown	Unknown	Not Monitored

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
SW7	280747, 215119	Yes	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
SW8	280791, 214479	Yes	Low	Not Meeting	Unknown	Unknown	Not Monitored
SW9	290217, 221486	Yes	Low	Meeting	Unknown	Unknown	Monitored
TBC	281152, 216908	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	281841.5, 212371.0	Yes	Low	Meeting	Unknown	Unknown	Monitored
TBC	TBC	No	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	TBC	No	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	TBC	No	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Unknown

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	No
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 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
D0002-SIP:01	Infiltration programme	C	31/03/2013	Yes	At Planning Stage		
D0002-SIP:02	Infiltration programme	C	31/03/2013	Yes	Not Started		The improvement programme will be reviewed by Irish Water to assess the works required to comply with the licence

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
							condition on a prioritised basis
D0002-SIP:03	Upgrade of the Monread Road Pumping Station (associate with SW9)	C	31/03/2013	Yes	Work ongoing on-site		
D0002-SIP:04	Upgrade of the Newhall Pumping Station (associated with SW3),	C	31/03/2013	Yes	Work ongoing on-site		
D0002-SIP:05	Upgrade to Blessington Road Pumping Station	C	31/03/2011	Yes	Works Completed		
D0002-SIP:06	Upgrading of sewer network to ensure all SWO comply with the criteria outlined in the DoEHLG 'Procedures and Criteria in relation to Storm Water Overflows, 1995'	C	31/12/2020	No	Work ongoing on-site		
D0002-SIP:07	Waste water sewer network rehabilitation programme	C	31/03/2013	Yes	Work ongoing on-site		
D0002-SIP:08	Waste Water treatment plant upgrade and ancillary works	C	31/03/2013	Yes	Work ongoing on-site		
D0002-SIP:09	Waste Water works network rehabilitation programme	C	31/03/2013	Yes	Work ongoing on-		

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
					site		

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

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.

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	2013	No	
Priority Substances Assessment	Yes	2012	Yes	5.2

5.1 DRINKING WATER ABSTRACTION POINT RISK ASSESSMENT

The Drinking Water Abstraction Point Risk Assessment Report has been included in the AER 2013.

5.2 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report is included in Appendix 7.1 - Priority Substances Assessment. A summary of the findings of this report is included below.

Parameter	Value
Does the assessment include a review of Trade inputs to the works?	Yes
Does the assessment include a review of other inputs to the works?	Yes

Parameter	Value
Does the assessment use the Desk Top Study Method or Screening Analysis to determine if the discharge contains the parameters in Appendix 1 of the EPA guidance	Screening Analysis
Does the report include an assessment of the significance of the results where a listed material is present in the discharge? (e.g. impact on the relevant EQS standard for the receiving water)	Yes
Is the agglomeration included in the Irish Water Dangerous Substance Effluent Monitoring Programme (if yes, what year)	Yes (2018)
Does the Dangerous Substance Effluent Monitoring Programme reporting identify Irish Water measures for minimising priority substances and eliminating priority hazardous substances in the discharges	N/A
Does the Dangerous Substance Effluent Monitoring assessment identify that priority substances were found at levels above EQS or target LOD values?	N/A

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:

Date: 05/03/2020

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

Appendix
Appendix 7.1 - Priority Substances Assessment

Certificate of Analysis

Customer	Irish Water	**Date Received**	11/04/2019
		Date Analysed	11/04/2019 - 21/05/2019
Office	Kildare County Council	**Issue Date**	23/05/2019
		Quote No.	
Customer Contact	Caroline Murphy	**Customer PO**	
Project:		**BATCH NUMBER**	**19-01674**

Conor Murphy
Operations Manager

Index to symbols used & Notes

*	Analysis is not INAB/UKAS accredited
**	Adapted from Standard Methods for the Examination of Water and Wastewater.
****	Customer specific limits
(F)	Analysis carried out at our Farranfore Laboratory.
(D)	Analysis carried out at our Dunrine Laboratory.
LOD	Parameter Limit of Detection.
Note 6	Subcontracted Parameter.

Notes

- **The results relate only to the items tested.**
- **Opinions and interpretations expressed herein are outside the scope of INAB accreditation.**
- **The analysis report shall not be reproduced except in full without written approval of the laboratory.**
- **Sampling is outside the scope of the laboratory activities.**

Customer Sample Ref:	Oberstown Effluent	**Customer Sample Code:**	19/544
Project:		**Sampled By:**	
Our Reference:	5842 (19-01674)	**Sample Matrix:**	Effluent
Date Sampled:	08/04/2019	**Time Sampled:**	:

Method:		Parameter:	Units	LOD	Result
		Chemical Analysis: (F)			
- Note 6		1,2 Dicloroethane	µg/L	0.1	< 0.1
- Note 6		pH	pH Unit	4.0	7.4
- Note 6		Conductivity (external)	µS/cm @ 20 ℃	25.0	791.0
- Note 6		Cynaide Total	µg/L	1.0	< 1.0
- Note 6	*	Total Hardness	mg/L CaCO3	3.0	253.7
- Note 6	*	Calcium	mg/L	1.0	86.5
- Note 6	*	Magnesium	mg/L	0.3	9.2
- Note 6		Cadmium - Total	mg/L	0.0002	< 0.0002
- Note 6		Chromium - Total	mg/L	0.0003	0.0013
- Note 6		Zinc - Total	mg/L	0.006	0.042
- Note 6		Antimony - Total	µg/L	0.3	0.6
- Note 6		Arsenic - Total	µg/L	1.0	< 1.0
- Note 6		Barium - Total	µg/L	3.0	14.5
- Note 6		Boron - Total	mg/L	0.5	< 0.5
- Note 6		Cobalt - Total	µg/L	3.0	< 3.0
- Note 6		Copper - Total	mg/L	0.002	< 0.020
- Note 6		Lead - Total	µg/L	0.9	< 0.9
- Note 6		Mercury - Total	µg/L	0.1	< 0.06
- Note 6		Molybdenum - Total	µg/L	3.0	< 3.0
- Note 6		Nickel - Total	µg/L	1.5	5.1
- Note 6		Selenium - Total	µg/L	3	< 3
- Note 6		Tin - Total	µg/L	3	< 3
- Note 6		Vanadium - Total	µg/L	1	< 3
- Note 6		2,4-D	µg/L	0.05	< 0.05
- Note 6		MCPA	µg/L	0.05	< 0.05
- Note 6		MCPP (Mecoprop)	µg/L	0.05	< 0.05
- Note 6		Chloride	mg/L	13.0	96.0
- Note 6		Fluoride	mg/L	0.10	0.26
- Note 6		Glyphosate	µg/L	0.1	< 5.0
- Note 6	*	2, 6-dichlorobenzamide	µg/L	0.1	< 1.0
- Note 6		1,2,3-Trichlorobenzene	µg/L	0.01	< 0.01
- Note 6		1,2,4-Trichlorobenzene	µg/L	0.01	< 0.01
- Note 6		1,3,5-Trichlorobenzene	µg/L	0.01	< 0.01
- Note 6		Aplha-HCH	ug/L	0.003	< 0.050
- Note 6		Beta-HCH	µg/L	0.003	< 0.050
- Note 6		Dichlobenil	µg/L	0.002	< 0.050
- Note 6		Dieldrin	µg/L	0.004	< 0.050
- Note 6		Gamma-HCH (Lindane)	µg/L	0.0027	< 0.0500
- Note 6		Hexachlorobenzene	µg/L	0.002	< 0.050
- Note 6		Isodrin	µg/L	0.004	< 0.050
- Note 6		Acenaphthene	µg/L	0.01	< 0.01
- Note 6		Acenaphthylene	µg/L	0.01	< 0.01
- Note 6		Anthracene	µg/L	0.01	< 0.01

Customer Sample Ref:	Oberstown Effluent	**Customer Sample Code:**	19/544
Project:		**Sampled By:**	
Our Reference:	5842 (19-01674)	**Sample Matrix:**	Effluent
Date Sampled:	08/04/2019	**Time Sampled:**	:

Method:		Parameter:	Units	LOD	Result
- Note 6		Benzo(a)anthracene	µg/L	0.01	< 0.01
- Note 6		Benzo(a)pyrene	µg/L	0.01	< 0.01
- Note 6		Benzo(b)fluoranthene	µg/L	0.01	< 0.01
- Note 6		Benzo(ghi)perylene	µg/L	0.01	< 0.01
- Note 6		Benzo(k)fluoranthene	µg/L	0.01	< 0.01
- Note 6		Chrysene (218-01-9)	µg/L	0.01	< 0.01
- Note 6		Dibenz(a,h)anthracene	µg/L	0.01	< 0.01
- Note 6		Fluoranthene	µg/L	0.01	< 0.01
- Note 6		Fluorene	µg/L	0.01	< 0.01
- Note 6		Indeno(1,2,3-cd)pyrene	µg/L	0.010	< 0.010
- Note 6		Naphthalene	µg/L	0.01	< 0.01
- Note 6	*	Total PAH	µg/L	0.01	< 0.01
- Note 6		Phenanthrene	µg/L	0.01	< 0.01
- Note 6		Pyrene	µg/L	0.01	< 0.01
- Note 6		Diuron	µg/L	0.05	< 0.05
- Note 6		Isoproturon	µg/L	0.05	< 0.05
- Note 6		Linuron	µg/L	0.05	< 0.05
- Note 6		Atrazine	µg/L	0.005	< 0.020
- Note 6		Simazine	µg/L	0.005	< 0.020
- Note 6		Dichloromethane	µg/L	5.0	< 5.0
- Note 6		Hexachlorobutadiene	µg/L	0.5	< 0.5
- Note 6		Chloroform	µg/L	1.0	< 1.0
- Note 6		Carbon tetrachloride	µg/L	0.5	< 0.5
- Note 6		Benzene	µg/L	0.1	< 0.1
- Note 6		Trichloroethane	µg/L	0.1	< 0.1
- Note 6		Toluene	µg/L	0.5	< 0.5
- Note 6		Tetrachloroethene	µg/L	0.1	0.2
- Note 6		Ethylbenzene	µg/L	0.5	< 0.5
- Note 6		Xylene P&M	µg/L	0.5	< 0.5
- Note 6		Xylene - o	µg/L	0.5	< 0.5

Certificate of Analysis

Customer:	Irish Water	**Project:**	Dangerous Substances
Address:	Kildare County Council	**Date Received:**	25/09/2019
		Condition of Sample:	Satisfactory
Report to:	Caroline Murphy	**Date Analysed:**	26/09/2019 - 18/11/2019
Customer PO		**Issue Date:**	19/11/2019
Quote No.		**BATCH NUMBER:**	**19-03909**

Conor Murphy
Operations Manager

Index to symbols used & Notes

*	Analysis is not INAB/UKAS accredited
**	Adapted from Standard Methods for the Examination of Water and Wastewater.
****	Customer specific limits
(F)	Analysis carried out at our Farranfore Laboratory.
(D)	Analysis carried out at our Dunrine Laboratory.
LOD	Parameter Limit of Detection.
Note 6	Subcontracted Parameter.

Notes

- **The results relate only to the items tested.**
- **Opinions and interpretations expressed herein are outside the scope of INAB accreditation.**
- **The analysis report shall not be reproduced except in full without written approval of the laboratory.**
- **Sampling is outside the scope of the laboratory activities.**

Customer Sample Ref:	Oberstown Effluent	**Customer Sample Code:**	19/1050
Project:	Dangerous Substances	**Sampled By:**	C. Murphy
Our Reference:	12085 (19-03909)	**Sample Matrix:**	Effluent
Date Sampled:	25/09/2019	**Time Sampled:**	11:00

Method:		Parameter:	Units	LOD	Result
		Chemical Analysis: (F)			
- Note 6		Atrazine	µg/L	*0.020*	< 0.020
- Note 6		Simazine	µg/L	*0.020*	< 0.020
- Note 6		Conductivity (external)	µS/cm @ 20 °C	*25.0*	562.0
- Note 6		pH	pH Unit	*4.0*	8.0
- Note 6		Chloride	mg/L	*13.0*	56.0
- Note 6	*	Total Hardness	mg/L CaCO3	*3.0*	208.2
- Note 6		Cynaide Total	µg/L	*1.0*	< 1.0
- Note 6		Fluoride	mg/L	*0.10*	0.30
- Note 6		Boron - Total	mg/L	*0.5*	< 0.5
- Note 6	*	Calcium	mg/L	*1.0*	71.6
- Note 6	*	Magnesium	mg/L	*0.3*	7.1
- Note 6		Antimony - Total	µg/L	*0.3*	0.8
- Note 6		Arsenic - Total	µg/L	*1.0*	< 1.0
- Note 6		Barium - Total	µg/L	*3.0*	6.4
- Note 6		Cadmium - Total	mg/L	*0.0002*	< 0.0005
- Note 6		Chromium - Total	mg/L	*0.0003*	< 0.0008
- Note 6		Cobalt - Total	µg/L	*3.0*	1816.4
- Note 6		Copper - Total	mg/L	*0.003*	< 0.003
- Note 6		Lead - Total	µg/L	*0.9*	< 0.9
- Note 6		Mercury - Total	µg/L	*0.06*	< 0.06
- Note 6		Molybdenum - Total	µg/L	*3.0*	44.3
- Note 6		Nickel - Total	µg/L	*1.5*	3.8
- Note 6		Selenium - Total	µg/L	*3*	< 3
- Note 6		Tin - Total	µg/L	*3*	< 3
- Note 6		Vanadium - Total	µg/L	*3*	< 3
- Note 6		Zinc - Total	mg/L	*0.006*	0.058
- Note 6		1,2 Dicloroethane	µg/L	*0.1*	< 0.1
- Note 6		1,2,4-Trichlorobenzene	µg/L	*0.01*	< 0.01
- Note 6		Acenaphthene	µg/L	*0.01*	< 0.01
- Note 6		Acenaphthylene	µg/L	*0.01*	< 0.01
- Note 6		Anthracene	µg/L	*0.01*	< 0.01
- Note 6		Benzene	µg/L	*0.1*	< 0.1
- Note 6		Benzo(a)anthracene	µg/L	*0.01*	< 0.01
- Note 6		Benzo(a)pyrene	µg/L	*0.01*	< 0.01
- Note 6		Benzo(b)fluoranthene	µg/L	*0.01*	< 0.01
- Note 6		Benzo(ghi)perylene	µg/L	*0.01*	< 0.01
- Note 6		Benzo(k)fluoranthene	µg/L	*0.01*	< 0.01
- Note 6		Chrysene (218-01-9)	µg/L	*0.01*	< 0.01
- Note 6		Dibenz(a.h)anthracene	µg/L	*0.01*	< 0.01
- Note 6		Diuron	µg/L	*0.05*	< 0.05
- Note 6		Fluoranthene	µg/L	*0.01*	< 0.01
- Note 6		Fluorene	µg/L	*0.01*	< 0.01

Customer Sample Ref:	Oberstown Effluent	**Customer Sample Code:**	19/1050
Project:	Dangerous Substances	**Sampled By:**	C. Murphy
Our Reference:	12085 (19-03909)	**Sample Matrix:**	Effluent
Date Sampled:	25/09/2019	**Time Sampled:**	11:00

Method:		Parameter:	Units	LOD	Result
- Note 6		Hexachlorobenzene	µg/L	*0.050*	< 0.050
- Note 6		Hexachlorobutadiene	µg/L	*0.5*	< 0.5
- Note 6		Indeno(1,2,3-cd)pyrene	µg/L	*0.010*	< 0.010
- Note 6		Isoproturon	µg/L	*0.05*	< 0.05
- Note 6		Linuron	µg/L	*0.05*	< 0.05
- Note 6		Naphthalene	µg/L	*0.01*	< 0.01
- Note 6		Phenanthrene	µg/L	*0.01*	< 0.01
- Note 6		Pyrene	µg/L	*0.01*	< 0.01
- Note 6		Toluene	µg/L	*0.5*	< 0.5
- Note 6		1,2,3-Trichlorobenzene	µg/L	*0.01*	< 0.01
- Note 6		1,3,5-Trichlorobenzene	µg/L	*0.01*	< 0.01
- Note 6	*	2, 6-dichlorobenzamide	µg/L	*0.1*	< 1.0
- Note 6		Carbon tetrachloride	µg/L	*0.5*	< 0.5
- Note 6		Chloroform	µg/L	*1.0*	< 1.0
- Note 6		Dichlobenil	µg/L	*0.050*	< 0.050
- Note 6		Dichloromethane	µg/L	*5.0*	< 5.0
- Note 6		Ethylbenzene	µg/L	*0.5*	< 0.5
- Note 6		Isodrin	µg/L	*0.050*	< 0.050
- Note 6		Aplha-HCH	µg/L	*0.050*	< 0.050
- Note 6		Beta-HCH	µg/L	*0.050*	< 0.050
- Note 6		Dieldrin	µg/L	*0.050*	< 0.050
- Note 6		Gamma-HCH (Lindane)	µg/L	*0.0500*	< 0.0500
- Note 6		2,4-D	µg/L	*0.05*	< 0.05
- Note 6		MCPA	µg/L	*0.05*	0.06
- Note 6		MCPP (Mecoprop)	µg/L	*0.05*	0.05
- Note 6		Glyphosate	µg/L	*0.1*	< 1.0
- Note 6	*	Total PAH	µg/L	*0.01*	< 0.01
- Note 6		Tetrachloroethene	µg/L	*0.1*	< 0.1
- Note 6		Trichloroethane	µg/L	*0.1*	< 0.1
- Note 6		Xylene P&M	µg/L	*0.5*	< 0.5
- Note 6		Xylene - o	µg/L	*0.5*	< 0.5

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