UISCE EIREANN : IRISH WATER **MONAGHAN COUNTY COUNCIL**

WASTE WATER DISCHARGE LICENCE REGISTER NUMBER: D0348 AGGLOMERATION: Inniskeen Village ANNUAL ENVIRONMENTAL REPORT 1st JANUARY 2013 - 31st DECEMBER 2013

County Manager: E Cummins
Director of Services: D Treanor
Senior Engineer: C McCrossan

Inniskeen Waste Water Treatment Plant – Annual Environmental Report 2013

Document Amendment Record

Client: Uisce Eireann : Irish Water
Plant: Inniskeen Waste Water Treatment Plant
Title: Annual Environmental Report 2013

Ref No.: D0348

DATE	Issue Purpose:	originated	Monaghan County Council: Approved:	Ulsce Eireann : Irish Water Approved:
February 2014	Annual Environmental Report 2013 Document for Submission to the EPA:	S. Mallon A.E.	C McCrossan S.E.	

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Section 1. Executive Summary and Introduction to the 2013 AER

1.1 Summary report on 2013

This is the fourth Annual Environmental Report (AER) for Inniskeen Village Wastewater Treatment Plant.

The Environmental Protection Agency granted a Waste Water Discharge Licence (Register No. D0348) in respect of the agglomeration named, to Monaghan County Council on the 10th Feb 2010.

The purpose of this Annual Environmental Report (AER) is to provide a summary of activities relevant to the discharges from 1st January 2013 to the 31st December 2013 as required under Condition 6.11 of the discharge licence. The Annual Environmental Report (AER) for the Inniskeen agglomeration includes the information specified in Schedule D of the Wastewater Discharge Licence D0348.

Inniskeen is located near the County Louth border in the extreme south eastern corner of County Monaghan. It is located approximately 10.5 km from the nearest large town of Carrickmacross and 16 km West of Dundalk in County Louth. The Waste Water Works comprises a network of gravity sewers, a pumping station and associated rising main and a Waste Water Treatment Works with a design capacity of 1750 P.E. Treatment comprises of aeration, settlement, clarification, tertiary treatment, ferric dosing to reduce phosphorus levels, storm storage and sludge dewatering is provided by thickening the sludge in a picket fence thickener followed by dewatering on a sludge belt press. There is one storm water overflow (SWO) from a storm tank.
The SWO would only activate during periods of prolonged rainfall or storm conditions at the plant.
The primary discharge of the Waste Water Works is to the River Fane at National Grid Reference 293963E 306678N in the Town land of Lacklom, Co Monaghan.
The River Fane is not designated Salmonid water (under the European Communities (Quality of Salmonid Waters) Regulations, 1988) nor is it identified as sensitive water in terms of the Urban Waste Water Treatment Regulations 2001. The river is not designated as an SPA, SAC or NHA. However, it is a valuable salmonid river and contains good stocks of wild brown trout and salmon throughout. The river Fane is in the Neagh Bann river basin district with its overall status classified as poor and at risk of not meeting good status by 2015, with overall objective to restore it to good status by 2021, however, the 'point risk source' and potential for impact from the Inniskeen WWTP discharge on the river is categorised as '2b – not at risk' it is therefore not identified as impacting on the poor river quality status, (ref: WFD Ireland maps/website & reports.).
There are no known combined sewer overflows on the Inniskeen network.

The discharge from the Inniskeen WWTP had some exceedances in 2013. There were two allowable exceedances (condition 2, licence) over the ELV (1.5mg/l) for Ortho P on the 21/03/2013 at 1.552mg/l with no obvious cause and on the 25/09/2013 as 1.743mg/l, which was related to the sand filter mechanical failure. The remainder of exceedances occurred from June to the end of the year, due to mechanical issues with the tertiary sand filter, which involved taking the filter apart and replacing pipe work and parts within it. Some of the replacement parts had to be ordered from overseas, which involved a delay in fixing the filter, hence it is only back operating from the end of December 2013. The filter was by-passed for the aforementioned period, hence exceedances occurred during this period. The exceedances were for SS, Ammonia, Total P, and Ortho P during the time period from 24/06/2013 to 09/12/2013. These exceedances were all reported to the EPA under Incident INCI002279, this incident is still open, but effluent results for December were all compliant except for SS which was slightly over the ELV at 12mg/l, indicating that the sand filter is operating again.

The ambient monitoring results for 2013 indicate that the Environmental Quality Standard (EQS) (Surface Water Reg's 2009) for BOD 'good status' mean flows of 1.5mg/l is being met both upstream and downstream in the river with little variation between both sets of figures and all results under 1.5mg/l. One downstream result dated 21/03/2013 for BOD is considered erroneous from the lab at a figure of '<14mg/l'.
Ammonia results average figure at 0.029mg/l for the year downstream is under the 'mean' EQS figure of 0.065mg/l, with one exceedance on 21/03/2013 at 0.123mg/l, the effluent figure for ammonia on the same date is under the ELV. Upstream ammonia average figure exceeds the 'mean' good status figure of 0.065mg/l and individual results exceed the EQS in comparison to downstream results on the same dates, thus indicating that there are other sources impacting the receiving water quality with respect to ammonia. Ortho P (MRP) average figures both upstream and downstream exceeds the 'mean' figure (0.035mg/l) with downstream figure higher at 0.121mg/l. Individual results downstream are exceeded coinciding with the sand filter breakdown at the WWTP and the elevated ELV figures in the effluent for Ortho P. The impact on the receiving water should be of short duration as the sand filter is now operational again.

There are no specified improvement works specified under schedule C of the Inniskeen discharge licence.

Section 2. Monitoring Reports Summary

2.1 Summary report on monthly influent monitoring

Monaghan County Council's summary on influent monitoring for Inniskeen WWTP is tabulated in tables 1, 1.1 and 2.2 attached in appendix 1. As required under condition 4.15 of the licence, bi-monthly monitoring of the influent stream to the WWTP for BOD, COD, Suspended Solids, Total Nitrogen and Total Phosphorus measuring mass loadings and removal efficiencies has been calculated and tabulated in tables 1 and 1.3. A summary of the removal efficiencies for the WWTP is as follows:

BOD – range 90 -99%, average 97%
COD – range 68 – 98%, average 83%
SS – range 50 – 98%, average 88%
TP – range 44 – 96%, average 97%

One result for COD and SS on 29/10/2013 has been omitted from the above figures as negative removal efficiencies were calculated due to low inflow figures for these parameters, this is attributed to very high flow figure for the WWTP on this date of 1134m3 due to heavy rainfall and thus diluted inflow parameters, as Inniskeen is a combined system.
Total Nitrogen results vary greatly with a range 8 – 66%, average removal efficiency of 37%, this can be attributed to the sand filter being out of operation for a number of months at the WWTP.

Table 1.1

Influent monitoring summary table

	BOD mg/l	COD mg/l	SS mg/l	Total P mg/l P	Total N mg/l N	Volumetric Loading m3/day	Organic Loading PE/day
Number of samples	11	11	11	10	11	n/a	n/a
Maximum result	565.00	1290.00	317.00	15.70	112.30	1134	
Annual Mean	177.09	402.27	109.18	7.11	51.34	206	607

Table 1.2

Remaining Hydraulic & Organic treatment capacities summary table:	
Hydraulic Capacity - Design (M^3/day)	315
Hydraulic Capacity - Current loading (M^3/day)	206
Hydraulic Capacity - Remaining (M^3/day)	**109**
Organic Capacity - Design (PE)	1750
Organic Capacity - Current loading (PE)	607
Organic Capacity - Remaining (PE)	**1143**
Will the capacity be exceeded in the next 3 years?	no

The influent monitoring summary table 1.1 above details the number of influent samples taken, the maximum and mean results for each parameter specified, in 2013 and the organic and hydraulic loading based on 2013 figures for the WWTP. The design capacity of the Inniskeen WWTP is detailed in table 1.2 above, there is adequate hydraulic and organic capacity available at the WWTP from average flow/load figures for 2013. The hydraulic capacity was exceeded using the maximum flow figures from the WWTP, the Inniskeen sewerage network is a combined collection system thus experiences high inflows to the WWTP during prolonged periods of rainfall, however, there is a storm tank at the WWTP to contain excess inflows and return to the inlet works when flow conditions revert to normal.

2.2 Discharges from the agglomeration

A summary presentation of monitoring results for the primary discharge (National Grid Reference 293963E 306678N) are tabulated in table 2.1 attached in appendix 1. The Emission Limit Value's (ELVs) where applicable are included in the heading columns in red text in accordance with schedule A.1 of the licence. Six samples are required under schedule B of the licence, twelve samples were collected. pH, temperature and conductivity monitoring is required weekly for the effluent, these is recorded on site by the caretaker along with flow figures and visual inspection details. These on site test results are tabulated in the effluent monitoring summary table in appendix 1. All pH values recorded for 2013 ranged between 6 and 9.

The discharge from the Inniskeen WWTP had some exceedances in 2013. There were two allowable exceedances (condition 2, licence) over the ELV (1.5mg/l) for Ortho P on the 21/03/2013 at 1.552mg/l with no obvious cause and on the 25/09/2013 as 1.743mg/l, which was related to the sand filter mechanical failure. The remainder of exceedances occurred from June to the end of the year, due to mechanical issues with the tertiary sand filter, which involved taking the filter apart and replacing pipe work and parts within it. Some of the replacement parts had to be ordered from overseas, which involved a delay in fixing the filter, hence it is only back operating from the end of December 2013. The filter was by-passed for the aforementioned period, hence exceedances occurred during this period. The exceedances were for SS, Ammonia, Total P, and Ortho P during the time period from 24/06/2013 to 09/12/2013. These exceedances were all reported to the EPA under Incident INCI002279, this incident is still open, but effluent results for December were all compliant except for SS which was slightly over the ELV at 12mg/l, indicating that the sand filter is operating again. This incident remains open. An effluent monitoring summary table detailing number of incidents etc is attached in appendix 1. The ambient monitoring results for 2013 indicate that the Environmental Quality Standard (EQS) (Surface Water Reg's 2009) for BOD 'good status' mean flows of 1.5mg/l is being met both upstream and downstream in the river with little variation between both sets of figures and all results under 1.5mg/l. As discussed in the executive summary, the impact from this sand filter malfunction on the receiving water with regard to the

surface water quality parameter BOD is that 'good status' mean flow EQS figure of 1.5mg/l is being met both upstream and downstream in the river with little variation between both sets of figures and all results under 1.5mg/l. One downstream result dated 21/03/2013 for BOD is considered erroneous from the lab at a figure of '<14mg/l'.
Ammonia results average figure at 0.029mg/l for the year downstream is under the 'mean' EQS figure of 0.065mg/l, with one exceedance on 21/03/2013 at 0.123mg/l, the effluent figure for ammonia on the same date is under the ELV. Upstream ammonia average figure exceeds the 'mean' good status figure of 0.065mg/l and individual results exceed the EQS in comparison to downstream results on the same dates, thus indicating that there are other sources impacting the receiving water quality with respect to ammonia. Ortho P (MRP) average figures both upstream and downstream exceeds the 'mean' figure (0.035mg/l) with downstream figure higher at 0.121mg/l. Individual results downstream are exceeded coinciding with the sand filter breakdown at the WWTP and the elevated ELV figures in the effluent for Ortho P. The impact on the receiving water should be of short duration as the sand filter is now operational again.

The removal efficiencies for the WWTP for BOD, COD, SS, TN and TP are tabulated in table 1 attached in appendix 1 and summarised in section 2.1 of this document.

Priority Substance Assessment
Under condition 4.11 of the licence, '*a representative sample from the effluent shall be screened for the presence of organic compounds and metals as required by the Agency'*. This assessment and report was submitted as part of the 2011 AER to the Agency.

2.3 Ambient monitoring summary

A summary presentation of the ambient monitoring results for the upstream (National grid reference 293947E 306689N) and downstream (National grid reference 293979E 306669N) receiving waters is tabulated in tables 2.3 and 2.4 attached in appendix 1. Under Schedule B of the licence, ten samples are required per year, there were ten sample analyses carried out in 2013. An SSRS Assessment (carried out by Environment section of Monaghan County Council) downstream of the Inniskeen WWTP on the River Fane is tabulated in appendix 1.
The primary discharge of the Waste Water Works is to the River Fane at National Grid Reference 293963E 306678N in the Town land of Lacklom, Co Monaghan.
The River Fane is not designated Salmonid water (under the European Communities (Quality of Salmonid Waters) Regulations, 1988) nor is it identified as sensitive water in terms of the Urban Waste Water Treatment Regulations 2001. The river is not designated as an SPA, SAC or NHA. However, it is a valuable salmonid river and contains good stocks of wild brown trout and salmon throughout. The river Fane is in the Neagh Bann river

basin district with its overall status classified as poor and at risk of not meeting good status by 2015, with overall objective to restore it to good status by 2021, however, the 'point risk source' and potential for impact from the Inniskeen WWTP discharge on the river is categorised as '2b – not at risk' it is therefore not identified as impacting on the poor river quality status, (ref: WFD Ireland maps/website & reports.).
Dissolved Oxygen (DO), pH and temperature results are recorded on site by the caretaker throughout the year and the results are tabulated in table 2.5, appendix 1. DO results recorded were all above 8mg/l and pH results between 6 and 9 in the receiving waters. Visual inspection records are recorded on site by the caretaker. The ambient monitoring results for 2013 indicate that the Environmental Quality Standard (EQS) (Surface Water Reg's 2009) for BOD 'good status' mean flows of 1.5mg/l is being met both upstream and downstream in the river with little variation between both sets of figures and all results under 1.5mg/l. One downstream result dated 21/03/2013 for BOD is considered erroneous from the lab at a figure of '<14mg/l'.
Ammonia results average figure at 0.029mg/l for the year downstream is under the 'mean' EQS figure of 0.065mg/l, with one exceedance on 21/03/2013 at 0.123mg/l, the effluent figure for ammonia on the same date is under the ELV. Upstream ammonia average figure exceeds the 'mean' good status figure of 0.065mg/l and individual results exceed the EQS in comparison to downstream results on the same dates, thus indicating that there are other sources impacting the receiving water quality with respect to ammonia. Ortho P (MRP) average figures both upstream and downstream exceeds the 'mean' figure (0.035mg/l) with downstream figure higher at 0.121mg/l. Individual results downstream are exceeded coinciding with the sand filter breakdown at the WWTP and the elevated ELV figures in the effluent for Ortho P. The impact on the receiving water should be of short duration as the sand filter is now operational again.

2.4 Data Collection and reporting requirements under the UWWT Directive.

This information will be submitted separately to the EPA through EDEN.

2.5 Pollutant Release and Transfer Register (PRTR).

The PRTR is not required for the Inniskeen agglomeration as the p.e. is between 1,001 and 2,000.

Section 3. Operational Reports Summary

3.1 Treatment Efficiency Report

Table 1.3

Treatment Efficiency Report Summary Table

	cBOD mg/l (kg/day)	COD mg/l (kg/day)	SS mg/l (kg/day)	TP mg/l (kg/day)	TN mg/l (kg/day)	Comment
Influent mass loading (kg/day)	181	372	98	71	58	
Effluent mass emission (kg/day)	5.85	65.12	11.62	2.28	36.91	
% Efficiency (% reduction of influent load)	96.77	82.52	88.13	96.80	36.81	

The Inniskeen WWTP is generally considered to be operating efficiently despite the tertiary sand filter being out of operation for a number of months in 2013.

A summary of the removal efficiencies for the WWTP is as follows:

BOD – range 90 -99%, average 97%
COD – range 68 – 98%, average 83%
SS – range 50 – 98%, average 88%
TP – range 44 – 96%, average 97%

One result for COD and SS on 29/10/2013 has been omitted from the above figures as negative removal efficiencies were calculated due to low inflow figures for these parameters, this is attributed to very high flow figure for the WWTP on this date of 1134m3 due to heavy rainfall and thus diluted inflow parameters, as Inniskeen is a combined system.

Total Nitrogen results vary greatly with a range 8 – 66%, average removal efficiency of 37%, this can be attributed to the sand filter being out of operation for a number of months at the WWTP.

3.2 Treatment Capacity Report

This assessment has been completed in section 2.1(table 1.2) of this report.

3.3 Complaints Summary

There were no complaints of an environmental nature related to the discharge to waters from the Inniskeen WWTP in 2013.

3.4 Reported Incidents Summary

The discharge from the Inniskeen WWTP had some exceedances in 2013. There were two allowable exceedances (condition 2, licence) over the ELV (1.5mg/l) for Ortho P on the 21/03/2013 at 1.552mg/l with no obvious cause and on the 25/09/2013 as 1.743mg/l, which was related to the sand filter mechanical failure. The remainder of exceedances occurred from June to the end of the year, due to mechanical issues with the tertiary sand filter, which involved taking the filter apart and replacing pipe work and parts within it. Some of the replacement parts had to be ordered from overseas, which involved a delay in fixing the filter, hence it is only back operating from the end of December 2013. The filter was by-passed for the aforementioned period, hence exceedances occurred during this period. The exceedances were for SS, Ammonia, Total P, and Ortho P during the time period from 24/06/2013 to 09/12/2013. These exceedances were all reported to the EPA under Incident INCI002279, this incident is still open, but effluent results for December were all compliant except for SS which was slightly over the ELV at 12mg/l, indicating that the sand filter is operating again. Summary tables are tabulated as follows:

Effluent Monitoring Summary Table								
	BOD mg/l	COD mg/l	TSS mg/l	Ammonia mg/l	Total P mg/l	Ortho P mg/l	Total Nitrogen mg/l	Comments
WWDL ELV (schedule A)	10	125	10	2	2	1.50	N/A	
ELV with Cond. 2 interpretation	No result >100% ELV = 20mg/l	No result >100% ELV = 250mg/l	No result >150% ELV = 25mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 1.8mg/l	N/A	12 samples taken, therefore 2 'allowable' failures
Number of sample results	12	12	12	12	12	12	12	
Number of sample results above WWDL ELV	0	0	8	2	4	5	N/A	
Annual Mean (for parameters where a mean ELV applies)	N/A	N/A	N/A	1.03	2.02	1.66	N/A	
Overall compliance (Pass/Fail)	Pass	Pass	Fail	Fail	Fail	Fail	N/A	

Summary of Incidents tables:

Incident Type	Incident description	Cause	No. of incidents	Corrective Action	Authorities Contacted	Reported to EPA	Closed
ELV exceedances	SS, Ammonia, Total P, Ortho P ELV exceedances	Mechanical failure of tertiary sand filter	15	Tertiary sand filter repaired	No	Yes	No

Number of Incidents in 2013	15
No. Incidents reported to EPA via EDEN in 2013	15
Explanation of any discrepancies between the two numbers above	N/A

Section 4. Infrastructural Assessment & Programme of Improvements

4.1 Storm water overflow identification and inspection report

As per condition 4.12.1 of the licence, a report on the investigation and assessment of storm water overflows was submitted as part of the second AER for Inniskeen in January 2012. An assessment of the storm water overflows in therefore not required as part of this AER (further assessment to be submitted by 2014 AER).

SWO Identification and Inspection Summary Report Table A:

WWDL Name/Code for Storm Water Overflow	SW -2
IGR	293928E, 306704N
Included in Schedule A4 of the WWDL	Yes
Compliance with DoEHLG Criteria	Complies under part 4, 5 & 7 as assessed in the 2011 AER for Inniskeen.
No. of times activated in 2013	0
Total volume discharged (m3)	N/A
Total volume discharged in 2013 (P.E.)	N/A
Estimated/Measured Data	Estimated

4.2 Report on progress made and proposals being developed to meet the improvement programme requirements.

As per condition 5 of the licence, *a programme of infrastructural improvements to maximise the efficiency and effectiveness of the licence is required as part of the second AER.* This report was submitted with the second 2011 AER for Inniskeen.

There is no specified improvement programmes required under schedule A3 or C of the Inniskeen licence. There are no other planned improvement works for the Inniskeen WWTP.

Section 5. Licence Specific Reports

Licence Specific Reports Summary Table

Licence Specific Report	Required in 2013 AER or outstanding from previous AER	Included in 2013 AER	Reference to relevant section of AER
Priority Substance Assessment	Yes	Yes	Section 2.2
Drinking Water Abstraction Point Risk Assessment	Yes	Yes	Section 5
Habitats Impact Assessment	No	No	N/A
Shellfish Impact Assessment	No	No	N/A
Pearl Mussel Report	No	No	N/A
Toxicity/Leachate Management	No	No	N/A
Toxicity of Final Effluent Report	No	No	N/A

Drinking Water Abstraction Risk Assessment Report

Under condition 4.17 of the licence '*a risk assessment for the protection of the downstream drinking water abstraction point*' is required. This risk assessment is assessing the impact of the Inniskeen waste water treatment plant and it's discharges on the receiving water, the River Fane, as there is a drinking water abstraction point (Cavan Hill water supply scheme) approximately 10km downstream of the primary discharge supplying Dundalk town and parts of County Louth.

Cavan Hill water supply scheme abstracts water from the River Fane at Stephenstown in County Louth and treats the water at a treatment plant located approximately 2km from the intake at 'Cavan Hill'. Cavan Hill water treatment plant is a large modern treatment plant using rapid gravity filtration. Dundalk Town Council have a Water Order for abstraction of 36,400m3/day from the River Fane, they are presently abstracting half of this amount producing an average of 18,000m3/day treated water for their consumers.

Inniskeen WWTP discharge has the potential to impact on the downstream water abstraction point at Stephenstown in relation to pollutant loading into the River Fane. The risk from the Inniskeen WWTP will be assessed under four separate headings with an overall risk ranking applied in conclusion:

(1) Level of treatment and capacity of WWTP.
(2) Discharge compliance.
(3) River Fane quality and monitoring data.
(4) Discharges impact during periods of normal and abnormal operation and control measures.

(1) Level of treatment and capacity of WWTP:
Inniskeen WWTP provides tertiary treatment with nutrient removal (phosphorus reduction). The plant is operated and maintained to a good standard with a caretaker 8 hours per day Monday to Friday and 2 hours Saturdays and Sundays. The plant runs automatically with monitors and meters linked to a SCADA system on site. The design P.E. of the plant is 1750. An assessment of the remaining capacities at the plant is outlined in section 4.1 of this AER, (tabulated in table 1.2, appendix 1). The conclusion of this is that there is adequate remaining hydraulic and Organic capacity at the treatment works based on the current loading.
The level of treatment and capacity of the treatment works is adequate to cater for the loading into the plant and to produce effluent compliant with licence requirements, thus the risk ranking for this element of the WWTP is applied as ***low risk***.

(2) Discharge Compliance:
Under Schedule B and condition 2 of the licence (ref. table 2.1, appendix 1 and section 2.2 of this AER report) the Inniskeen WWTP discharge has some exceedances during 2013 due to a sand filter mechanical breakdown. The impact of these exceedances on the receiving River Fane is assessed in section 2.3 of the report and concluded that some impact may have occurred with regard to Ortho P in the receiving water, however, it would have been minimal and of limited duration as the sand filter is back in operation now, thus results are compliant again. It is concluded that given the distance of 10km downstream from the discharge point to the Cavan Hill abstraction point, the risk to the abstraction would be low and assimilated. A regular monitoring and sampling program is in place for analysis of the discharge at the Inniskeen WWTP thus minimising the risk of pollution to the River Fane.
The risk ranking for this element of the discharge from the WWTP is therefore applied as '***low risk***'.

(3)River Fane quality and monitoring data.
The River Fane is not designated Salmonid water (under the European Communities (Quality of Salmonid Waters) Regulations, 1988) nor is it identified as sensitive water in terms of the Urban Waste Water Treatment Regulations 2001. The river is not designated as an SPA, SAC or NHA. The River Fane is in the Neagh Bann river basin district with overall status classified as poor and at risk of not meeting good status by 2015, with overall objective to restore it to good status by 2021, however, the 'point risk source' and potential for impact from the Inniskeen WWTP discharge on the river is categorised as '2b – not at risk' therefore it is not identified as impacting on the poor river quality status, (ref: WFD Ireland maps/website & reports.).

The ambient monitoring results for 2013 indicate that the Environmental Quality Standard (EQS) (Surface Water Reg's 2009) for BOD 'good status' mean flows of 1.5mg/l is being met both upstream and downstream in the river with little variation between both sets of figures and all results under 1.5mg/l. One downstream result dated 21/03/2013 for BOD is considered erroneous from the lab at a figure of '<14mg/l'.
Ammonia results average figure at 0.029mg/l for the year downstream is under the 'mean' EQS figure of 0.065mg/l, with one exceedance on 21/03/2013 at 0.123mg/l, the effluent figure for ammonia on the same date is under the ELV. Upstream ammonia average figure exceeds the 'mean' good status figure of 0.065mg/l and individual results exceed the EQS in comparison to downstream results on the same dates, thus indicating that there are other sources impacting the receiving water quality with respect to ammonia. Ortho P (MRP) average figures both upstream and downstream exceeds the 'mean' figure (0.035mg/l) with downstream figure higher at 0.121mg/l. Individual results downstream are exceeded coinciding with the sand filter breakdown at the WWTP and the elevated ELV figures in the effluent for Ortho P. The impact on the receiving water should be of short duration as the sand filter is now operational again.
EPA monitoring designates the river Fane as Q3-4 downstream of Inniskeen discharge location near the abstraction point at Stephenstown indicating 'good status' in the river at this location. The quality of the River Fane water downstream and the distance downstream of the drinking water abstraction point from the discharge point would indicate that the river can assimilate the discharge adequately and will not have a pollution effect over long distances. The risk ranking for this element of the discharge from the WWTP is therefore applied as '***low risk***'.

(4) Discharges impact during periods of normal and abnormal operation and control measures.
The impact of the Inniskeen discharge to the drinking water abstraction point at Stephenstown is considered minimal as discussed in points 1 to 3 above. Periods of abnormal operation at the plant would be considered to occur due to extreme storm conditions, equipment malfunction or breakdown, Power cut, or dumping of toxic waste e.g. diesel wash into the network. The impact to the treatment plant and discharge to the River Fane from these events occurring is minimised by having a plant operator on site every day at the plant, therefore identifying any abnormal events that occur and implementing control measures as necessary to alleviate them. There are is a storm tank on site, which has a storage capacity of 1.1 times the DWF of the plant, this means that the storm water overflow rarely activates, once per year or less which minimises the risk of any untreated effluent entering the River Fane. The controls and monitors at the treatment works are linked to a SCADA system on site, which is continually monitored by the plant operator, which would highlight any problem with the treatment plant equipment or treatment process. The risk of a chemical spill or overdose into the treatment system at the plant is minimised as the storage tanks for all chemicals are bunded and regular maintenance and calibration of the dosing pumps is undertaken. The

dosing pumps setting are reviewed by the plant operators and technician over the plant in conjunction with assessment of the effluent parameters. Regular monitoring of the effluent also ensures that any deviations in the effluent parameters resulting from problems with the treatment process are addressed. In the event of a power cut, the electricity supply company will be contacted and a diesel generator on standby at the WWTP will be employed to enable the treatment plant to continue to operate. From past experience a power cut occurs twice per year and usually lasts 2 to 3 hours. There has been no incidents of illegal waste being dumped into the sewer network at Inniskeen, however given the proximity of the plant to the border of Northern Ireland and that the dumping of illegal diesel wash is prevalent in the Monaghan/Louth border area, consideration is given to this event occurring. If this event occurred, it may lead to a worst case scenario of the Inniskeen WWTP being effectively 'shut down' while a cleanup of the treatment plant is undertaken and removal of the toxic material and effected plant media to a licensed disposal facility in Germany. While the WWTP is unable to operate and treat the influent from the agglomeration, the influent could be tankered by a licensed haulier to a WWTP elsewhere in Monaghan with available capacity to treat it, until the WWTP is up and running again.
If there is an event at the plant that leads to a pollution incident in the River Fane, Monaghan County Council will immediately notify the downstream drinking water source, Dundalk town council who are responsible for the downstream water abstraction water supply scheme, the EPA and the Inland Fisheries Board and implement any control measures and necessary works to address the incident.
From the occurrence of these periods of abnormal operation and the control measures in place to deal with them should they occur, the risk ranking for this element of the discharge from the WWTP is applied as '***low risk***'.

Conclusion:
From the risk ranking applied to the impacts of the Inniskeen WWTP discharge on the downstream drinking water abstraction point in county Louth in the four situations addressed previously in this section, it is concluded that the **overall risk is low**.

Section 6. Certification and Sign Off

Annual Statement of measures

Annual Statement of Measures

Risk /Description of issue	Risk Score	Mitigation Measure to be taken	Outcome	Action	Date for Completion	Owner/ Contact Person
No planned works for the Inniskeen WWTP						C McCrossan
No record of SWO activating or measurement or flows.		Install SWO measurement/recorder device to measure flows/record no. times it activates			Dependant on Irish Water Funding	C McCrossan

The above identified improvement measures will be undertaken subject to Irish Water approval and funding.

Signed: Con H° Crossan **Job Title:** A/SE

Name: Con H° CROSSAN **Date:** 27/2/2014

Certification and Sign Off

Does the AER include and executive summary	Yes
Does the AER include and assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements/EQS)	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 modifications to the existing WWDL? (ref. cond. 1.7 & cond. 4)	No
List reason e.g. failure to complete specified works within dates specified in the licence, changes to monitoring requirements	N/A
Have these processes commenced? (i.e. Request for Technical Amendment / Licence Review / Change Request)	N/A
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER?	N/A
List outstanding reports	N/A

Signed by: Con M° Cross Date: 17/12/2014

Position in Organisation: A/SE

Appendix 1

Influent monitoring results

Table 1

Inniskeen Influent monthly monitoring template - as per condition 4.15 of licence.

Location	Daily Flow M3	Influent/ Effluent	Date of Sampling	Sample Type (C or G)	cBOD mg/l	cBOD Loading (Kg/day)	cBOD Removal Efficiency %	COD mg/l	COD Loading (Kg/day)	COD Removal Efficiency %	SS mg/l	SS Loading (Kg/day)	SS Removal Efficiency %	Total P mg/l P	Total P Loading (Kg/day)	Total P Removal Efficiency %	Total N mg/l N	Total N Loading (Kg/day)	Total N Removal Efficiency %
Inniskeen	214.00	Influent	27/02/2013	G	51.00	10.91		120.00	25.68		16.00	3.42		nm	nm		18.95	4.06	
	214.00	Effluent	27/02/2013	C	2.00	0.43	96.08	27.00	5.78	77.50	8.00	1.71	50.00				10.17	2.18	46.33
Inniskeen	351.00	Influent	21/03/2013	G	37.00	12.99		124.00	43.52		64.00	22.46		3.18	1.12		25.60	8.99	
	351.00	Effluent	21/03/2013	C	2.00	0.70	94.59	39.00	13.69	68.55	2.00	0.70	96.88	1.75	0.61	44.97	18.36	6.44	28.28
Inniskeen	150.00	Influent	24/04/2013	G	12.00	1.80		137.00	20.55		19.00	2.85		2.63	0.39		24.69	3.70	
	150.00	Effluent	24/04/2013	C	0.90	0.14	92.50	14.00	2.10	89.78	6.00	0.90	68.42	1.41	0.21	46.39	16.89	2.53	31.59
Inniskeen	108.00	Influent	22/05/2013	G	197.00	21.28		360.00	38.88		77.00	8.32		3.86	0.42		42.22	4.56	
	108.00	Effluent	22/05/2013	C	0.90	0.10	99.54	18.00	1.94	95.00	1.00	0.11	98.70	1.35	0.15	65.03	22.93	2.48	45.69
Inniskeen	50.00	Influent	24/06/2013	G	193.00	9.65		667.00	33.35		194.00	9.70		10.77	0.54		73.07	3.65	
	50.00	Effluent	24/06/2013	C	3.00	0.15	98.45	29.00	1.45	95.65	20.00	1.00	89.69	3.72	0.19	65.46	40.77	2.04	44.20
Inniskeen	58.00	Influent	24/07/2013	G	565.00	32.77		1290.00	74.82		317.00	18.39		15.70	0.91		112.30	6.51	
	58.00	Effluent	24/07/2013	C	2.00	0.12	99.65	17.00	0.99	98.68	19.00	1.10	94.01	5.81	0.34	62.99	69.05	4.00	38.51
Inniskeen	39.00	Influent	20/08/2013	G	251.00	9.79		594.00	23.17		212.00	8.27		9.95	0.39		54.72	2.13	
	39.00	Effluent	20/08/2013	C	0.90	0.04	99.64	34.00	1.33	94.28	20.00	0.78	90.57	1.80	0.07	81.91	40.04	1.56	26.83
Inniskeen	59.00	Influent	25/09/2013	G	338.00	19.94		627.00	36.99		123.00	7.26		13.00	0.77		111.10	6.55	
	59.00	Effluent	25/09/2013	C	2.00	0.12	99.41	60.00	3.54	90.43	29.00	1.71	76.42	2.69	0.16	79.31	37.70	2.22	66.07
Inniskeen	1134.00	Influent	29/10/2013	G	31.00	35.15		22.00	24.95		6.00	6.80		0.27	0.31		8.87	10.06	
	1134.00	Effluent	29/10/2013	C	3.00	3.40	90.32	25.00	28.35	-13.64	20.00	22.68	-233.33	0.15	0.17	44.44	8.18	9.27	7.85
Inniskeen	205.00	Influent	19/11/2013	G	70.00	14.35		146.00	29.93		46.00	9.43		3.34	0.68		17.38	3.56	
	205.00	Effluent	19/11/2013	C	3.00	0.62	95.71	21.00	4.31	85.62	14.00	2.87	69.57	1.78	0.36	46.71	12.14	2.49	30.15
Inniskeen	61.00	Influent	09/12/2013	G	203.00	12.38		338.00	20.62		127.00	7.75		8.36	0.51		75.79	4.62	
	61.00	Effluent	09/12/2013	C	0.90	0.05	99.56	27.00	1.65	92.01	12.00	0.73	90.55	0.29	0.02	96.53	27.70	1.69	63.45

Table 1.1

Influent monitoring summary table

	BOD mg/l	COD mg/l	SS mg/l	Total P mg/l P	Total N mg/l N	Volumetric Loading m3/day	Organic Loading PE/day
Number of samples	11	11	11	10	11	n/a	n/a
Maximum result	565.00	1290.00	317.00	15.70	112.30	1134	
Annual Mean	177.09	402.27	109.18	7.11	51.34	206	607

Table 1.2

Remaining Hydraulic & Organic treatment capacities summary table:	
Hydraulic Capacity - Design (M^3/day)	315
Hydraulic Capacity - Current loading (M^3/day)	206
Hydraulic Capacity - Remaining (M^3/day)	109
Organic Capacity - Design (PE)	1750
Organic Capacity - Current loading (PE)	607
Organic Capacity - Remaining (PE)	1143
Will the capacity be exceeded in the next 3 years?	no

Table 1.3

Treatment Efficiency Report Summary Table

	cBOD mg/l (kg/day)	COD mg/l (kg/day)	SS mg/l (kg/day)	TP mg/l (kg/day)	TN mg/l (kg/day)	Comment
Influent mass loading (kg/day)	181	372	98	71	58	
Effluent mass emission (kg/day)	5.85	65.12	11.62	2.28	36.91	
% Efficiency (% reduction of influent load)	96.77	82.52	88.13	96.80	36.81	

Table 2 Monitoring Results for Inniskeen WWTP

Location	Flow M3/day	Location	Date of Sampling	Sample Type (C or G)	pH	cBOD mg/l	COD mg/l	Suspended Solids mg/l	Ammonia (as N)	Total Phosphorus mg/l (as P)	Ortho P mg/l (as P)	Total Nitrogen mg/l (as N)	Nitrate (as N)	Nitrite (as N)	Faecal Coliforms cfu/100ml	E Coli mpn/100ml	Enterococci mpn/100ml
Inniskeen		Influent	27/02/2013	G		51.00	120.00	16.00				18.95					
Inniskeen		Effluent	27/02/2013	C		2.00	27.00	8.00	0.019	1.084	1.106	10.17	8.750	0.021			
Inniskeen		Up Stream Of Works	27/02/2013	G		1.30			0.041		0.022	2.67					
Inniskeen		Down Stream of Works	27/02/2013	G		1.40			0.014		0.026	2.73					
Inniskeen		Influent	21/03/2013	G		37.00	124.00	64.00		3.180		25.60					
Inniskeen		Effluent	21/03/2013	C		2.00	39.00	2.00	0.058	1.750	1.552	18.36	14.480	0.008	240000	27550	1280
Inniskeen		Up Stream Of Works	21/03/2013	G		0.90			0.057		0.011	1.70					
Inniskeen		Down Stream of Works	21/03/2013	G		<14 lab error			0.123		0.037	1.70					
Inniskeen		Influent	24/04/2013	G		12.00	137.00	19.00		2.630		24.69					
Inniskeen		Effluent	24/04/2013	C		0.90	14.00	6.00	0.036	1.410	1.279	16.89	15.670	0.019			
Inniskeen		Up Stream Of Works	24/04/2013	G		0.90			0.381		0.038	1.20					
Inniskeen		Down Stream of Works	24/04/2013	G		0.90			0.009		0.029	1.10					
Inniskeen		Influent	22/05/2013			197.00	360.00	77.00		3.660		42.22					
Inniskeen		Effluent	22/05/2013	C		0.90	18.00	1.00	0.017	1.350	1.275	22.93	20.310	0.009			
Inniskeen		Up Stream Of Works	22/05/2013			0.90			0.021		0.000	0.96					
Inniskeen		Down Stream of Works	22/05/2013			0.90			0.021		0.000	1.00					
Inniskeen		Influent	24/06/2013	G		193.00	667.00	194.00		10.770		73.07					
Inniskeen		Effluent	24/06/2013	C		3.00	29.00	20.00	0.074	3.720	3.421	40.77	45.570	0.020			
Inniskeen		Up Stream Of Works	24/06/2013	G													
Inniskeen		Down Stream of Works	24/06/2013	G													
Inniskeen		Influent	24/07/2013	G		565.00	1290.00	317.00		15.700		112.30					
Inniskeen		Effluent	24/07/2013	C		2.00	17.00	19.00	7.360	5.810	5.587	69.05	61.980	0.074			
Inniskeen		Up Stream Of Works	24/07/2013	G		0.90			0.039		0.064	1.10					
Inniskeen		Down Stream of Works	24/07/2013	G		0.90			0.029		0.189	0.66					
Inniskeen		Influent															
Inniskeen		Effluent	14/08/2013	C		0.90	40.00	21.00	0.061	2.450	1.962	40.43	44.660	0.032			
Inniskeen		Up Stream Of Works															
Inniskeen		Down Stream of Works															
Inniskeen		Influent	20/08/2013			251.00	594.00	212.00		9.950		54.72					
Inniskeen		Effluent	20/08/2013	C		0.90	34.00	20.00	0.018	1.800	1.495	40.04	42.120	0.022			
Inniskeen		Up Stream Of Works	20/08/2013			0.90			0.091		0.014	0.89					
Inniskeen		Down Stream of Works	20/08/2013			0.90			0.037		0.016	0.80					
Inniskeen		Influent	25/09/2013	G		338.00	627.00	123.00		13.000		111.10					
Inniskeen		Effluent	25/09/2013	C		2.00	60.00	29.00	4.625	2.690	1.743	37.70	42.160	0.092	1100.00	1733.00	150.00
Inniskeen		Up Stream Of Works	25/09/2013	G		0.90			0.060		0.013	2.00					
Inniskeen		Down Stream of Works	25/09/2013	G		0.90			0.039		0.014	1.20					
Inniskeen		Influent	29/10/2013	G		31.00	22.00	6.00		0.270		8.87					
Inniskeen		Effluent	29/10/2013	C		3.00	25.00	20.00	0.056	0.150	0.109	8.18	6.580	0.108			
Inniskeen		Up Stream Of Works	29/10/2013	G		0.90			0.000		0.006	1.80					
Inniskeen		Down Stream of Works	29/10/2013	G		0.90			0.000		0.008	1.90					
Inniskeen		Influent	19/11/2013	G		70.00	146.00	46.00		3.340		17.33					
Inniskeen		Effluent	19/11/2013	C		3.00	21.00	14.00	0.003	1.760	0.137	12.14	12.280	0.000			
Inniskeen		Up Stream Of Works	19/11/2013	G		0.90			0.021		0.035	1.80					
Inniskeen		Down Stream of Works	19/11/2013	G		0.90			0.007		0.043	1.80					
Inniskeen		Influent	09/12/2013	G		203.00	338.00	127.00		8.360		75.79					
Inniskeen		Effluent	09/12/2013	C		0.90	27.00	12.00	0.013	0.290	0.229	27.70	25.090	0.000			
Inniskeen		Up Stream Of Works	09/12/2013	G		0.90			0.014		0.217	1.90					
Inniskeen		Down Stream of Works	09/12/2013	G		0.90			0.008		0.845	1.80					

Table 2.1

Effluent monitoring results: Note ELV's in red text

Location	Daily Flow M3/day	Effluent	Date of Sampling	Sample Type (C or G)	pH 6 to 9	cBOD mg/l 10mg/l	COD mg/l 125mg/l	TSS mg/l 10mg/l	Ammonia (as N) 2mg/l	Total Phosphorus (as P) mg/l 2mg/l	Ortho P mg/l (as P) 1.5mg/l	Total Nitrogen mg/l (as N)	Nitrate (as N)	Nitrite (as N)	Faecal Coliforms cfu/100ml	E Coli mpn/100ml	Enterococci mpn/100ml
Inniskeen	214	Effluent	27/02/2013	C	See table 2.11	2.00	27.00	8.00	0.019	1.084	1.106	10.17	8.750	0.021			
Inniskeen	351	Effluent	21/03/2013	C		2.00	39.00	2.00	0.058	1.750	1.552	18.36	14.480	0.008	240000	27550	1280
Inniskeen	150	Effluent	24/04/2013	C		0.90	14.00	6.00	0.036	1.410	1.279	16.89	15.670	0.019			
Inniskeen	108	Effluent	22/05/2013	C		0.90	18.00	1.00	0.017	1.350	1.275	22.93	20.310	0.009			
Inniskeen	50	Effluent	24/06/2013	C		3.00	29.00	20.00	0.074	3.720	3.421	40.77	45.570	0.020			
Inniskeen	58	Effluent	24/07/2013	C		2.00	17.00	19.00	7.360	5.810	5.587	69.05	61.980	0.074			
Inniskeen	39	Effluent	14/08/2013	C		0.90	40.00	21.00	0.061	2.460	1.962	40.43	44.660	0.032			
Inniskeen	39	Effluent	20/08/2013	C		0.90	34.00	20.00	0.018	1.800	1.495	40.04	42.120	0.022			
Inniskeen	59	Effluent	25/09/2013	C		2.00	60.00	29.00	4.625	2.690	1.743	37.70	42.160	0.092	1100.00	1733.00	150.00
Inniskeen	1134	Effluent	29/10/2013	C		3.00	25.00	20.00	0.056	0.150	0.109	8.18	6.580	0.108			
Inniskeen	205	Effluent	19/11/2013	C		3.00	21.00	14.00	0.003	1.780	0.137	12.14	12.280	0.000			
Inniskeen	61	Effluent	09/12/2013	C		0.90	27.00	12.00	0.013	0.290	0.229	27.70	25.090	0.000			
Average	206					1.79	29.25	14.33	1.03	2.02	1.66	28.70	28.30	0.03			
Condition 2 Licence: Interpretation								All excedances reported under INC002279 -sand filter mechanical failure	All excedances reported under INC002279 - sand filter mechanical failure	All excedances reported under INC002279 -sand filter mechanical failure	All excedances reported under INC002279 - sand filter mechanical failure						
Condition 2 Licence: Interpretation					No allowable failures. No deviation allowed	2 allowable failures provided under 100% of ELV (20mg/l)	2 allowable failures provided under 100% of ELV (250mg/l)	2 allowable failures provided under 150% of ELV (25mg/l)	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 1.8mg/l						
Total incidents:					0	0	0	6	2	4	3						

Effluent Monitoring Summary Table

	BOD mg/l	COD mg/l	TSS mg/l	Ammonia mg/l	Total P mg/l	Ortho P mg/l	Total Nitrogen mg/l	Comments
WWDL ELV (schedule A)	10	125	10	2	2	1.50	N/A	
ELV with Cond. 2 interpretation	No result >100% ELV = 20mg/l	No result >100% ELV = 250mg/l	No result >150% ELV = 25mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 2.4mg/l	8 out of 10 consecutive samples shall not exceed ELV, no result shall exceed ELV by >20% = 1.8mg/l	N/A	12 samples taken, therefore 2 'allowable' failures
Number of sample results	12	12	12	12	12	12	12	
Number of sample results above WWDL ELV	0	0	8	2	4	5	N/A	
Annual Mean (for parameters where a mean ELV applies)	N/A	N/A	N/A	1.03	2.02	1.66	N/A	
Overall compliance (Pass/Fail)	Pass	Pass	Fail	Fail	Fail	Fail	N/A	

On site effluent tests results Table 2.11

Location	Location	Date of Sampling	Sample Type (C or G)	pH	Temperature 'C	Conductivity
Inniskeen	Effluent	02/01/2013	G	6.65	12.10	576.00
Inniskeen	Effluent	10/01/2013	G	7.36	7.90	579.00
Inniskeen	Effluent	23/01/2013	G	7.27	7.80	572.00
Inniskeen	Effluent	30/01/2013	G	7.12	8.00	538.00
Inniskeen	Effluent	06/02/2013	G	7.18	7.30	585.00
Inniskeen	Effluent	20/02/2013	G	7.45	8.10	584.00
Inniskeen	Effluent	27/02/2013	G	7.15	7.60	594.00
Inniskeen	Effluent	06/03/2013	G	7.56	8.20	616.00
Inniskeen	Effluent	14/03/2013	G	7.07	8.30	588.00
Inniskeen	Effluent	09/04/2013	G	7.24	8.00	624.00
Inniskeen	Effluent	22/04/2013	G	7.53	11.70	579.00
Inniskeen	Effluent	26/04/2013	G	7.2	11.00	560.00
Inniskeen	Effluent	01/05/2013	G	7.12	12.40	612.00
Inniskeen	Effluent	07/05/2013	G	7.19	13.90	644.00
Inniskeen	Effluent	13/05/2013	G	7.06	12.00	615.00
Inniskeen	Effluent	18/05/2013	G	7.13	11.24	610.00
Inniskeen	Effluent	23/05/2013	G	7.12	13.10	669.00
Inniskeen	Effluent	29/05/2013	G	7.02	15.90	574.00
Inniskeen	Effluent	05/06/2013	G	7.06	17.60	695.00
Inniskeen	Effluent	12/06/2013	G	7.1	17.30	663.00
Inniskeen	Effluent	19/06/2013	G	6.97	19.60	714.00
Inniskeen	Effluent	27/06/2013	G	7	19.40	687.00
Inniskeen	Effluent	02/07/2013	G	7.36	21.30	823.00
Inniskeen	Effluent	09/07/2013	G	8.16	23.70	829.00
Inniskeen	Effluent	15/07/2013	G	6.99	22.10	960.00
Inniskeen	Effluent	22/07/2013	G	6.21	22.40	931.00
Inniskeen	Effluent	29/07/2013	G	6.12	29.40	877.00
Inniskeen	Effluent	05/08/2013	G	7.38	22.40	822.00
Inniskeen	Effluent	15/08/2013	G	7.14	21.40	733.00
Inniskeen	Effluent	21/08/2013	G	7.33	22.20	821.00
Inniskeen	Effluent	28/08/2013	G	7.46	19.10	869.00
Inniskeen	Effluent	04/09/2013	G	7	19.41	788.00
Inniskeen	Effluent	12/09/2013	G	7.23	17.60	832.00
Inniskeen	Effluent	19/09/2013	G	6.97	16.80	859.00
Inniskeen	Effluent	25/09/2013	G	6.99	16.10	776.00
Inniskeen	Effluent	30/09/2013	G	7.51	16.60	812.00
Inniskeen	Effluent	04/10/2013	G	6.96	16.11	784.00
Inniskeen	Effluent	16/10/2013	G	7.1	16.10	811.00
Inniskeen	Effluent	21/10/2013	G	7.14	16.00	809.00
Inniskeen	Effluent	26/10/2013	G	7	15.70	869.00
Inniskeen	Effluent	29/10/2013	G	7.02	13.50	561.00
Inniskeen	Effluent	01/11/2013	G	7.11	11.60	575.00
Inniskeen	Effluent	07/11/2013	G	7.11	11.10	599.00
Inniskeen	Effluent	13/11/2013	G	7.17	10.20	581.00
Inniskeen	Effluent	20/11/2013	G	7	11.14	611.00
Inniskeen	Effluent	26/11/2013	G	7.02	11.70	607.00
Inniskeen	Effluent	04/12/2013	G	7.13	10.96	612.00
Inniskeen	Effluent	12/12/2013	G	7.26	9.31	599.00
Inniskeen	Effluent	20/12/2013	G	7.16	8.14	616.00
Inniskeen	Effluent	28/12/2013	G	7.24	8.18	621.00
Inniskeen	Effluent	31/12/2013	G	7.12	8.87	556.00

Table 2.2
Influent monitoring results

Location	Flow M3/day	Location	Date of Sampling	Sample Type (C or G)		cBOD mg/l	COD mg/l	Suspended Solids mg/l	Ammonia (as N)	Total Phosphorus mg/l (as P)	Ortho P mg/l (as P)	Total Nitrogen mg/l (as N)	Nitrate (as N)	Nitrite (as N)	Faecal Coliforms cfu/100ml	E Coli mpn/100ml	Enterococci mpn/100ml
Inniskeen		Influent	27/02/2013	G		51.00	120.00	16.00		nm		18.95					
Inniskeen		Influent	21/03/2013	G		37.00	124.00	64.00		3.180		25.60					
Inniskeen		Influent	24/04/2013	G		12.00	137.00	19.00		2.630		24.69					
Inniskeen		Influent	22/05/2013	G		197.00	360.00	77.00		3.860		42.22					
Inniskeen		Influent	24/06/2013	G		193.00	667.00	194.00		10.770		73.07					
Inniskeen		Influent	24/07/2013	G		565.00	1290.00	317.00		15.700		112.30					
Inniskeen		Influent	20/08/2013	G		251.00	594.00	212.00		9.950		54.72					
Inniskeen		Influent	25/09/2013	G		338.00	627.00	123.00		13.000		111.10					
Inniskeen		Influent	29/10/2013	G		31.00	22.00	6.00		0.270		8.87					
Inniskeen		Influent	19/11/2013	G		70.00	146.00	46.00		3.340		17.38					
Inniskeen		Influent	09/12/2013	G		203.00	338.00	127.00		8.360		75.79					
Average						**177.09**	**402.27**	**109.18**		**7.11**		**51.34**					

Table 2.3
Upstream monitoring results

Location	Flow M3/day	Location	Date of Sampling	Sample Type (C or G)	pH	cBOD mg/l	COD mg/l	Suspended Solids mg/l	Ammonia (as N)	Total Phosphorus mg/l (as P)	Ortho P mg/l (as P)	Total Nitrogen mg/l (as N)	Nitrate (as N)	Nitrite (as N)	Faecal Coliforms cfu/100ml	E Coli mpn/100ml	Enterococci mpn/100ml
Inniskeen		Up Stream Of Works	27/02/2013	G		1.30			0.041		0.022	2.67					
Inniskeen		Up Stream Of Works	21/03/2013	G		0.90			0.057		0.011	1.70					
Inniskeen		Up Stream Of Works	24/04/2013	G		0.90			0.381		0.038	1.20					
Inniskeen		Up Stream Of Works	22/05/2013	G		0.90			0.021		0.000	0.96					
Inniskeen		Up Stream Of Works	24/07/2013	G		0.90			0.039		0.064	1.10					
Inniskeen		Up Stream Of Works	20/08/2013	G		0.90			0.091		0.014	0.89					
Inniskeen		Up Stream Of Works	25/09/2013	G		0.90			0.060		0.013	2.00					
Inniskeen		Up Stream Of Works	29/10/2013	G		0.90			0.000		0.006	1.80					
Inniskeen		Up Stream Of Works	19/11/2013	G		0.90			0.021		0.035	1.80					
Inniskeen		Up Stream Of Works	09/12/2013	G		0.90			0.014		0.217	1.90					
Average						**0.94**			**0.073**		**0.042**	**1.60**					

Table 2.4

Downstream monitoring results

Location	Flow M3/day	Location	Date of Sampling	Sample Type (C or G)	pH	cBOD mg/l	COD mg/l	Suspended Solids mg/l	Ammonia (as N)	Total Phosphorus mg/l (as P)	Ortho P mg/l (as P)	Total Nitrogen mg/l (as N)	Nitrate (as N)	Nitrite (as N)	Faecal Coliforms cfu/100ml	E Coli mpn/100ml	Enterococci mpn/100ml
Inniskeen		Down Stream of Works	27/02/2013	G		1.40			0.014		0.026	2.73					
Inniskeen		Down Stream of Works	21/03/2013	G		<14 lab error			0.123		0.037	1.70					
Inniskeen		Down Stream of Works	24/04/2013	G		0.90			0.009		0.029	1.10					
Inniskeen		Down Stream of Works	22/05/2013	G		0.90			0.021		0.000	1.00					
Inniskeen		Down Stream of Works	24/07/2013	G		0.90			0.029		0.189	0.86					
Inniskeen		Down Stream of Works	20/08/2013	G		0.90			0.037		0.016	0.80					
Inniskeen		Down Stream of Works	25/09/2013	G		0.90			0.039		0.014	1.20					
Inniskeen		Down Stream of Works	29/10/2013	G		0.90			0.000		0.008	1.90					
Inniskeen		Down Stream of Works	19/11/2013	G		0.90			0.007		0.043	1.80					
Inniskeen		Down Stream of Works	09/12/2013	G		0.90			0.008		0.845	1.80					
Average						**0.96**			**0.029**		**0.121**	**1.49**					

On site ambient tests results Table 2.5

Location	Date of Sampling	Sample Type (C or G)	Location	pH	Temperature °C	Dissolved Oxygen (DO) mg/l	Location	pH	Temperature °C	Dissolved Oxygen (DO) mg/l
Inniskeen	01/05/2013	G	Upstream	7.44	11.70	10.96	Downstream	7.69	11.69	10.94
Inniskeen	29/05/2013	G	Upstream	7.38	12.10	10.12	Downstream	7.8	11.92	10.11
Inniskeen	20/06/2013	G	Upstream	7.83	12.90	8..65	Downstream	7.94	23.40	8.93
Inniskeen	09/07/2013	G	Upstream	7.83	23.90	8.65	Downstream	7.94	23.40	8.93
Inniskeen	25/07/2013	G	Upstream	7.97	20.60	8..74	Downstream	7.79	20.60	8.60
Inniskeen	27/08/2013	G	Upstream	7.12	19.20	8.35	Downstream	7.14	19.20	8.89
Inniskeen	24/09/2013	G	Upstream	7.33	18.44	9.16	Downstream	7.32	13.60	9.26
Inniskeen	02/10/2013	G	Upstream	7.56	14.80	9.25	Downstream	7.93	14.70	9.44
Inniskeen	02/11/2013	G	Upstream	7.28	9.40	10.45	Downstream	7.43	9.20	10.62
Inniskeen	04/12/2013	G	Upstream	8.29	6.10	11.27	Downstream	8.22	5.90	11.34

SSRS Monitoring													
RWB_ Code	River Catchment	Location	Sampled By	Date	X	Y	Score	Category	Map Info Factor	Notes	Livestock	Degree	Substratum
XB_06_8	Fane	Magoney Br. Station 500	LB/AO	14/05/2013	290856	309660	9.6	Probably not at risk	1	Gammarus present. Algal growth on stones.	N	Slight	Stoney bottom
XB_06_8	Fane	~ 50m d/s Magoney Br. Station 500	LB/AO	14/05/2013	290940	309588	11.2	Probably not at risk	1	Gammarus abundant. Inlet stream clear. Algal growth on stones	N	Slight	Stoney bottom
XB_06_08	Fane	D/s of Br. at FA024	LB/AO	30/04/2013	292036	307809	9.6	Probably not at risk	1	Gammurus present. Fast flow. Brown algae on stones and weed growth.	N	Slight	Stoney Bottom
XB_06_08	Fane	~50m u/s of Fane Br.	LB/AO	30/04/2013	291923	307724	9.6	Probably not at risk	1	Gammurus present. Fast flow. Brown algae on stones and weed growth.	N	Clean	Stoney Bottom