Annual Environmental Report

2018

Inniskeen

D0348-01

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 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 are included as an appendix to the AER as follows:

1.1 Licence specific reporting included in AER

Assessment / Report	Included in AER
Small Stream Risk Score Assessment	Yes

1.2 Treatment Type

The agglomeration is served by a wastewater treatment plant INNISKEEN WWTP with a Plant Capacity PE of 1800. The treatment process includes the following:

1.2.1 INNISKEEN WWTP

Treatment type	Yes / No	Details
Preliminary Treatment	Yes	Screens (manual)
Primary Treatment	No	
Secondary Treatment	Yes	Aeration
Nutrient Removal	Yes	Chemical dosing for phosphorus removal
Tertiary Treatment	No	

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 2.2 Discharges from the agglomeration.

1.3 ELV Overview

1.3.1 INNISKEEN WWTP

Compliance Status	
Were all parameters compliant for INNISKEEN WWTP treatment plant	No
Where noncompliant see table 2.2.1 for details of parameters	

1.4 Sludge Removal

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

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
INNISKEEN WWTP	Cake Sludge	58.36	Weight (Tonnes)	10.5	Biocore

Annual Statement of Measures

There were no major capital or operational changes undertaken

2 MONITORING REPORTS SUMMARY

2.1 Summary report on monthly influent monitoring

A summary of influent monitoring for the treatment plant is presented in below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

2.1.1 Influent Monitoring Summary - INNISKEEN WWTP

Parameters	Number of Samples	Annual Max	Annual Mean
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	11	3657	357.53
COD-Cr mg/l	11	8150	853.14
Suspended Solids mg/l	11	8223	519.95
Total Nitrogen mg/l	11	151.8	31.77
Total Phosphorus (as P) mg/l	10	81.4	7.32
Hydraulic Capacity	0	1809	233

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 3.5 if applicable

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2. The annual maximum hydraulic loading is greater than the peak Treatment Plant Capacity as detailed further in Section 3.2.

2.2 Discharges from the agglomeration

2.2.1 Effluent Monitoring Summary - INNISKEEN WWTP

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	0	12	0	0	8.73	Pass
Faecal coliforms cfu/100ml	0	0	0	2	0	0	23889.09	Pass
Total Nitrogen mg/l	0	0	0	12	0	0	12.4	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	0	12	0	0	1.22	Pass
E. Coli MPN/100ml	0	0	0	2	0	0	8296.99	Pass
Enterococci (Intestinal) cfu/100ml	0	0	0	2	0	0	591.68	Pass
Ammonia-Total (as N) mg/l	2	2.4	0	12	1	0	0.17	Pass
pH pH units	0	0	0	14	1	0	7.65	Fail
Temperature °C	0	0	0	8	0	0	7.38	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 exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
ortho-Phosphate (as P) - unspecified mg/l	1.5	1.8	0	12	0	0	0.08	Pass
Total Phosphorus (as P) mg/l	2	2.4	0	12	0	0	0.15	Pass
Nitrite (as N) mg/l	0	0	0	12	0	0	0.03	Pass
Nitrate (as NO3) mg/l	0	0	0	8	0	0	16.38	Pass
Suspended Solids mg/l	10	25	0	12	2	1	4.35	Fail
Nitrate (as N) mg/l	0	0	0	4	0	0	8.13	Pass

Notes:
1– This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied
2 - For parameters where a mean ELV applies

Cause of Exceedance(s):

pH variations on influent caused a pH failure, suspended solids failure cause unknown

Significance of Results:

The WWTP was non-compliant with the ELV's set in the wastewater discharge licence. There were 4 exceedances in relation to the suspended solids, ammonia and ph parameter ELV, 2 of which were above the Condition 2 ELV. The Impact on receiving water is assessed further in Section 2.3.

2.3 Ambient monitoring summary

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.

2.3.1 Ambient Monitoring Report Summary - INNISKEEN WWTP

The table below provides details of ambient monitoring locations and details of any designations as sensitive areas.

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Upstream	293998, 306647	TPEFF2400D0348SW001	No	No	No	No	Good
Downstream	293998, 306647	TPEFF2400D0348SW001	No	No	No	No	Good

2.3.2 Ambient Monitoring Parameter Summary - INNISKEEN WWTP

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
ortho-Phosphate (as P) - unspecified mg/l	RS06F010650	0.05	RS06F010670	0.04	0.075	-13.8
Faecal coliforms no./100mls	RS06F010650	0	RS06F010670	0		
Coliform Bacteria (Total) MPN/100ml	RS06F010650	2421	RS06F010670	1535		

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	1.94	RS06F010670	2.33	2.6	14.7
Ammonia-Total (as N) mg/l	RS06F010650	0.01	RS06F010670	0.02	0.14	2.5
Total Nitrogen mg/l	RS06F010650	1.9	RS06F010670	1.75		
E. Coli MPN/100ml	RS06F010650	1860.5	RS06F010670	1273.5		
Enterococci (Intestinal) MPN/100ml	RS06F010650	118	RS06F010670	86.5		
Temperature °C	RS06F010650	11.23	RS06F010670	11.36		
Dissolved Oxygen mg/l	RS06F010650	10.49	RS06F010670	10.43		
pH pH units	RS06F010650	7.95	RS06F010670	7.95		

Significance of Results:

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

The ambient monitoring results meet the required EQS.

The discharge from the wastewater treatment plant does not have an observable negative impact on the water quality.

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

3 OPERATIONAL REPORTS SUMMARY

3.1 Treatment Efficiency Report

Treatment efficiency is based on the removal of key pollutants from the influent wastewater by the treatment plant. In essence the calculation is based on the balance of load coming into the plant versus the load leaving the plant. The efficiency is presented as a percentage removal rate.

A summary presentation of the efficiency of the treatment process including information for all the parameters specified in the licence is included below:

3.1.1 Treatment Efficiency Report Summary - INNISKEEN WWTP

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)	Comment
cBOD	29634.72	98.4	99.67	
COD	70715.6	706.12	99	
TN	2633.6	1002.88	61.92	
SS	43098.04	351.69	99.18	
TP	541.24	11.87	97.81	

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

3.2 Treatment Capacity Report Summary

Treatment capacity is an assessment of the hydraulic (flow) and organic (the amount of pollutants) load a treatment plant is designed to treat versus the current loading of that plant.

INNISKEEN WWTP	
Peak Hydraulic Capacity (m3/day) - As Constructed	1226

INNISKEEN WWTP	
DWF to the Treatment Plant (m3/day)	409
Current Hydraulic Loading - annual max (m3/day)	1809
Average Hydraulic loading to the Treatment Plant (m3/day)	233
Organic Capacity (PE) - As Constructed	1800
Organic Capacity (PE) - Collected Load (peak week)	325
Organic Capacity (PE) - Remaining	1475
Will the capacity be exceeded in the next three years? (Yes/No)	No

3.3 Complaints Summary

A summary of complaints of an environmental nature is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There is no Complaint data included in the AER.			

3.4 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.

3.4.1 Summary of Incidents

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Other	Plant or equipment breakdown at WWTP	1	No	Yes
Non-compliance	Other	1	No	Yes
Non-compliance	Other	1	No	No

3.4.2 Summary of Overall Incidents

Question	Answer
Number of Incidents in 2018	3
Number of Incidents reported to the EPA via EDEN in 2018	3
Explanation of any discrepancies between the two numbers above	

3.5 Sludge / Other inputs to the 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.							

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:

No Appendix Included

4.1.1 SWO Identification

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2018 (No. of events)	Total volume discharged in 2018 (m3)	Monitoring Status
SW-2	293928, 306704	Yes	Low	Meeting	0	0	Monitored

4.1.2 Inspection Summary Report

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	0.00
Is each SWO identified as non meeting DoEHLG Guidance included in the Programme of Improvements?	Yes
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / charges to Schedule C3 and A4 under Condition 1.7?	Yes

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)	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 improvements identified by under Condition 5.2 is included below.

4.2.2 Improvement Programme Summary

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

4.2.3 Sewer Integrity Risk Assessment

The utilisation of multiple capital maintenance programmes and the outputs of the workshops with the Local Authority Operations Staff held under the programme can be used to satisfy the requirements of Condition 5 regarding network integrity. Improvement works identified by way of these programmes and workshops will be included in the Improvements Summary Table".

5 LICENCE SPECIFIC REPORTS

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER (e.g. Appendix X).
Small Stream Risk Score Assessment	Yes	2017	Yes	5.1

5.1 Small Stream Risk Score Assessment

The Small Stream Risk Score Assessment Report is included in Appendix 7.1 - Small Stream Risk Score Assessment. A summary of the findings of this report is included below.

Parameter	Value
SSRS Required?	Yes
What is Upstream SSRS?	8.8
Condition 5 Improvement Programme Reference	n/a
Does SSRS indicate discharges are posing a pollution risk?	No
Does improvement programme include any procedural and/or infrastructal works?	
Downstream SSRS Water Quality Risk	not at risk

Parameter	Value
Upstream SSRS Water Quality Risk	not at risk
What is Downstream SSRS?	8

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	
Is there a need to request/advise the EPA of any modifications to the existing WWDL?	No
List reason e.g. changes to monitoring requirements	
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: 14/03/2019

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

Eleanor Roche

Acting Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

River code: FANE	Date: 09/10/18	Time: 15:10	Grid: 296598, 303743
Stream accessibility: Accessible / Inaccessible	**Location:** INNISKEEN WWTP d/s		**Stream Order:** 3

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

DO%	
DO mg/l	
Temp	
Conductivity	
pH	
Bank width	
Wet Width	
Avg Depth	

Dominant Types: Bedrock / Boulder (>128mm) / Cobble (32-128mm) / **Gravel (8-32mm)** / Fine Gravel (2-8mm) / Sand (0.25-2mm) / Silt (<0.25mm)

Stream flow: Riffle / **Riffle/Glide** / Slow flow

Substratum condition: Calcareous – Compacted – **Loose**

Substratum: **Stoney bottom** – Muddy bottom – Mud over stones

Degree of siltation: **Clean** – Slight – Moderate – Heavy

Depth of mud: **None** <1cm: 1-5cm: 5-10cm: 10cm+

Litter: **NO** – P – M – A

Shading: H – M – L – **N**

Cattle access Y: u/s – d/s or **N**

Photo: Yes or **No**

Filamentous Algae: (A – M – P – **NO**)

Sewage fungus: (A – M – P – **NO**)

Velocity:	Colour:
Torrential	**None**
Fast	Slight
Moderate	Moderate
Slow	High
Very slow	

Clarity:	Discharge
Very clear	Flood
Clear	**Normal**
Slightly Turbid	Low
Highly Turbid	Recent flood
	Very low
	Dry

Main land use u/s: **Pasture** / Bog / Forestry / Urban / Tillage / Other

Sample retained: **Y** – **N**

Sampled in Minutes: Pond net x / Stone wash x / Weed sweep x

General Comments: Good habitat

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeropteran (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecopteran (2-tails) – note that tails may be damaged during sampling
- Group 3 = Trichopteran
- Group 4 = GOLD (Gastropoda, Oligochaeta and Diptera)
- Group 5 = Asellus

Calculate the total number of taxa and total abundance of each macroinvertebrate group below:

Abundance = Ab: 1-5 macroinvertebrates = Ab 1; >6 macroinvertebrates = Ab 2

Ephemeropteran:

Mayflies:
- *Ecdyonurus* Ab: 2
- *Rhithrogena* Ab: 2
- *Heptagenia* Ab:
- *Ephemerella* Ab:
- *Caenis* Ab:
- *Paraleptophlebia* Ab:
- *Ephemera danica* Ab:
- _____ Ab:
- _____ Ab:

Total no. of taxa: 2 Total: 4

Plecopteran:

Stoneflies:
- *Leuctra* Ab: 1
- *Isoperla* Ab:
- *Protonemura* Ab:
- *Amphinemura* Ab:
- *Perla* Ab:
- *Dinocras* Ab:
- *Taeniopterygidae* Ab:
- _____ Ab:
- _____ Ab:

Total no. of taxa: 1 Total: 1

Trichopteran:

Caseless caddis:
- *Hydropsyche* Ab: 1
- *Polycentropus* Ab: 1
- *Rhyacophila* Ab:
- *Philopotamus* Ab:

Cased caddis:
- *Limnephilidae* Ab: 1
- *Sericostomatidae* Ab:
- *Glossosomatidae* Ab:
- *Leptostomatidae* Ab:
- *Goeridae* Ab:
- _____ Ab:
- _____ Ab:

Total no. of taxa: 3 Total: 3

GOLD

Snails:
- *Lymnaea* Ab:
- *Potamopyrgus* Ab:
- *Planorbis* Ab:
- *Ancylus* Ab:
- *Physa* Ab:

Worms:
- *Lumbriculus* Ab:
- *Eiseniella* Ab:
- *Tubificidae* Ab: 1
- _____ Ab:
- _____ Ab:

Total no.of taxa: 2

- *Tubifex* (Worm) Ab:
- *Chironomidae* Ab:
- *Chironomus* Ab:
- *Simulium* Ab: 2
- *Dicranota* Ab:
- *Tipula* Ab:
- *Ceratopogonidae* Ab:
- _____ Ab:
- _____ Ab:
- _____ Ab:

Dipteran flies

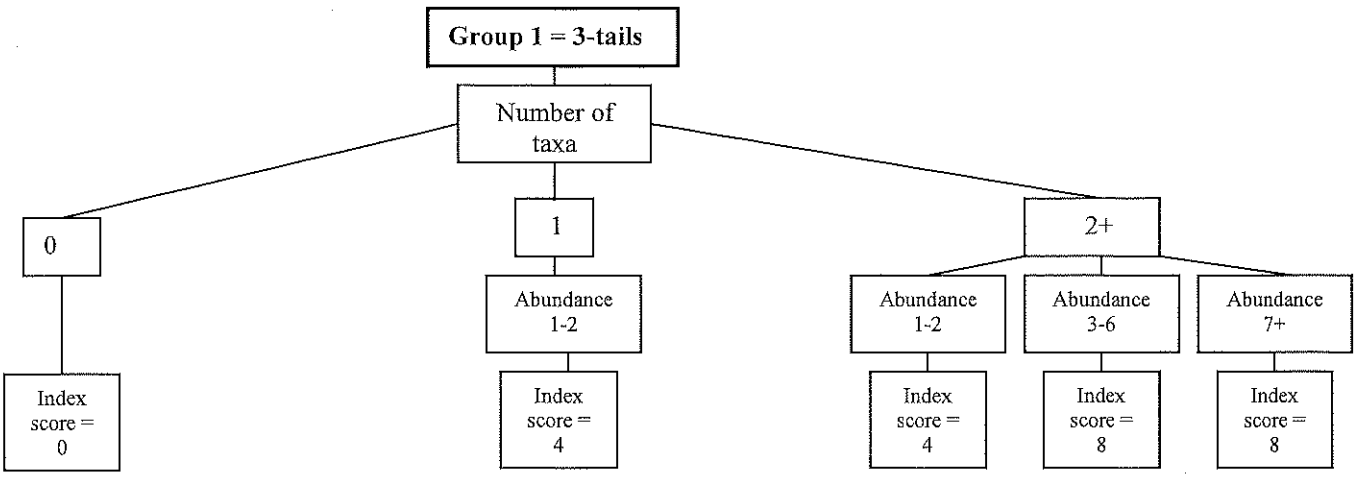
Total: 3

Asellus: Ab: 0

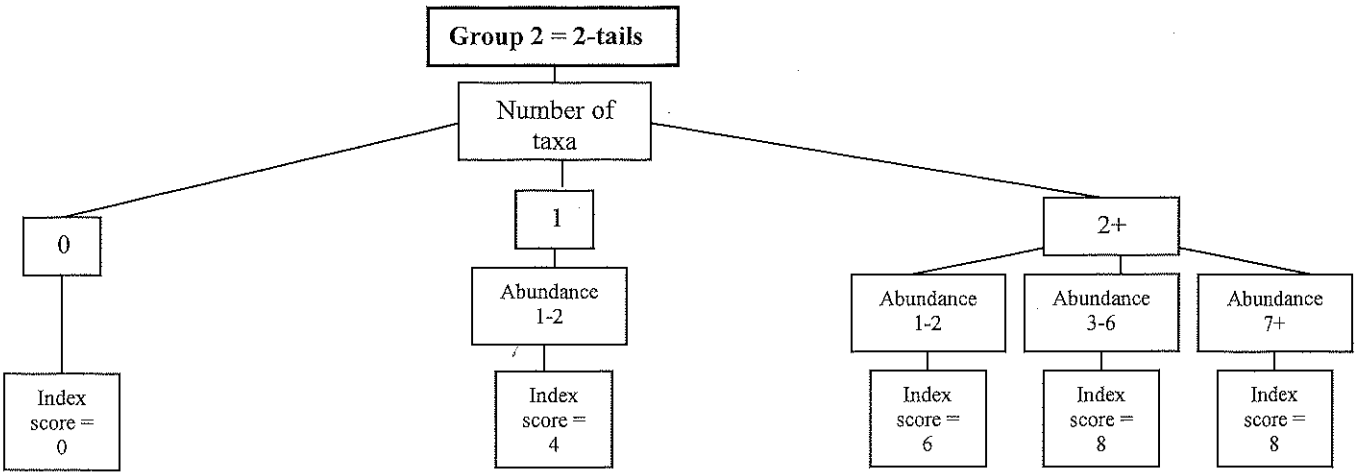
Baetis: Present/Absent _____ Abundance _____

Protected species:

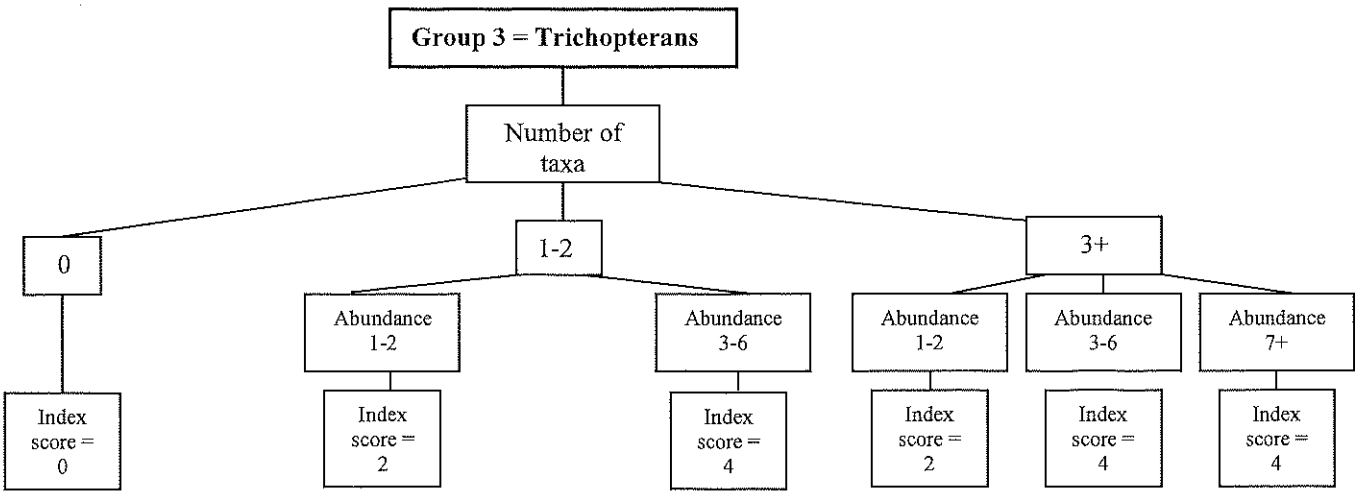
Calculate the Index score by circling the appropriate box representing the total number of taxa and the total abundance calculated from each macroinvertebrate group above and enter into the boxes provided below:



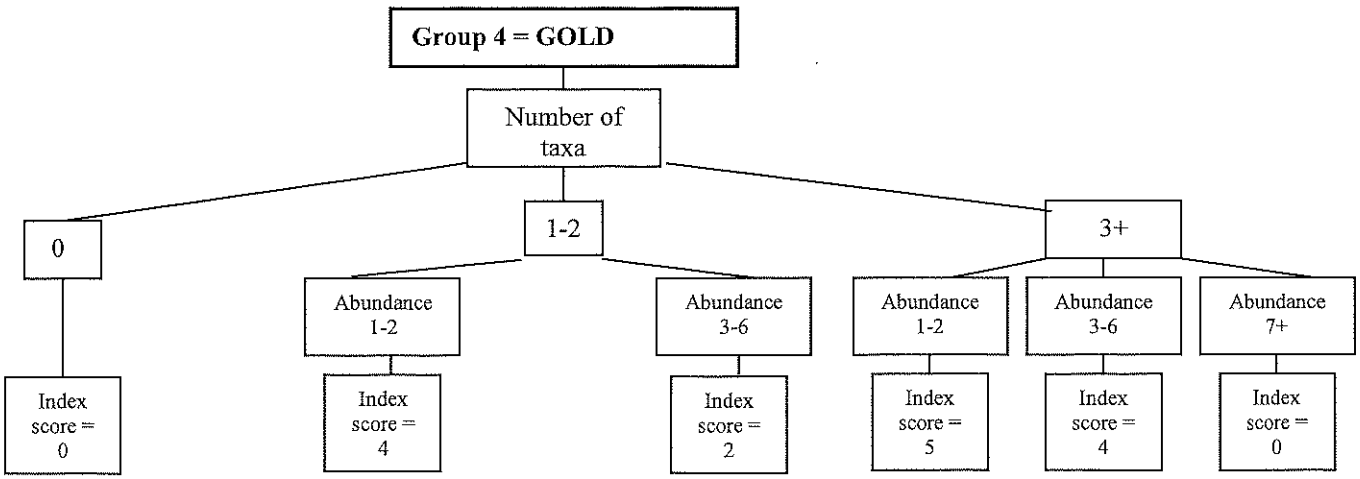
Overall Index score for 3 tails = 8



Overall Index score for 2-tails = 4

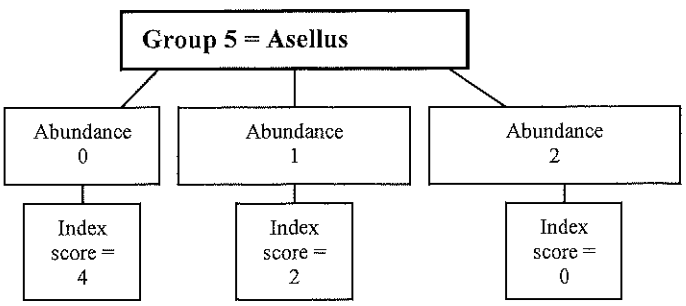


Overall Index score for Trichopterans = 2 2



Overall Index score for GOLD = 2 2

8 + 4 + 4 + 2 + 4



Overall Index score for Asellus = 4 2 4

Overall Index score for 3-tails	=	8
Overall Index score for 2-tails	=	4
Overall Index score for Trichopteran	=	2
Overall Index score for GOLD	=	2
Overall Index score for Asellus	=	4
Total Index score of 5 groups (sum all 5 groups)	=	20
Average of Index score in 5 groups	=	4

x2 = → Small Stream Risk (SSR) Score: 8

Assess the stream by comparing the final SSR Score calculated with the following categories:

- > 8 = probably not at risk
- 6.5-8 = probably at risk
- < 6.5 = at risk

Signed: _____

Date: 9/10/18

River code: FANE	Date: 09/10/18	Time: 14:10	Grid: 293260, 307046
Stream accessibility: Accessible / Inaccessible	**Location:** D/S Inishcarra WWTP		**Stream Order:** 3

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

DO%	
DO mg/l	
Temp	
Conductivity	
pH	
Bank width	
Wet Width	
Avg Depth	

Dominant Types: Bedrock / Boulder (>128mm) / Cobble (32-128mm) / Gravel (8-32mm) / Fine Gravel (2-8mm) / Sand (0.25-2mm) / Silt (<0.25mm)

Stream flow: Riffle / Riffle/Glide / Slow flow

Substratum condition: Calcareous – Compacted – Loose

Substratum: Stoney bottom – Muddy bottom – Mud over stones

Degree of siltation: Clean – Slight – Moderate – Heavy

Depth of mud: None: <1cm: 1-5cm: 5-10cm: 10cm+

Litter: NO – P – M – A

Shading: H – M – L – N

Cattle access Y: u/s – d/s or **N**

Photo: Yes or No

Filamentous Algae: (A – M – P – NO)

Sewage fungus: (A – M – P – NO)

Velocity:	**Colour:**
Torrential	None
Fast	Slight
Moderate	Moderate
Slow	High
Very slow	

Clarity:	**Discharge**
Very clear	Flood
Clear	Normal
Slightly Turbid	Low
Highly Turbid	Recent flood
	Very low
	Dry

Main land use u/s: Pasture / Bog / Forestry / Urban / Tillage / Other

Sample retained: Y – N

Sampled in Minutes: Pond net x / Stone wash x / Weed sweep x

General Comments: Good habitat

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeropteran (3-tails) – note that tails may be damaged during sampling
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- Group 3 = Trichopteran
- Group 4 = GOLD (Gastropoda, Oligochaeta and Diptera)
- Group 5 = Asellus

Calculate the total number of taxa and total abundance of each macroinvertebrate group below:

Abundance = Ab: 1-5 macroinvertebrates = Ab 1; >6 macroinvertebrates = Ab 2

Ephemeropteran: (Mayflies)

Ecdyonurus Ab	2
Rhithrogena Ab	2
Heptagenia Ab	
Ephemerella Ab	
Caenis Ab	
Paraleptophlebia Ab	
Ephemera danica Ab	
_____ Ab	
_____ Ab	

Total no. of taxa 2 Total 4

Plecopteran: (Stoneflies)

Leuctra Ab	1
Isoperla Ab	
Protonemura Ab	
Amphinemura Ab	
Perla Ab	
Dinocras Ab	
Taeniopterygidae Ab	
_____ Ab	
_____ Ab	

Total no. of taxa 1 Total 1

Trichopteran:

Caseless caddis:

Hydropsyche Ab	1
Polycentropus Ab	
Rhyacophila Ab	
Philopotamus Ab	

Cased caddis:

Limnephilidae Ab	
Sericostomatidae Ab	
Glossosomatidae Ab	
Leptostomatidae Ab	
Goeridae Ab	
_____ Ab	
_____ Ab	

Total no. of taxa 1 Total 1

GOLD

Snails:

Lymnaea Ab	
Potamopyrgus Ab	
Planorbis Ab	
Ancylus Ab	
Physa Ab	

Worms:

Lumbriculus Ab	
Eiseniella Ab	
Tubificidae Ab	1
_____ Ab	
_____ Ab	

Total no.of taxa 2

Tubifex (Worm) Ab	1
Chironomidae Ab	
Chironomus Ab	
Simulium Ab	1
Dicranota Ab	
Tipula Ab	
Ceratopogonidae Ab	
_____ Ab	
_____ Ab	
_____ Ab	

Dipteran flies

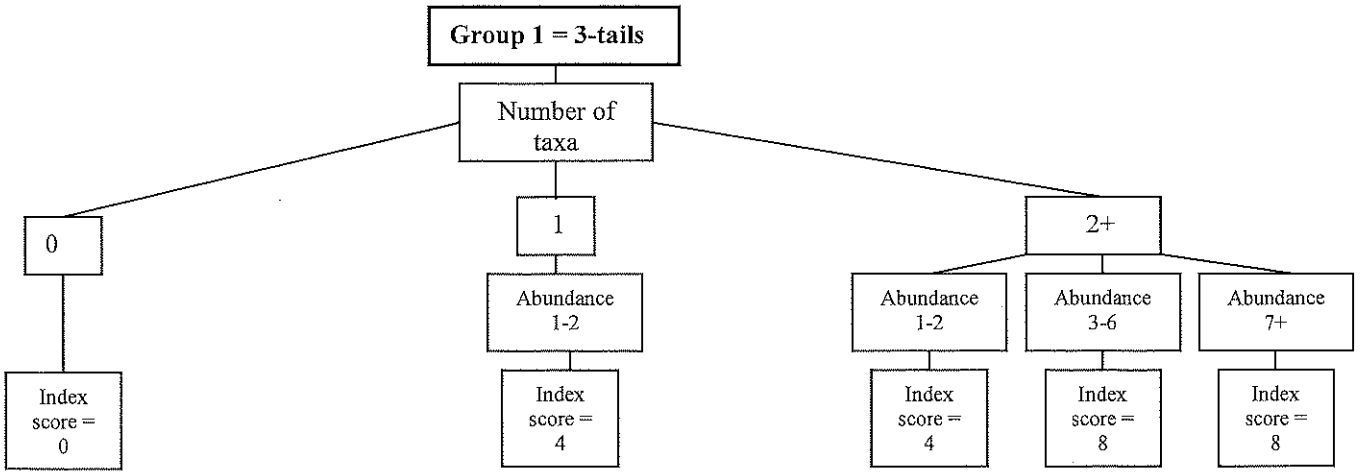
Total 3

Asellus: Ab 0

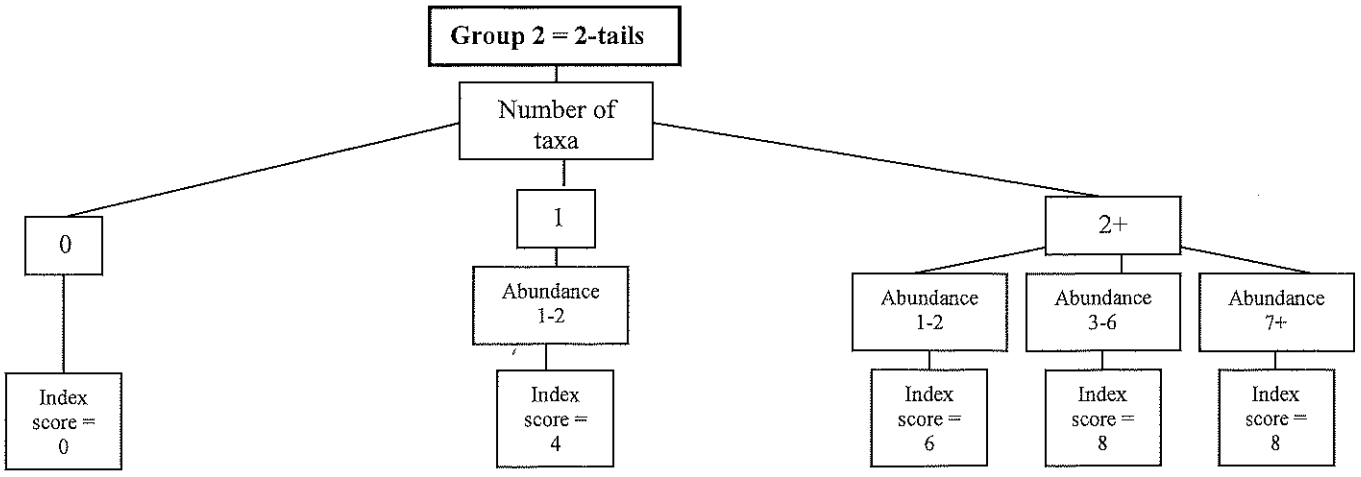
Baetis: Present/Absent Present Abundance _____

Protected species:

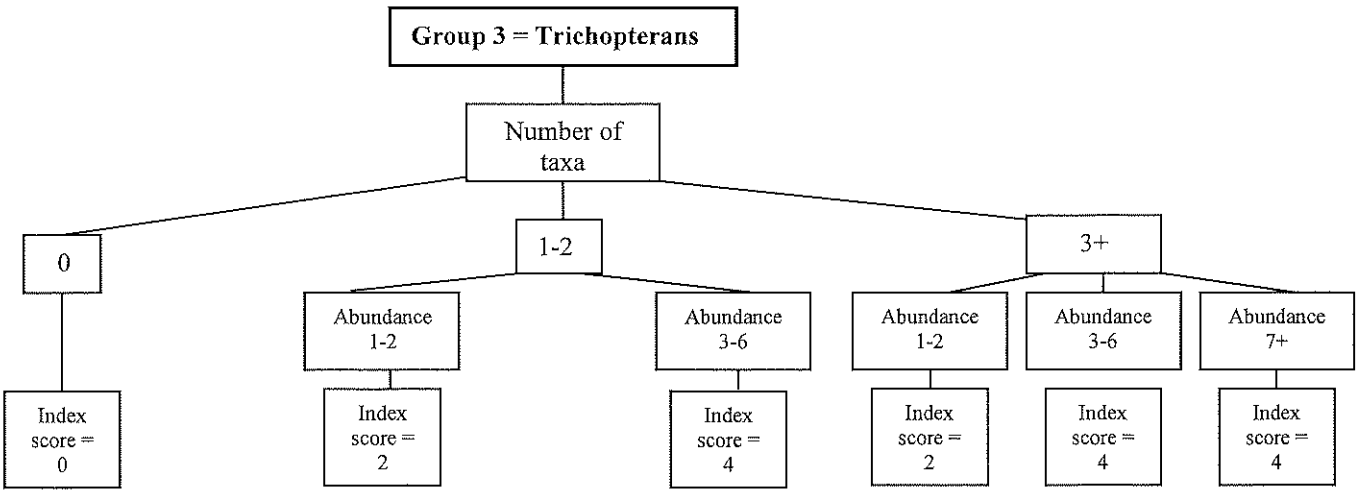
Calculate the Index score by circling the appropriate box representing the total number of taxa and the total abundance calculated from each macroinvertebrate group above and enter into the boxes provided below:



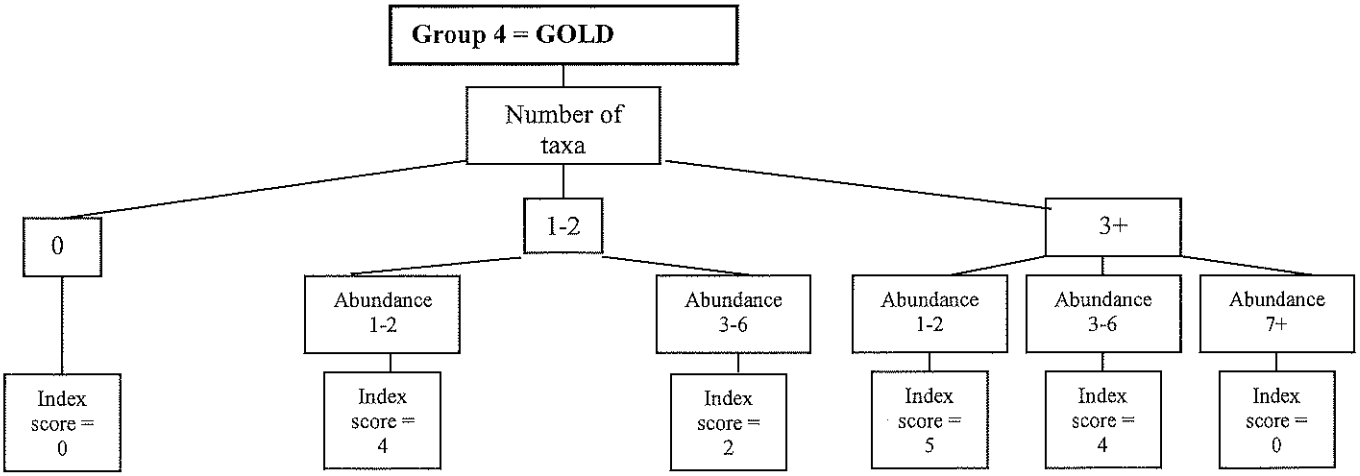
Overall Index score for 3 tails = 8 8



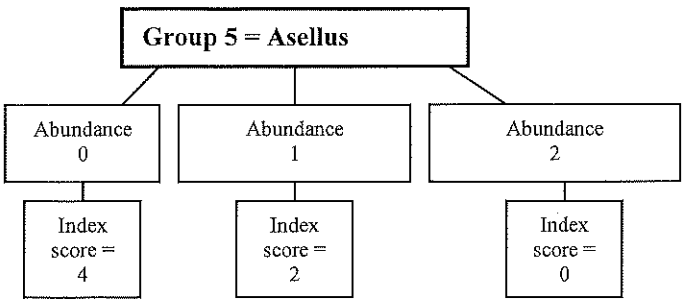
Overall Index score for 2-tails = 4 4



Overall Index score for Trichopterans = 4



Overall Index score for GOLD = 2



Overall Index score for Asellus = 4

Overall Index score for 3-tails	=	8
Overall Index score for 2-tails	=	4
Overall Index score for Trichopteran	=	4
Overall Index score for GOLD	=	2
Overall Index score for Asellus	=	4
Total Index score of 5 groups (sum all 5 groups)	=	22
Average of Index score in 5 groups	=	4.4

x2 = → Small Stream Risk (SSR) Score: 8.8

Assess the stream by comparing the final SSR Score calculated with the following categories:

- > 8 = probably not at risk
- 6.5-8 = probably at risk
- < 6.5 = at risk

Signed: _____

Date: 9/10/18