



Cork County Council

Wastewater Discharge Licence Application under S.I. 684 of 2007  
Regulations

Scheme / Agglomeration Name : Blarney

Submission Date : 14<sup>th</sup> December 2007

Environmental Protection Agency Licensing
Received
14 DEC 2007
Initials _____

## Index

<u>Section</u>	<u>Title</u>	<u>No. of Pages</u>	<u>Type</u>
-	Cover Sheet	1	Text
A	Non-Technical Summary	6	Text
A	A1-Site Location Map	3	Map
B	General	8	Text
B	Agglomeration served by application	1	Map
B	B2	1	Map
B	B3	2	Map
B	B4	1	Map
B	B5	1	Map
B	B6	65	Text
B	B7 & B8	4	Text & Map
B	B9	1	Text
B	B10	4	Text
B	B11	0	
B	B12	0	
C	Infrastructure & Operation	3	Text
C	C1	1	Map
C	C2	0	
D	Discharge to the Aquatic Environment	1	Text
D	D1	16	Text
D	D2	1	
E	Monitoring	0	
E	E1	2	Text
E	E2	2	Text
E	E3	1	
E	Attachment E4	7	Text
F	Existing Environment & Impact of Discharge	0	
F	F1	14	Text
F	F2	21	Text
G	Programme of Improvements	1	Text
G	G1	3	Text
G	G2	1	Text

G		G3		1		Text
G		G4		0		
H		Declaration		0		
I		Joint Declaration		0		
Annex 2		Annex 2		3		Text

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

## SECTION A: NON-TECHNICAL SUMMARY

*Advice on completing this section is provided in the accompanying Guidance Note.*

A non-technical summary of the application is to be included here. The summary should identify all environmental impacts of significance associated with the discharge of waste water associated with the waste water works. This description should also indicate the hours during which the waste water works is supervised or manned and days per week of this supervision.

The following information must be included in the non-technical summary:

A description of:

- the waste water works and the activities carried out therein,
- the sources of emissions from the waste water works,
- the nature and quantities of foreseeable emissions from the waste water works into the receiving aqueous environment as well as identification of significant effects of the emissions on the environment,
- the proposed technology and other techniques for preventing or, where this is not possible, reducing emissions from the waste water works,
- further measures planned to comply with the general principle of the basic obligations of the operator, i.e., that no significant pollution is caused;
- measures planned to monitor emissions into the environment.

### **A Description of the Waste Water Works and the Activities Carried Out Therein**

The wastewater in the twin settlement of Blarney - Tower is collected in a partially combined foul and separated foul sewage drainage network. The wastewater drains from the settlements to the Waste Water Treatment Plant.

There are two trunk sewers discharging to the inlet works at the Blarney Waste Water Treatment Plant, one from Tower and the other from Blarney village.

#### ***Tower to Treatment Plant Sewer; -***

The gravity trunk main serves the Tower area and runs along parallel to the river to the inlet of the treatment plant.

It is proposed to pump the catchment that is presently served by Cloghroe Waste Water Treatment Plant to Tower. It is also proposed to discharge sewage from Bawnafinny to the sewer by crossing the river.

#### ***Village to Treatment Plant Sewer; -***

This gravity sewer serves the village and Station Road areas. There are three pumping stations discharging to the gravity sewer in Station Road, two from housing estates and one from Blarney Business Park. The Killard area discharges to a pumping station at the Gothic Bridge from where it is pumped to the gravity sewer in the village.

It is proposed to pump the sewage from the Kerry Pike catchment to this line.

### **Treatment Plant**

The Blarney WWTP is designed for a Population Equivalent (PE) of 13,000PE and BOD loading of 780Kg/day. The maximum hydraulic capacity of the Blarney WWTP is 384m<sup>3</sup>/h which is 2.7 Dry Weather Flow (2.7DWF). In order to cope with flows above 2.7DWF storm storage has been provided at the WWTW. The volume of storm storage at the WWTW is approximately 366m<sup>3</sup>. In the event that the storm water holding tanks are filled and the storm continues, the storm water tanks are operated as a pre-clarification tank without sludge removal. The overflow from the storm water storage tank is connected to the final effluent outlet pipe.

The treatment plant treats all flows that arrive at the works to secondary standards in accordance with the Urban Waste Water Directive 1994 as shown in the following table:

<b>Parameter</b>	<b>Effluent Limit</b>
BOD	25 mg/l
COD	125 mg/l
Suspended Solids	35 mg/l
Phosphate	2 mg/l
Ammonia	3 mg/l
Total Nitrogen	25 mg/l
Sludge	18% or greater

Table 1 – Effluent Limits discharge

The existing WWTW were upgraded with an additional stream. The flow is split after the wastewater passes through the new inlet works. 50% of the flow is diverted to the existing wastewater treatment stream. The remaining 50% is directed to a new treatment system. The existing stream has an aeration phase, a secondary settlement phase and return activated sludge phase. The new stream has an anaerobic, anoxic and aeration phase, a secondary settlement phase and return activated sludge phase.

Sludge is wasted separately from each stream to a common storage sludge blend tank, common Picket Fence Thickener and common dewatering plant.

A summary of the treatment process is presented below:

<b>Inlet works</b>	2Duty/1Standby pumps, 2 No. mechanical screens with aerated grit and grease removal system, flow measurement and grit classifier.	
	<b>EXISTING STREAM</b>	<b>NEW STREAM</b>
<b>Biological Treatment</b>	1 No. aeration tank with 3 No. surface aerators.	- 1 No. Anaerobic tank with 3 No. mixers. - 1 No. Anoxic tank - 1 No. aeration tank with fine bubble disc aeration
<b>Phosphorus Removal</b>	Ferric Sulphate dosing	
<b>Secondary Settling</b>	1 No. 19m diameter final settlement tanks with half bridge sludge scraper.  Sludge settled within the settlement tanks is withdrawn by gravity from each central sludge hopper to the return sludge pump sump.  Surplus Activated Sludge (SAS) is pumped by 2 No. pumps (Duty/Standby) from the pump sump to the sludge blend/holding tank. Return Activated Sludge (RAS) is pumped 2 No. pumps (Duty/Standby) from the pump sump and is mixed with the incoming influent.	1 No. 17m diameter final settlement tanks with half bridge sludge scraper.
<b>Sludge Treatment</b>	<ul style="list-style-type: none"> <li>- 1 No. sludge acceptance tank, 45m<sup>3</sup>, 1 No. mixer and sludge pump sump equipment with 2 No. Pumps.</li> <li>- 1 No. Sludge Blend/Holding tank, 192m<sup>3</sup>, 1 No. mixer and sludge pump sump equipment with 2 No. Pumps.</li> <li>- 1 No. Picket Fence Thickener for thickening from 0.5% to 2% Dry Solids, 192m<sup>3</sup>.</li> <li>- 2 No. Sludge Belt Presses with 2 No. sludge transfer pumps, 1 No. poly make-up unit with 3 No. dosing pumps.</li> </ul>	
<b>Effluent Discharge</b>	1 No. 450mm gravity outfall pipe to River Shournagh.	

Ancillary equipment at the WWTP also includes the following:

- Odour Treatment Unit with 2 No extractor fans.
- Standby Generator and SCADA system covering all the plant including sludge treatment process.
- Buildings - Inlet and sludge building, electricity transformer building, laboratory and control room building with fire alarm and security alarm systems.

The Blarney WWTP is currently operated by Cork County Council staff. The plant is manned during the working week 8.30am - 5.00pm (Monday - Friday) by a

Wastewater Curator and general operatives as required. An Environmental Technician is fully employed between Ballincollig and Blarney WWTPs. During out of hours the SCADA system can send alarms to a mobile phone of the person on standby.

### **The Sources of Emissions from the Waste Water Works**

The pollution load for the Blarney agglomeration arises from the following areas:

- The local Population
- The local Industries, commercial and non domestic users.

The pollution load from these sources varies with daily, weekly and seasonal producers of effluent. The sewage from all industries is collected via the public sewer and treated in conjunction with domestic waste at the waste water treatment plant.

The domestic population of Blarney has grown over the last three censuses owing to its development as a town within the Cork Metropolitan area. The most recent Census figures show that Blarney Town and environs now has a population in excess of 5,226. (Census, 2006). Other sources of influent that contribute to the sewage scheme would be:

- Commercial premises
- Schools
- Tourism

### **The nature and quantities of foreseeable emissions from the waste water works into the receiving aqueous environment as well as identification of significant effects of the emissions on the environment.**

The final effluent is discharged into the River Shournagh. At design capacity the WWTW will discharge 3,357m<sup>3</sup>/d to the river.

The effluent quality will be according Table 1. (above)

### **Environmental Impacts**

An Environmental Impact Statement was carried out for the Expansion and Upgrading of Blarney Sewage Treatment Works in April 2000 by T.J. O'Connor & Associates. This report stated:

*“The most significant long-term impact will be the improvement in aquatic habitat to the extent that during the heavy rains, storm water overflow occurrences and volumes will be minimised and the storm overflows that do occur will be screened. The final effluent discharged to the river will meet the discharge criteria laid down in the relevant standards and directives. The quantity of suspended solids will be reduced and the oxygen levels during flood should remain high.*

*As the bulk of the waste is to remain composed primarily of municipal wastewater and therefore does not contain significant quantities of materials that would be toxic to the flora and fauna of the stream. If the upgrading of the works is not*

*undertaken, the suitability of the aquatic environment for salmonid populations will noticeably decrease. Oxygen levels may tend to below 40 % of saturation, bacteria and algae will tend to flourish as the conditions tend towards septic. However, with the proposed works, the river has every chance to retain its current status of Q4-5 and its diversity of species.”*

It is necessary to consider that the effluent quality will meet the requirements stated in the Urban Waste Water Directive 1994.

## **The Proposed Technology and Other Techniques for Preventing or, Where This Is Not Possible, Reducing Emissions from the Waste Water Works**

### ***Technologies***

In the WWTW at Blarney a sufficient number of standby pumps, fans, etc. is provided in order to ensure continuation of the wastewater and sludge treatment and to comply with all environmental standards in case of equipment failures or breakdowns. Standby equipment is installed, ready for take over, or available in stock on site.

Standby diesel generators or generator sockets in control panels are provided to enable the plant to operate during mains electric power failure thereby preventing untreated emissions from entering the receiving aqueous environment.

### ***Techniques***

A Performance Management System (PMS) will be put in place at the Blarney Wastewater Treatment Plant. The Water Services National Training Group (WSNTG) is developing this Performance Management System. The PMS will provide a uniform approach to dealing with all relevant performance management issues, including Independent Compliance Audits, Management of Change, Dispute Resolution, Public Relations, Emergency Procedures and Reporting Procedures.

Cork County Council performs the Operation of the WWTP in accordance with the Operation Manual procedures and maintains the design performance capability of the existing treatment plant.

**Further measures planned to comply with the general principle of the basic obligations of the operator, i.e., that no significant pollution is caused**

### ***Prevention of pollution***

Any alteration upgrading of the existing infrastructure undertaken by Cork County Council shall not increase the potential to cause pollution in the environment. In particular any alterations to the wastewater treatment plant will be designed to enable any operator of the facility to prevent pollution of the environment by the following potential contaminants:

- Surface water run-off
- Spillages
- Solid Waste



### ***Toxic Substances***

Cork County Council shall ensure that any modification or alterations to the plant do not increase the impact by any toxic substances. All chemicals and dangerous substances must be stored safely at all times and all appropriate safety measures must be taken to ensure against leakage and spillage in accordance with the relevant Health and Safety Legislation.

### **Measures planned to monitor emissions into the environment**

Cork County Council, as current operator monitors the treatment plant in accordance with the Urban Waste Water Treatment Regulations. The analysis undertaken by the monitoring body (Cork County Council Environment Dept) is done in accordance with the latest edition of the Standard Methods for the Examination of Water and Wastewater. The American Public Health Association publishes these methods.

This lab is ISO 17025 accredited under the umbrella of the Irish National Accreditation Board (INAB).

To monitor compliance with the regulations the inlet and discharge samples tested are 24-hour composite samples either flow proportional or time based. A refrigerated sampler minimizes degradation between collection and analysis. Analysis is undertaken within 24 hours of the sample being taken. Non-regulatory analysis is routinely carried out using standard laboratory procedures.

There is planned for the coming year the introduction of a PMS system. This system will set out a control system for procedures and processes for running the treatment plant.

Heavy metal analysis is determined on de-watered sludge. This analysis is part of the licence at the receiving facility. This analysis is done as part of the 'Sewage Sludge in Agriculture regulations'.

Supporting information should form **Attachment N<sup>o</sup> A.1**



Notes:

This drawing is the property of Cork County Council. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.

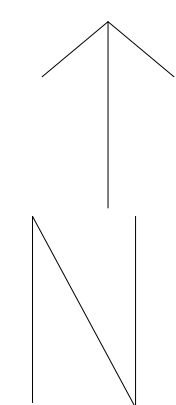
DO NOT SCALE. Use figured dimensions only. If in doubt ask.

All dimensions to be checked on site.

Drawing to be read in conjunction with Licence Application Form attached.

Includes Ordnance Survey Ireland data reproduced under OSi Licence number:

Cork County Council CCMA 2004/07. Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland. © Ordnance Survey Ireland, 2004.



Cork County Council  
South Cork Division

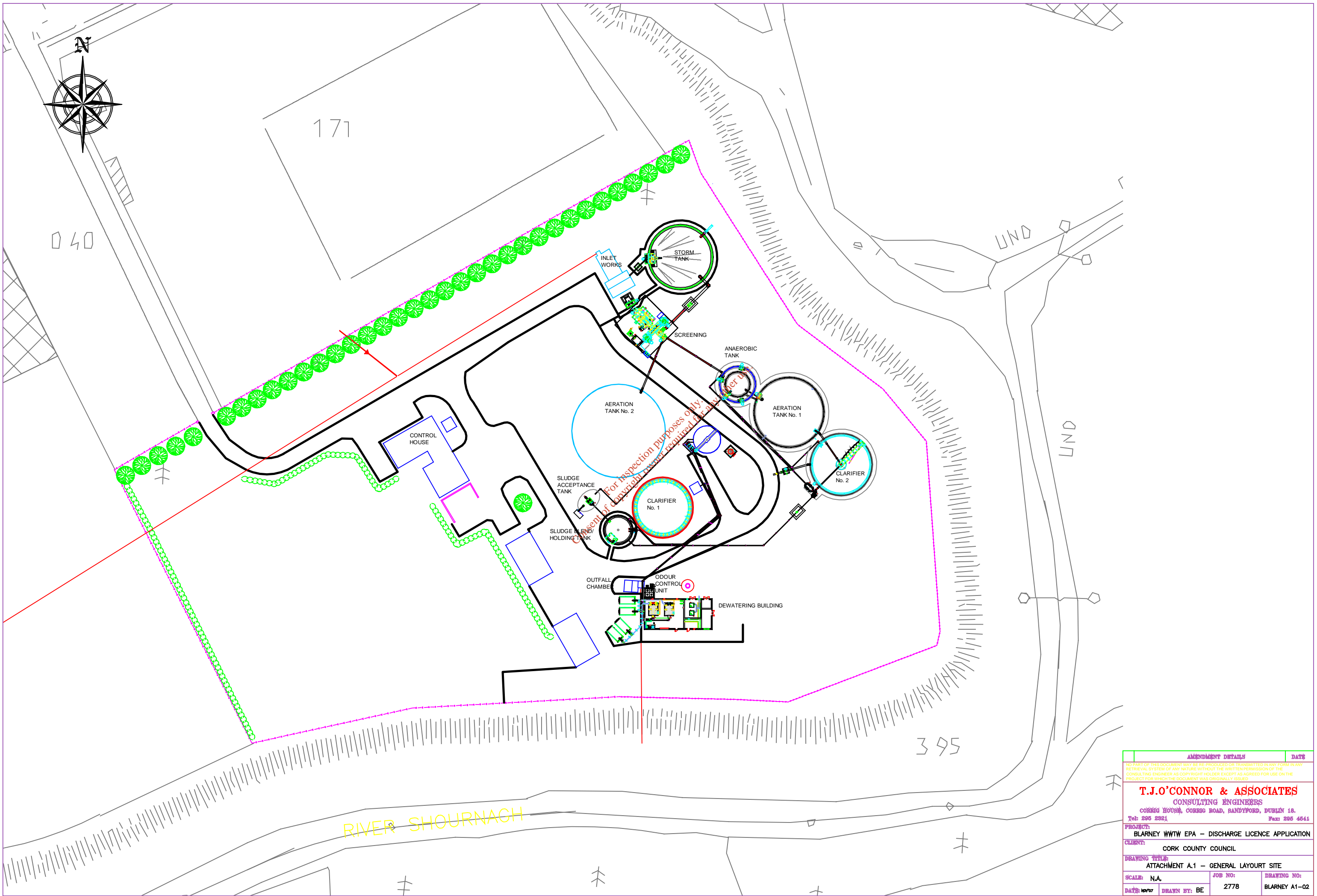
N. O'Keeffe, B.Eng., C.Eng., Eur. Ing., F.I.E.I., M.I.C.E.,  
Acting County Engineer  
County Hall, Cork.

P. Power  
Director of Services  
South Cork.

Project:  
EPA LICENCE APPLICATION

Title:  
Section A1-  
Site Location Map.

Designed:LL	Checked: MM	Scale: NTS	Drawing No. A1-01-Blarney
Drawn:LL	Approved:MM	Date:Dec 07	



AMENDMENT DETAILS		DATE
<small>NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM IN ANY RETRIEVAL SYSTEM OR ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE CONSULTING ENGINEER AS COPYRIGHT HOLDER EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DOCUMENT WAS ORIGINALLY ISSUED.</small>		
<b>T.J.O'CONNOR &amp; ASSOCIATES</b> CONSULTING ENGINEERS CORRING HOUSE, CORRING ROAD, SANDYFORD, DUBLIN 18. Tel: 295 2321 Fax: 295 4641		
<b>PROJECT:</b> BLARNEY WWTW EPA - DISCHARGE LICENCE APPLICATION		
<b>CLIENT:</b> CORK COUNTY COUNCIL		
<b>DRAWING TITLE:</b> ATTACHMENT A.1 - GENERAL LAYOUT SITE		
SCALE: N.A.	JOB NO: 2778	DRAWING NO: BLARNEY A1-02
DATE: 16/07/13	DRAWN BY: BE	



## SECTION B: GENERAL

Advice on completing this section is provided in the accompanying Guidance Note.

### B.1 Applicant's Details\*

#### Name and Address for Correspondence

Only application documentation submitted by the applicant and by the nominated person will be deemed to have come from the applicant.

Provide a drawing detailing the agglomeration to which the licence application relates. It should have the boundary of the agglomeration to which the licence application relates clearly marked in red ink.

<b>Name**:</b>	Cork County Council Southern Division
<b>Address:</b>	County Hall, Carrigrohane Road, Cork
<b>Tel:</b>	021 2476891
<b>Fax:</b>	021 4276321
<b>e-mail:</b>	

\*This should be the name of the water services authority in whose ownership or control the waste water works is vested.

\*\*Where an application is being submitted on behalf of more than one water services authority the details provided in Section B.1 shall be that of the lead water services authority.

<b>Name*:</b>	Patricia Power
<b>Address:</b>	Director of Services Floor 5 County Hall, Cork
<b>Tel:</b>	021 4285285
<b>Fax:</b>	021 4276321
<b>e-mail:</b>	patricia.power@corkcoco.ie

\*This should be the name of person nominated by the water services authority for the purposes of the application.

### Co-Applicant's Details

<b>Name*:</b>	Not Applicable
<b>Address:</b>	
<b>Tel:</b>	
<b>Fax:</b>	
<b>e-mail:</b>	

\*This should be the name of a water services authority, other than the lead authority, where multiple authorities are the subject of a waste water discharge (authorisation) licence application.

## Design, Build & Operate Contractor Details

<b>Name*:</b>	Not Applicable
<b>Address:</b>	
<b>Tel:</b>	
<b>Fax:</b>	
<b>e-mail:</b>	

\*Where a design, build & operate contract is in place for the waste water works, or any part thereof, the details of the contractor should be provided.

**Attachment B.1** should contain appropriately scaled drawings / maps ( $\leq A3$ ) of the agglomeration served by the waste water works showing the boundary clearly marked in red ink. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g., ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. These drawings should be provided to the Agency on a separate CD-Rom containing sections B.2, B.3, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	*	

## B.2 Location of Associated Waste Water Treatment Plant(s)

Give the location of the waste water treatment plant associated with the waste water works, if such a plant or plants exists.

<b>Name*:</b>	Michael Murphy
<b>Address:</b>	Blarney WWTP
	Riverview Estate
	Kilnamucky, Tower
	Co Cork
<b>Grid ref (6E, 6N)</b>	E159196 N74918
<b>Level of Treatment</b>	Tertiary
<b>Primary Telephone:</b>	021 4875643
<b>Fax:</b>	021 4289868
<b>e-mail:</b>	mick.murphy@corkcoco.ie

\*This should be the name of the person responsible for the supervision of the waste water treatment plant.

**Attachment B.2** should contain appropriately scaled drawings / maps ( $\leq A3$ ) of the site boundary and overall site plan, including labelled discharge, monitoring and sampling points. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g., ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. These drawings should

be provided to the Agency on a separate CD-Rom containing sections B.1, B.3, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	*	

### B.3 Location of Primary Discharge Point

Give the location of the primary discharge point, as defined in the Waste Water Discharge (Authorisation) Regulation, associated with the waste water works.

<b>Type of Discharge</b>	Pipe to river.
<b>Unique Point Code</b>	SW01-Blarney
<b>Location</b>	Kilnamucky, Tower
<b>Grid ref (6E, 6N)</b>	E159261 N074835

**Attachment B.3** should contain appropriately scaled drawings / maps ( $\leq A3$ ) of the discharge point, including labelled monitoring and sampling points associated with the discharge point. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing the drawings and tabular data requested in sections B.1, B.2, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	*	

### B.4 Location of Secondary Discharge Point(s)

Give the location of **all** secondary discharge point(s) associated with the waste water works. Please refer to Guidance Note for information on Secondary discharge points.

<b>Type of Discharge</b>	Emergency overflow to outfall.
<b>Unique Point Code</b>	SW01-Blarney
<b>Location</b>	Kilnamucky, Tower
<b>Grid ref (6E, 6N)</b>	E159261 N074835

<b>Type of Discharge</b>	Emergency.
<b>Unique Point Code</b>	SW02-Blarney
<b>Location</b>	Shean Lower, Blarney
<b>Grid ref (6E, 6N)</b>	E161602 N075245

<b>Type of Discharge</b>	Emergency overflow.
<b>Unique Point Code</b>	SW03-Blarney
<b>Location</b>	Woodside Kerry Pike
<b>Grid ref (6E, 6N)</b>	E160341 N073241

<b>Type of Discharge</b>	Emergency overflow.
<b>Unique Point Code</b>	SW04-Blarney
<b>Location</b>	Coolflugh, Tower
<b>Grid ref (6E, 6N)</b>	E157548 N074040

**Attachment B.4** should contain appropriately scaled drawings / maps ( $\leq A3$ ) of the discharge point(s), including labelled monitoring and sampling points associated with the discharge point(s). These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.5, C.1, D.2, E.3 and F.2.

<b>Attachment included</b>	<b>Yes</b>	<b>No</b>
	*	

#### **B.5 Location of Storm Water Overflow Point(s)**

Give the location of **all** storm water overflow point(s) associated with the waste water works.

<b>Type of Discharge</b>	Pipe
<b>Unique Point Code</b>	SW01-Blarney
<b>Location</b>	Kilnamucky, Tower
<b>Grid ref (6E, 6N)</b>	E159261 N074835

**Attachment B.5** should contain appropriately scaled drawings / maps ( $\leq A3$ ) of storm water overflow point(s) associated with the waste water works, including labelled monitoring and sampling points associated with the discharge point(s). These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, C.1, D.2, E.3 and F.2.

<b>Attachment included</b>	<b>Yes</b>	<b>No</b>
	*	



## B.6 Planning Authority

Give the name of the planning authority, or authorities, in whose functional area the discharge or discharges take place or are proposed to take place.

<b>Name:</b>	Cork County Council
<b>Address:</b>	County Hall, Carrigrohane Road, Cork
<b>Tel:</b>	021 2476891
<b>Fax:</b>	021 4276321
<b>e-mail:</b>	

Planning Permission relating to the waste water works which is the subject of this application:- (tick as appropriate)

<i>has been obtained</i>	*	<i>is being processed</i>	
<i>is not yet applied for</i>		<i>is not required</i>	

<b>Local Authority Planning File Reference N<sup>o</sup>:</b>	Part 9 of the 1994 local Government Regs May 2000
---	--

**Attachment B.6** should contain *the most recent* planning permission, including a copy of *all* conditions, and where an EIS was required, copies of any such EIS and any certification associated with the EIS, should also be enclosed. Where planning permission is not required for the development, provide reasons, relevant correspondence, etc.

<b>Attachment included</b> EIS attached	<b>Yes</b>	<b>No</b>
	*	

## B.7 Other Authorities

B.7 (i) Shannon Free Airport Development Company (SFADCo.) area

The applicant should tick the appropriate box below to identify whether the discharge or discharges are located within the Shannon Free Airport Development Company (SFADCo.) area.

**Attachment B.7(i)** should contain details of any or all discharges located within the SFADCo. area.

<b>Within the SFADCo Area</b>	<b>Yes</b>	<b>No</b>
		*

B.7 (ii) Health Services Executive Region

The applicant should indicate the **Health Services Executive Region** where the discharge or discharges are or will be located.

<b>Name:</b>	HSE Southern Division
<b>Address:</b>	Slanta House
	Wilton Road
	Cork
<b>Tel:</b>	021-4545011
<b>Fax:</b>	021-4545748
<b>e-mail:</b>	Not available

B.7 (iii) Other Relevant Local Authorities

Regulation 13 of the Waste Water Discharge (Authorisation) Regulations, 2007 requires all applicants, not being the local authority in whose functional area the relevant waste water discharge or discharges, to which the relevant application relates, takes place or is to take place, to notify the relevant local authority of the said application.

<b>Name:</b>	Not Applicable
<b>Address:</b>	
<b>Tel:</b>	
<b>Fax:</b>	
<b>e-mail:</b>	

Relevant Authority Notified	Yes	No

**Attachment B.7(iii)** should contain a copy of the notice issued to the relevant local authority.

Attachment included	Yes	No
		*

**B.8 Notices and Advertisements**

Regulations 10 and 11 of the Waste Water Discharge (Authorisation) Regulations, 2007 require all applicants to advertise the application in a newspaper and by way of a site notice. See *Guidance Note*.

**Attachment B.8** should contain a copy of the site notice and an appropriately scaled drawing ( $\leq A3$ ) showing its location. **The original application must include the original page of the newspaper in which the advertisement was placed.** The relevant page of the newspaper containing the advertisement should be included with the original and two copies of the application.

Attachment included	Yes	No
	*	

### B.9 (i) Population Equivalent of Agglomeration

**TABLE B.9.1 POPULATION EQUIVALENT OF AGGLOMERATION**

The population equivalent (p.e.) of the agglomeration to be, or being, served by the waste water works should be provided and the period in which the population equivalent data was compiled should be indicated.

<b>Population Equivalent</b>	<b>13,000</b>
<b>Data Compiled (Year)</b>	<b>2007</b>
<b>Method</b>	<b>Design capacity</b>

### B.9 (ii) FEES

State the relevant Class of waste water discharge as per Column 1 of the Second Schedule, and the appropriate fee as per Columns 2 or 3 of the Third Schedule of the Waste Water Discharges (Authorisation) Regulations 2007, S.I. No. 684 of 2007.

<b>Class of waste water discharge</b>	<b>Fee (in €)</b>
Greater than 10,000 pe	30,000

<b>Appropriate Fee Included</b>	<b>Yes</b>	<b>No</b>
	*	

### B.10 Capital Investment Programme

State whether a programme of works has been prioritised for the development of infrastructure to appropriately collect, convey, treat and discharge waste water from the relevant agglomeration. If a programme of works has been prioritised provide details on funding (local or national), allocated to the capital project. Provide details on the extent and type of work to be undertaken and the likely timeframes for this work to be completed.

**Attachment B.10** should contain the most recent development programme, including a copy of any approved funding for the project and a timeframe for the completion of the necessary works to take place.

The Council has recently completed an upgrade of the wastewater treatment plant at Blarney to 13,000 p.e. and has no immediate proposals to increase that capacity. The plant at Blarney has two independent secondary treatment processes with the wastewater load being split approximately evenly between them. One stream has biological nutrient removal and the other has chemical nutrient removal. There is concern in relation to the nutrient levels in the river catchments north of Cork City and the Council has obtained approval to carry out a drainage study, the City Environs (CASP) Drainage Study which is being funded under the Water Services Investment Programme 2007-2009. This study will consider the drainage options available for the catchment concerned having regard to existing and planned developments in the area. The Council is currently preparing a brief for the appointment of a consultant and expects to advertise the appointment in early January 2008 and to have the study completed in approx six months thereafter.

It is proposed to pump the catchment that is presently served by Cloghroe Waste Water Treatment Plant to the gravity sewer at Tower.

It is proposed to pump the sewage from the Kerry Pike catchment to the trunk sewer from the village to the treatment plant.

Attachment included	Yes	No
WSIP Kerry Pike SS & Cloghroe SS	*	

### B.11 Significant Correspondence

Provide a summary of any correspondence resulting from a Section 63 notice issued by the Agency in relation to the waste water works under the Environmental Protection Agency Acts, 1992 and 2003, as amended by Section 13 of Protection of the Environment Act, 2003.

**Attachment B.11** should contain a summary of any relevant correspondence issued in relation to a Section 63 notice.

Attachment included	Yes	No
Not applicable		*

### B.12 Foreshore Act Licences.

Provide a copy of the most recent Foreshore Act licence issued in relation to discharges from the waste water works issued under the Foreshore Act 1933.

**Attachment B.12** should contain the most recent licence issued under the Foreshore Act 1933, including a copy of **all** conditions attached to the licence and any monitoring returns for the previous 12-month period, if applicable.

Attachment included	Yes	No
Not applicable		*





171

040

LND

LND

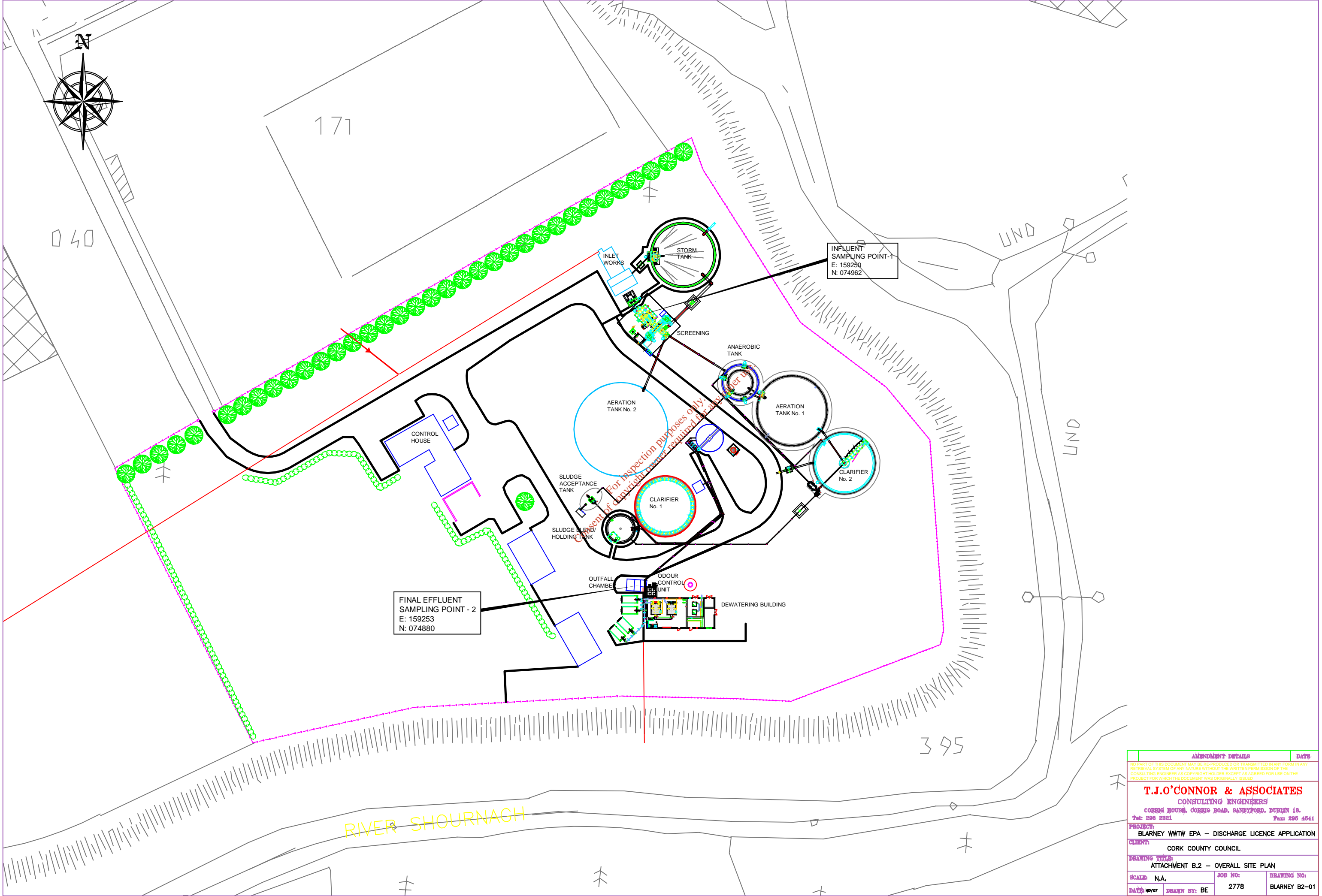
INFLUENT SAMPLING POINT-1  
E: 159250  
N: 074962

FINAL EFFLUENT SAMPLING POINT - 2  
E: 159253  
N: 074880

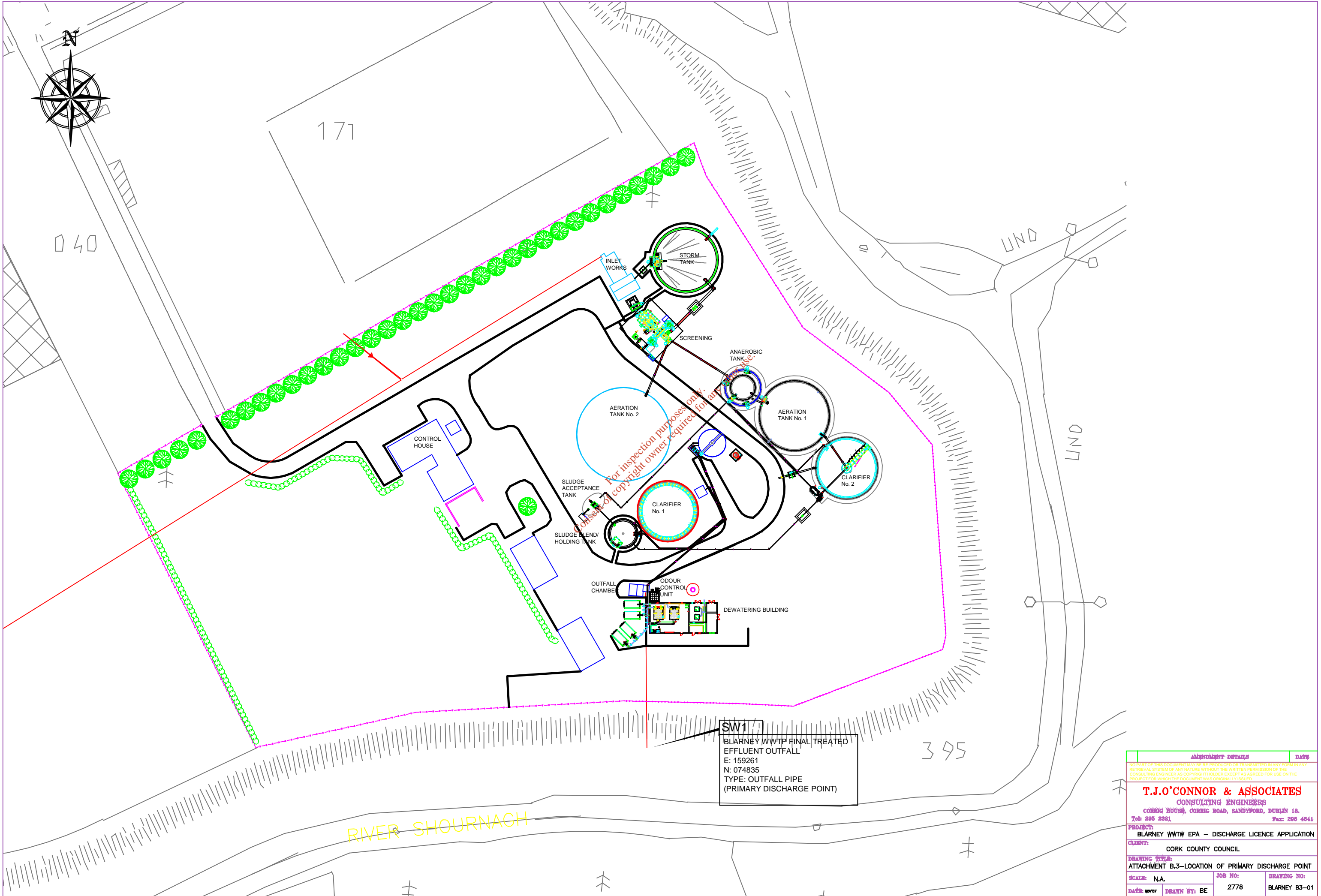
395

RIVER SHOURNACH

For inspection purposes only.  
No part of copyright may be reproduced



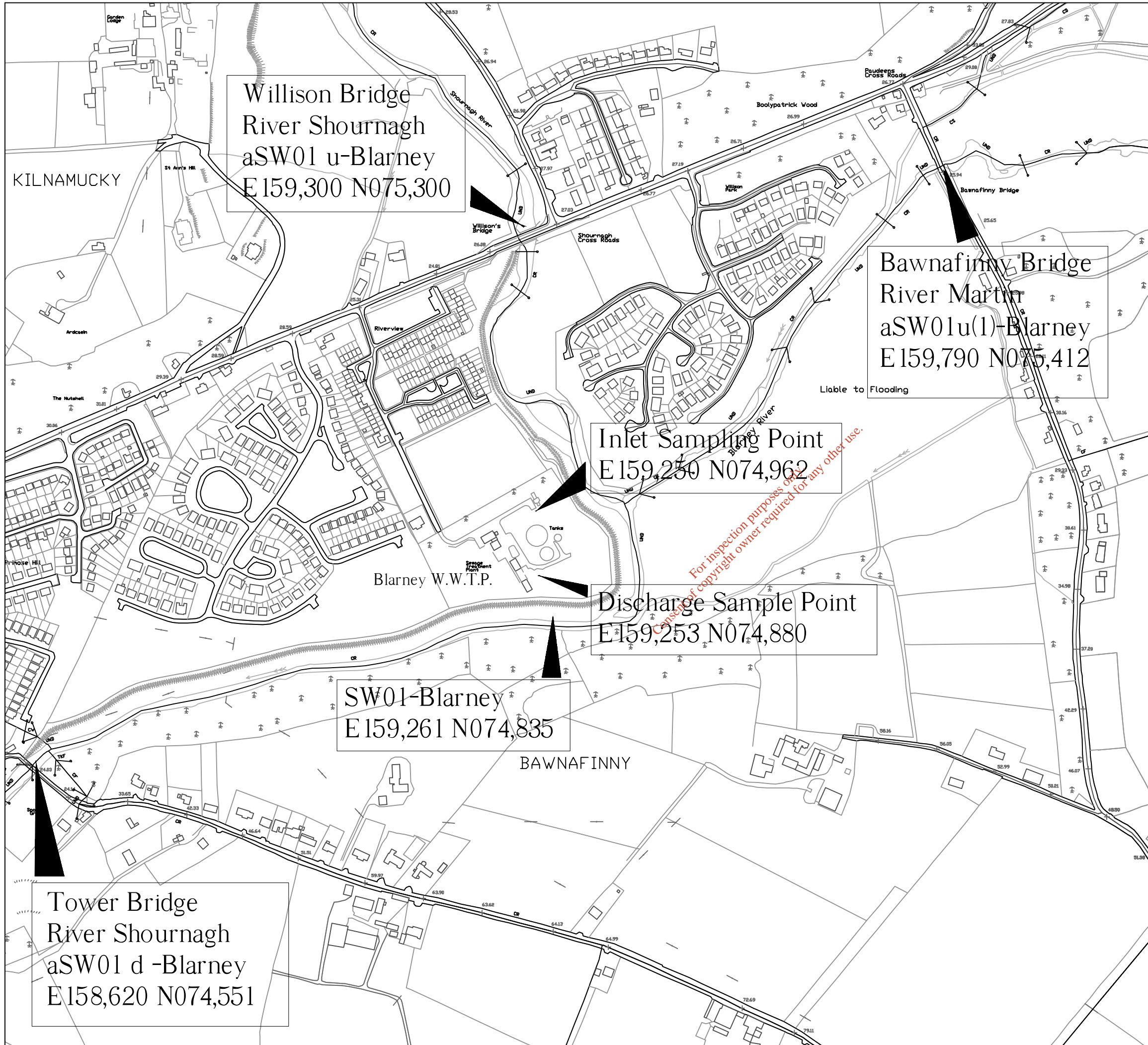
AMENDMENT DETAILS		DATE
NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF THE CONSULTING ENGINEER AS COPYRIGHT HOLDER EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DOCUMENT WAS ORIGINALLY ISSUED		
<b>T.J.O'CONNOR &amp; ASSOCIATES</b> CONSULTING ENGINEERS		
CORRIG HOUSE, CORRIG ROAD, SANDYFORD, DUBLIN 18. Tel: 295 2321 Fax: 295 4541		
PROJECT: BLARNEY WWTW EPA - DISCHARGE LICENCE APPLICATION		
CLIENT: CORK COUNTY COUNCIL		
DRAWING TITLE: ATTACHMENT B.2 - OVERALL SITE PLAN		
SCALE: N.A.	JOB NO: 2778	DRAWING NO: BLARNEY B2-01
DATE: 10/07	DRAWN BY: BE	



For inspection purposes only.  
Consent of copyright owner required for any other use.

SW1  
BLARNEY WWTP FINAL TREATED  
EFFLUENT OUTFALL  
E: 159261  
N: 074835  
TYPE: OUTFALL PIPE  
(PRIMARY DISCHARGE POINT)

AMENDMENT DETAILS		DATE
NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF THE CONSULTING ENGINEER AS COPYRIGHT HOLDER EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DOCUMENT WAS ORIGINALLY ISSUED.		
<b>T.J.O'CONNOR &amp; ASSOCIATES</b> CONSULTING ENGINEERS CORRIG HOUSH, CORRIG ROAD, SANDYFORD, DUBLIN 18. Tel: 296 2351 Fax: 296 4641		
PROJECT: BLARNEY WWTP EPA - DISCHARGE LICENCE APPLICATION		
CLIENT: CORK COUNTY COUNCIL		
DRAWING TITLE: ATTACHMENT B.3-LOCATION OF PRIMARY DISCHARGE POINT		
SCALE: N.A.	JOB NO: 2778	DRAWING NO: BLARNEY B3-01
DATE: 10/07	DRAWN BY: BE	



Notes:

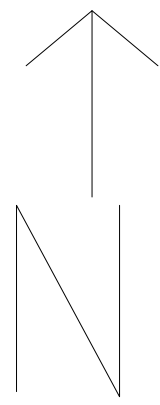
This drawing is the property of Cork County Council. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.

DO NOT SCALE. Use figured dimensions only. If in doubt ask.

All dimensions to be checked on site.

Drawing to be read in conjunction with Licence Application Form attached.

Includes Ordnance Survey Ireland data reproduced under OSi Licence number:  
Cork County Council CCMA 2004/07. Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland. © Ordnance Survey Ireland, 2004.



Cork County Council  
South Cork Division  
  
N. O'Keeffe, B.Eng., C.Eng., Eur.Ing., F.I.E.I., M.I.C.E.,  
Acting County Engineer  
County Hall, Cork.  
  
P. Power  
Director of Services  
South Cork.

Project:  
EPA LICENCE APPLICATION

Title:  
Primary Discharge Points.

Designed:LL	Checked: MM	Scale: 1:5000	Drawing No. B3-02-Blarney
Drawn:LL	Approved:MM	Date:Dec 07	





Notes:

This drawing is the property of Cork County Council. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.

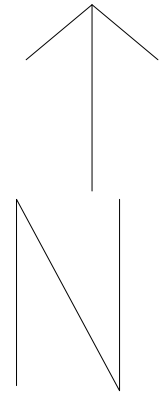
DO NOT SCALE. Use figured dimensions only. If in doubt ask.

All dimensions to be checked on site.

Drawing to be read in conjunction with Licence Application Form attached.

Includes Ordnance Survey Ireland data reproduced under OSi Licence number:

Cork County Council CCMA 2004/07. Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland. © Ordnance Survey Ireland, 2004.



Cork County Council  
South Cork Division

N. O'Keeffe, B.Eng., C.Eng., Eur.Ing., F.I.E.I., M.I.C.E.,  
Acting County Engineer  
County Hall, Cork.

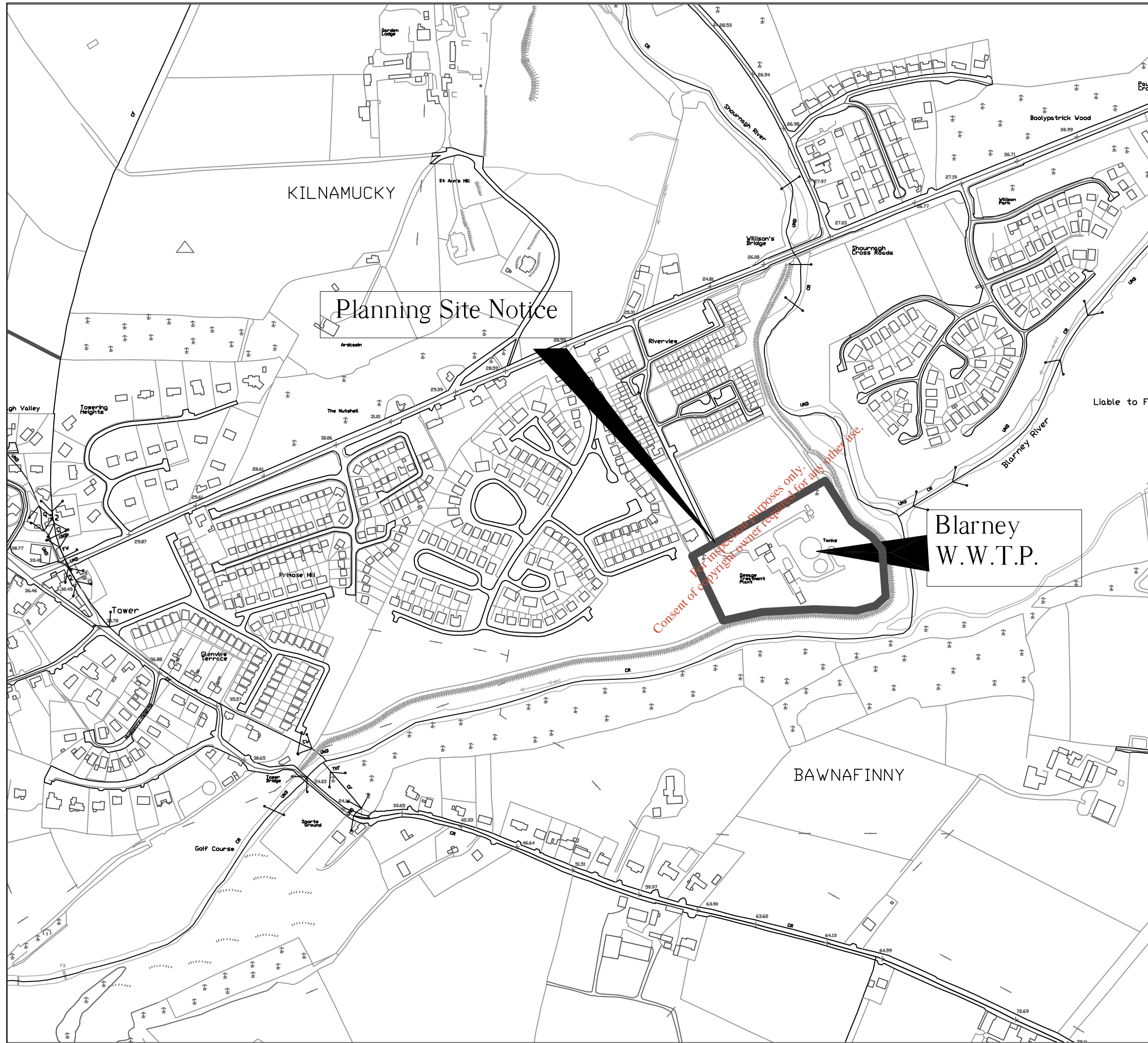
P. Power  
Director of Services  
South Cork.

Project:  
EPA LICENCE APPLICATION

Title:  
Secondary Discharge Points.

Designed:LL	Checked:MM	Scale: NTS	Drawing No. B4-01-Blarney
Drawn:LL	Approved:MM	Date:Dec 07	





Notes:

This drawing is the property of Cork County Council. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.

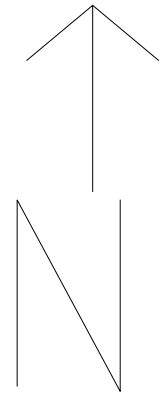
DO NOT SCALE. Use figured dimensions only. If in doubt ask.

All dimensions to be checked on site.

Drawing to be read in conjunction with Licence Application Form attached.

Includes Ordnance Survey Ireland data reproduced under OSI Licence number:

Cork County Council CCMA 2004/07. Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland. © Ordnance Survey Ireland, 2004.



Cork County Council  
South Cork Division

N. O'Keefe, B.Eng., C.Eng., Eur.Ing., F.I.E.I., M.I.C.E.,  
Acting County Engineer  
County Hall, Cork.

P. Power  
Director of Services  
South Cork.

Project:  
EPA LICENCE APPLICATION

Title:  
Site Notice Location.

Designed:LL	Checked: MM	Scale: NTS	Drawing No. B8-01-Blarney
Drawn:LL	Approved:MM	Date:Dec 07	

Cork County Council Southern Division

**APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE**

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007 SI No. 684 of 2007, Water Services Southern Division of Cork County Council, County Hall, Carrigrohane Road, Cork is applying to the Environmental Protection Agency for a Waste Water Discharge Licence in respect of Blarney Wastewater Treatment Plant serving the agglomeration of Blarney

<b>Plant Name</b>	<b>Location</b>	<b>National Grid Ref.</b>
<b>Blarney WWTP</b>	<b>Riverview Estate, Tower, Co. Cork Townland of Kilnamucky</b>	<b>E159196 N74918</b>

<b>Discharge</b>	<b>Function</b>	<b>Townland</b>	<b>Receptor</b>	<b>Grid Reference</b>
<b>Primary</b>	<b>Main Outfall</b>	<b>Kilnamucky</b>	<b>River Shournagh</b>	<b>E159,261 N74,835</b>
<b>Secondary</b>	<b>Emergency</b>	<b>Woodside</b>	<b>River Shournagh</b>	<b>E160,341 N73,241</b>
<b>Secondary</b>	<b>Emergency</b>	<b>Coolflugh</b>	<b>Owennagearagh</b>	<b>E157,548 N74,040</b>
<b>Secondary</b>	<b>Emergency</b>	<b>Shean Lower</b>	<b>Mill Race to River Martin</b>	<b>E161,602 N75,245</b>

It is intended to submit the Environmental Impact Statement associated with the recent upgrading of the Waste Water Treatment Plant to the Agency along with the Application.

A copy of the application for the Waste Water Discharge Licence, the Environmental Impact Statement and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall as soon as is practicable after receipt by the Agency be available for inspection or purchase at the

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335599 Telephone: 053-9160600 Fax: 053-9160699 Email: info@epa.ie  
and at
- Cork County Council Offices, Water Services South, Co Hall Carrigrohane Road, Co. Cork, Telephone: 021-4276891 Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above



## CORK COUNTY COUNCIL

### SITE NOTICE

#### APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007 SI No. 684 of 2007, Water Services Southern Division of Cork County Council, County Hall, Carrigrohane Road, Cork is applying to the Environmental Protection Agency for a Waste Water Discharge Licence in respect of Blarney Wastewater Treatment Plant serving the agglomeration of Blarney

Plant Name	Location	National Grid Ref.
Blarney WWTP	Riverview Estate, Tower, Co. Cork Townland of Kilnamucky	E159196 N74918

Discharge	Function	Townland	Receptor	Grid Reference
Primary	Main Outfall	Kilnamucky	River Shournagh	E159,261 N74,835
Secondary	Emergency	Woodside	River Shournagh	E160,341 N73,241
Secondary	Emergency	Coalfhugh	Owennagearagh	E157,548 N74,040
Secondary	Emergency	Shean Lower	Mill Race to River Martin	E161,602 N75,245

It is intended to submit the Environmental Impact Statement associated with the recent upgrading of the Waste Water Treatment Plant to the Agency along with the Application.

A copy of the application for the Waste Water Discharge Licence, the Environmental Impact Statement and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall as soon as is practicable after receipt by the Agency be available for inspection or purchase at the

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335599 Telephone: 053-9160600 Fax: 053-9160699 Email: info@epa.ie

and at

- Cork County Council Offices, Water Services South, Co Hall Carrigrohane Road, Co. Cork, Telephone: 021-4276891 Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above



**Kevin Sugrue**

I have examined B.10 Capital Investment Programme and I have broken down the request to its constituent parts as shown below and have addressed them in the table to the best of my ability. You should attach a copy of the Assessment of Needs and the published WSIP.

Regards,

ROF

10<sup>th</sup> December 2007

**B.10 Capital Investment Programme**

Provide details of

1/ any proposed infrastructural development for the waste water works which has been prioritised in the water services authority 'Assessment of Needs' study.

2/ State whether this development work has been allocated funding under local or national **Water Services Investment Plans**.

If so, provide details

2a/ on the extent and type of work to be undertaken,

2b/ the likely timeframes for this work to be completed and

2c/ the level of funding being provided.

For inspection purposes only.  
Consent of copyright owner required for any other use.

**Table B10.**

	AGGLOMERATION	ASSESSMENT OF NEEDS	WATER SERVICES INVESTMENT PLANS.	EXTENT AND TYPE OF WORK	LIKELY TIMEFRAMES	LEVEL OF FUNDING
1	Blarney	No	No	Blarney (Blarney/Tower) has recently been upgraded to 13,000 p.e. secondary treatment and <u>includes nutrient removal</u> . No additional upgrading is proposed at this time.	N/A	N/A
2	Crosshaven	Yes	Yes- works at Crosshaven completed under the WSIP 2005-2007.	Forms an element of the proposed Lower Harbour SS. Crosshaven collection systems connected to Carrigaline SS from where it is pumped onwards to the 'IDA' outfall discharging at the Dognose Bank.	Element is completed and commissioned.	€ 5m 80% DEHLG grant , 20% local funding
3	Cobh	Yes	Yes	Forms part of the proposed Lower Harbour SS that includes major upgrading of the Cobh collection system and transfer of the wastewater across Cork Harbour to a proposed new 80,000 p.e. secondary WWTP to be constructed at Carrigaline East, Ringaskiddy and which will discharge to the 'IDA' outfall. Nutrient removal is not being proposed as discharge is not to a sensitive area.	EIS for WWTP to be submitted to An Bored Pleanala Jan '08. PR for Lower Harbour SS expected to be approved Sept.08, Construction to commence March 2010, completion March 2012	€76m Estimated 80% DEHLG grant and 20% local funding
4	Carrigaline	Yes	Yes	Forms part of the proposed Lower Harbour SS. The effluent from Carrigaline, which now includes Crosshaven, discharges untreated via the 'IDA' outfall at the Dognose Bank. It will be served by the proposed new 80,000 p.e. secondary WWTP to be constructed at Carrigaline East, Ringaskiddy and which will discharge to the 'IDA' outfall.	As for Cobh	As for Cobh
5	Ringaskiddy	Yes	Yes	Forms part of the proposed Lower Harbour SS. Wastewater from Ringaskiddy will be pumped to the new WWTP at Carrigaline East Ringaskiddy	As for Cobh	As for Cobh
6	Carrigtwohill	Yes	Yes	First phase proposal is to increase capacity to 45,000 p.e. secondary treatment. Nutrient removal is being proposed in the EIS and PR as the discharge area is currently designated a sensitive area.	EIS to ABP March '08	€20m - To be funded as an SLI Scheme i.e. 40% DEHLG funding and 60% local funding

Attachment included		Yes	No
1/ Assessment of Needs		Yes	
2/ Water Services Investment programme 2007-2009		Yes	



## SECTION C: INFRASTRUCTURE & OPERATION

Advice on completing this section is provided in the accompanying Guidance Note.

### C.1 Operational Information Requirements

Provide a description of the plant, process and design capacity for the areas of the waste water works where discharges occur, to include a copy of such plans, drawings or maps, (site plans and location maps, process flow diagrams), and such other particulars, reports and supporting documentation as are necessary to describe all aspects of the area of the waste water works discharging to the aquatic environment. Maps and drawings must be no larger than A3 size.

#### *Treatment Plant*

The Blarney WWTP is designed for a Population Equivalent (PE) of 13,000PE and BOD loading of 780Kg/day. The maximum hydraulic capacity of the Blarney WWTP is 384m<sup>3</sup>/h which is 2.7 Dry Weather Flow (2.7DWF). In order to cope with flows above 2.7DWF storm storage has been provided at the WWTW. The volume of storm storage at the WWTW is approximately 366m<sup>3</sup>. In the event that the storm water holding tanks are filled and the storm continues, the storm water tanks are operated as a pre-clarification tank without sludge removal. The overflow from the storm water storage tank is connected to the final effluent outlet pipe.

The treatment plant treats all flows that arrive at the works to secondary standards in accordance with the Urban Waste Water Directive 1994 as shown in the following table:

Parameter	Effluent Limit
BOD	25 mg/l
COD	125 mg/l
Suspended Solids	35 mg/l
Phosphate	2 mg/l
Ammonia	3 mg/l
Total Nitrogen	25 mg/l
Sludge	18% or greater

Table 1 – Effluent Limits discharge

The existing WWTW were upgraded with an additional stream. The flow is split after the wastewater passes through the new inlet works. 50% of the flow is diverted to the existing wastewater treatment stream. The remaining 50% is directed to a new treatment system. The existing stream has an aeration phase, a secondary settlement phase and return activated sludge phase. The new stream has an anaerobic, anoxic and aeration phase, a secondary settlement phase and return activated sludge phase.

Sludge is wasted separately from each stream to a common storage sludge blend tank, common Picket Fence Thickener and common dewatering plant.

A summary of the treatment process is presented below:

<b>Inlet works</b>	2Duty/1Standby pumps, 2 No. mechanical screens with aerated grit and grease removal system, flow measurement and grit classifier.	
	<b>EXISTING STREAM</b>	<b>NEW STREAM</b>
<b>Biological Treatment</b>	1 No. aeration tank with 3 No. surface aerators.	- 1 No. Anaerobic tank with 3 No. mixers. - 1 No. Anoxic tank - 1 No. aeration tank with fine bubble disc aeration
<b>Phosphorus Removal</b>	Ferric Sulphate dosing	
<b>Secondary Settling</b>	1 No. 19m diameter final settlement tanks with half bridge sludge scraper.  Sludge settled within the settlement tanks is withdrawn by gravity from each central sludge hopper to the return sludge pump sump.  Surplus Activated Sludge (SAS) is pumped by 2 No. pumps (Duty/Standby) from the pump sump to the sludge blend/holding tank. Return Activated Sludge (RAS) is pumped 2 No. pumps (Duty/Standby) from the pump sump and is mixed with the incoming influent.	1 No. 17m diameter final settlement tanks with half bridge sludge scraper.
<b>Sludge Treatment</b>	<ul style="list-style-type: none"> <li>- 1 No. sludge acceptance tank, 45m<sup>3</sup>, 1 No. mixer and sludge pump sump equipment with 2 No. Pumps.</li> <li>- 1 No. Sludge Blend/Holding tank, 192m<sup>3</sup>, 1 No. mixer and sludge pump sump equipment with 2 No. Pumps.</li> <li>- 1 No. Picket Fence Thickener for thickening from 0.5% to 2% Dry Solids, 192m<sup>3</sup>.</li> <li>- 2 No. Sludge Belt Presses with 2 No. sludge transfer pumps, 1 No. poly make-up unit with 3 No. dosing pumps.</li> </ul>	
<b>Effluent Discharge</b>	1 No. 450mm gravity outfall pipe to River Shournagh.	

Ancillary equipment at the WWTP also includes the following:

- Odour Treatment Unit with 2 No extractor fans.
- Standby Generator and SCADA system covering all the plant including sludge treatment process.
- Buildings - Inlet and sludge building, electricity transformer building, laboratory and control room building with fire alarm and security alarm systems.

**Attachment C.1** should contain supporting documentation with regard to the plant and process capacity, systems, storm water overflows, emergency overflows, etc., including flow diagrams of each with any relevant additional information. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, D.2, E.3 and F.2.

Attachment included	Yes	No
	*	

**C.2 Outfall Design and Construction**

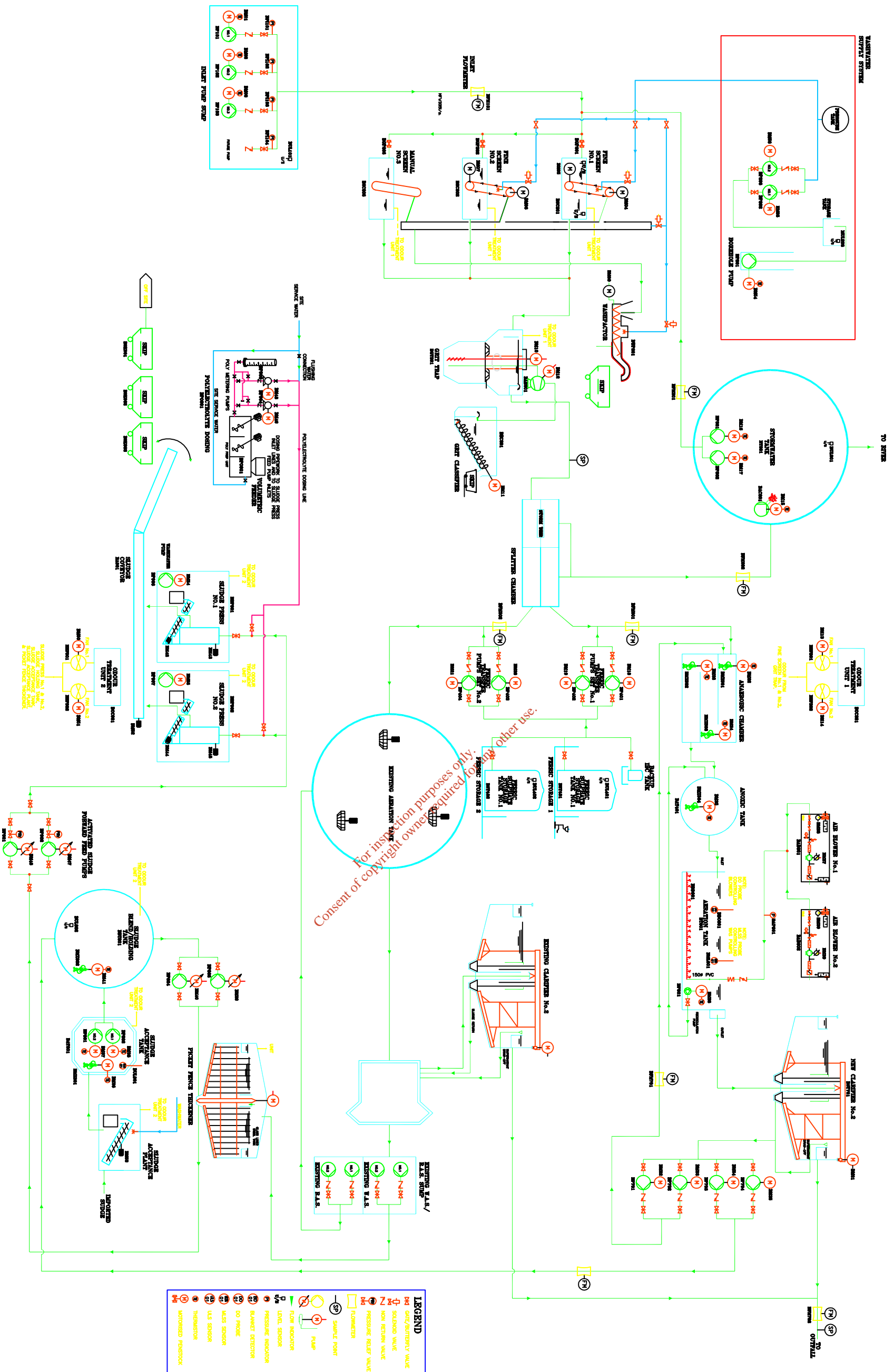
Provide details on the primary discharge point & secondary discharge points and storm overflows to include reference, location, design criteria and construction detail.

**Attachment C.2** should contain any supporting documentation on the design and construction of any and all discharge outfalls, including stormwater overflows, from the waste water works.

Attachment included	Yes	No
	*	

For inspection purposes only.  
Consent of copyright owner required for any other use.

1. ALL SUBMERSIBLE PUMPS TO HAVE A THERMISTOR
2. ALL MIXERS TO HAVE LOCAL CONTROL



For inspection purposes only.  
Consent of copyright owner required for any other use.

FOR APPROVAL

No.	Revd.	Date	Description
1	MOS KC JP	13.01.03	Addition of Grit Trap No.2 & movement of Inlet Sampler.
0	MOS KC JP	08.08.02	Issued for Tender
Rev Dm/Ckd/lpd Date			
No. Reqd.		Materials:	
		Finish:	

**EPS** Pumping & Treatment Systems  
 Industrial Estate,  
 Dunderstown,  
 Co. Cork,  
 Phone: 022-31200  
 Fax: 022-31280  
 Email: info@epsireland.com

Ballyhouna,  
 Co. Mayo,  
 Phone: 0907-30726  
 Fax: 0907-30761  
 Mounteth,  
 Co. Leitrim,  
 Phone: 0502-32279  
 Fax: 0502-33518

Contract: **CORK COUNTY COUNCIL**  
**BLARNEY-C01**

Drawing Title: **Process & Instrumentation Diagram**

Scale: NTS	Date: 04/07/02
Drawn By: M O'Shea	
Revision Suffix: 0 1 2	
Job No.:	
Dwg No.:	BLARNEY-C01
Workshop No.:	

## SECTION D: DISCHARGES TO THE AQUATIC ENVIRONMENT

Advice on completing this section is provided in the accompanying Guidance Note.

Give particulars of the source, location, nature, composition, quantity, level and rate of discharges arising from the agglomeration and, where relevant, the period or periods during which such emissions are made or are to be made.

The applicant should address in particular all discharge points where the substances outlined in Tables D.1(i), (b) & (c) and D.1(ii), (b) & (c) of Annex 1 are emitted.

Where it is considered that any of the substances listed in Annex X of the Water Framework Directive (2000/60/EC) or any of the Relevant Pollutants listed in Annex VIII of the Water Framework Directive (2000/60/EC) are being discharged from the waste water works or are seen to be present in the receiving water environment downstream of a discharge from the works (as a result of any monitoring programme) the applicant shall screen the discharge for the relevant substance.

### D.1 Discharges to Surface Waters

Details of all discharges of waste water from the agglomeration should be supplied. Tables D.1(i)(a), (b) & (c) should be completed for the primary discharge point from the agglomeration and Tables D.1(ii)(a), (b) & (c) of Annex 1 should be completed for **each** secondary discharge point, where relevant. Table D.1(iii)(a) should be completed for **each** storm water overflow. Individual Tables must be completed for each discharge point.

Supporting information should form **Attachment D.1**

Attachment included	Yes	No

### D.2 Tabular Data on Discharge Points

Applicants should submit the following information for each discharge point:

**Table D.2:**

**See attached file: D2\_Blarney**

PT_CD	PT_TYPE	LA_NAME	RWB_TYPE	RWB_NAME	DESIGNATION	EASTING	NORTHING
Point Code Provide label ID's	Point Type (e.g., Primary/ Secondary/ Storm Water Overflow)	Local Authority Name (e.g., Donegal County Council)	Receiving Water Body Type (e.g., River, Lake, Groundwater, Transitional, Coastal)	Receiving Water Body Name (e.g., River Suir)	Protected Area Type (e.g., SAC, candidate SAC, NHA, SPA etc.)	6E-digit GPS Irish National Grid Reference	6N-digit GPS Irish National Grid Reference

An individual record (i.e. row) is required for each discharge point.

**TABLE D.1(i)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Primary Discharge Point)**

**Discharge Point Code:** SW01Blarney

Source of Emission:	Treated wastewater from Blarney wastewater treatment plant
Location:	Townland of Kilnamucky
Grid Ref. (12 digit, 6E, 6N):	E159261 N74835
Name of receiving waters:	River Shournagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA ,Shournagh is tributary of Salmonid River Lee
Flow rate in receiving waters:	_____m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow _____m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow

**Emission Details:**

(i) Volume emitted			
Normal/day	2046m <sup>3</sup>	Maximum/day	5779m <sup>3</sup>
Maximum rate/hour	240m <sup>3</sup>	Period of emission (avg)	24 hours per day per annum _____min/hr _____hr/day _____day/yr
Dry Weather Flow	m <sup>3</sup> /sec		

**TABLE D.1(i)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (Primary Discharge Point)**

***Discharge Point Code:SW01Blarney***

Number	Substance	As discharged	
		Max. daily average	
1	pH	7.37	
2	Temperature	Not available	
3	Electrical Conductivity(@20°C)	332	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	13.5	27.6
5	Ammonia (as N)	0.35	0.72
6	Biochemical Oxygen Demand	8.6	17.5
7	Chemical Oxygen Demand	44.8	91.7
8	Total Nitrogen (as N)	21.1	43.1
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	0.43	0.9
11	Total Phosphorus (as P)	2.95	6.0
12	Orthophosphate (as P) <sup>Note 1</sup>	1.76	3.6
13	Sulphate (SO <sub>4</sub> )	42	86.8
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	<0.10	<0.0002

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Consent of copyright owner required for any other use  
For inspection purposes only

**TABLE D.1(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Primary Discharge Point - Characteristics of the emission**

***Discharge Point Code: SW01Blarney***

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	<0.01	<0.000021	<0.0077
2	Dichloromethane	<1		
3	Simazine	<0.01	<0.000021	<0.0077
4	Toluene	<0.01	<0.000021	<0.0077
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	<0.01	<0.000021	<0.0077
7	Arsenic	6	0.0123	4.49
8	Chromium	<20	<0.041	<14.96
9	Copper	<20	<0.041	<14.96
10	Cyanide	<5	<0.0102	<3.72
11	Fluoride	230	0.47	171.6
12	Lead	<20	<0.041	<14.96
13	Nickel	<20	<0.041	<14.96
14	Zinc	30	0.06	21.9
15	Boron	<20	<0.041	<14.96
16	Cadmium	<20	<0.041	<14.96
17	Mercury	0.6	0.0012	0.44
18	Selenium	<0.7	<0.0015	<0.55
19	Barium	<20	<0.041	<14.96



**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS**  
**(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code:** SW02Blarney

Source of Emission:	Emergency Outfall Blarney
Location:	Townland of Shean Lower
Grid Ref. (12 digit, 6E, 6N):	E161602 N75245
Name of receiving waters:	Mill Race to River Martin
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not Available
Flow rate in receiving waters:	<p>_____ Not Available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p>_____ Not Available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not Available			
Normal/day	Not Available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not Available m <sup>3</sup>	Period of emission (avg)	_____ Not Available__min/hr _____hr/day _____day/yr
Dry Weather Flow	Not Available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW02Blarney

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW02Blarney**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code:** SW03Blarney

Source of Emission:	Emergency Outfall Blarney
Location:	Townland of Woodside
Grid Ref. (12 digit, 6E, 6N):	E160341 N73241
Name of receiving waters:	River Shournagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not available
Flow rate in receiving waters:	_____ Not available _____ m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow _____ Not available _____ m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow

**Emission Details:**

(i) Volume emitted Not available			
Normal/day	Not available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not available m <sup>3</sup>	Period of emission (avg)	_____ Not available__min/hr _____hr/day _____day/yr
Dry Weather Flow	Not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW03Blarney

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW03Blarney**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code:** SW04Blarney

Source of Emission:	Emergency Outfall Blarney
Location:	Townland of Coolflugh
Grid Ref. (12 digit, 6E, 6N):	E157548 N74040
Name of receiving waters:	River Owennagearagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not available
Flow rate in receiving waters:	<p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not available			
Normal/day	Not available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not available m <sup>3</sup>	Period of emission (avg)	____ Not available ____ min/hr ____ hr/day ____ day/yr
Dry Weather Flow	Not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW04Blarney

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.



**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW04Blarney**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code:** SW01Blarney

Source of Emission:	Storm water Overflow Blarney
Location:	Townland of Kilnamucky
Grid Ref. (12 digit, 6E, 6N):	E159261 N74835
Name of receiving waters:	River Shournagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA ,Shournagh is tributary of Salmonid River Lee
Flow rate in receiving waters:	<p style="text-align: right;">_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p style="text-align: right;">_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not available			
Normal/day	Not available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not available m <sup>3</sup>	Period of emission (avg)	_____Not available__min/hr _____hr/day _____day/yr

**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code:** SW02Blarney

Source of Emission:	Storm water Overflow Blarney
Location:	Townland of Shean Lower
Grid Ref. (12 digit, 6E, 6N):	E161602 N75245
Name of receiving waters:	Mill Race to River Martin
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not Available
Flow rate in receiving waters:	<p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not Available			
Normal/day	Not Available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not Available m <sup>3</sup>	Period of emission (avg)	_____ Not Available_min/hr _____hr/day _____day/yr

**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code:** SW03Blarney

Source of Emission:	Storm water Overflow Blarney
Location:	Townland of Woodside
Grid Ref. (12 digit, 6E, 6N):	E160341 N73241
Name of receiving waters:	River Shournagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not available
Flow rate in receiving waters:	<p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not available			
Normal/day	Not available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not available m <sup>3</sup>	Period of emission (avg)	_____ Not available__ min/hr _____ hr/day _____ day/yr

**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code:** SW04Blarney

Source of Emission:	Storm water Overflow Blarney
Location:	Townland of Coolflugh
Grid Ref. (12 digit, 6E, 6N):	E157548 N74040
Name of receiving waters:	River Owennagearagh
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not available
Flow rate in receiving waters:	<p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> Dry Weather Flow</p> <p>_____ Not available _____ m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</p>

**Emission Details:**

(i) Volume emitted Not available			
Normal/day	Not available m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	Not available m <sup>3</sup>	Period of emission (avg)	_____ Not available _min/hr _____hr/day _____day/yr









**TABLE E.1(i): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Primary and Secondary Discharge Points**

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m <sup>3</sup> /annum)
SW01Blarney ( <b>P</b> )	365 days per annum	746790(based on an average flow)
SW02Blarney	Not available	Not available
SW03Blarney	Not available	Not available
SW04Blarney	Not available	Not available

For inspection purposes only.  
Consent of copyright owner required for any other use.

**TABLE E.1(ii): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Storm Water Overflows**

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m <sup>3</sup> /annum)	Complies with Definition of Storm Water Overflow
SW01Blarney	Not available	Not available	Not available
SW02Blarney	Not available	Not available	Not available
SW03Blarney	Not available	Not available	Not available
SW04Blarney	Not available	Not available	Not available

For inspection purposes only.  
Consent of copyright owner required for any other use.

## Attachment E2

### Blarney application

Cork County Council operate a composite sampler on the primary discharge outlet from the treatment plant to the river. The plant is currently monitored by the Environment Directorate of Cork County Council on a monthly basis to measure compliance with the requirements of the Urban wastewater Directive. Samples are also collected upstream and downstream of the discharge location at this time. The inlet and outlet are monitored by the water services section on a fortnightly basis in order to evaluate the performance of the plant. The river Lee which is the receiving water body is monitored in terms of the Salmonid Directive ,the Phosphorus Regulations by the Water laboratory of Cork County Council and in recent times the Water Framework Directive as part of the River basin project. It is proposed to continue with this multi- faceted approach to monitoring the treatment plant and the impacts of the discharge to waters.

The river is also monitored at the waterworks intake for the Cork City Council drinking water plant by both Cork County and Cork city council on a monthly basis as part of the salmonid programme by Cork County Council and in terms of the Abstraction directive by Cork City Council. The intake location is monitored by Cork City Council for both **Cryptosporidium** and Giardia and the results were acceptable. The city council have monitored the intake since the last date of results recorded on the spreadsheet in E4 and while the results were not available at this time in a spreadsheet for use in the application it has been confirmed that there have been no exceedances and the water at this location is suitable for abstraction purposes to produce drinking water for human consumption..

There are no designated shellfish waters or bathing waters downstream of the plant and the river downstream of the treatment plant is not designated sensitive under the urban wastewater directive.

Samples from the treatment plant discharge are analysed for BOD,COD, Ammonia, pH ,Suspended Solids, Total Nitrogen Total Phosphorus ,Sulphate ,Ortho phosphate(in recent times) and Metals (in recent times). Upstream and downstream samples were analysed in accordance with the urban waste water directive requirements for river samples.

The wastewater Laboratory of Cork County Council are accredited for a number of analytical tests under the Irish National Accreditation Board (INAB) under the ISO 17025 international standard . We currently are accredited for the following parameters under the ISO 17025 system

- pH
- Biochemical Oxygen Demand
- Chemical Oxygen Demand
- Suspended Solids
- Ammonia
- Ortho Phosphate
- Total Phosphate
- Chloride
- Sulphate

The laboratory perform a number of analytical tests e.g. Fats Oil, Grease &Metals using an ICP-OES system and while we are not currently accredited for extra tests the analytical procedures and protocol are adhered to by the laboratory as if the tests are accredited,. The laboratory also participate in proficiency testing schemes which measure the accuracy of results and performance of the laboratory in both the EPA scheme and the WRC Aquacheck scheme from the UK. The performance of the laboratory in these schemes is excellent and the non accredited tests are within the performance criteria for the schemes as evaluated by the scheme coordinators.

For inspection purposes only  
Consent of copyright owner required for any other use.



Monitoring by Cork City Council under the Abstarction Directive at the intake to Lee Road waterworks

**SURFACE WATER 2006 mg/l**

*(For Surface Water Directive)  
Monitoring by Cork City Council*

<b>DATE</b>	<b>Jan</b>	<b>Feb</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>July</b>	<b>Aug</b>	<b>Oct</b>	<b>Nov</b>	(For Surface Water Dir) Long List OCTOBER sample
<b>pH</b>	7.11	6.85	6.8	7.11	7.15	7.35	7.46	7.22	7.35	
<b>Col</b>	20H.U	20HU	30H.U	17H.U	15H.U	15H.U	18H.U	17H.U	20H.U	
<b>SS</b>	17mg/l	14mg/l	15mg/l	17mg/l	18mg/l	12mg/l	9mg/l	3	11mg/l	
<b>TEMP</b>	9.5.C	10.1.C	10.5.C	16.5.C	18.1.C	21.C	22.C	15.6.C	13.C	<b>Parameter</b> <b>Result</b>
<b>COND.</b>	187us	200us	138us	150us	220us	178us	168us	147us/cm	170us	<b>Cyanide</b> <0.1
<b>ODOUR</b>	None	None	None	None	None	None	None	None	None	<b>Phenol.</b> <0.005
<b>Nitrate</b>	22.3	20.4	25.2	26.1	27.2	17	12.3	11.4	13.5	<b>COD.</b> 22
<b>Fluoride</b>	0.009	0.11	0.15	0.008	0.12	0.05	0.03	0.03	0.04	<b>D.O.</b> 97%
<b>Dis. Iron</b>	0.007	0.01	0.05	0.01	0.02	0.015	0.025	0.03	0.02	<b>BOD.</b> 2.1
<b>Mn</b>	0.01	0.006	0.022	0.009	0.008	0.01	0.03	0.013	0.02	<b>K.Nitrogen.</b> 0.3
<b>Cu</b>	0.007	0.004	0.007	0.006	0.005	0.003	0.001	0.015	0.001	<b>Ammonia.</b> 0.07
<b>Zn</b>	0.007	0.004	0.005	0.003	0.009	0.004	0.001	0.002	0.002	<b>Tot. Coli</b> 2,000/100ml
<b>Lead</b>	0.001	0.001	<0.001	<.001	0.001	0.001	0.001	,0.001	0.001	<b>F.Coli.</b> 200/100ml
<b>Sulphate</b>	2.7	1.5	2.1	2.6	2.4	2.5	2	2	2.4	<b>Boron.</b> <0.3
<b>Chloride</b>	21.7	24.1	15.7	16.1	15.6	16.2	17	18.4	16.5	<b>Arsenic.</b> <0.001
<b>Surf.</b>	0.001	0.001	0.002	0.001	0.001	0.002	0.003	<0.005	0.003	<b>Selenium.</b> 0.003
<b>Tot.P</b>	0.75	0.81	0.9	1	1.1	1	1.1	0.06	1.3	<b>Mercury.</b> <0.1
<b>Phenol</b>	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<b>Barium.</b> 0.011
<b>COD</b>	9	7	15	12	9	9	10		12	<b>PAH.</b> <0.01ug/l
<b>DO</b>	98%	97%	96%	96%	165%	125%	104%		90%	<b>Tot.Pest.</b> <0.05ug/l
<b>BOD</b>	1.5	1	2	2.1	2.1	2	2.2		2.4	<b>F.Strep.</b> 47/100mls
<b>K.Nitrogen</b>	0.09	0.07	0.1	0.2	0.15	0.19	0.2		0.21	<b>Salmonella.</b> <b>ABSENT</b>
<b>Ammonia</b>	0.01	0.03	0.15	0.08	0.11	0.15	0.12		0.17	
<b>TOT COLI</b>	2000/100ml	1750/100ml	1150/100ml	2000/100ml	2000/100ml	2748/100ml	2354/100ml		1500/100ml	
<b>F. COLI</b>	500/100ml	440/100ml	370/100ml	200/100ml	220/100ml	170/100ml	180/100ml		120/100ml	

## Section E4

**Cork City Council Monitoring Data at water works Intake****CRYPTOSPORIDIUM/GIARDIA ANALYSIS IN RAW WATER**

Sampling Point	Date Sample taken	Vol Analysed (L)	No. of Cryptosporidial Oocysts/L	No. of Giardial Cysts/L
Inlet, C.C.W.W.	28/01/1998	10	0	
Inlet, C.C.W.W.	30/03/1998	10	0	0
Inlet, C.C.W.W.	12/05/1998	10	0	0
Inlet, C.C.W.W.	18/06/1998	10	0	0
Inlet, C.C.W.W.	28/07/1998	10	0	0
Inlet, C.C.W.W.	01/09/1998	10	0.1	1
Inlet, C.C.W.W.	06/10/1998	5	0.2	0
Inlet, C.C.W.W.	03/11/1998	10	0	0
Inlet, C.C.W.W.	15/12/1998	5	0.2	0.6
Inlet, C.C.W.W.	19/01/1999	10	0	0
Inlet, C.C.W.W.	23/02/1999	10	0	0
Inlet, C.C.W.W.	30/03/1999	10	0.4	0
Inlet, C.C.W.W.	13/04/1999	10	0	0
Inlet, C.C.W.W.	11/05/1999	10	0.1	0.1
Inlet, C.C.W.W.	01/06/1999	10	0	0
Inlet, C.C.W.W.	06/07/1999	10	0	0
Inlet, C.C.W.W.	07/09/1999	10	0	0
Inlet, C.C.W.W.	02/11/1999	10	0	0
Inlet, C.C.W.W.	14/12/1999	10	0	0
Inlet, C.C.W.W.	01/02/2000	10	0	0
Inlet, C.C.W.W.	14/03/2000	10	0	0
Inlet, C.C.W.W.	11/04/2000	10	0	0
Inlet, C.C.W.W.	09/05/2000	10	0	0
Inlet, C.C.W.W.	20/06/2000	10	0	0
Inlet, C.C.W.W.	24/07/2000	10	0	0
Inlet, C.C.W.W.	23/08/2000	10	0	0
Inlet, C.C.W.W.	27/09/2000	10	0	0
Inlet, C.C.W.W.	24/10/2000	10	0	0
Inlet, C.C.W.W.	21/11/2000	10	0	0
Inlet, C.C.W.W.	05/12/2000	10	0.2	0
Inlet, C.C.W.W.	23/01/2001	10	0	0
Inlet, C.C.W.W.	20/02/2001	10	0	0
Inlet, C.C.W.W.	20/03/2001	10	0	0
Inlet, C.C.W.W.	29/05/2001	10	0	0
Inlet, C.C.W.W.	26/06/2001	10	0	0
Inlet, C.C.W.W.	24/07/2001	10	0	0
Inlet, C.C.W.W.	21/08/2001	10	0	0
Inlet, C.C.W.W.	18/09/2001	10	0	0
Inlet, C.C.W.W.	31/10/2001	10	0.3	0.2
Inlet, C.C.W.W.	20/11/2001	10	0	0
Inlet, C.C.W.W.	22/01/2002	10	0	0
Inlet, C.C.W.W.	19/03/2002	10	0	0
Inlet, C.C.W.W.	16/07/2002	10	0	0
Inlet, C.C.W.W.	13/08/2002	10	0	0
Inlet, C.C.W.W.	24/09/2002	10	0	0
Inlet, C.C.W.W.	31/10/2002	10	0	0
Inlet, C.C.W.W.	29/01/2003	10	0	0
Inlet, C.C.W.W.	01/04/2003	10	0	0
Inlet, C.C.W.W.	19/05/2003	10	0	0
Inlet, C.C.W.W.	01/07/2003	10	0	0
Inlet, C.C.W.W.	22/09/2003	10	0	0

For inspection purposes only.  
Consent of copyright owner required for any other use.

Inlet, C.C.W.W.	04/11/2003	10	0	0
Inlet, C.C.W.W.	06/02/2004	10	0	0
Inlet, C.C.W.W.	26/03/2004	10	0	0
Inlet, C.C.W.W.	22/04/2004	10	0	0
Inlet, C.C.W.W.	27/07/2004	10	0	0
Inlet, C.C.W.W.	28/10/2004	10	0	0
Inlet, C.C.W.W.	03/03/2005	10	0	0
Inlet, C.C.W.W.	07/04/2005	10	0	0
Inlet, C.C.W.W.	01/06/2005	10	0	0
Inlet, C.C.W.W.	11/08/2005	10	0	0
Inlet, C.C.W.W.	20/10/2005	10	0	0
Inlet, C.C.W.W.	10/11/2005	10	0	0

In 2006 we discontinued taking a 10 litre grab sample and now use a Filta-Max.

Section E4

### Cork City Council Monitoring Data at water works Intake

<u>Sampling Point</u>	<u>Date Sample Taken</u>	<u>Vol Filtered (in Litres )</u>	<u>No of Cryptosporidial Oocysts detected/l</u>	<u>No of Giardial Cysts/l</u>
Inlet, C.C.W.W.	09/02/2006		0.03/L	0/L
Inlet, C.C.W.W.	27/07/2006	80	0.000/L	0.000/L
Inlet, C.C.W.W.	01/09/2006	199	<0.01/10L	<0.01/10L
Inlet, C.C.W.W.	05/10/2006	83	0.24/10L	0.48/10L
Inlet, C.C.W.W.	16/11/2006		<0.01/10L	<0.01/10L
Inlet, C.C.W.W.	11/01/2007	38	1.05/10L	<0.01/10L
Inlet, C.C.W.W.	08/02/2007	67	<0.01/10L	0.29/10L
Inlet, C.C.W.W.	09/02/2007	24	6.67/10L	<0.01/10L

For inspection purposes only.  
Consent of copyright owner required for any other use.



# BLARNEY SEWAGE TREATMENT PLANT

Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-P04-P	Flow	Cond 200	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	Fluoride	Nitrate as N
24/01/2007	Effluent	7.4	28	53	31	2.45	32				1398											
12/04/2007	Effluent	7.4	4.8	27	15	1.85	11.9				1773											
26/04/2007	Effluent	7.4	6.6	39	20	4.78	13.3	0.2			1366											
24/05/2007	Effluent	7.8	7.4	50	13	2.25	29.25				1028											
20/06/2007	Effluent	7.2	3.8	24	16	3.68	4.86	0.6			5779											
04/07/2007	Effluent	7.4	4.1	29	4	1.83					1299											
17/07/2007	Effluent	7	23	118	20	5.85	16	0.4			1840											
18/07/2007	Effluent	7.7	12	63	23						3217											
24/07/2007	Effluent	7.4	4.1	22	5	3.63	21	<0.1			1477											
21/08/2007	Effluent	7.3	2.1	23	5	2.2	6.5	<1			1814											
06/09/2007	Effluent	7.2	2	<21	3	2.22	10.9	0.2			1706											
24/10/2007	Effluent	7.2	4.8	<21	7	1.74	65	<0.1			1855											
	Average	7.37	8.5583333	44.8	13.5	2.95273	21.071	0.35			2046											
	Kg/Day		17.51035	91.6608	27.621	6.04128	43.111266	0.7161														

Parameter	Method	Results	Units	Source	Kg/Day
Arsenic (OES)	ICP-OES	6	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	0.012276
Atrazine	HPLC	<0.01	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00002046
Cyanide	Colorimetry	<5	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.01023
Dichloromethane	GC-MS 1	<1	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.002046
EPH	GC-FID	<1	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	0.0012276
Mercury (OES)	ICP-OES	0.6	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.0002046
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00002046
Polyaromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00151404
Selenium (OES)	ICP-OES	<0.74	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00002046
Simazine	HPLC	<0.01	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00002046
Toluene	GC-MS 1	<0.01	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	0.01205094
Total Organic Carbon	TOC analyser (NPOC)	5.89	mg/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.002046
TPH C10-C36	GC-FID	<1	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.002046
Xylene	GC-MS 1	<0.01	ug/L	GR1052 Blarney WWTP Effluent 24/10/07	<0.00002046

For inspection purposes only. Consent of copyright owner required for reuse.

# BLARNEY SEWAGE TREATMENT PLANT

Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-Po4-P	Cond 20c	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	NO <sub>3</sub>	Fluoride	NO <sub>2</sub>	Alk	MRP	
24/01/2007	US	7.6	<1		22	<0.2	10.5	<0.1																	
12/04/2007	US		1.3		8	<0.2	9.2	<0.1																	
26/04/2007	US		1		<2.5	<0.2	6.41	<0.1																	
24/05/2007	US	7.8	1.1		<2.5	<0.2	6.61	<0.1																	
20/06/2007	US		5		41	<0.2	4.56	0.1																	
04/07/2007	US		<1		<2.5	<0.2	<1	<0.1																	
17/07/2007	US	7.8	2.1		6	<0.2	6	<0.1																	
21/08/2007	US	7.7	<1		3	<0.2	4.1	<0.1																	
06/09/2007	US	7.9	1		4	<0.20	7	<0.1																	
24/10/2007	US	7.8	2		<21	<0.2	4.2	<0.1																	
Average		7.766667	1.9285714	<21	13.285714	<0.2	6.508889	0.1	<30	<0.05	197	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	4.66	<0.1	0.0067	50	0.045	

Parameter	Method	Results	Units	Source
Arsenic (OES)	ICP-OES	4	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Atrazine	HPLC	<0.01	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Cyanide	Colorimetry	<5	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Dichloromethane	GC-MS 1	<1	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
EPH	GC-FID	5.6	mg/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Mercury (OES)	ICP-OES	0.8	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Polycyclic Aromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Selenium (OES)	ICP-OES	<0.74	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Simazine	HPLC	<0.01	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Toluene	GC-MS 1	<0.01	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Total Organic Carbon	TOC analyser (NPOC)	5.95	mg/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
TPH C10-C36	GC-FID	5.6	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07
Xylene	GC-MS 1	<0.01	ug/L	GR1054 Blarney WWTP Upstream River Shournagh @Willisons Bdg 24/10/07

Sample Date	MRP	NH4	NO <sub>3</sub>	NO <sub>2</sub>	Temp	Diss O <sub>2</sub>	Diss O <sub>2</sub> %
09-Jan-02	0.026	0.05	<b>25.88</b>	0.023			
13-Feb-02	0.03	0.05	<b>29.4</b>	0.033			
20-Mar-02	0.028	0.11	23.66	0.024			
16-May-02	0.027	0.02		0.043	11.4	10.9	
19-Jun-02	<b>0.038</b>	0.03	21.8	0.043	12	10.5	
19-Sep-02	<b>0.057</b>	0.03	18.9	0.013	12	12.2	
16-Oct-02	<b>0.047</b>	0.03	18	0.013	8.4	11.2	
14-Nov-02	0.035	0.03	<b>25.3</b>	0.034	7.5	11.8	
12-Dec-02	0.034	0.02	<b>28.2</b>	0.033	7	12.4	
15-Jan-03	<b>0.058</b>	0.18	24	<b>0.089</b>			
12-Feb-03	<b>1.86</b>	<b>1.79</b>	<b>25.9</b>	<b>1.82</b>			
12-Mar-03	<b>0.032</b>	0.02	24.4	0.024			
12-Jun-03	<b>0.039</b>	0.035	20.17	0.035	13.9	10.1	97
14-Aug-03	<b>0.047</b>	< 0.026	20.6	< 0.013			
22-Oct-03	0.016	0.03	18.84	< 0.013			

Legend	
MRP(P)=Molybdate Reactive Phosphorus	Temp=Temperature
NH4=Ammonia	Colour (Hz)
NO3=Nitrate	Cl=Chloride
NO2=Nitrite	Cond=Conductivity at 20 Degrees C
Diss O <sub>2</sub> =Dissolved Oxygen	Hard=Hardness
S.Solids=Suspended Solids	Alk=Alkalinity
Diss Cu=Dissolved Copper	

Sampling Details	
Category	Rivers
Project	Shournagh
Location	Willisons b
Sample Template	Salmonoid
Location Reference	19S010280
Location Easting	459300
Location Northing	75300
Sample Method	Grab

### BLARNEY SEWAGE TREATMENT PLANT

Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-PO <sub>4</sub> -P	Cond 20C	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	NO <sub>3</sub>	Fluoride	Alk	Nitrite		
24/01/2007	D/S	7.6	<1			<0.2	19.4	<0.1																	
12/04/2007	D/S		1.6			<0.2	6.2	<0.1																	
26/04/2007	D/S		2.1			<0.2	6.8	<0.1																	
24/05/2007	D/S	7.7	2			<0.2	7.52	0.6																	
20/06/2007	D/S		5.3			<0.2	5.9	0.4																	
04/07/2007	D/S		<1			<0.2	<1	<0.1																	
17/07/2007	D/S	7.6	5.3	45	30	0.29	8	0.2																	
21/08/2007	D/S	7.6	3.6	<21		0.29	3.9	<0.1	<30																
06/09/2007	D/S	7.8	3.9			<0.02	8.3	<0.1	<30																
24/10/2007	D/S	7.7	1.4	<21	<2.5	<0.2	9.4	<0.1	<30	0.08	232	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	56	0.011		
Average		7.6666667	3.15	45	30	0.29	8.38	0.4	<30	0.08	232	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	56	0.011			
Parameter	Method	Results	Units	Source																					
Arsenic (OES)	ICP-OES	7	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Atrazine	HPLC	<0.01	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Cyanide	Colorimetry	<5	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Dichloromethane	GC-MS 1	<1	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
EPH	GC-FID	<1	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Mercury (OES)	ICP-OES	0.9	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Polyaromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Selenium (OES)	ICP-OES	1	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Simazine	HPLC	<0.01	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Tolulene	GC-MS 1	<0.01	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Total Organic Carbon	TOC analyser (NPOC)	5.98	mg/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
TPH C10-C36	GC-FID	<1	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					
Xylene	GC-MS 1	<1	ug/L	GR1055 Blarney WWTP Downstream River Shournagh @ Tower Bdg 24/10/07																					

#### Sampling Details

Category	Rivers
Project	Shournagh
Location	Tower Br.
Location Reference	19S010300
Location Easting	158620
Location Northing	74551
Sample Template	Salmonoid
Sample Method	Grab

#### Legend

MRP(P)=Molybdate Reactive Phosphorus
NH4=Ammonia
NO3=Nitrate
NO2=Nitrite
Diss O2=Dissolved Oxygen
S.Solids=Suspended Solids
Diss Cu=Dissolved Copper
Temp=Temperature
Colour (Hz)
Cl=Chloride
Cond=Conductivity at 20 Degrees C
Hard=Hardness
Alk=Alkalinity

Sample Date	MRP	NH3	NO3	NO2	Temp	Diss O2	Diss O2%	Sample Date	MRP	NH3	NO3	NO2	Temp	Diss O2	Diss O2%
09-Jan-02	0.047	0.05	26.98	0.04				02-Nov-04	0.044	0.037	34.16	0.055	10.9	10.1	94
13-Feb-02	0.013	0.1	28.4	0.115				26-Jan-05	0.045	0.047	35.1	0.088	8.3	11.7	99
20-Mar-02	0.078	0.03	6.33	0.088				23-Mar-05	0.057	0.071	24.43	0.081	10.1	10.8	98
16-May-02	0.062	0.03		0.056	11.6	10.6		27-Apr-05	0.047	<0.026	28.88	0.045	10.1	10.8	98
19-Jun-02	0.048	0.03	22.83	0.072	14.6	10.3		26-May-05	0.072	0.223	21.55	0.162	13.3	11.2	108
19-Sep-02	0.062	0.12	19.7	0.128	12.2	10.4		21-Jul-05	0.117	0.162	25.15	0.136	17.5	8.1	85
16-Oct-02	0.125	0.03	20.4	0.221	8.7	10.9		25-Aug-05	0.094	<0.026	22.21	<0.013	13.8	11.5	107
14-Nov-02	0.047	0.03	25.7	0.05	7.4	11.4		28-Sep-05	0.085	0.038	22.79	0.034	11.5	10.6	98
12-Dec-02	0.048	0.04	29.1	0.133	6	12.3		25-Oct-05	0.085	0.076	31.05	0.089			
15-Jan-03	0.065	0.14	26.7	0.102				22-Nov-05	0.042	0.031	36.87	0.058			
12-Feb-03	0.028	<0.02	26.6	0.021				14-Dec-05	0.039	<0.026	32.9	0.057			
12-Mar-03	0.044	0.02	26.1	0.044				27-Mar-07	<0.006	0.07	24.4	0.042	9.6	8.1	76
12-Jun-03	0.056	0.047	20.48	0.072	13.6	9.9		30-May-07	0.074	0.541	27.2	0.123	12.3	10.7	103
14-Aug-03	0.107	0.069	21.05	0.03				02-Aug-07	0.142	<0.026	27.2	0.023	14.3	10.3	100
22-Oct-03	0.148	0.042	23.63	0.026				24-Oct-07	0.101	<0.026	22.5	0.037			100
10-Mar-04	0.034	0.034	26.39	0.111				24-Oct-07			22.6				
15-Apr-04	0.075	0.114	22.52	0.1	10.4	11.7		Sample Date							
20-May-04	0.049	<0.026	28.52	0.065	13.2	11.5		pH units							
29-Jun-04	0.147	0.055	22.48	0.076	15	10			7.6	0.4	23	19.6	237	103	80
30-Jul-04	0.234	0.034		0.053	15	11.2			7.8	2.7	35	19.4	229	100	64
25-Aug-04	0.106	0.053	17.68	0.088	14.9	9			7.7	0.3	23		221	108	52
22-Sep-04	0.066	0.03	23.99	0.029	14.2	10.4			7.8		61		229	97	56
									7.6		67		228	99	60

### BLARNEY SEWAGE TREATMENT PLANT

Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-PO <sub>4</sub> -P	Cond 20C	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	Nitrate as N
20/06/2007	Inlet																			
04/07/2007	Inlet												<0.02	0.08	<0.02	<0.02	0.206	0.078		
17/07/2007	Inlet																			
18/07/2007	Inlet	7.2	532	2730	587	20.35		22.9	42.5											
24/07/2007	Inlet			1425		7.15			34.6				0.033	0.232	0.057	0.031	0.857	0.267		
01/08/2007	Inlet					8.78		38.3	42.8											
06/09/2007	Inlet							21.9	42	5.66	549	<0.02	<0.02	0.026	<0.02	<0.02	0.11	0.043	<0.02	0.43
24/10/2007	Influent	7.2	292	634	138	8.23	36	27.7	40.475	5.66	549	<0.02	0.033	0.1267	<0.02	0.031	0.32433	0.12933333	<0.02	0.43
	Average		412	1596.3333	362.5	11.1275	36													

Parameter	Method	Results	Units	Source
Arsenic (OES)	ICP-OES	4	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Atrazine	HPLC	<0.01	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Cyanide	Colorimetry	<5	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Dichloromethane	GC-MS 1	<1	ug/L	GR1051 Blarney WWTP Influent 24/10/07
EPH	GC-FID	<1	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Mercury (OES)	ICP-OES	0.5	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Polyaromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Selenium (OES)	ICP-OES	7	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Simazine	HPLC	<0.01	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Toluene	GC-MS 1	<0.01	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Total Organic Carbon	TOC analyser (NPOC)	75.50	mg/L	GR1051 Blarney WWTP Influent 24/10/07
TPH C10-C36	GC-FID	<1	ug/L	GR1051 Blarney WWTP Influent 24/10/07
Xylene	GC-MS 1	<0.01	ug/L	GR1051 Blarney WWTP Influent 24/10/07

For inspection only and not to be used without the consent of the copyright owner



**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
 (Primary Discharge Point – one table per upstream and downstream location)

**Discharge Point Code:** SW01Blarney

**MONITORING POINT CODE:** SW01Blarney

Parameter	Results (mg/Note 1)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	2007	July17	Aug 21	Sept 06			
pH	7.0	7.3	7.2	7.2	Composite	2	Electrochemical
Temperature	NA	NA	NA	NA	Composite	NA	NA
Electrical Conductivity (@20°C)	NA	NA	NA	332	Composite	0.5 µmhos/cm	Electrochemical
Suspended Solids	20	5	3	7	Composite	0.5 mg/L	Gravimetric
Ammonia (as N)	0.4	<0.1	0.2	<0.1	Composite	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	23	2.1	2	4.8	Composite	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	118	23	<21	<21	Composite	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	Composite	NA	NA
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	Composite	N/A	NA
Total Nitrogen (as N)	16	6.5	10.9	65	Composite	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	NA	Composite	NA	N/A
Nitrate (as N)	NA	NA	NA	0.43	Composite	0.5 mg/L	Colorimetric
Total Phosphorus (as P)	5.85	2.20	2.22	1.7	Composite	0.2 mg/L	Digestion + Colorimetric
Orthophosphate (as P) - unfiltered	NA	2.1	2.19	1.04	Composite	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	42	44	47	<30	Composite	30 mg/L	Turbidimetric
Phenols (sum) Note 2 (ug/l)	NA	NA	NA	<0.1	Composite	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.  
 Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**NA=not available**

**TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
 (Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: SW01Blarney

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July17	Aug 21	Sept 06	Oct 24			
Atrazine	NA	NA	NA	<0.01	Composite	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	<1	Composite	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	<0.01	Composite	0.01 µg/L	HPLC
Toluene	NA	NA	NA	<0.01	Composite	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	Composite	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	<0.01	Composite	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	6	Composite	0.96 µg/L	ICP-OES
Chromium	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Copper	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	<5	Composite	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	230	Composite	100 µg/L	ISE
Lead	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Nickel	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Zinc	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Boron	NA	NA	NA	<20	Composite	20 µg/L	ICP-OES
Cadmium	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES
Mercury	NA	NA	NA	0.6	Composite	0.2 µg/L	ICP-OES
Selenium	NA	NA	NA	<0.74	Composite	0.74 µg/L	ICP-OES
Barium	NA	<20	NA	<20	Composite	20 µg/L	ICP-OES

NA=not available

**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
 (Primary Discharge Point – one table per upstream and downstream location)

**Discharge Point Code:** SW01Blarney

**MONITORING POINT CODE:** aSW01u(1) Blarney Bawnafinny

Parameter	Results (mg/l) <sup>(Note 1)</sup>				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	2007	July 17	Aug 21	Sept 06			
pH	NA	NA	NA	NA	Grab	2	Electrochemical
Temperature	NA	NA	NA	NA	Grab	NA	NA
Electrical Conductivity (@20°C)	NA	NA	NA	251	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	NA	NA	NA	NA	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	NA	NA	NA	0.039	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	NA	NA	NA	2.8	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	NA	NA	NA	<21	Grab	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	Grab	NA	NA
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	Grab	N/A	NA
Total Nitrogen (as N)	NA	NA	NA	5.3	Grab	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	0.015	Grab	NA	N/A
Nitrate (as N)	NA	NA	NA	5.11	Grab	0.5 mg/L	Colorimetric
Total Phosphorus (as P)	NA	NA	NA	0.2	Grab	0.2 mg/L	Digestion + Colorimetric
Orthophosphate (as P) - unfiltered	NA	NA	NA	0.074	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	NA	NA	NA	<30	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	NA	NA	NA	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.  
 Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**NA=not available**



**TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
 (Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: aSW01u(1) Blarney Bawnafinny

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July 17	Aug 21	Sept 06	Oct 24			
Atrazine	NA	NA	NA	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	<1	Grab	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	<0.01	Grab	0.01 µg/L	HPLC
Toluene	NA	NA	NA	<0.01	Grab	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	Grab	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	<1	Grab	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	5	Grab	0.96 µg/L	ICP-OES
Chromium	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Copper	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	<5	Grab	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	<100	Grab	100 µg/L	ISE
Lead	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Nickel	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Zinc	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Boron	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Cadmium	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Mercury	NA	NA	NA	1.0	Grab	0.2 µg/L	ICP-OES
Selenium	NA	NA	NA	5	Grab	0.74 µg/L	ICP-OES
Barium	NA	NA	NA	24	Grab	20 µg/L	ICP-OES

NA=not available

**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
 (Primary Discharge Point – one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: aSW01uBlarney Willsons Bdg

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	2007	July 17	Aug 21	Sept 06			
pH	7.8	7.7	7.9	7.8	Grab	2	Electrochemical
Temperature	NA	NA	NA	NA	Grab	NA	NA
Electrical Conductivity (@20°C)	NA	NA	NA	197	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	6	3	4		Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	<0.1	<0.1	<0.1	0.038	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	2.1	<1.0	1	2	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	NA	na	<21	<21	Grab	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	Grab	NA	NA
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	Grab	N/A	NA
Total Nitrogen (as N)	6	4.1	7	4.2	Grab	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	0.007	Grab	NA	N/A
Nitrate (as N)	NA	NA	NA	4.66	Grab	0.5 mg/L	Colorimetric
Total Phosphorus (as P)	<0.2	<0.2	<0.2	<0.2	Grab	0.2 mg/L	Digestion + Colorimetric
Orthophosphate (as P) - unfiltered	NA	NA	NA	0.045	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	NA	<30	<30	<30	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (µg/l)	NA	NA	NA	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.  
 Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**NA=not available**

**TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
 (Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: aSW01uBlarneyWillsons

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July 17	Aug 21	Sept 06	Oct 24			
Atrazine	NA	NA	NA	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	<1	Grab	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	<0.01	Grab	0.01 µg/L	HPLC
Toluene	NA	NA	NA	<0.01	Grab	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	Grab	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	<0.01	Grab	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	4	Grab	0.96 µg/L	ICP-OES
Chromium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Copper	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	<5	Grab	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	<100	Grab	100 µg/L	ISE
Lead	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Nickel	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Zinc	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Boron	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Cadmium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Mercury	NA	NA	NA	0.8	Grab	0.2 µg/L	ICP-OES
Selenium	NA	NA	NA	<0.74	Grab	0.74 µg/L	ICP-OES
Barium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES

NA=not available

**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
(Primary Discharge Point – one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: aSW01d Blarney

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	2007	July17	Aug 21	Sept 06			
pH	7.6	7.6	7.6	7.8	7.7	2	Electrochemical
Temperature	NA	NA	NA	NA	NA	NA	NA
Electrical Conductivity (@20°C)	NA	NA	NA	NA	232	0.5 µmhos/cm	Electrochemical
Suspended Solids	30	NA	NA	NA	<0.5	0.5 mg/L	Gravimetric
Ammonia (as N)	0.2	<0.1	<0.1	<0.1	<0.02	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	5.3	3.6	3.9	3.9	1.4	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	45	<21	<21	NA	<21	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	NA	NA	NA
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	NA	N/A	NA
Total Nitrogen (as N)	8.0	3.9	8.3	8.3	9.4	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	NA	0.011	NA	N/A
Nitrate (as N)	NA	NA	NA	NA	5.1	0.5 mg/L	Colorimetric
Total Phosphorus (as P)	0.29	0.29	<0.2	<0.2	<0.2	0.2 mg/L	Digestion + Colorimetric
Orthophosphate (as P) - unfiltered	NA	NA	NA	NA	0.10	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	NA	<30	<30	<30	<30	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (µg/l)	NA	NA	NA	NA	<0.1	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.  
Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**NA=not available**

**TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
 (Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SW01Blarney

MONITORING POINT CODE: aSW01dBlarney

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July24	Aug 21	Sept 06	Oct 24			
Atrazine	NA	NA	NA	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	<1	Grab	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	<0.01	Grab	0.01 µg/L	HPLC
Toluene	NA	NA	NA	<0.01	Grab	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	Grab	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	<1	Grab	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	7	Grab	0.96 µg/L	ICP-OES
Chromium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Copper	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	<5	Grab	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	<100	Grab	100 µg/L	ISE
Lead	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Nickel	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Zinc	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Boron	NA	NA	NA	<20	Grab	20 µg/L	ICP-OES
Cadmium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES
Mercury	NA	NA	NA	0.9	Grab	0.2 µg/L	ICP-OES
Selenium	NA	NA	NA	1.0	Grab	0.74 µg/L	ICP-OES
Barium	NA	<20	NA	<20	Grab	20 µg/L	ICP-OES

For internal purposes only. Consent of copyright owner required for any other use.

NA=not available

**TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING - (1 table per discharge point upstream and downstream locations)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW02Blarney

**MONITORING POINT CODE:** SW02Blarney

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July 24	Aug 21	Sept 06	Oct 24			
2007	NA	NA	NA	NA	NA	2	Electrochemical
pH	NA	NA	NA	NA	NA	N/A	N/A
Temperature	NA	NA	NA	NA	NA	0.5 µmhos/cm	Electrochemical
Electrical Conductivity (@25°C)	NA	NA	NA	NA	NA		
Suspended Solids	NA	NA	NA	NA	NA	0.5 mg/L	Gravimetric
Ammonia (as N)	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	NA	NA	NA	NA	NA	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	NA	NA	NA	NA	NA	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	NA	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	NA	N/A	N/A
Total Nitrogen (as N)	NA	NA	NA	NA	NA	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	NA	NA	N/A	N/A
Nitrate (as N)	NA	NA	NA	NA	NA	N/A	N/A
Total Phosphorus (as P)	NA	NA	NA	NA	NA	0.5 mg/L	Colorimetric
Orthophosphate (as P) - unfiltered	NA	NA	NA	NA	NA	0.2 mg/L	Digestion + Colorimetric
Sulphate (SO <sub>4</sub> )	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric
Phenols (sum) <sup>Note 2</sup> (µg/l)	NA	NA	NA	NA	NA	30 mg/L	Turbidimetric
	NA	NA	NA	NA	NA	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate - please specify.  
Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
 (Secondary Discharge Point - one table per upstream and downstream location)

**Discharge Point Code:** SW02Blarney

**MONITORING POINT CODE:** SW02Blarney

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July24	Aug 21	Sept 06	Oct 24			
Atrazine	NA	NA	NA	NA	NA	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	NA	NA	0.01 µg/L	HPLC
Toluene	NA	NA	NA	NA	NA	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	NA	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	NA	NA	0.96 µg/L	ICP-OES
Chromium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Copper	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	NA	NA	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	NA	NA	100 µg/L	ISE
Lead	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Nickel	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Zinc	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Boron	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Cadmium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Mercury	NA	NA	NA	NA	NA	0.2 µg/L	ICP-OES
Selenium	NA	NA	NA	NA	NA	0.74 µg/L	ICP-OES
Barium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES

NA=not available

**TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING - (1 table per discharge point upstream and downstream locations)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW03Blarney

**MONITORING POINT CODE:** SW03Blarney

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July 24	Aug 21	Sept 06	Oct 24			
<b>2007</b>	NA	NA	NA	NA	NA	2	Electrochemical
pH	NA	NA	NA	NA	NA	N/A	N/A
Temperature	NA	NA	NA	NA	NA	0.5 µmhos/cm	Electrochemical
Electrical Conductivity (@25°C)	NA	NA	NA	NA	NA		
Suspended Solids	NA	NA	NA	NA	NA	0.5 mg/L	Gravimetric
Ammonia (as N)	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	NA	NA	NA	NA	NA	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	NA	NA	NA	NA	NA	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	NA	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	NA	N/A	N/A
Total Nitrogen (as N)	NA	NA	NA	NA	NA	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	NA	NA	N/A	N/A
Nitrate (as N)	NA	NA	NA	NA	NA	0.5 mg/L	Digestion + Colorimetric
Total Phosphorus (as P)	NA	NA	NA	NA	NA	N/A	N/A
Orthophosphate (as P) - unfiltered	NA	NA	NA	NA	NA	0.5 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	NA	NA	NA	NA	NA	0.2 mg/L	Digestion + Colorimetric
Phenols (sum) <sup>Note 2</sup> (µg/l)	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric
	NA	NA	NA	NA	NA	30 mg/L	Turbidimetric
	NA	NA	NA	NA	NA	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate - please specify.  
Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.



**TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING - (1 table per discharge point upstream and downstream locations)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW03Blarney

**MONITORING POINT CODE:** SW03Blarney

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July24	Aug 21	Sept 06	Oct 24			
2007							
Atrazine	NA	NA	NA	NA	NA	0.96 µg/L	HPLC
Dichloromethane	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Simazine	NA	NA	NA	NA	NA	0.01 µg/L	HPLC
Toluene	NA	NA	NA	NA	NA	0.02 µg/L	GC-MS 1
Tributyltin	NA	NA	NA	NA	NA	0.02 µg/L as Sn	GC-MS 1
Xylenes	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Arsenic	NA	NA	NA	NA	NA	0.96 µg/L	ICP-MS
Chromium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Copper	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Cyanide	NA	NA	NA	NA	NA	5 µg/L	Colorimetric
Fluoride	NA	NA	NA	NA	NA	100 µg/L	ISE
Lead	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Nickel	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Zinc	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Boron	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Cadmium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Mercury	NA	NA	NA	NA	NA	0.2 µg/L	ICP-MS
Selenium	NA	NA	NA	NA	NA	0.74 µg/L	ICP-MS
Barium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES

[Empty box]

Copyright © 2007 by the State of New Jersey. All rights reserved. For internal use only. No other use permitted without written permission from the Department of Environmental Protection.

**TABLE F.1(ii)(a): SURFACE/GROUND WATER MONITORING - (1 table per discharge point upstream and downstream locations)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW04Blarney

**MONITORING POINT CODE:** SW04Blarney

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July 24	Aug 21	Sept 06	Oct 24			
2007	NA	NA	NA	NA	NA	2	Electrochemical
pH	NA	NA	NA	NA	NA	N/A	N/A
Temperature	NA	NA	NA	NA	NA	0.5 µmhos/cm	Electrochemical
Electrical Conductivity (@25°C)	NA	NA	NA	NA	NA		
Suspended Solids	NA	NA	NA	NA	NA	0.5 mg/L	Gravimetric
Ammonia (as N)	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	NA	NA	NA	NA	NA	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	NA	NA	NA	NA	NA	8 mg/L	Digestion + Colorimetric
Dissolved Oxygen	NA	NA	NA	NA	NA	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	NA	NA	NA	NA	NA	N/A	N/A
Total Nitrogen (as N)	NA	NA	NA	NA	NA	0.5 mg/L	Digestion + Colorimetric
Nitrite (as N)	NA	NA	NA	NA	NA	N/A	N/A
Nitrate (as N)	NA	NA	NA	NA	NA	0.5 mg/L	Digestion + Colorimetric
Total Phosphorus (as P)	NA	NA	NA	NA	NA	N/A	N/A
Orthophosphate (as P) - unfiltered	NA	NA	NA	NA	NA	0.5 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	NA	NA	NA	NA	NA	0.2 mg/L	Digestion + Colorimetric
Phenols (sum) <sup>Note 2</sup> (µg/l)	NA	NA	NA	NA	NA	0.02 mg/L	Colorimetric

Note 1: Or other unit as appropriate - please specify.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Copyright © 2007. For inspection purposes only. No reproduction or other use without permission required for any other use.

**TABLE F.1(ii)(b): SURFACE/GROUND WATER MONITORING - (1 table per discharge point upstream and downstream locations)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW04Blarney

**MONITORING POINT CODE:** SW04Blarney

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	July24	Aug 21	Sept 06	Oct 24			
2007	NA	NA	NA	NA	NA	0.96 µg/L	HPLC
Atrazine	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Dichloromethane	NA	NA	NA	NA	NA	0.01 µg/L	HPLC
Simazine	NA	NA	NA	NA	NA	0.02 µg/L	GC-MS 1
Toluene	NA	NA	NA	NA	NA	0.02 µg/L as Sn	GC-MS 1
Tributyltin	NA	NA	NA	NA	NA	1 µg/L	GC-MS 1
Xylenes	NA	NA	NA	NA	NA	0.96 µg/L	ICP-MS
Arsenic	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Chromium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Copper	NA	NA	NA	NA	NA	5 µg/L	Colorimetric
Cyanide	NA	NA	NA	NA	NA	100 µg/L	ISE
Fluoride	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Lead	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Nickel	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Zinc	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Boron	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Cadmium	NA	NA	NA	NA	NA	0.2 µg/L	ICP-MS
Mercury	NA	NA	NA	NA	NA	0.74 µg/L	ICP-MS
Selenium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES
Barium	NA	NA	NA	NA	NA	20 µg/L	ICP-OES

Copyright of copyright owner required for any other use. For inspection purposes only.

# Cryptosporidium Risk Assessment

At

## Lee Road Waterworks

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

**Revision Control Table**

Revision No.	Description of changes	Prepared by	Date
4	Revised score to source type – 8 instead of 4	BG	31/3/2006
3	Scottish model 2003 Directions. Entire document reviewed.	BG	11/10/2005
2	Once monthly continuous monitoring introduced	BG	19/08/2005
1	Blarney sewage treatment plant included in assessment risk.	BG	24/02/2004
0	Final draft – 1 <sup>st</sup> issue	BG/KOD	14/11/2002

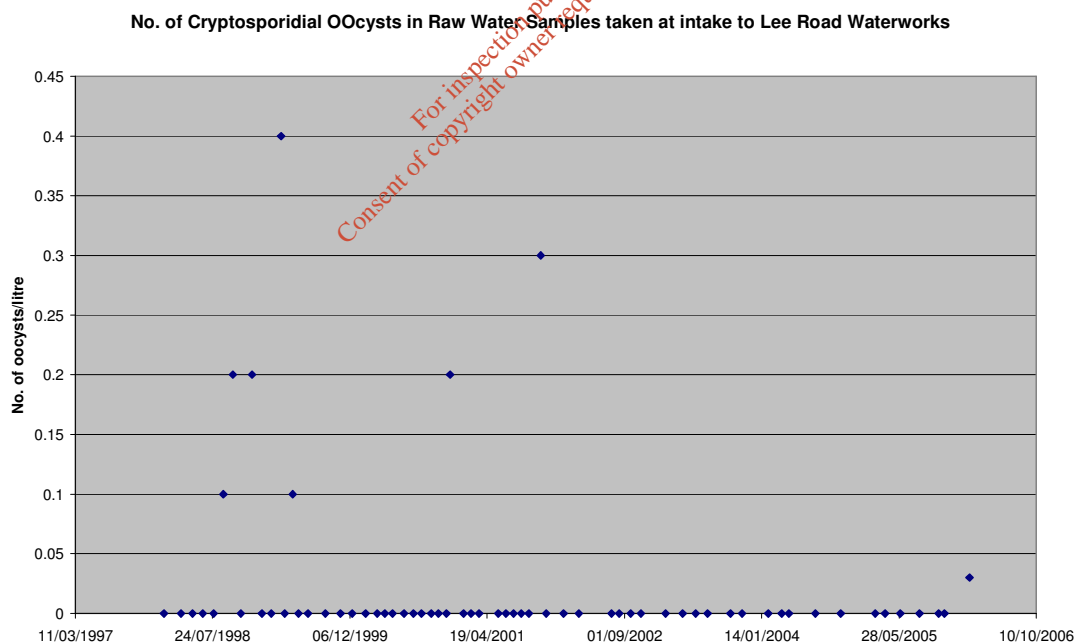
For inspection purposes only.  
Consent of copyright owner required for any other use.

## Background

This document is based on the Scottish Model – *The Cryptosporidium (Scottish Water) Directions 2003* as recommended by the EPA. This methodology with some modifications to the text is outlined in Appendix 6 of the document *European Communities (Drinking Water) Regulations, 2000 (S.I. 439 of 2000) A Handbook on Implementation for Sanitary Authorities* published by the EPA. The text of this document is reproduced in Appendix 1 of this document. Use has also been made of a template spreadsheet for risk assessment developed by Michael Lavelle of Cork County Council.

## Cryptosporidium Monitoring at the Lee Road Waterworks

Sampling of both the raw water and treated water at the Lee Road has been ongoing since 1998. One grab sample is taken each month from the intake and treated water leaving the plant and sent to Dublin for analysis. Since March 2005 a Filta Max filter system has been in place for monitoring the final water outflow of the plant and a similar system has now been setup for the Raw Water since February 2006. To date, no cryptosporidium has been detected in the treated water. However, it has been found in the raw water as follows:



As can be seen, there are some shows though most results show zero concentrations. It should be noted that most of these individual samples represent a snapshot in time and place and are unrepresentative. Nothing had been found for a number of years since 31/10/2001 but the first run of the Filta Max in February 2006 found 3 oocysts in 100 litres.

**Risk Assessment Scoring:**

<b>Supply Classification</b>	<b>Risk Assessment Score</b>	<b>Action to be taken by water authorities on completion of a risk assessment</b>
Very High Risk	>100	Improve treatment process to reduce the risk to lower risk category. Implement continuous monitoring of treated water for Cryptosporidium.
High Risk	76-100	Improve treatment process to reduce the risk to lower risk category. Implement continuous monitoring of treated water for Cryptosporidium.
Moderate Risk	50-75	Improve treatment process to reduce the risk to lower risk category. Implement continuous monitoring of treated water for Cryptosporidium.
Low Risk	<50	No need to monitor supplies unless there is an outbreak of cryptosporidiosis occurs within the supply area.

For inspection purposes only.  
Consent of copyright owner required for any other use.

## Assessment

Scheme Lee Road Waterworks  
Enter the Scheme name in the box above and on the Tab and enter the name of the source in the box below.

Source River Lee  
Enter the assessed score in the shaded boxes on the right of the table. The excel sheet will do all of the calculations.

### SURFACE WATER RISK ASSESSMENT (CATCHMENT RISK SCORE)

#### Animals within the Catchment

Item No.	Risk Factor	Item Scores	Score
1.1	Cattle/calves at less than or equal to one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	6	12
1.2	Cattle/calves at more than one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	12	
1.3	Sheep/lambs at less than or equal to one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	6	6
1.4	Sheep/lambs at more than one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	12	
1.5	Wild or farmed deer	2	0
1.6	Pig farms	2	2
1.7	Animals have direct access to water sources including feeder streams	4	4
1.8	Fencing prevents access to water sources including feeder streams	-1	
1.9	High numbers of birds	2	0
1,10	Any other farmed animal or bird	1	0
	<b>SCORE FOR SECTION 1;</b>		<b>24</b>

#### Agricultural Practices within the Catchment

2.1	Slurry spraying	6	6
2.2	Dung spreading	3	3
2.3	Slurry or dung stores	3	3
2.4	Sheep pens or cattle byres	6	6
2.5	Lambing or calving on the catchment	8	8
	<b>SCORE FOR SECTION 2;</b>		<b>26</b>

#### Discharges to the Catchment / Water Source

3.1	Population served by all septic tanks = 100	4	6
3.2	Population served by all septic tanks > 100	6	
3.3	Population equivalent served by all sewage works <100	4	7
3.4	Population equivalent served by all sewage works 500 to 5,000	5	
3.5	Population equivalent served by all sewage works 5,001 to 20,000	6	
3.6	Population equivalent served by all sewage works 20,001 to 50,000	7	
3.7	Population equivalent served by all sewage works > 50,000	8	
3.8	Storm sewage overflows (Regardless of number)	2	2
3.9	Abattoirs/livestock markets (Regardless of number)	2	2
	<b>SCORE FOR SECTION 3;</b>		<b>17</b>

#### Water Source Type

4.1	Secure natural springs – vulnerable soil/hydrogeology	4	8
-----	---	---	---



4.2	Secure natural springs – non-vulnerable soil/hydrogeology	1	
4.3	Other shallow underground sources - vulnerable soil/hydrogeology	4	
4.4	Other shallow underground sources – non-vulnerable soil/hydrogeology	2	
4.5	Upland reservoir	2	
4.6	Lowland long term storage reservoir	4	
4.7	Upland river or stream – direct abstraction	6	
4.8	Lowland river or stream – direct abstraction or bankside storage	8	
	<b>SCORE FOR SECTION 4;</b>		<b>8</b>

**Raw Water Aquaducts**

5.1	Raw water aqueduct known or suspected to be vulnerable to contamination from farmland	8	<b>0</b>
5.2	Raw water aqueduct proven to be secure contamination from farmland within past five years	0	
5.3	No Aquaduct bringing water from source to treatment plant	0	
	<b>SCORE FOR SECTION 5;</b>		<b>0</b>

**Catchment Inspections**

6.1	Catchment inspections carried out at least monthly	-3	<b>-3</b>
6.2	Catchment inspections carried out less frequently	6	
6.3	Procedures in place to deal with irregularities on the catchment	-3	<b>-3</b>
6.4	No procedures in place to deal with irregularities on the catchment	0	
	<b>SCORE FOR SECTION 6;</b>		<b>-6</b>

**Raw Water Intake Management for Direct Abstraction**

7.1	No turbidity monitor on intake	3	<b>-2</b>
7.2	Turbidity monitor on intake that is alarmed and connected to telemetry	-2	
7.3	Automatic intake shut down when poor water quality	-4	<b>-1</b>
7.4	Manual intake shut down when poor water quality	-1	
7.5	No intake shut down when poor water quality	3	
	<b>SCORE FOR SECTION 7;</b>		<b>-3</b>

**Surface Water Catchment Risk Score (Sections 1 to 7)****66****WATER TREATMENT PROCESSES**

8.1	Disinfection only	10	<b>-10</b>
8.2	Microstraining	10	
8.3	Simple sand filtration (not slow sand filtration)	8	
8.4	Coagulation followed by DAF/sedimentation and filtration	-10	
8.5	Coagulation followed by rapid gravity or pressure filtration (no flotation or sedimentation)	-7	
8.6	Slow sand filtration	-9	
8.7	Membrane filtration (on Scottish Executive or DWI list)	-16	
8.8	Membrane filtration (not on Scottish Executive or DWI list)	-2	
8.9	Cartridge/Kalsep filtration	-2	
8.10	Filtamat or similar filtration system	-2	
	<b>SCORE FOR SECTION 8;</b>		<b>-10</b>

For section 9 below complete only the relevant section. Ignore the other 2.

**Treatment Works Monitoring of Coagulation and Filtration****Rapid gravity and pressure filters**

9.1	Turbidity meter on each filter with alarm on telemetry	-5	<b>2</b>
9.2	Turbidity meter on each filter but no alarm on telemetry	0	
9.3	One turbidity meter shared by more than one filter with alarm on telemetry	-2	

9.4	One turbidity meter shared by more than one filter but no alarm on telemetry	2	
9.5	No turbidity meters monitoring filter performance	10	
9.6	Final water turbidity meter with alarm on telemetry	-2	2
9.7	Final water turbidity meter but no alarm on telemetry	2	
9.8	No final water turbidity meter	5	
9.9	Particle counter used continuously to monitor filter performance	-5	0
9.10	Continuous residual coagulant monitor on combined filtrate or works outlet with alarm	-5	5
9.11	Continuous residual coagulant monitor on combined filtrate or works outlet but no alarm	-1	
9.12	No continuous residual coagulant monitor on combined filtrate or works outlet	5	
9.13	Routine discrete monitoring of treated water for turbidity/residual coagulant	-2	-2
9.14	No routine discrete monitoring of treated water for turbidity/residual coagulant	2	
9.15	Turbidity of backwash supernatant monitored when recycled	-2	0
9.16	Turbidity of backwash supernatant not monitored when recycled	2	
	9.1 to 9.16		7

**Slow sand filters**

9.17	Turbidity meter on each filter with alarm on telemetry	-5	0
9.18	Turbidity meter on each filter but no alarm on telemetry	0	
9.19	One turbidity meter shared by more than one filter with alarm on telemetry	-2	
9.20	One turbidity meter shared by more than one filter but no alarm on telemetry	2	
9.21	No turbidity meters monitoring filter performance	10	
9.22	Final water turbidity meter with alarm on telemetry	-2	0
9.23	Final water turbidity meter but no alarm on telemetry	2	
9.24	No final water turbidity meter		
9.25	Particle counter used continuously to monitor filter performance	-5	0
9.26	Filters matured and filtrate analysed for turbidity, coliforms and Cryptosporidium during maturation	-4	0
9.27	Filters matured but no analysis carried out on filtrate	5	
9.28	Filters not matured	15	
	9.17 to 9.28		0

**Membrane filters**

9.29	Plant monitored and alarmed for integrity	-3	0
9.30	Plant monitored for integrity but not alarmed	0	
9.31	Plant not monitored for integrity	10	
9.32	Particle counter used continuously to monitor filter performance	-5	0
	9.29 to 9.32		0
	<b>SCORE FOR SECTION 9 [9.1 to 9.16] or [9.17 to 9.28] or [9.29 to 9.32];</b>		<b>7</b>

**Rapid Gravity and Pressure Filter Works Performance**

10.1	Final water turbidity increases by more than 50%, excluding normal backwash period	4	0
10.2	Treated water turbidity increases by less than 50%, excluding normal backwash period	0	
10.3	Media loss from any filter has brought media depth below design level	6	0

10.4	Media depth above minimum design level with audit trail maintained	-2	
10.5	Signs of media cracking on any filter	4	4
10.6	All filters have been drained, inspected and any necessary remedial action taken within last year	-2	0
10.7	Air scour and backwash maintained and operating efficiently as per maintenance manual	-2	-2
<b>SCORE FOR SECTION 10;</b>			<b>2</b>

#### Treatment works Operation

11.1	Process control manuals specific to works available	-1	-1
11.2	Process control manuals specific to works not available	1	
11.3	Auditable action plans available for dealing with deviations in quality	-1	1
11.4	Auditable action plans not available for dealing with deviations in quality	1	
11.5	Slow start facility on filters operational	-4	-4
11.6	No slow start facility on filters, or slow start facility not operational	4	
11.7	Filters run to waste for appropriate period after backwash	-6	4
11.8	Filters run to head of works for a period following backwash	-4	
11.9	Filters not run to waste or head of works for a period following backwash	4	
11,10	Backwash water and/or sludge supernatant has to be recycled	2	-2
11.11	Other disposal route available for backwash water and sludge supernatant	-2	
11.12	Water flow through works when operating has not varied by >10% in <30 minutes in last 12 months	-2	2
11.13	Water flow through works when operating has varied by >10% in <30 minutes in last 12 months	2	
11.14	Flow through works above design flow for >10% of time in last 12 months	4	4
11.15	Flow through works above design flow for =10% of time in last 12 months	0	
<b>SCORE FOR SECTION 11;</b>			<b>4</b>

#### Surface Water Treatment and Supply Risk Score (Sections 8, 9, 10 and 11)

3

#### Final Weighted Surface Water Risk Assessment Score (Sections 1 to 11)

69

#### Population Criterion

The population weighting factor is $0.4 \times \log_{10}$ (population served by the supply). The final weighted surface water risk assessment score is the final surface water risk assessment score x the population weighting factor.		
<b>Insert the population at risk in the shaded box on the next line</b>		
<b>Population Served</b>		<b>90,000</b>
Log to the base 10 of the population served		4.95
0.4 (Log to the base 10 of pop served)		1.98
<b>Cryptosporidium Risk Score</b>		<b>137</b>

Comments / notes concerning peculiarities of this scheme or this evaluation

**Insert Name of Assessor and Date of the Assessment (Date Month and Year e.g.13/04/2005) in the blue boxes below**

Assessment undertaken by  
**Brendan Goggin, Cork City Council**  
Date 31/03/2006

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

## Improvements in the existing plant to reduce the risk.

<b>Items 1 – 5</b>	<b>Reduce Score by:</b>
It is not possible to change the first 4 categories – thus the score for these will remain the same. (These are the Animals on the Catchment, Agricultural Practices on the Catchment, Discharges into the Catchment/ Water Source, Water Source Type and Raw Water Aqueducts.	0
<b>Item 6: Catchment Inspections</b>	
Already have the maximum score possible here.	0
<b>Item 7: Raw Water Intake Management for Direct Abstractions</b>	
Automatic shutdown would be expensive and may not even be desirable. No change.	0
<b>Item 8: Water Treatment Processes</b>	
Already have maximum score here.	0
<b>Item 9: Treatment Works Monitoring of Coagulation and Filtration.</b>	
Putting a turbidity meter on each filter, at a cost of €36,000, would reduce the score by 3. Alarm on final water turbidity would reduce score by 4. This is almost complete, already is on telemetry. This should be in place by next year. Reasonable expectation – reduce score by 4.	4
<b>Item 10: Rapid Gravity and Pressure Filter Works Performance</b>	
There is severe cracking on all filters. Probably all require a filter media replacement at this stage. This would be very costly and in view of the proposed upgrade probably wasteful. The filters are also overloaded.	0
<b>Item 11: Treatment works operation</b>	
Filters could be left run to waste for a while after backwash. This is not easily done at this stage as the wash sequence was programmed into a PLC over 20 years ago and the entire system is delicate to say the least. This system may have to be looked at if the improvement project does not go ahead in the short term. This could reduce the score by 10. If the winter peak was eliminated, the variation in flow through the plant could be kept within 10%. This would reduce the score by 4. This not desirable Reasonable expectation (optimistic) – reduce score by 10	10
<b>Total:</b>	<b>14</b>

## Conclusions and Recommendations

Based on the recommended risk assessment procedure, i.e. The Scottish Model, the waterworks plant at Lee Road is at **Very High Risk** of allowing Cryptosporidium into the water distribution network. Even if moderate improvements were made to the existing plant, the Plant would remain in the **Very High Risk Category (137-14=123)**. The recommended procedure is to either put in place measures which will bring the risk down to the **Low Risk** category and in the meantime to put in place continuous monitoring. In view of the imminent plant upgrade, it would not be economically viable to put these measures in place and thus the latter solution of implementing continuous monitoring has been partly put in place.

For inspection purposes only.  
Consent of copyright owner required for any other use.

## Appendix 1

# EPA Guidance Document to Drinking Water Regulations RISK ASSESSMENT FOR CRYPTOSPORIDIUM

### INTRODUCTION

A specific risk assessment methodology for *Cryptosporidium* is given below as an example of the application of the above general principles set out in Section 9.

One of the most significant drinking water and public health issues in recent years in the United Kingdom and elsewhere has been outbreaks of cryptosporidiosis related to drinking water supplies. A UK Group of Experts on *Cryptosporidium* in water supplies has published three reports giving comprehensive advice to water suppliers and other organisations. One of the recommendations of the Group of Experts is that water suppliers should carry out risk assessments for each of their water supplies, although the methodology to be used is not specified in any detail.

The Drinking Water Inspectorate has published a methodology for water suppliers in England and Wales to use to meet the requirement in Regulations to carry out risk assessments for *Cryptosporidium*. This methodology sets out the factors that water suppliers are required to take into account. Where the water supplier has found a significant risk the Regulations require it to install treatment to meet the treatment standard of an average of less than one oocyst per 10 litres and to monitor the treated water continuously to establish whether the treatment standard is met. The water supplier uses the professional judgement of its scientists to decide when there is a significant risk. The methodology does not include any quantification of the risks such as a scoring system.

The Scottish Executive has published a similar methodology for Scottish Water to use to meet the requirement in the Directions to carry out risk assessments for *Cryptosporidium*. The original Directions were made in 2000. The Scottish Executive has reviewed these Directions in the light of experience of their use and has proposed new Directions. The new Directions are “The *Cryptosporidium* (Scottish Water) Directions 2003”. This methodology, in addition to setting out the factors that Scottish Water is required to take into account, sets out a quantitative scoring system for each factor to enable Scottish Water to determine whether each supply is high, medium or low risk. The new 2003 Directions specify the frequency of sampling of both raw water and treated water at each treatment works. The frequency for raw water depends on the catchment risk score and the maximum design flow of the works and ranges between no samples per year for small works and low risk catchments to 52 samples per year for large works and high risk catchments. The frequency for treated waters depends on the catchment plus treatment risk score and the maximum design flow of the works and ranges from 12 samples per year for small, low risk works to 365 samples per year for large, high risk works. Each sample must be taken continuously and for frequencies of less than 365 samples per year the period over which each sample is taken must be a minimum of 24 hours and a maximum of 36 hours. The National Disease Surveillance Centre in its draft report on a waterborne outbreak of cryptosporidiosis

prepared by a sub-committee of its Scientific Advisory Committee has included the *Cryptosporidium* risk assessment methodology published by the Scottish Executive in the original 2000 Directions.

An assessment has been made of these two risk assessment methodologies to decide which one would be most appropriate for sanitary authorities and private water suppliers in Ireland. It is considered that a methodology relying on a quantitative scoring system rather than professional judgement is more appropriate for the sanitary authorities and private water suppliers. Therefore it is recommended that sanitary authorities and private water suppliers use the Scottish methodology in the new 2003 Directions involving a relatively simple quantitative scoring system that assesses the risk by identifying the factors for the potential for *Cryptosporidium* being present in water supplies. The higher the score, the greater the potential risk. The methodology involves assessing surface water supplies separately from groundwater supplies. For both types of supply a catchment risk score and a treatment/supply risk score is calculated separately and then the two scores for each type are added and population weighted to give a final risk score. This methodology, with some modifications to the text, is given in the paragraphs below.

## **SURFACE WATER RISK ASSESSMENT (CATCHMENT RISK SCORE)**

Surface water is defined as water that is open to the atmosphere and subject to surface run off. It includes rivers, streams, lakes, loughs, reservoirs (impounding and pumped long term and bankside storage), springs and shallow underground sources (such as river gravels). Where there is more than one source supplying a treatment works, each source should be assessed individually and the highest score used to calculate the combined catchment and treatment and supply score, and the final, population weighted score.

### **Animals within the Catchment**

Sheep and cattle, particularly when lambing or calving, are significant sources of *Cryptosporidium*. The higher the density of animals in the forage area the higher the potential risk. Forage areas are defined as grass, open woodland, rape for stock feed, rough grazing, turnips/swedes for stock feed and other crops for stock feed. Deer (also when high numbers in the wild) and pigs, particularly if farmed close to water sources, can also be a source of *Cryptosporidium*. The risk is higher when animals have direct access to water. High numbers of birds, particularly when roosting on or near water sources, can also be a source of *Cryptosporidium*. The total score for item 1 is the sum of the scores from items 1.1 or 1.2, 1.3 or 1.4, 1.5, 1.6, 1.7 or 1.8, 1.9 and 1.10.

<b>Item No.</b>	<b>Risk Factor</b>	<b>Score</b>
1.1	Cattle/calves at less than or equal to one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	6
1.2	Cattle/calves at more than one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	12



1.3	Sheep/lambs at less than or equal to one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	6
1.4	Sheep/lambs at more than one animal per hectare of forage area. If density not known assume more than one animal per hectare of forage area.	12
1.5	Wild or farmed deer	2
1.6	Pig farms	2
1.7	Animals have direct access to water sources including feeder streams	4
1.8	Fencing prevents access to water sources including feeder streams	-1
1.9	High numbers of birds	2
1,10	Any other farmed animal or bird	1

### Agricultural Practices within the Catchment

Slurry spraying and dung spreading, particularly the former, pose a high risk of *Cryptosporidium* contamination of water sources. Although well kept and managed slurry stores can kill oocysts, there is no way of knowing how effectively they are being operated and therefore a risk should be assumed. Sheep pens and cattle byres and lambing or calving on the catchment present a potential risk. The total score for Item 2 is the sum of the scores for each of the risk factors in the table below that is taking place on the catchment.

Item No.	Risk Factor	Score
2.1	Slurry spraying	6
2.2	Dung spreading	3
2.3	Slurry or dung stores	3
2.4	Sheep pens or cattle byres	6
2.5	Lambing or calving on the catchment	8

### Discharges to the Catchment / Water Source

Sewage works and septic tanks may not remove oocysts if there is cryptosporidiosis in the community, so there could be oocysts in the sewage works or septic tank effluent and that effluent could enter a raw water source. The impact of septic tanks and sewage works is scored separately on the basis of the total population served by **all** tanks or works in the catchment. Storm sewage overflows (outlets) and abattoirs/livestock markets are also a potential source of *Cryptosporidium* and each should be scored only once even when there is more than one of each discharging into the catchment. The total score for item 3 is the sum of the scores from items 3.1 or 3.2, 3.3 or 3.4 or 3.5 or 3.6 or 3.7, 3.8 and 3.9.

Item No.	Risk Factor	Score
3.1	Population served by all septic tanks $\leq$ 100	4
3.2	Population served by all septic tanks $>$ 100	6
3.3	Population equivalent served by all sewage works $<$ 100	4

3.4	Population equivalent served by all sewage works 500 to 5,000	5
3.5	Population equivalent served by all sewage works 5,001 to 20,000	6
3.6	Population equivalent served by all sewage works 20,001 to 50,000	7
3.7	Population equivalent served by all sewage works > 50,000	8
3.8	Storm sewage overflows (Regardless of number)	2
3.9	Abattoirs/livestock markets (Regardless of number)	2

### Water Source Type

Surface water sources present the highest risk from *Cryptosporidium*, particularly when there is direct abstraction from a river or stream. Lowland rivers present a greater risk than upland reservoirs. The risk from springs and shallow underground sources depends on hydrogeological factors, particularly their vulnerability to contamination from activities on the surface. The total score for item 4 consists of one score from the list of sources in the table below (no adding of scores).

Item No.	Risk Factor	Score
4.1	Secure natural springs – vulnerable soil/hydrogeology	4
4.2	Secure natural springs – non-vulnerable soil/hydrogeology	1
4.3	Other shallow underground sources - vulnerable soil/hydrogeology	4
4.4	Other shallow underground sources - non-vulnerable soil/hydrogeology	2
4.5	Upland reservoir	2
4.6	Lowland long term storage reservoir	4
4.7	Upland river or stream – direct abstraction	6
4.8	Lowland river or stream – direct abstraction or bankside storage	8

### Raw Water Aquaducts

If the raw water is transferred to the treatment works in an aqueduct, this item should be scored. The total score for item 5 is the score from items 5.1 or 5.2.

Item No.	Risk Factor	Score
5.1	Raw water aqueduct known or suspected to be vulnerable to contamination from farmland	8
5.2	Raw water aqueduct proven to be secure contamination from farmland within past five years	0

### Catchment Inspections

Regular catchment inspections and procedures to deal with any identified irregularities reduce the risk from *Cryptosporidium*. The total score for item 6 is the sum of the scores

Item No.	Risk Factor	Score
----------	-------------	-------

6.1	Catchment inspections carried out at least monthly	-3
6.2	Catchment inspections carried out less frequently	6
6.3	Procedures in place to deal with irregularities on the catchment	3

### Raw Water Intake Management for Direct Abstraction

This item should only be scored if the raw water is abstracted directly from a river or stream and for lowland rivers with direct abstraction into a short-term bankside storage reservoir. Risk is reduced when turbidity monitors are installed at the intake and further reduced when the monitors are alarmed and the intake shut when poor water quality conditions are detected. The total score for item 7 is the sum of the scores from items 7.1 or 7.2 and 7.3 or 7.4 or 7.5.

Item No.	Risk Factor	Score
7.1	No turbidity monitor on intake	3
7.2	Turbidity monitor on intake that is alarmed and connected to telemetry	-2
7.3	Automatic intake shut down when poor water quality	-4
7.4	Manual intake shut down when poor water quality	-1
7.5	No intake shut down when poor water quality	3

### Surface Water Catchment Risk Score

Calculate the surface water catchment risk score by adding the scores from items 1, 2, 3, 4, 5, 6 (if applicable) and 7 (if applicable).

### Surface Water Risk Assessment (Treatment and Supply Risk Score)

If there is more than one treatment process stream at the water treatment works, each treatment process stream should be scored separately and the highest scoring treatment process stream should be used to calculate the treatment and supply risk score and the combined catchment and treatment and supply risk score and the final population weighted score.

### Water Treatment Processes

It is well established that some treatment processes are much more effective in removing *Cryptosporidium*, and therefore reducing the risk, than others. The most effective processes are those that use membrane filtration or coagulation followed by sedimentation or dissolved air flotation and filtration. Membrane filtration is particularly effective when the membrane is capable of removing or retaining particles greater than one micron diameter – the Scottish Executive and the Drinking Water Inspectorate publish lists of membrane products that achieve this performance. Simple disinfection and microstraining do not reduce the risk from *Cryptosporidium*. The total score for item 8 is one of the scores from the risk factors in the table below based on the principal treatment at the works.

Item No.	Risk Factor	Score
8.1	Disinfection only	10

8.2	Microstraining	10
8.3	Simple sand filtration (not slow sand filtration)	8
8.4	Coagulation followed by DAF/sedimentation and filtration	-10
8.5	Coagulation followed by rapid gravity or pressure filtration (no flotation or sedimentation)	-7
8.6	Slow sand filtration	-9
8.7	Membrane filtration (on Scottish Executive or DWI list)	-16
8.8	Membrane filtration (not on Scottish Executive or DWI list)	-2
8.9	Cartridge/Kalsep filtration	-2
8,10	Filtamat or similar filtration system	-2

### Treatment Works Monitoring of Coagulation and Filtration

This section only applies when coagulation and filtration or filtration only is part of the water treatment process. Turbidity meters provide a good indication of filtration efficiency. Where turbidity meters are fitted and are alarmed so action can be taken, the risk from *Cryptosporidium* is reduced. Similarly a residual coagulant monitor on the outlet of the works, particularly when alarmed, provides an indication of the efficiency of the coagulation and filtration process. When membrane filters have an alarm to monitor the integrity of the membrane or have particle counters to monitor performance, the risk from *Cryptosporidium* is reduced. Routine discrete monitoring of treated water quality is also important. For **rapid gravity or pressure filters** the total score for item 9 is the sum of the scores for items 9.1 or 9.2 or 9.3 or 9.4 or 9.5, 9.6 or 9.7 or 9.8, 9.9, 9.10 or 9.11 or 9.12, 9.13 or 9.14, and 9.15 or 9.16. For **slow sand filters** the total score for item 9 is the sum of the scores for items 9.17 or 9.18 or 9.19 or 9.20 or 9.21, 9.22 or 9.23 or 9.24, 9.25, and 9.26 or 9.27 or 9.28. For **membrane filters** the total score for item 9 is the sum of the scores for items 9.29 or 9.30 or 9.31, and 9.32.

### Rapid gravity and pressure filters

Item No.	Risk Factor	Score
9.1	Turbidity meter on each filter with alarm on telemetry	-5
9.2	Turbidity meter on each filter but no alarm on telemetry	0
9.3	One turbidity meter shared by more than one filter with alarm on telemetry	-2
9.4	One turbidity meter shared by more than one filter but no alarm on telemetry	2
9.5	No turbidity meters monitoring filter performance	10
9.6	Final water turbidity meter with alarm on telemetry	-2
9.7	Final water turbidity meter but no alarm on telemetry	2
9.8	No final water turbidity meter	5
9.9	Particle counter used continuously to monitor filter performance	-5
9,10	Continuous residual coagulant monitor on combined filtrate or works outlet with alarm	-5
9.11	Continuous residual coagulant monitor on combined filtrate or works outlet but no alarm	-1
9.12	No continuous residual coagulant monitor on combined filtrate or works outlet	5

9.13	Routine discrete monitoring of treated water for turbidity/residual coagulant	-2
9.14	No routine discrete monitoring of treated water for turbidity/residual coagulant	2
9.15	Turbidity of backwash supernatant monitored when	-2
9.16	Turbidity of backwash supernatant not monitored when recycled	2

#### Slow sand filters

9.17	Turbidity meter on each filter with alarm on telemetry	-5
9.18	Turbidity meter on each filter but no alarm on telemetry	0
9.19	One turbidity meter shared by more than one filter with alarm on telemetry	-2
9.20	One turbidity meter shared by more than one filter but no alarm on telemetry	2
9.21	No turbidity meters monitoring filter performance	10
9.22	Final water turbidity meter with alarm on telemetry	-2
9.23	Final water turbidity meter but no alarm on telemetry	2
9.24	No final water turbidity meter	5
9.25	Particle counter used continuously to monitor filter performance	-5
9.26	Filters matured and filtrate analysed for turbidity, coliforms and Cryptosporidium during maturation	-4
9.27	Filters matured but no analysis carried out on filtrate	5
9.28	Filters not matured	15

#### Membrane filters

9.29	Plant monitored and alarmed for integrity	-3
9.30	Plant monitored for integrity but not alarmed	0
9.31	Plant not monitored for integrity	10
9.32	Particle counter used continuously to monitor filter performance	-5

#### Rapid Gravity and Pressure Filter Works Performance

This item only applies to treatment works with rapid gravity or pressure filters. Final water turbidity is a good indicator of filter performance. Filter condition, particularly loss of filter media and cracking of filter bed, the effect of filter backwashing on final water turbidity, and filter maintenance are also relevant. The total score for item 10 is the sum of the scores for items 10.1 or 10.2, 10.3 or 10.4, 10.5, 10.6 and 10.7.

Item No.	Risk Factor	Score
10.1	Final water turbidity increases by more than 50%, excluding normal backwash period	4
10.2	Treated water turbidity increases by less than 50%, excluding normal backwash period	0
10.3	Media loss from any filter has brought media depth below design level	6
10.4	Media depth above minimum design level with audit trail maintained	-2
10.5	Signs of media cracking on any filter	4

10.6	All filters have been drained, inspected and any necessary remedial action taken within last year	-2
10.7	Air scour and backwash maintained and operating efficiently as per maintenance manual	-2

### Treatment Works Operation

When a treatment works is operated in accordance with good practice with quality assured procedures, the risk from *Cryptosporidium* is reduced, particularly when there are auditable action plans to deal with any deviations from expected quality. The methods of returning filters to service following backwashing (following skimming and cleaning in the case of slow sand filters) and dealing with filter backwash water have an effect on the risk. Other relevant factors are significant short-term variations in flow through the works and whether the works has operated above its design flow. The total score for item 11 is the sum of the scores from items 11.1 or 11.2, 11.3 or 11.4, 11.5 or 11.6 (if relevant), 11.7 or 11.8 or 11.9 (if relevant), 11.10 or 11.11 (if relevant), 11.12 or 11.13 and 11.14 or 11.15.

11.1	Process control manuals specific to works available	-1
11.2	Process control manuals specific to works not available	1
11.3	Auditable action plans available for dealing with deviations in quality	-1
11.4	Auditable action plans not available for dealing with deviations in quality	1
11.5	Slow start facility on filters operational	-4
11.6	No slow start facility on filters, or slow start facility not operational	4
11.7	Filters run to waste for appropriate period after backwash	-6
11.8	Filters run to head of works for a period following backwash	-4
11.9	Filters not run to waste or head of works for a period following backwash	4
11,10	Backwash water and/or sludge supernatant has to be recycled	2
11.11	Other disposal route available for backwash water and sludge supernatant	-2
11.12	Water flow through works when operating has not varied by >10% in <30 minutes in last 12 months	-2
11.13	Water flow through works when operating has varied by >10% in <30 minutes in last 12 months	2
11.14	Flow through works above design flow for >10% of time in last 12 months	4
11.15	Flow through works above design flow for ≤10% of time in last 12 months	0

### Surface Water Treatment and Supply Risk Score

The surface water treatment and supply risk score is the sum of the scores for items 8, 9 (if relevant and for the relevant treatment process), 10 (if relevant) and 11.

### Final Weighted Surface Water Risk Assessment Score

The final surface water risk assessment score is the sum of the surface water

catchment risk score and the surface water treatment and supply risk score. This score is then weighted according to the population served by the supply. The population weighting factor is  $0.4 \times \log_{10}$  (population served by the supply). The final weighted surface water risk assessment score is the final surface water risk assessment score  $\times$  the population weighting factor.

### **WATER SUPPLY RISK CLASSIFICATION**

The classification depends on the final risk assessment score. It should be noted that the high risk assessment classification used by the Scottish Executive has been renamed very high risk and the moderate risk classification split into two classifications – high risk and moderate risk.

<b>Water Supply Risk Classification</b>	<b>Final Risk Assessment Score</b>
Very high risk	>100
High risk	76-100
Moderate risk	50-75
Low risk	<50

For inspection purposes only.  
Consent of copyright owner required for any other use.

**Table G**

	AGGLOMERATION	G1- COMPLIANCE WITH COUNCIL DIRECTIVES	G2- COMPLIANCE WITH QUALITY STANDARDS FOR PHOSPHOROUS REGULATIONS (SI No. 258 OF 1998)	G3-IMPACT MITIGATION	G4- STORM OVERFLOWS.
1	Blarney	No information to hand on this.	Blarney (Blarney/Tower) has recently been upgraded to 13,000 p.e. secondary treatment and <b><i>includes nutrient removal</i></b> . No additional upgrading is proposed at this time.	No further works identified as necessary at this time.	No programme of improvements at this time
2	Crosshaven	Forms an element of the proposed Lower Harbour SS. Will be served by the Lower Harbour Wastewater Treatment Plant the EIS for which will be lodged with An Bord Pleanála at end 2007. The Preliminary Report is also at an advanced stage and will be lodged with DEHLG in February 2008. The reports will address all relevant environmental and drainage issues.	Nutrient removal is not envisaged as discharge is not to sensitive waters	No interim mitigation measures are proposed	Will be addressed in the Preliminary Report
3	Cobh	As for Crossshaven	As for Crossshaven	As for Crossshaven	As for Crossshaven
4	Carrigaline	As for Crossshaven	As for Crossshaven	As for Crossshaven	As for Crossshaven
5	Ringaskiddy	As for Crossshaven	As for Crossshaven	As for Crossshaven	As for Crossshaven
6	Carrigtwohill	First phase proposal is to increase capacity to 45,000 p.e. secondary treatment. EIS and PR will address these issues	Nutrient removal is being proposed in the EIS and PR as the discharge area is currently designated a sensitive area.	No interim proposals	EIS to ABP March '08

<b>Attachment included</b> <b>1/ Assessment of Needs</b> <b>2/ Water Services Investment programme 2007-2009</b>	<b>Yes</b>	<b>No</b>
	<b>Yes</b> <b>Yes</b>	



## **SECTION G: G.1 Compliance with Directives**

### **G.1(a) 2006**

Based on monitoring data by both Cork City Council and Cork County Council Water Laboratory there were no breaches of the Abstraction Directive in 2006.

### **G.1(b) 2007**

The data supplied relates to monitoring in 2007 by Cork County Council as part of the Salmonid Directive at Cork City Council intake location.

The analytical results were also assessed against the Abstraction Directive for those parameters that are regulated under the Abstraction Regulations. There was one non-compliant date, i.e. February 8<sup>th</sup> 2007 where the directive was breached for BOD and colour. The A2 category permitted values are 5 mg/L for BOD and 100 Hazen units for colour.

This exceedance was due to heavy rain and flooding in the adjacent locality as the level of Suspended Solids was also elevated on that date.

For inspection purposes only  
Consent of copyright owner required for any other use

Monitoring by Cork City Council under the Abstraction Directive at the intake to Lee Road waterworks

**SURFACE WATER 2006 mg/l**

*(For Surface Water Directive)  
Monitoring by Cork City Council*

DATE	Jan	Feb	Apr	May	Jun	July	Aug	Oct	Nov	(For Surface Water Dir) Long List OCTOBER sample
pH	7.11	6.85	6.8	7.11	7.15	7.35	7.46	7.22	7.35	
Col	20H.U	20HU	30H.U	17H.U	15H.U	15H.U	18H.U	17H.U	20H.U	
SS	17mg/l	14mg/l	15mg/l	17mg/l	18mg/l	12mg/l	9mg/l	3	11mg/l	
TEMP	9.5.C	10.1.C	10.5.C	16.5.C	18.1.C	21.C	22.C	15.6.C	13.C	<b>Parameter</b> <b>Result</b>
COND.	187us	200us	138us	150us	220us	178us	168us	147us/cm	170us	<b>Cyanide</b> <0.1
ODOUR	None	None	None	None	None	None	None	None	None	<b>Phenol.</b> <0.005
Nitrate	22.3	20.4	25.2	26.1	27.2	17	12.3	11.4	13.5	<b>COD.</b> 22
Fluoride	0.009	0.11	0.15	0.008	0.12	0.05	0.03	0.03	0.04	<b>D.O.</b> 97%
Dis. Iron	0.007	0.01	0.05	0.01	0.02	0.015	0.025	0.03	0.02	<b>BOD.</b> 2.1
Mn	0.01	0.006	0.022	0.009	0.008	0.01	0.03	0.013	0.02	<b>K.Nitrogen.</b> 0.3
Cu	0.007	0.004	0.007	0.006	0.005	0.003	0.001	0.015	0.001	<b>Ammonia.</b> 0.07
Zn	0.007	0.004	0.005	0.003	0.009	0.004	0.001	0.002	0.002	<b>Tot. Coli</b> 2,000/100ml
Lead	0.001	0.001	<0.001	<.001	0.001	0.001	0.001	,0.001	0.001	<b>F.Coli.</b> 200/100ml
Sulphate	2.7	1.5	2.1	2.6	2.4	2.5	2	2	2.4	<b>Boron.</b> <0.3
Chloride	21.7	24.1	15.7	16.1	15.6	16.2	17	18.4	16.5	<b>Arsenic.</b> <0.001
Surf.	0.001	0.001	0.002	0.001	0.001	0.002	0.003	<0.005	0.003	<b>Selenium.</b> 0.003
Tot.P	0.75	0.81	0.9	1	1.1	1	1.1	0.06	1.3	<b>Mercury.</b> <0.1
Phenol	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<b>Barium.</b> 0.011
COD	9	7	15	12	9	9	10		12	<b>PAH.</b> <0.01ug/l
DO	98%	97%	96%	96%	165%	125%	104%		90%	<b>Tot.Pest.</b> <0.05ug/l
BOD	1.5	1	2	2.1	2.1	2	2.2		2.4	<b>F.Strep.</b> 47/100mls
K.Nitrogen	0.09	0.07	0.1	0.2	0.15	0.19	0.2		0.21	<b>Salmonella.</b> <b>ABSENT</b>
Ammonia	0.01	0.03	0.15	0.08	0.11	0.15	0.12		0.17	
TOT COLI	2000/100ml	1750/100ml	1150/100ml	2000/100ml	2000/100ml	2748/100ml	2354/100ml		1500/100ml	
F. COLI	500/100ml	440/100ml	370/100ml	200/100ml	220/100ml	170/100ml	180/100ml		120/100ml	

Kevin Sugrue,  
Senior Engineer,  
Water Services

## Re: Licensing of Discharges

**Ballincollig-** Donald Cronin is preparing a response in respect of Ballincollig

**Blarney-** The Council has recently completed an upgrade of the wastewater treatment plant at Blarney to 13,000 p.e. and has no immediate proposals to increase that capacity. The plant at Blarney has two independent secondary treatment processes with the wastewater load being split approximately evenly between them. One stream has biological nutrient removal and the other has chemical nutrient removal. There is concern in relation to the nutrient levels in the river catchments north of Cork City and the Council has obtained approval to carry out a drainage study, the City Environs (CASP) Drainage Study which is being funded under the Water Services Investment Programme 2007-2009. This study will consider the drainage options available for the catchment concerned having regard to existing and planned developments in the area. The Council is currently preparing a brief for the appointment of a consultant and expects to advertise the appointment in early January 2008 and to have the study completed in approx six months thereafter.

**Crosshaven-** wastewater from Crosshaven is collected and discharged to the Carrigaline network and ultimately discharges to Cork Harbour via the 'IDA' sewer at the Dognose Bank. The discharge is currently untreated but will ultimately be served by the Lower Harbour SS, the treatment plant for which will be located at Carrigaline East and the effluent from this plant will discharge through the 'IDA' outfall to the harbour. The EIS for the wastewater treatment plant is being prepared and the Council hopes to lodge it with ABP by end of 2007. Nutrient removal is not being proposed as the receiving waters are not designated sensitive. The PR for the Scheme will be lodged with the DEHLG shortly after the EIS is sent to ABP but approval to the PR will not issue until after the EIS is approved, say mid 2008. The Lower Harbour SS is being funded under the Water Services Investment Programme 2007-2009 and the scheme is expected to be fully operational before the end of 2012.

**Cobh** – this also forms part of the proposed Lower Harbour SS and a significant upgrading of the Cobh sewer network is envisaged with the wastewater being pumped across the harbour to the proposed WWTP at Carrigaline East. The current estimated design capacity required is 80,000 p.e.

**Carrigaline-** this wastewater is discharged (see Crosshaven) via the 'IDA' sewer and will ultimately form part of the Lower Harbour SS

**Ringaskiddy** – as for Carrigaline

**Carrigtwohill** –EIS under preparation and expected to be submitted to ABP March '08. The anticipated first phase will be to increase treatment capacity to 45000 p.e. from the current 8500 p.e. . The works are to be funded under the Serviced land Initiative. Nutrient removal will be included in the EIS and the PR as the Lee Estuary/Lough Mahon Area is currently designated a sensitive water.

The above information should be read in conjunction with earlier correspondence on the same matter and in particular you should cross-reference with response received from Duane O'Brien in relation to Carrigtwohill.

Regards,

R O'Farrell,  
Senior Engineer,  
WSIP Projects Office  
4<sup>th</sup> December 2007

## Section G 2

### Blarney

Compliance with the phosphorus regulations

The discharge to the river Shournagh from Blarney wastewater treatment plant is 1.0 km upstream of site No 19S01 0300 at Tower bridge, Tower ,Co. Cork .

The baseline Q value was set at Q4 in 1997

The Q value for 2000 was Q3 -Q4 at this location

The Q value for 2000 was Q3 -Q4 at this location

The Q value for 2005 was Q3 -Q4 at this location .

On the basis of the above this site is not complaint with the Phosphate regulations. The treatment plant in Blarney has been upgraded and nutrient removal included as part of the upgrade . Details are included in section B10 and the listings of schemes in section G outline the details of the upgrade .

On this basis it is expected that there will be an improvement in the Q rating due to this measure and other measures that were undertaken as part of a programme of measures and that the site will be in compliance with the Phosphate regulations at this location within the next two to three years..

# Cork County

## Water Services Investment Programme 2007 - 2009

Schemes at Construction	W/S	Est. Cost	W/S	Est. Cost
<b>Cork North</b>			<b>Cork South</b>	
Mitchelstown Sewerage Scheme (Nutrient Removal)	S	221,000	Ballincollig Sewerage Scheme (Upgrade) (G)	S 22,248,000
<b>Cork South</b>			Cork Lower Harbour Sewerage Scheme (excl. Crosshaven SS)	S 73,542,000
Ballyvourney/ Ballymakeery Sewerage Scheme	S	3,049,000	Shannagarry/ Garryvoe/ Ballycotton Sewerage Scheme	S 3,780,000
Cobh/ Midleton/ Carrigtwohill Water Supply Scheme	W	10,135,000	Youghal Sewerage Scheme	S 14,420,000
Cork Lower Harbour Sewerage Scheme (Crosshaven SS) (G)	S	4,850,000	<b>Cork West</b>	
Cork Water Strategy Study (G)	W	941,000	Ballydehob Sewerage Scheme	S 683,000
Kinsale Sewerage Scheme	S	20,000,000	Bantry Water Supply Scheme	W 14,935,000
Midleton Sewerage Scheme (Infiltration Reduction) (G)	S	2,078,000	Clonakilty Sewerage Scheme (Plant Capacity Increase)	S 3,677,000
		<b>41,274,000</b>	Courtmacsherry/ Timoleague Sewerage Scheme	S 2,472,000
<b>Schemes to start 2007</b>			Dunmanway Regional Water Supply Scheme Stage 1	W 12,669,000
<b>Cork North</b>				<b>164,629,000</b>
North Cork Grouped DBO Wastewater Treatment Plant (Buttevant, Doneraile & Kilbrin)	S	5,150,000	<b>Serviced Land Initiative</b>	
<b>Cork West</b>			<b>Cork North</b>	
Skibbereen Sewerage Scheme	S	20,000,000	Ballycough Water Supply Scheme	W 139,000
		<b>25,150,000</b>	Ballyhooley Improvement Scheme	W/S 139,000
<b>Schemes to start 2008</b>			Broghill-Rathgoggin Sewerage Scheme	S 406,000
<b>Cork North</b>			Bweeng Water Supply Scheme	W 115,000
Mallow/ Ballyvinitier Regional Water Supply Scheme (H) W		8,662,000	Churchtown Sewerage Scheme (incl. Water)	W/S 543,000
Mallow Sewerage Scheme (H)	S	3,408,000	Clondulane Sewage Treatment Plant	S 417,000
<b>Cork South</b>			Freemount Sewerage Scheme	S 150,000
Ballincollig Sewerage Scheme (Nutrient Removal) (G)	S	948,000	Pike Road Sewerage Scheme (incl. Water)	W/S 2,080,000
Ballingeary Sewerage Scheme	S	1,296,000	Rathcormac Sewerage Scheme (incl. Water)	W/S 555,000
Bandon Sewerage Scheme Stage 2	S	14,729,000	Spa Glen Sewerage Scheme	S 736,000
City Environs (CASP) Strategic Study (G)	S	153,000	Uplands Fermoy Sewerage Scheme (incl. Water)	W/S 1,174,000
Cloghroe Sewerage Scheme (Upgrade)	S	683,000	Watergrasshill Water Supply Scheme (incl. Sewerage) (G)	W/S 4,151,000
Coachford Water Supply Scheme	W	1,318,000	<b>Cork South</b>	
Garretstown Sewerage Scheme	S	2,153,000	Ballincollig Sewerage Scheme (Barry's Rd Foul and Storm Drainage) (G)	S 1,164,000
Inniscarra Water Treatment Plant Extension Phase 1	W	2,678,000	Belgooley, Water Supply Scheme (incl. Sewerage)	W/S 2,913,000
Little Island Sewerage Scheme (G)	S	2,200,000	Blarney Water Supply Scheme (Ext. to Station Rd) (G)	W 416,000
<b>Cork West</b>			Carrigtwohill Sewerage Scheme (Treatment and Storm Drain) (G)	S 7,632,000
Bantry Sewerage Scheme	S	7,148,000	Castlematyr Wastewater Treatment Plant Extension	S 1,200,000
Dunmanway Sewerage Scheme	S	2,153,000	Crookstown Sewerage Scheme (incl. Water)	W/S 1,200,000
Leap/ Baltimore Water Supply Scheme	W	6,365,000	Dripsey Water Supply Scheme (incl. Sewerage)	W/S 1,112,000
Schull Water Supply Scheme	W	5,253,000	Glounthane Sewerage Scheme (G)	S 1,576,000
		<b>61,137,000</b>	Innishannon Sewerage Scheme	S 277,000
<b>Schemes to start 2009</b>			Innishannon Wastewater Treatment Plant	S 694,000
<b>Cork North</b>			Kerrypike Sewerage Scheme	S 832,000
Banteer/Dromahane Regional Water Supply Scheme	W	1,576,000	Kerrypike Water Supply Scheme	W 416,000
Conna Regional Water Supply Scheme Extension	W	2,627,000	Killeagh Wastewater Treatment Plant Extension	S 1,200,000
Cork NE Water Supply Scheme	W	4,326,000	Killeagh Water Supply Scheme (includes Sewerage)	W/S 485,000
Cork NW Regional Water Supply Scheme	W	6,046,000	Killeens Sewerage Scheme	S 420,000
Millstreet Wastewater Treatment Plant (Upgrade)	S	1,628,000	Kinagleary Sewerage Scheme	S 694,000
			Midleton Wastewater Treatment Plant Extension	S 4,050,000

# Cork County contd.

## Water Services Investment Programme 2007 - 2009

	W/S	Est. Cost		W/S	Est. Cost
Mogeely, Castlemartyr & Ladysbridge Water Supply Scheme	W	2,566,000	<b>Cork South</b>		
North Cobh Sewerage Scheme (G)	S	3,193,000	Carrigtwohill Sewerage Scheme (G)	S	20,000,000
Riverstick Water Supply Scheme (incl. Sewerage)	W/S	525,000	Cork Sludge Management (G)	S	14,420,000
Rochestown Water Supply Scheme	W	2,700,000	Cork Water Supply Scheme (Storage - Mount Emla,		
Saleen Sewerage Scheme	S	1,051,000	Ballincollig & Chetwind) (G)	W	8,500,000
Youghal Water Supply Scheme	W	2,300,000	Inniscarra Water Treatment Plant (Sludge Treatment)(G)W		5,356,000
			Macroom Sewerage Scheme	S	5,150,000
<b>Cork West</b>			Minane Bridge Water Supply Scheme	W	1,421,000
Castletownshend Sewerage Scheme	S	1,576,000			
		<b>50,797,000</b>	<b>Cork West</b>		
<b>Rural Towns &amp; Villages Initiative</b>			Bantry Regional Water Supply Scheme (Distribution)	W	9,455,000
<b>Cork North</b>			Cape Clear Water Supply Scheme	W	1,679,000
Buttevant Sewerage Scheme (Collection System)	S	2,446,000	Castletownbere Regional Water Supply Scheme	W	8,405,000
Doneraile Sewerage Scheme (Collection System)	S	1,738,000	Glengarriff Sewerage Scheme	S	2,500,000
			Roscarberry/Owenahincha Sewerage Scheme	S	1,576,000
<b>Cork South</b>			Skibbereen Regional Water Supply Scheme Stage 4	W	7,880,000
Innishannon (Ballinadee/ Ballinspittle/ Garrettstown)					<b>95,646,000</b>
Water Supply Scheme	W	6,726,000	<b>Water Conservation Allocation</b>		<b>12,206,000</b>
			<b>Asset Management Study</b>		<b>300,000</b>
<b>Cork West</b>			<b>South Western River Basin District (WFD) Project<sup>1</sup></b>		<b>9,400,000</b>
Ballylicky Sewerage Scheme	S	2,153,000			
Baltimore Sewerage Scheme	S	3,162,000			
Castletownbere Sewerage Scheme	S	5,302,000			
Schull Sewerage Scheme	S	3,523,000			
		<b>24,950,000</b>	<b>Programme Total</b>		<b>485,489,000</b>
<b>Schemes to Advance through Planning</b>					
<b>Cork North</b>					
Mitchelstown North Galtees Water Supply Scheme	W	3,152,000			
Mitchelstown Sewerage Scheme	S	3,000,000			
Newmarket Sewerage Scheme	S	3,152,000			

<sup>1</sup> This project is being led by Cork County Council on behalf of other authorities in the River Basin District

(H) Refers to a Hub as designated in the National Spatial Strategy

(G) Refers to a Gateway as designated in the National Spatial Strategy

**SECTION H: DECLARATION**

**Declaration**

I hereby make application for a waste water discharge licence/revised licence, pursuant to the provisions of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

I certify that the information given in this application is truthful, accurate and complete.

I give consent to the EPA to copy this application for its own use and to make it available for inspection and copying by the public, both in the form of paper files available for inspection at EPA and local authority offices, and via the EPA's website.

This consent relates to this application itself and to any further information or submission, whether provided by me as Applicant, any person acting on the Applicant's behalf, or any other person.

Signed by Patricia Power  
(on behalf of the organisation)

Date: 14 Dec 07

Print signature name: PATRICIA POWER

Position in organisation: Director of Services

For inspection purposes only  
Consent of copyright owner required for any other use.

## Blarney :ANNEX 2: Check List For Regulation 16 Compliance

Regulation 16 of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) sets out the information which must, in all cases, accompany a discharge licence application. In order to ensure that the application fully complies with the legal requirements of Regulation 16 of the 2007 Regulations, all applicants should complete the following.

In each case, refer to the attachment number(s) of your application which contain(s) the information requested in the appropriate sub-article.

<b>Regulation 16(1) In the case of an application for a waste water discharge licence, the application shall -</b>		<b>Attachment Number</b>	<b>Checked by Applicant ✓</b>
<b>(a)</b>	give the name, address, telefax number (if any) and telephone number of the applicant (and, if different, of the operator of any treatment plant concerned) and the address to which correspondence relating to the application should be sent and, if the operator is a body corporate, the address of its registered office or principal office,	<b>B1</b>	✓
<b>(b)</b>	give the name of the water services authority in whose functional area the relevant waste water discharge takes place or is to take place, if different from that of the applicant,	<b>B7</b>	✓
<b>(c)</b>	give the location or postal address (including where appropriate, the name of the townland or townlands) and the National Grid reference of the location of the waste water treatment plant and/or the waste water discharge point or points to which the application relates,	<b>B2</b>	✓
<b>(d)</b>	state the population equivalent of the agglomeration to which the application relates,	<b>B9</b>	✓
<b>(e)</b>	specify the content and extent of the waste water discharge, the level of treatment provided, if any, and the flow and type of discharge,	<b>C,D</b>	✓
<b>(f)</b>	give details of the receiving water body, including its protected area status, if any, and details of any sensitive areas or protected areas or both in the vicinity of the discharge point or points likely to be affected by the discharge concerned, and for discharges to ground provide details of groundwater protection schemes in place for the receiving water body and all associated hydrogeological and geological assessments related to the receiving water environment in the vicinity of the discharge.	<b>D2</b>	✓



<b>Regulation 16(1) continued.../</b>		<b>Attachment Number</b>	<b>Checked by Applicant ✓</b>
<b>(g)</b>	identify monitoring and sampling points and indicate proposed arrangements for the monitoring of discharges and, if Regulation 17 does not apply, provide details of the likely environmental consequences of any such discharges,	<b>E3</b>	✓
<b>(h)</b>	in the case of an existing waste water treatment plant, specify the sampling data pertaining to the discharge based on the samples taken in the 12 months preceding the making of the application,	<b>E4</b>	✓
<b>(i)</b>	describe the existing or proposed measures, including emergency procedures, to prevent unintended waste water discharges and to minimise the impact on the environment of any such discharges,	<b>G</b>	✓
<b>(j)</b>	give particulars of the nearest downstream drinking water abstraction point or points to the discharge point or points,	<b>F2</b>	✓
<b>(k)</b>	give details, and an assessment of the effects, of any existing or proposed emissions on the environment, including any environmental medium other than those into which the emissions are, or are to be made, and of proposed measures to prevent or eliminate or, where that is not practicable, to limit any pollution caused in such discharges,	<b>F1</b>	✓
<b>(l)</b>	give detail of compliance with relevant monitoring requirements and treatment standards contained in any applicable Council Directives of Regulations,	<b>G</b>	✓
<b>(m)</b>	give details of any work necessary to meet relevant effluent discharge standards and a timeframe and schedule for such work.	<b>G3</b>	✓
<b>(n)</b>	Any other information as may be stipulated by the Agency.	<b>x</b>	<b>X</b>

<b>Regulation 16(3)</b> Without prejudice to Regulation 16 (1) and (2), an application for a licence shall be accompanied by -		<b>Attachment Number</b>	<b>Checked by the applicant ✓</b>
<b>(a)</b>	a copy of the notice of intention to make an application given pursuant to Regulation 9,	<b>B8</b>	✓
<b>(b)</b>	where appropriate, a copy of the notice given to a relevant water services authority under Regulation 13,	<b>Not applicable</b>	✓
<b>(c)</b>	Such other particulars, drawings, maps, reports and supporting documentation as are necessary to identify and describe, as appropriate -		
	(i) the point or points, including storm water overflows, from which a discharge or discharges take place or are to take place, and	<b>B5</b>	✓
	(ii) the point or points at which monitoring and sampling are undertaken or are to be undertaken,	<b>E3</b>	✓
<b>(d)</b>	such fee as is appropriate having regard to the provisions of Regulations 38 and 39.	<b>B9(ii)</b>	✓
<b>Regulation 16(4)</b> An original application shall be accompanied by 2 copies of it and of all accompanying documents and particulars as required under Regulation 16(3) in hardcopy or in an electronic or other format as specified by the Agency.			✓
<b>Regulation 16(5)</b> For the purpose of paragraph (4), all or part of the 2 copies of the said application and associated documents and particulars may, with the agreement of the Agency.			✓
	Signed original.		✓
	2 hardcopies of application provided or 2 CD versions of application (PDF files) provided.		✓
	1 CD of geo-referenced digital files provided.		✓
<b>Regulation 17</b> Where a treatment plant associated with the relevant waste water works is or has been subject to the European Communities (Environmental Impact Assessment) Regulations 1989 to 2001, in addition to compliance with the requirements of Regulation 16, an application in respect of the relevant discharge shall be accompanied by a copy of an environmental impact statement and approval in accordance with the Act of 2000 in respect of the said development and may be submitted in an electronic or other format specified by the Agency			✓
	EIA provided if applicable		✓
	2 hardcopies of EIS provided if applicable.		✓
	2 CD versions of EIS, as PDF files, provided.		✓