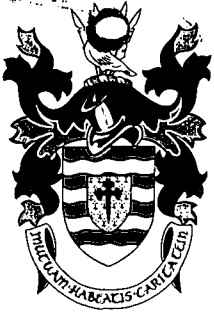


1507



# Comhairle Chontae Dhún na nGall Donegal County Council

Tel/Guthán: (074) 93 73700 Fax/Facs: (074) 93 29022  
www.donegalcoco.ie www.ccdhunngall.ie

Our Ref: ANSWER/

17<sup>th</sup> January 2012

ENVIRONMENTAL PROTECTION AGENCY  
PO BOX 3000  
JOHNSTOWN CASTLE  
CO. WEXFORD

The Environmental Protection Agency  
Your Ref:  
20 JAN 2012  
**CORK**

ENVIRONMENTAL PROTECTION AGENCY  
19 JAN 2012

Proposed Pilot Project on the use of Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works

Dear Sir/Madam,

Donegal County Council propose a pilot project to use Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works in the townlands of Carrowreagh and Skeoge, Co. Donegal.

The pilot will involve pumping treated effluent (liquid wastewater) through an irrigation system laid between rows of willow. It should be noted that the effluent has been treated in the treatment works and will now be further treated through bioremediation by Short Rotation Coppice Willow. Currently the effluent is being discharged into the Skeoge river, this project acts as further treatment and reduces the amount of effluent entering the river.

The pilot scheme to form a 14 hectare Willow Plantation irrigated with final discharge quality water from Bridgend Waste Water Treatment Works, for the treatment and bioremediation of the waste water through the growth and eventual harvesting of willows. The works will consist of a new pumping station at Bridgend Waste Water Treatment Works, Rising Main from Treatment Works to adjoining irrigation lands, irrigation pipe-work with interconnecting pipe-work, valves, flow-meter and associated site works at Bridgend, Co. Donegal.

(Cont'd Page 2)

The overall extent of the works is shown on drawing number 551-002

In accordance with The Planning and Development Acts 2000 - 2010 and Part 8, article 82 of The Planning and Development Regulations 2001 - 2011, please find:

1. Notice of the proposed development
2. Description of the proposed development
3. Maps describing the proposed development

Submissions and observations with respect to the proposed development, dealing with the proper planning and development of the area in which the development is situated may be made to The County Secretary, the County Secretarys Office, Donegal County Council, County House, Lifford, County Donegal before 4.30 p.m. on Thursday 15<sup>th</sup> March 2012.

Yours faithfully,

---

**For Joe Peoples  
Director of Services  
Water and Environment  
Donegal County Council**

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*Person dealing with this:*

*Con McLaughlin, Senior Engineer, Water and Environment*

**Part 8**  
**Proposed Pilot Project on the use of Short Rotation**  
**Coppice Willow for the Bioremediation of discharge water**  
**at Bridgend Waste Water Treatment Works**

**Part 8 Procedures**  
**Drawings and Particulars**  
**Donegal County Council**  
**January 2012**

Please keep file available for  
Inspection by the public from:

**9.00am to 4.30pm**  
**Tuesday January 17<sup>th</sup> to Thursday March 1<sup>st</sup> 2012**

**Note:**

Plans and particulars are available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy.

Copies can be obtained from the front desk between the hours of 9.00am to 12.30pm and 1.00pm to 4.30pm

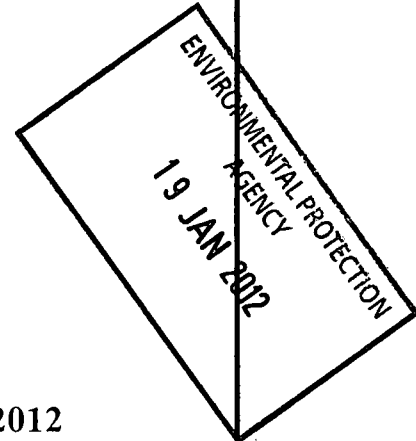
***Submissions must be made to:***

**The County Secretary**  
The County Secretary's Office  
Donegal County Council  
County House  
Lifford  
Co. Donegal

**Before 4:30pm on Thursday 15<sup>th</sup> March 2012**

***If there are any queries please contact:***

**Martina Doherty**  
Donegal County Council  
Water and Environment  
Carndonagh  
Co. Donegal



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# Donegal County Council



## PLANNING AND DEVELOPMENT REGULATIONS 2001-2011

**Nature and Extent of proposed development in accordance with  
Part 8 requirements of the above Regulations.  
(Available for public inspection)**

**Proposed Pilot Project on the use of Short  
Rotation Coppice Willow for the Bioremediation  
of discharge water at Bridgend Waste Water  
Treatment Works**

**Prepared By:** Donegal County Council  
Water and Environment  
Carndonagh Public Services Centre

**Date:** January 2012

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Planning Notice

Appendix A - Stage 1 Appropriate Assessment for ANSWER Project

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## 1.0 Introduction

Donegal County Council propose a pilot project to use Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works in the townlands of Carrowreagh and Skeoge.

The pilot will involve pumping treated effluent (liquid wastewater) through an irrigation system laid between rows of willow. It should be noted that the effluent has been treated in the treatment works and will be now further treated through bioremediation by Short Rotation Coppice Willow. Currently the effluent is being discharged into the Skeoge river, this project acts as further treatment and reduces the amount of effluent entering the river.

This report describes and sets out the principle features of the proposed project as required by the Local Government Planning and Development Regulations 2001-2011.

## 2.0 ANSWER Project

The pilot project is part of the ANSWER ( Agricultural Need for Sustainable Willow Effluent Recycling) project which is a cross-border project examining the potential of using Short Rotation Coppice (SRC) willow for the bioremediation of effluents and leachates. It is part funded by the European Union's European Regional Development Fund (ERDF) through the INTERREG IVA Cross-border Programme, managed by the Special EU Programmes Body (SEUPB).

There are eight partners in the ANSWER project, AFBI (Agri-Food and Biosciences Institute) the lead partner, Donegal County Council, Monaghan County Council, Sligo Institute of Technology, Teagasc, Northern Ireland Water, Cookstown District Council and South West College.

Various environmental directives in recent years have determined that discharges from waste water treatment plants, farming, industry, etc will require further treatment before being discharged into river and streams.

The primary aim of the project is to provide scientific evidence on the effectiveness and sustainability of using fast growing energy crops, in particular, Short Rotation Coppice (SRC) willow, for the treatment of organic effluents and sludges. The science organisations (AFBI, Teagasc and Sligo Institute of Technology) will collect data from experimental trial sites in each jurisdiction. This data will assist policy makers, regulators and potential users of the technologies. Furthermore, working in close collaboration with water utilities, municipal authorities, industrial firms, a number of demonstration/pilot sites will be established.

### Project Aims:

- To develop small-scale, local embedded solutions to both waste management and renewable energy production
- Encourage co-operation between farmers and local rural communities leading to increased employment opportunities
- Address current waste disposal issues

### Project Objectives:

- Establishment of pilot Effluent Recycling Schemes
- Mapping land resources matched to effluent disposal requirements
- Research and Development of effluent/sludge application to SRC willow or other energy crops
- Extending technology transfer/education opportunities

### Project Outputs:

- 1 environmental management project funded
- 5 demonstration sites developed
- 6 research papers completed
- 1 stakeholder group established
- 2 field trials undertaken

### **3.0 Bioremediation**

Bioremediation is the intentional use of living plants for the remediation of waste. Through bioremediation, waste products that previously were regarded as a burden for society can now be used as valuable resources to increase short-rotation willow biomass production. From the plants point of view pollutants may be considered as nutrition and in suitable concentrations may be used to increase biomass production. These pollutants/nutrients (macronutrients like N, P and K, and all micronutrients) perform the role of a fertiliser and are incorporated into the plant tissue during the growing process and degraded into harmless compounds.

Short rotation willow coppice increases its value as a renewable energy when its ability to extract nutrient and non-nutrient elements from discharge waste streams is utilised, offering a significant opportunity to improve sustainability. Bioremediation is particularly relevant in the current climate, where a proactive approach to whole farm nutrient management is of increasing importance in addressing the Water Framework and Nitrates Directives.

Willow is a particularly good species for the recycling (bioremediation) of dilute wastes for a number of reasons;

- Willow has a significantly higher water use than any other woody or arable crop species grown in Ireland. It has been calculated that willow coppice can use up to 1.0 million litres per tonne of dry matter produced annually.
- The shrub type of Willow used in coppice plantations generally has a fine shallow root system with 85% situated in the top 20cm of the soil profile. This not only improves stability but also provides an excellent receptive surface for the application of wastes.
- Leaf area is maximized early in the year so that by early July the system is at its maximum potential with the leaves providing, through evapo-transpiration, the maximum pull through the system of water and nutrients.
- Willow is a pioneer species and therefore produces vigorous juvenile growth. It is this factor which is exploited in the short rotational cycles imposed on the coppice system and maximizes the nutrient off-take in the harvested crop.

### **4.0 Legislation**

There are a number of important areas of legislation relating to the recycling of wastes on Short Rotation Coppice Willow and the major ones are summarised below. Additionally, there are codes of good practice and specifically the Safe Sludge Matrix, which also provide direction for the recycling of wastes to agricultural land.

#### **4.1 The Nitrates Directive 91/676/EEC**

[http://ec.europa.eu/water/water\\_nitrates/indexen.htm](http://ec.europa.eu/water/water_nitrates/indexen.htm)

This Directive seeks to reduce and prevent the pollution of water caused by nitrates from agricultural sources. It is designed both to safeguard drinking water supplies and to prevent wider ecological damage in the form of the eutrophication of freshwater and marine

waters generally. Under this proposal for Bridgend, the final discharge water currently entering the Skeoge river from the Waste Water Treatment Works (WWTW), will be diverted to the willow plantation thus reducing significantly the amount of effluent entering the river and with that the potential for pollution.

#### 4.2 Waste Framework Directive (WFD 75/442/EC)

[http://ec.europa.eu/environment/waste/pdf/directive\\_waste.pdf](http://ec.europa.eu/environment/waste/pdf/directive_waste.pdf)

The primary objective of the WFD is to ensure that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment, and in particular without risk to water, air, soil, and plants and animals; without causing a nuisance through noise or odours; and without adversely affecting the countryside or places of special interest: the prevention and reduction of waste; the recovery of waste by means of recycling, its re-use, reclamation etc; and the use of waste as a source of energy.

#### 4.3 Sludge Directive (86/278/EEC)

<http://europa.eu/scadplus/legn/en/lvb/l 28088.htm>

The purpose of the Directive is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of such sewage sludge.

## 5.0 Carbon Mitigation and Capture

Short Rotation Coppice Willow and Carbon: One of the major drivers for growing SRC willow is its potential for the reduction of Green House Gas (GHG) emissions. There are potentially two ways in which growing willow as a source of renewable energy can offset carbon emissions.

### 5.1 Carbon mitigation:

- The energy content of dry willow wood chip is approximately 19 MJ kg<sup>-1</sup>. One hectare of SRC willow produces the equivalent energy of 3,300 – 5,700 litres of heating oil, an average medium sized house will burn around 3,000 litres of oil per year, which releases 8.02 tonnes CO<sub>2</sub>.
- SRC Willow wood is a carbon neutral fuel and carbon that is released during its combustion has been absorbed by the plants when they were growing. For every GJ of energy produced from wood chip around 7 kg CO<sub>2</sub> is released compared to 79 kg CO<sub>2</sub> released when the same amount of energy is produced from oil, resulting in an over 90% reduction in emissions.

### 5.2 Carbon sequestration:

- While growing, SRC willow has the potential to sequester (capture) carbon, thus preventing its release as GHG.
- After the above ground biomass has been harvested for wood chip carbon can be stored in three ways: in the non-harvested above-ground biomass (stumps); the below-ground biomass in the form of coarse and fine roots; and the input of the carbon onto the soil organic matter.
- SRC willow can sequester around 0.12 t of carbon ha<sup>-1</sup> yr<sup>-1</sup>.
- There are a number of factors which will determine the rate of change as well as the total amount of soil carbon sequestered by SRC willow. These include the carbon inputs to the system – i.e. during the net primary production phase; decomposition of the major carbon pools – which is affected by soil moisture and temperature; the initial carbon content of the soil – there is an inverse relationship with the sequestration rate; crop management – e.g.

harvest intervals, re-plantation; depth of soil influenced by the willow – which will influence the total amount of carbon sequestered.

- The amount of carbon captured by SRC willow can be further enhanced if plantations are used for bioremediation.

## 6.0 Irrigation System



*Fig 6.1: Installed irrigation system for bioremediation of wastewater*

The site at Bridgend Waste Water Treatment Works will be arranged as follows: SRC willow is planted in double rows with irrigation lines laid on the surface between them (see fig 6.1). Irrigation emitters will be at intervals along lateral lines and caps allow the water to move horizontally ensuring distribution and preventing aerosols. The system operates at low pressure.

The irrigation pump will be operated by time clock and operate automatically by a controller. A filter will remove particles larger than 3mm, valves will be used to control irrigation to the individual irrigation zones of 0.5 ha. Approximately 10 - 20 independently irrigated zones will be used at Bridgend, the control unit and switches will be installed in the existing plant house.

The high density planting, typically 15,000 plants per hectare, and high growth rate mean that the willow readily takes up the water and nutrients applied in the wastewater. Irrigation pipe work is installed allowing for 10m un-irrigated margins and buffer zones at the edges of the willow plantation. The whole system is automatically controlled and run with the minimum of input on a week to week basis. The willow coppice is divided into zones approximately 0.5 ha in size to facilitate careful control over effluent application. Each zone is atomically irrigated by a controller depending on soil temperature, soil moisture, rainfall, etc.

An overall plan is summarised on submitted plans enclosed with this Part 8 process. It outlines the total area potentially assigned to willow for effluent biofiltration. It comprises of a 14 hectare plot at Bridgend operated and irrigated systematically as per methodology above.

## 7.0 Bridgend Waste Water Treatment Works

### 7.1 Background

Bridgend is a border village in the Northeast of the county at the terminal of National Road N13. It is about 4km West of Derry city. The Waste Water Works at Bridgend was installed in 1975 on the Southside of the river Skeoge. The Waste Water Treatment Plant (WWTP) currently has a capacity of 260 P.E. The current population of Bridgend is approx. 500.

Donegal County Council made an application in August 2011 to the Environmental Protection Agency (EPA) for a Waste Water Discharge Licence and is awaiting its approval (included in Appendix A is a copy of the stage 1 Appropriate Assessment for this project).

The primary discharge of the Bridgend Waste Water Works is to the Skeoge river ( at National Grid Reference 239470E, 422012N) in the townland of Carrowreagh. The Skeoge river flows into Lough Swilly at Inch which is a distance of 4km. The Skeoge River joins with the Burnfoot river just prior to the point of entry of the Skeoge river which is within the Inch SAC (Special Area of Conservation) code. The discharge point is also approximately 1km from the Lough Swilly SPA (Special Protection Area). A recent survey of the Skeoge river prior to its confluence with the Burnfoot river has shown that there is no significant impact from the Bridgend WWTW in terms of physico-chemical parameters such as BOD levels and nutrient levels prior to its entry into the SAC.

### 7.2 Proposal

The existing population of Bridgend is approximately 500. The proposed project using the final effluent will be treated to a higher standard to accommodate the existing population levels through bioremediation using Short Rotation Coppice Willow.

### 7.4 Water Quality

Environmental monitoring takes place on the Skeoge River upstream and downstream of the Bridgend WWTW discharge point. Table 7A shows the monitoring results and Fig 7.4.1 shows the monitoring points.

The outlet discharge is non-compliant with the requirements of the Urban Waste Water Treatment Regulations. The treated effluent enters the Skeoge River at location 239457E, 421976N. The Q value downstream from this entry point along the Skeoge River is 2-3 according to the EPA River Report (see table 7B), indicating an unsatisfactory water quality. The water body report of the Water Framework Directive gives an overall status for this water body as "Moderate" with an overall objective to "Restore". The overall risk category is "1b" – at risk. Previous reports have noted that sewage and agriculture combined cause pollution of the Skeoge, silage pollution has impacted the biology of the river.

This pilot project which will reduce the amount of effluent being discharged into the Skeoge river will help to improve the water quality of the river.

Table 7A: Bridgend Downstream and Upstream monitoring results

Location	Lab Ref	Date	pH	BOD (mg/l)	SS (mg/l)
<b>Downstream</b>					
Bridgend - downstream	092501186	21/01/2009	7.09	1.11	10.5
Bridgend - downstream	092503718	14/07/2009	7.26	1.44	7
Bridgend - downstream	092505516	28/10/2009	7.54	0.61	1.75
Bridgend - downstream	102501071	18/01/2010	7.16	1.48	10.25
Bridgend - downstream	102501836	09/03/2010	7.16	1.30	9.5
Bridgend - downstream	102502981	31/05/2010	7.16	1.06	1.5
Bridgend - downstream	102504072	27/07/2010	7.19	0.86	1.6
<b>Upstream</b>					
Bridgend - upstream	092501183	21/01/2009	7.03	1.17	9
Bridgend - upstream	092503715	14/07/2009	7.38	2.29	5
Bridgend - upstream	092505513	28/10/2009	7.44	0.53	1.25
Bridgend - upstream	102501068	18/01/2010	7.16	1.34	7.25
Bridgend - upstream	102501833	09/03/2010	7.15	1.19	8.5
Bridgend - upstream	102502978	31/05/2010	7.29	1.49	2.5
Bridgend - upstream	102504069	27/07/2010	7.16	0.53	2

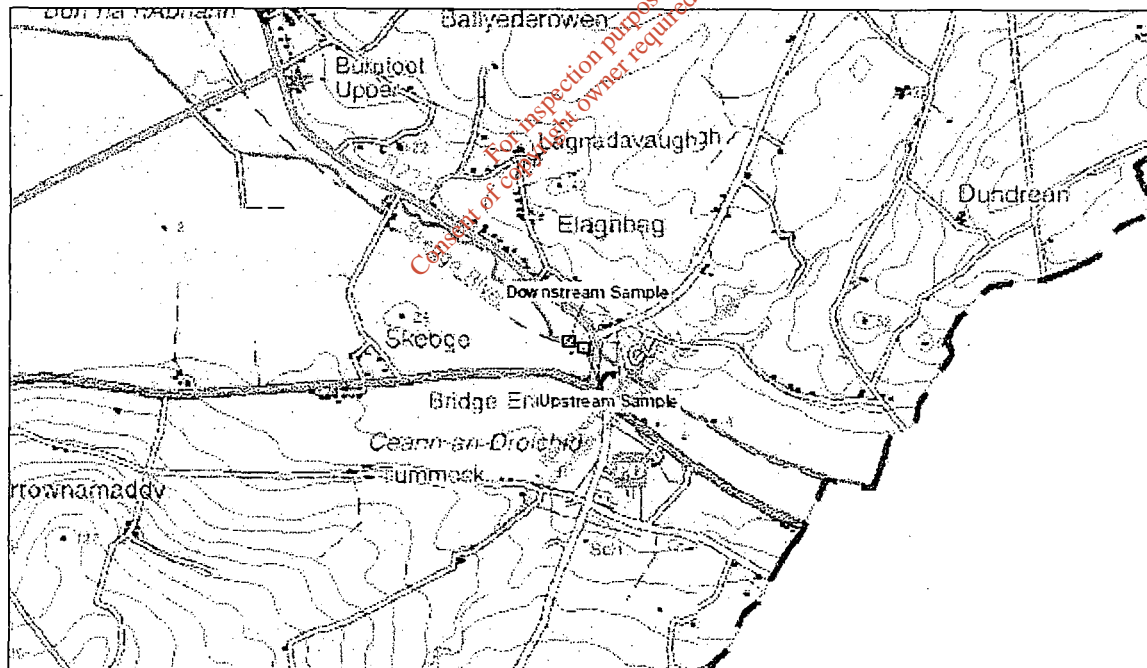


Fig 7.4.1 Bridgend WWTW Downstream and Upstream Monitoring points along River Skeoge

Table 7B: Biological Quality Ratings of Skeoge river

River and Code : **SKEOGE** 39/S/01  
 Tributary of : Sea - Lough Swilly OS Catchment No: 51  
 OS Grid Ref : C 354 232 Date(s) Surveyed : 26/08/2004

Sampling Stations No.	Location	Biological Quality Ratings (Q Values)							
		1980	1985	1987	1988	1991	1996	1998	2004
0050	Bridge S.W. of Magheryard	-	-	3	-	3	3	3	3
0100	Bridge E. of Skeoge	3-4	3	2-3	3	2-3	-	-	-
0300	Bridge u/s Lough Swilly	-	3	2-3	3	2-3	2-3	3	3

**Assessment:** The Skeoge River was again moderately polluted when surveyed in August 2004.

Sampling Stations No.	Location	National Grid Ref.		Discovery Series No.	County Code
		X	Y		
0050	Bridge S.W. of Magheryard	240996	423105	7	DL
0100	Bridge E. of Skeoge	239600	422000	7	DL
0300	Bridge u/s Lough Swilly	237864	423024	7	DL

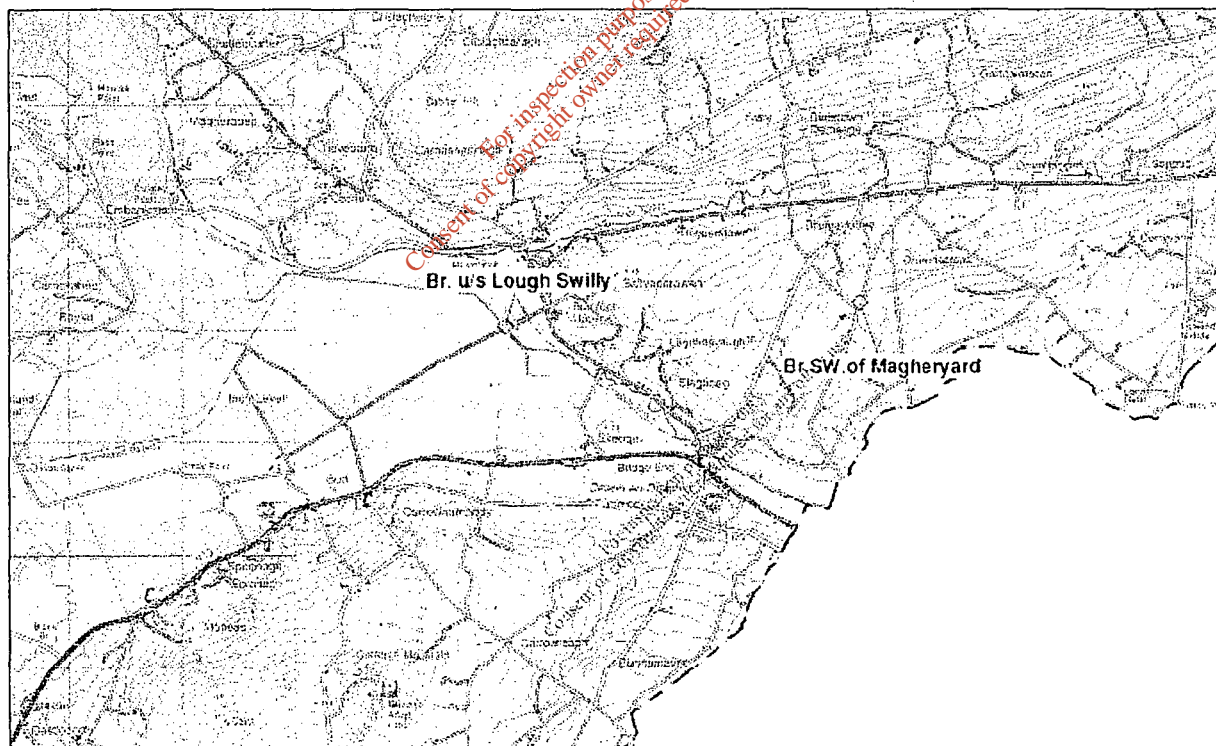


Fig 7.4.2 EPA Monitoring Points as noted in Table 7B

## 7.5 Discharge Quality

The outlet monitoring results for Bridgend WWTW are shown in table 7C, as the treatment process at Bridgend is overloaded it is not possible for the outlet discharge to be in compliance with the Urban Waste Water Treatment Regulations. There is no evidence to suggest that the discharge would lead to emissions of the main polluting substances (as defined in the dangerous substances regulations S.I. No.12 of 2001) at levels, which would be likely to impair the environment.

However the use of SRC willow as a bioremediation measure which will use the discharge for irrigation and an organic fertiliser will result in an improvement in the water quality of the Skeoge river as less discharge will be entering it.

Table 7C: Bridgend inlet and outlet monitoring results

Location	Lab Ref	Date	pH	BOD (mg/l)	COD (mg/l)	SS (mg/l)
<b>Intake</b>						
Bridgend - inlet	092501184	21/01/2009	6.89	34.3	156	50.5
Bridgend - inlet	092503716	14/07/2009	8.07	223.6	496	128
Bridgend - inlet	092505514	28/10/2009	7.93	216	518	108
Bridgend - inlet	102501069	18/01/2010	7.23	165.6	630	97
Bridgend - inlet	102501834	09/03/2010	6.93	171.2	841	780
Bridgend - inlet	102502979	31/05/2010	7.02	314.8	1314	911
Bridgend - inlet	102504070	27/07/2010	6.93	321.2	882	160
<b>Outlet</b>						
Bridgend - outlet	092501185	21/01/2009	7.05	16.45	111	24
Bridgend - outlet	092503717	14/07/2009	7.27	22.4	93	50
Bridgend - outlet	092505515	28/10/2009	7.61	3.52	39	7
Bridgend - outlet	102501070	18/01/2010	7.14	28.4	120	36
Bridgend - outlet	102501835	09/03/2010	7.09	134	262	66
Bridgend - outlet	102502980	31/05/2010	7.10	125	314	278
Bridgend - outlet	102504071	27/07/2010	7.26	78.4	287	50

## 8.0 Conclusion

The ANSWER Project has been successful in attracting funding from the INTERREG IVA Cross-border Programme.

Donegal County Council as a project partner intends to use the funding for the installation of irrigated SRC (Short Rotation Coppice) willow plantation to receive effluent from a waste water treatment plant at Bridgend.

This will be followed by tendering for willow grower and separately for the irrigation infrastructure. Once the willow site is established, the science of the process of the bioremediation will be tracked and papers published on the effectiveness and sustainability of this technology (willows in bioremediation) for use in Ireland.

Donegal County Council believe that it is important that this type of sustainable technology is actively encouraged in today's environmentally aware and financially constrained climate. The benefits anticipated include the following:

- A reduction in carbon footprint required to safely treat and dispose of effluent
- Reduction in the potential for polluting impacts on waterway by removing the point source discharge
- Generation of a useful by-product, wood from willow to be used for woodchip boilers (reducing the reliance on fossil fuels)
- Generating income from woodchip

## 9.0 List Of Drawings

### A3 Size Drawings

	Title	Scale
551-001	Site Location	None
551-002	Site Extents	1:4000 @ A3
551-003	Irrigation Lands	1:4000 @ A3
551-004	Bridgend WWTW	1:250 @ A3
551-005	Bridgend WWTW	1:500 @ A3

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DONEGAL COUNTY COUNCIL

PLANNING AND DEVELOPMENT ACT 2000-2010

PLANNING AND DEVELOPMENT REGULATIONS 2001-2011

NOTICE PURSUANT TO ARTICLE 81, PART 8 OF THE ABOVE REGULATIONS,  
RELATING TO A PROPOSED DEVELOPMENT BY DONEGAL COUNTY COUNCIL

TAKE NOTICE that Donegal County Council propose a pilot project to use Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works in the townlands of Carrowreagh and Skeoge in the Inishowen Electoral Area as scheduled below.

SCHEDULE OF PROPOSED WORK

No.	Title	Townlands	Local Water and Environment Office For Viewing Plans
1	Pilot Project on the use of Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works	Carrowreagh Skeoge	Carndonagh Public Services Centre, Water and Environment Office, CARNDONAGH
<b>Description and Extents</b>			
Donegal County Council propose a pilot project to use Short Rotation Coppice Willow for the Bioremediation of discharge water at Bridgend Waste Water Treatment Works in the townlands of Carrowreagh and Skeoge.			
The pilot scheme to form a 14 hectare Willow Plantation irrigated with final discharge quality water from Bridgend Waste Water Treatment Works, for the treatment and bioremediation of the waste water through the growth and eventual harvesting of willows. The works will consist of a new pumping station at Bridgend Waste Water Treatment Works, Rising Main from Treatment Works to adjoining irrigation lands, irrigation pipe-work with interconnecting pipe-work, valves, flow-meter and associated site works at Bridgend, Co. Donegal.			

The plans and particulars of this proposed development will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy, at the Carndonagh Water and Environment Office.

Plans may be inspected or purchased between the hours of 9:00am to 12:30pm and 1:00pm to 4:30 p.m. from Tuesday the 17<sup>th</sup> January 2012 for a period of six weeks.

Submissions and observations with respect to the proposed development, dealing with the proper planning and development of the area in which the development is situated may be made in writing to The County Secretary, the County Secretary's Office, Donegal County Council, County House, Lifford, County Donegal, before 4:30 p.m. on Thursday 15<sup>th</sup> March 2012.

Please mark the front of the envelope with the project name as per the above schedule.

Signed,

\_\_\_\_\_  
Joe Peoples  
Director of Water & Environment  
Donegal County Council

**Appendix A**


**Stage 1 - Appropriate Assessment for Bridgend WWTW**

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**Habitats Directive Article 6 Screening Assessment for  
Agricultural Need for Sustainable Willow Effluent Recycling  
(ANSWER) Project**

**Bridgend**

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	Origin	Project Name	Description	Date	Check By
	Donegal County Council Central Laboratory	Agricultural Need for Sustainable Willow Effluent Recycling (ANSWER) Project Bridgend	Appropriate Assessment	16/1/2012	Donal Casey

16/1/2012

## Executive Summary

Article 6 assessments are required under the Habitats Directive (92/43/EEC), and are required where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of Community importance designated under the Habitats Directive (Special Areas of Conservation, here after referred to as SACs) or the Birds Directive (Special Protection Areas, here after referred to as SPAs). In the case of the present assessment, Ramsar sites are also included by way of best practice. It is important to note that the phrase 'Appropriate Assessment' is sometimes used more loosely to refer to the whole process set out under Articles 6(3) and 6(4) of the Habitats Directive (Dodd *et al.*, 2008), and therefore note that for the present assessment the term 'Article 6 assessment' will be used, not 'Appropriate Assessment' (which refers to Stage 2 in the sequence under Article 6 assessment).

Guidance on Strategic Environmental Assessment (SEA) produced by the EPA (EPA, 2008) provides a useful definition of Article 6 assessments (referred to as appropriate assessment in that document) (EPA, 2008): "An assessment based on best scientific knowledge, of the potential impacts of the plan on the conservation objectives of any Natura 2000 site (including Natura 2000 sites not situated in the area encompassed by the draft plan or scheme) and the development, where necessary, of mitigation or avoidance measures to preclude negative effects". Importantly, an Article 6 assessment has a narrow focus i.e. the maintenance of the integrity of the site and assessing the significance of the effects on designated interest features and the conservation objectives of the site. It is a protection led assessment and is carried out using the precautionary principle.

The assessment of the present proposal for the pilot treating the waste water discharge from Bridgend Waste Water Treatment Works (WWTP) through the

○ **Agricultural Need for Sustainable Willow Effluent Recycling (ANSWER) project** concluded the following:

The screening process has been undertaken to identify the qualifying interests and potential impacts arising from the ANSWER project located at Bridgend County Donegal on any Natura 2000 site. The process has found that there are no significant impacts likely to arise from the proposed pilot ANSWER project on any such site. It is also unlikely that there will be 'in combination' negative effects from any other additional plans or developments in the catchment.

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## Introduction

Article 6 is one of the most important articles of the Habitats Directive in determining the relationship between conservation and site use. Article 6(3) requires that “Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.” The purpose of this report is to describe how that Article 6 assessment was carried out, and also to detail the results and conclusions from the assessment.

## Part 8 Planning Regulations

Local Authorities are required to carry out an Appropriate Assessment as per article 6 of the Habitats Directive (92/43/EEC (2000)) in relation to any project proposed by the Local Authority within its jurisdiction that may impact on a Natura 2000 site.

## Article 6 Assessment

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora better known as “The Habitats Directive” provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network. The Habitats Directive and the Birds Directive and sites designated under them form this network of European protected sites that are better known as the Natura 2000 network. This consists of:

Special Areas of Conservation (SACs) for flora, fauna and habitats of Community interest under the EU Habitats Directive;

Special Protection Areas (SPAs) for rare, vulnerable or migratory birds under the EU Birds Directive;

Sites that are being considered for designation as one of the above are referred to as cSAC (candidate) or pSPA (proposed).

Ramsar sites are wetlands of global importance, listed under the Convention on Wetlands of International Importance. Ramsar sites are contained within Natura 2000 sites and for that reason, and in line with best practice, Ramsar sites, if present would have been included in this assessment.

Article 6 sets out provisions, which govern the conservation and management of Natura 2000 sites. Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public"

This assessment is underpinned by the precautionary principle, especially in the assessment of potential impacts and their resolution. If it is not possible to rule out a risk of harm on the evidence available then it is assumed a risk may exist and it needs to be dealt with in the appropriate assessment process.

### **Stages of the Article 6 assessment**

The stages of an Article 6 assessment are outlined in the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites'. These are set out below:

## Stage 1 - Screening

Step 1: Management of the site. In the case of all waste water discharges the project is not connected with , or necessary to the management of a Natura 2000 site

Step 2: Description of the Project (in this case the ANSWER project at Bridgend) and identification of European sites that may be affected (including 'in combination' effects)

Step 3: Characteristics of the site identifying areas where the project may impact on European sites.

Step 4: Assessment of Significance. Assessment of the likelihood of significant effects of the project on European sites, including individual and cumulative impacts. Exclusion of site where it can be objectively concluded that there will be no significant effects and hence no requirement to proceed to further stages.

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## ○ Stage 2 - Appropriate Assessment (AA)

Step 1: Information collation of likely effects of project and impacts on European site.

Step 2: Description of the Natura 2000 sites, including qualifying interests.

Step 3: Identification of the conservation objectives for of these sites and potential significant impacts likely to occur from the proposal

Step 4: Identification and assessment of mitigation measures against any likely adverse effects of the Project.

## Stage 3 - Assessment of alternative solutions

Step 1: Identification of alternative solutions

Step 2: Assessment of alternative solutions

## Stage 4 – Imperative Reasons of Overriding Public Interest

Confirm that there are a) imperative reasons of overriding public interest and b) human health or safety considerations or important environmental benefits. If this is so then compensation measures are required for any remaining adverse effect.

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## Results of ANSWER Project Assessment

### Stage 1 – Screening

#### Step 1: Management of the Site.

The project is a modification of the processes involved in a WWTP and therefore is not directly connected with or necessary for the management of the European sites involved.

#### Step 2: Description of Project and European Sites

##### Description of the Project

### **Agricultural Need for Sustainable Willow Effluent Recycling (ANSWER)**

Donegal County Council is a partner on the **ANSWER Project**, which is part funded by the European Union's European Regional Development Fund (ERDF) through the INTERREG IVA Cross-border Programme, managed by the Special EU Programmes Body (SEUPB)

The project lifetime is 48 months commencing 1<sup>st</sup> November 2010 completing on 31<sup>st</sup> October 2014.

#### Project Partners Involved:

- Agri-Food and Biosciences Institute (AFBI) (Lead Partner)
- Donegal County Council
- Monaghan County Council
- Institute of Technology, Sligo
- Teagasc
- Northern Ireland Water

- Cookstown County Council
- South West College, Cookstown Campus

### **Brief Project Description:**

Various environmental directives in recent years have determined that discharges from waste water treatment plants, farming, industry, etc will require further treatment before being discharged into river and streams

The primary aim of the project is to provide scientific evidence on the effectiveness and sustainability of using fast growing energy crops, in particular, Short Rotation Coppice (SRC) willow, for the treatment of organic effluents and sludges. The science organisations (AFBI, Teagasc and Sligo Institute of Technology) will collect data from experimental trial sites in each jurisdiction. This data will assist policy makers, regulators and potential users of the technologies. Furthermore, working in close collaboration with water utilities, municipal authorities, industrial firms, a number of demonstration/pilot sites will be established.

### **Project Aims:**

- To develop small-scale, local embedded solutions to both waste management and renewable energy production
- Encourage co-operation between farmers and local rural communities leading to increased employment opportunities
- Address current waste disposal issues

### **Project Objectives:**

- Establishment of pilot Effluent Recycling Schemes
- Mapping land resources matched to effluent disposal requirements
- Research and Development of effluent/sludge application to SRC willow or other energy crops
- Extending technology transfer/education opportunities

### **Project Outputs:**

- 1 environmental management project funded
- 5 demonstration sites developed
- 6 research papers completed

- 1 stakeholder group established
- 2 field trials undertaken

### **ANSWER Project in summary:**

The ANSWER Project has been successful in attracting funding from the INTERREG IVA Cross-border Programme. Donegal County Council as a project partner intends to use the funding for the installation of irrigated SRC (Short Rotation Coppice) willow plantation to receive proportion of effluent from a waste water treatment plant at Bridgend. Bridgend is a border village in the Northeast of the county at the terminal of National road N13. It is about 4km West of Derry city. The waste water works at Bridgend was installed in 1975 on the Southside of the river Skeoge. The Waste water Treatment plant currently has a capacity of 260 P.E. The current domestic population is approximately 500.

The main elements of the WWTP are given below: The existing treatment plant is based on the extended aeration activated sludge process and the works comprises the following:

- inlet manhole
- Aeration/Settlement tanks
- Control/store building
- Outlet Manhole
- Outfall to the River Skeoge

Negotiations with Donegal Creameries, who are adjoining land owners have progressed well and it is hoped to bring a proposal through part 8 planning process.

This will be followed by tendering for willow grower and separately for the irrigation infrastructure. Once the willow site is established, the science of the process of the bioremediation will be tracked and papers published on the effectiveness and sustainability of this technology (willows in bioremediation) for use in Ireland.

It is important that this type of sustainable technology is actively encouraged in today's environmentally aware and financially constrained climate

The benefits anticipated include the following:

- A reduction in carbon footprint required to safely treat and dispose of effluent

- Reduction in the potential for polluting impacts on waterway by removing the point source discharge
- Generation of a useful by-product, wood from willow to be used for woodchip boilers (reducing the reliance on fossil fuels)
- Generating income from woodchip

### European Natura 2000 Sites

The WWTP discharge flows into the Skeoge river which flows into Lough Swilly at Inch, which is a distance of 4Km. The Skeoge River joins with the Burnfoot River just prior to the point of entry of the Skeoge River at Inch which is within the Inch SAC code. The discharge point is also approx 1 Km from the Lough Swilly SPA. A recent survey of the Skeoge river prior to its confluence with the Burnfoot River has shown that there is no significant impact from the Bridgend WWTP in terms of physico-chemical parameters such as BOD levels and nutrient levels prior to its entry into the SAC. The ANSWER project proposes to divert the outfall from the Skeoge River and provide tertiary treatment through the process of distribution of the discharge over a constructed area of willow plantation.

### Lough Swilly SAC (site code 002287)

This large site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly. It extends from below Letterkenny to just north of Buncrana. Lough Swilly is a long sea-lough, cutting through a variety of metamorphic rocks on the west side of Inishowen.

The site is estuarine in character, with shallow water and intertidal sand and mud flats being the dominant habitats. The main rivers flowing into the site are the Swilly, Leannan and Crana. At low tide, extensive sand and mud flats are exposed, especially at the mouths of the Swilly and Leannan rivers. Salt marshes are well represented in the inner sheltered areas of the site, with good examples in the Ramelton area. The marshes are the Atlantic salt meadow type. Lakes, which are lagoonal in character occur at Inch and Blanket Nook. Inch Lough is a good example of a large, shallow lagoon with very low salinity in most of the lagoon. Less information is available for Blanket Nook but it is of a higher salinity and adds to the richness of the habitat within the site as a whole.

### Lough Swilly SPA (site code: 004075)

This site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly, a long inlet of the sea that cuts through a variety of metamorphic rocks on the west side of the Inishowen Peninsula. The Lough Swilly SPA extends from just below Letterkenny north to Bridgend and, except in the area between

Farsetmore and Blanket Nook on the southern side of Lough Swilly, the site is bounded by the High Water Mark; its seaward boundary is the Low Water Mark. Between Farsetmore and Blanket Nook a series of improved pasture and arable fields of importance to geese and swans are included. The site includes sections of the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is a series of extensive sand and mud flats which are exposed at low tide – both estuaries and sand/mud flats are listed on Annex I of the E.U. Habitats Directive. Other habitats represented on the site are salt marshes, lakes which are lagoonal in character (at Blanket Nook), rivers and streams, sand and shingle beaches, lowland wet, dry and improved grasslands, arable land, drainage ditches, reedbeds and scrub. Other areas of Lough Swilly include Inch Lough and Levels are covered in a separate SPA. Lough Swilly is an important site for waterfowl in autumn and winter. The shallow waters provide suitable habitat for grebes and diving duck, while the intertidal flats are used by an excellent diversity of wildfowl and waders. At high tide, the duck and wader species roost on the salt marshes and shorelines, with some species moving to the adjacent pasture and arable fields.

#### Other Discharges to Receiving Waters

There are no other discharges within the jurisdiction to the Skeoge River, which originates in Derry City in Northern Ireland. The Skeoge joins with the Burnfoot River prior to entering L Swilly at Inch as mentioned above. There are other wastewater discharges into Lough Swilly including Letterkenny, Buncrana, which are the two major population centers within the County however these are geographically removed from the Bridgend site and are subject to separate Licence applications. There are also discharges from smaller agglomerations such as Ramelton and Manorcunningham which again are also geographically removed from the Bridgend site and are subject to separate License applications. The Skeoge River meets the Burnfoot River at a point close to entering the SAC. The Burnfoot is the receiving waters for Burnfoot WWTP.

#### Step 3: Potential Impacts

The qualifying interests of the Lough Swilly SAC and Lough Swilly SPA have been identified and tabulated below (Table 1.0) along with an assessment of water dependence (Curtis et al 2006. North South Shared Aquatic Resource (NS Share) Register of Protected Areas – Report on the ecological requirements of water dependent habitats and species designated under the Habitats Directive NS Share T5 (2)-2.1). The water dependent qualifying interests in terms of habitats that could potentially be impacted by the WWTP discharge are Estuaries (Habitat Code 1130) and Coastal Lagoons (Habitat Code 1150). The qualifying interests for species listed that could be impacted for the Lough Swilly SAC is the Otter.

While a large range of bird species occur in significant numbers at the Lough Swilly SPA, the Birds Directive Annex I species listed in the site synopsis for this site is given in Table 1.1. These are the Greenland White-fronted goose (*Anser albifrons flavirostris*) the Whooper Swan (*Cygnus cygnus*), the Bar-tailed godwit (*Limosa*

*lapponica*), the Great Northern Diver (*Gavia immer*) The Slavonian Grebe (*Podiceps auritus*) and the Golden Plover (*Pluvialis Apricarai*) and of these the later four could potentially be effected by the WWTP discharge. All listed species are discussed below for completeness.

#### Cumulative, Direct, Indirect, Short& Long Term Effects

As the ANSWER pilot project is designed to eliminate the direct discharge from the Skeoge River the question of Cumulative, Direct, Indirect, Short and Long Term Effects on the receiving waters is regarded as not applicable to the project.

#### Step 4.0 Likely Significance of Impacts

##### 'SAC Water Dependant habitats potentially impacted by the proposed developement

#### Estuaries (Habitat Code 1130)

The 'Status of EU Habitats and Species in Ireland' (NPWS 2008) states while this habitat has been poorly sampled it is regarded that while their overall conservation status is considered as 'poor' most estuaries are seen as having favourable future prospects. Some estuaries face significant pressures from aquaculture, fishing, coastal development and water pollution. However, in this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites no negative impact on this habitat is considered likely.

#### Coastal Lagoons (Habitat Code 1150)

The EU interpretation manual describes the habitat coastal lagoons as "expanses of shallow coastal salt water, of varying salinity and water volume, wholly, or partially separated from the sea by sandbanks or shingle, or less frequently, by rocks. Salinity may vary from brackish to hypersalinity depending on rainfall, evaporation and through the addition of fresh seawater from storms, temporary flooding of the sea and winter or tidal exchange". This habitat also includes artificial lagoons such as salt basins and salt ponds, providing that they had their origin on a transformed old natural lagoon, or on a salt marsh and are not significantly exploited.

According to the SAC site synopsis and the NPWS habitat map, coastal lagoons occur at Inch and Blanket Nook (south west of Inishowen peninsula). In the site synopsis, Inch Lough is described as being a good example of a large, shallow lagoon with very low salinity in most of the lagoon, while less information is available for Blanket Nook but it is of a higher salinity and adds to the richness of the habitat within the site as a whole. Although artificial in origin, the Inch lagoon habitat in this site is one of the largest and best examples of a shallow, low salinity lagoon habitat in the country.

The Conservation Status of this habitat in Ireland is assessed as Unfavourable – Bad overall, mainly attributable to the loss of this resource through drainage (e.g. Tacumshim Lake and Shannon airport). There are significant threats to this habitat as a whole in Ireland due to natural silting-up, water pollution (mostly from agricultural sources, but also due to domestic effluents, due to an increase in urbanisation and industry) (DoEHLG, 2008). However, in this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites no negative impact on this habitat is considered likely.

#### SAC Qualifying Interests species

Otter: The ecology of otters has been the subject of a project under the LIFE Nature programme of the European Commission, published by Life in UK Rivers. The study shows that otters require huge territories. Quantities of prey dictate numbers of otters and any factor that impacts on fish stock numbers can have significant impact. A little eutrophication favours the species. The food taken by otters has been the subject of a number of studies, and the main prey of the otter includes fish, frogs, crayfish and eels. However, in this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites no negative impact on this species is considered likely.

#### SPA Annex I Birds:

To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status we are using the habitats directive definition of FCS. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable as defined below. The favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

In relation to the general impact of sewage discharges on the aquatic environment moderate input of nutrients can promote increased primary production leading to increased localised biomass, which may support greater numbers of wildfowl. However, excessive loadings leading to anoxic conditions in the sediments may result in azoonotic areas (nematodes and microbes only), which will not support significant wildfowl populations. Reduced nutrient loads will improve water quality and reduce the impacts of eutrophication. The removal of elevated levels of nutrients which provide conditions where an un-natural level of food supply is created for

○ certain bird species, will be altered to a situation where the composition of the flora and fauna will return to a more natural and sustainable level.

Overall therefore the development of the ANSWER project on the wastewater treatment works at Bridgend will be beneficial to the wildfowl population as well as the biodiversity of the indigenous aquatic species present in the area, which form part of their food chain.

The Annex 1 birds referred to in the Site synopsis are discussed below. These species are referred to in Table 1.1 The site synopsis also refers to a number of bird species found in L Swilly that are of national importance and others of conservation interest, although found commonly at various location around the country. Currently NPWS have not concluded on what the SPA conservation interests are for the L Swilly SPA but have advised that a significant proportion of the birds mentioned in the Site Synopsis are proposed as conservation or additional conservation interests. A list of these other species, as advised by NPWS, is provided in Table 1.2. All of these species are water dependant and are either waders or are more frequently found in offshore waters. In this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River, leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites, no negative impact on the qualifying interests of this SAC is considered likely.

#### Annex 1 Birds

##### Greenland White-fronted Goose. (*Anser albifrons flavirostris*)

The Greenland White-fronted goose (*Anser albifrons flavirostris*) or 'bog' goose is a winter visitor with a traditional and specialised association with bogs. The distribution of the Greenland White-fronted Goose in Ireland, and in Scotland and Wales, coincides with the climatic template that engenders the formation of oceanic blanket bog. These bogs, together with the midland raised bogs are bounded by the four-degree January isotherm and hence rarely freeze. They constituted the species' traditional habitat before the influence of man began to change things.

The species feeds by probing for the nutritionally rich underground storage organs of Cotton grass (*Eriophorum angustifolium*) and White-beaked sedge (*Rhynchospora alba*). Like these other species the Greenland White-front has been able to adapt and take advantage of agricultural grasslands and other crops. It has therefore been the situation that with the gradual disappearance of the bogs, particularly the raised bog, that link with the bogs is in the process of being broken. In this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River, leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites, no negative impact on this species of this SAC is considered likely.

### Whooper Swan (*Cygnus cygnus*)

Whooper Swans, like the Bewick's Swan adults show an all white plumage and a yellow patch on the blackbill. They are a common winter visitor arriving in late autumn and leaving in mid-April, with some adults remaining here over the summer. A first breeding pair was recorded in 1992, but main breeding grounds are in Iceland and northern Europe. Whooper Swans can be found alongside other swan species on lakes and marshes feeding on grass, roots and water plants. Deterioration of habitat, disturbances, illegal hunting and pollution by lead and pesticides are the major threats to this species. As this species is mainly a winter grazer on lands surrounding the estuary and as the discharge point from Bridgend WWTP into the Skeoge River is at a point approximately 4 Km upstream of where the Skeoge River enters the SPA at Inch and given the relatively small scale of the lands involved in the project it can be concluded there be no significant impact on this species.

### Bar-tailed godwit (*Limosa lapponica*)

This is a winter visitor from Russia & Scandinavia. Most occur between October & February. It is usually seen feeding along outer shoreline of estuaries, sometimes in large flocks. It feed along the tidal edge, or in shallow water (up to 15 cm depth). They usually commence feeding on an ebbing tide, and feed continuously for up to 6 hours. Polychaete worms, particularly lugworms, form a large proportion of their diet. On the muddier estuaries, where lugworms may be absent, they take ragworms and bivalves. It breeds in northern Norway, Finland and further to the north and east. Their wintering distribution is entirely coastal and largely confined to estuaries, with largest numbers recorded on sandy estuaries. Small numbers have been recorded using non-estuarine coastline. In this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River, leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites, no negative impact on this species of is considered likely.

### Great Northern Diver (*Gavia immer*)

This is a winter visitor and occurs in Ireland from September to April. They are large and powerfully built birds feeding mostly on fish but also feeds on crustaceans, molluscs, annelids, insects and amphibians. Great Northern Divers do not breed in Ireland. The closest breeding birds are in Iceland and the breeding distribution spreads east through Greenland to North America. They are usually observed as single birds or small groups. They are the most numerous of the divers occurring in Ireland and are particularly abundant off the south, west and northwest coasts over the winter. Great Northern Divers occur along a variety of coastlines, particularly deeper bays and inlets, as well as shallow bays with sandy shores. They can forage up to 10 km offshore and numbers close to shore tend to be highest when winds blow onshore. Taking into account the tendency of this species to remain offshore to feed and given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River, leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites, no negative impact on this species of is considered likely.

### Slavonian grebe (*Podiceps auritus*)

Grebes are fish-eating seabirds usually diving for small fish and invertebrates. Though divers can dive down to 60 metres and stay submerged for a long time, they prefer to forage at the edges of estuaries. Grebes tend to maintain their flocks while feeding and roosting, diving in the presence of danger. Both divers and grebes are vulnerable to effects of pollution and disturbance. The Slavonian grebe is a small, flat-crowned grebe with its stubby dark, pale-tipped bill can be found in bays and harbours, often in small groups, as well as occasionally on inland lakes and reservoirs. Leaving its breeding grounds in Iceland and Scandinavia in winter it is one of the more uncommon visitors to Ireland. An active feeder, the Slavonian Grebe sometimes jumps clear of the water when diving for small fish, insects or other marine invertebrates. Deterioration of habitat and disturbance from fishers, photographers and tourists are the major threats for the species, with fluctuations in water levels in their far North breeding grounds and egg-collecting having a negative impact in reproductive success. Water clarity improves the ability of such species to seek out prey. In this case, given the location of the Bridgend discharge on the Skeoge River and the proposed mitigating effect of the diversion and tertiary treatment of the waste water discharge through the ANSWER project from the Skeoge River, leading to an improved water quality prior to its entering the marine waters of the Natura 2000 sites, no negative impact on this species is considered likely.

### Golden Plover (*Pluvialis Apricaria*)

Golden Plover are migratory and winter in southern Europe and North Africa. Around 500,000 birds winter in Ireland and Great Britain. Their breeding habitat is moorland and tundra in northernmost parts of Europe and western Asia. They nest on the ground in a dry open area. They are most in Ireland between October & February. This species feeds on a variety of soil and surface-living invertebrates, principally beetles and earthworms, but also on plant material such as berries, seeds and grasses. Throughout the winter, Golden Plover are regularly found in large, densely packed flocks, and in a variety of habitats, both coastal and inland. Their distribution is widespread in Ireland. Taking into account the extent of the available terrestrial feeding habits of this species and given the location and scale of lands involved in the ANSWER project at Bridgend it is extremely unlikely to have a significant impact on this species.

### Other Policies, Plans or Projects

The Water Services Investment Programme 2010-2012 shows Bridgend WWTP as a "contract to start". It is a Service Land Initiative Scheme.

### Conclusion

The screening process has been undertaken to identify the qualifying interests of Natura 2000 sites and potential impacts arising from the ANSWER project

The process has shown that it is extremely unlikely that there will be any significant negative effects on the Natura 2000 sites arising from the ANSWER project. It is also unlikely that there will be 'in combination' negative effects from any other plans or developments in the catchment.

In conclusion the AA has determined that the ANSWER Project at Bridgend WWTP will not adversely impact in any significant manner on the Natura 2000 sites, their qualifying interests or conservation objectives.

TABLE 1.0. The qualifying interests of the Lough Swilly SAC are listed in the table below along with an assessment of their water dependence and any potential significant effects of the Bridgend WWTP.

Code	Qualifying Interest	Water Dependency	Potential Significant Effect
1130	Estuaries	Surface Water Dependent. Aquatic Ecosystem - Quality and hydromorphology.	Potential impact of waste water discharge
1330	Atlantic Salt Meadows	Surface Water Dependent coastal habitat on upper part of intertidal zone on muds and sands vegetation tolerant of saline conditions- Quality and hydromorphology	No impact of waste water discharge NPWS survey report overgrazing and Infilling /reclamation main threat to this habitat
1150	Coastal Lagoons	Surface Water Dependent coastal habitat partially separated from the sea by sandbanks or shingle, or less frequently, by rocks.	Potential impact of waste water discharge
1355	Otter ( <i>Lutra lutra</i> )	Surface Water Dependent: Rivers and Lakes. Mild eutrophication favours otters.  Chemical vulnerability relates to prey (principally fish) and possibility of PCB	Potential impact of waste water discharge

		contamination. Any factor that impacts on fish stock numbers	
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Table 1.1: Birds Directive (79/409/EEC) Annex I Species at Lough Swilly SPA

Qualifying Interest	Water Dependency	Potential Significant Effect
The Greenland White-fronted goose. <i>Anser albifrons flavirostris</i>	Water Dependent	No potential impact as habitat is bog or agricultural land and not estuarine waters
Whooper Swan <i>Cygnus cygnus</i>	Water Dependent	No potential impact of waste water discharge mainly winter grazer
Bar-tailed godwit <i>Limosa lapponica</i>	Water Dependant	Potential impact of waste water discharge
Great Northern Diver <i>Gavia immer</i>	Water Dependant	Potential impact of waste water discharge
Slavonian Grebe <i>Podiceps auritus</i>	Water Dependant	Potential impact of waste water discharge
Golden Plover <i>Pluvialis Apricarai</i>	Water Dependant	Potential impact of waste water discharge

Table 1.2 NPWS proposed/additional list of birds considered of conservation interest for Lough Swilly SPA

Proposed conservation interest	Additional conservation interest
Greylag Goose	Great Crested Grebe
Shelduck	Wigeon
Teal	Mallard
Oystercatcher	Shoveler
Dunlin	Scaup
Curlew	Red-breasted Merganser
Redshank	Knot
	Common Gull

## References

Dodd, A.M., Cleary, B.E., Dawkins, J.S., Ferry, C.D., and Williams, G.M. 2008. The Appropriate Assessment of Plans in Northern Ireland: a guide to why, when and how to do it. The RSPB, Sandy.

European Communities. 2000. Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. Luxembourg.

European Communities. 2002. Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Luxembourg.

Environmental Protection Agency. 2008. Strategic Environmental Assessment – SEA Pack. 08/05/08

National Parks and Wildlife Service. 2008. The status of EU protected habitats and species in Ireland. DEHLG.

Curtis et al 2006. North South Shared Aquatic Resource (NS Share) Register of Protected Areas – Report on the ecological requirements of water dependent habitats and species designated under the Habitats Directive NS Share T5 (2)-2.1

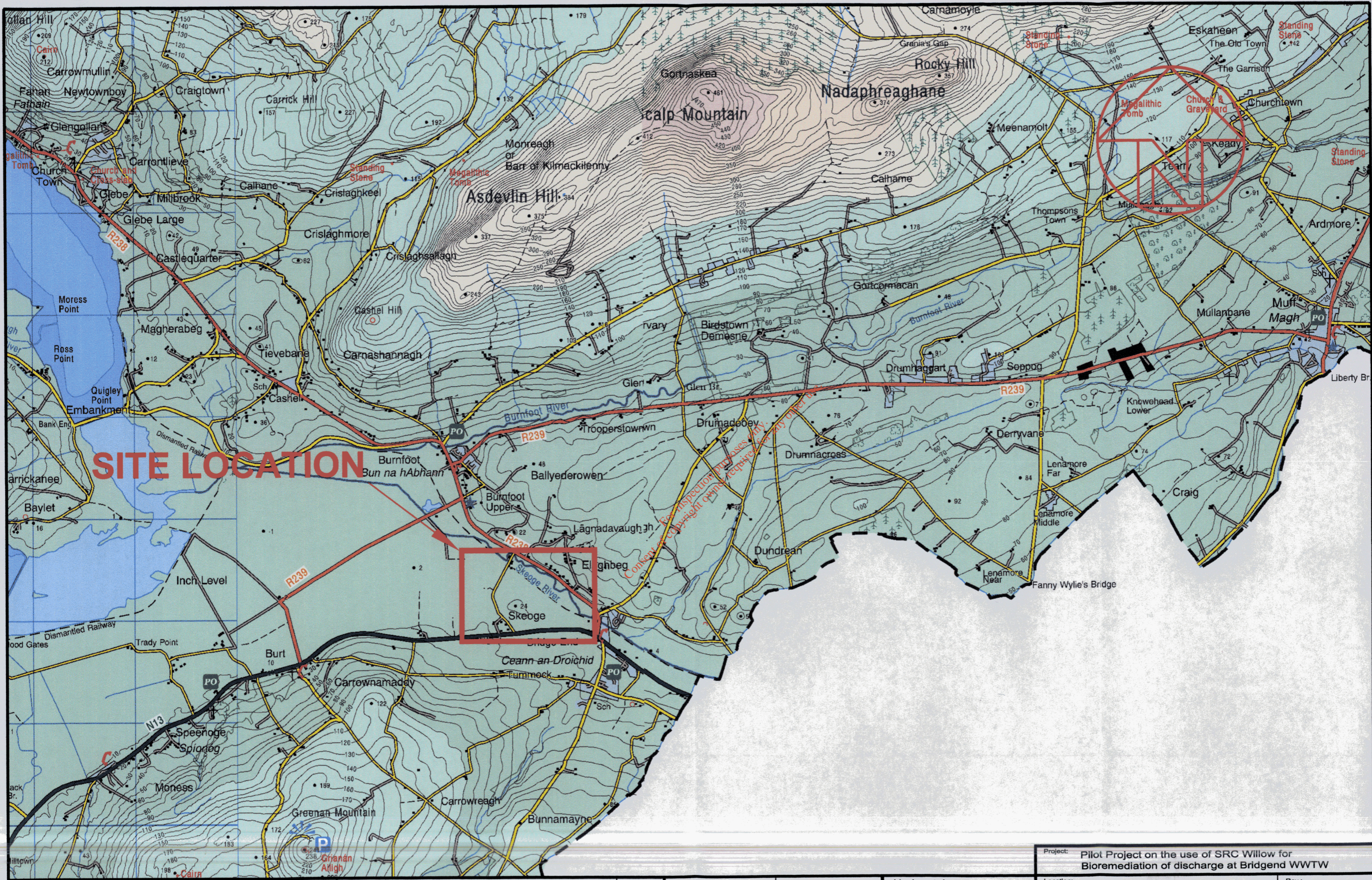
[www.ramsar.org](http://www.ramsar.org)

[www.wetlands.org](http://www.wetlands.org)

[www.birdlife.org](http://www.birdlife.org)

[www.antisce.org](http://www.antisce.org)

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**SITE LOCATION**

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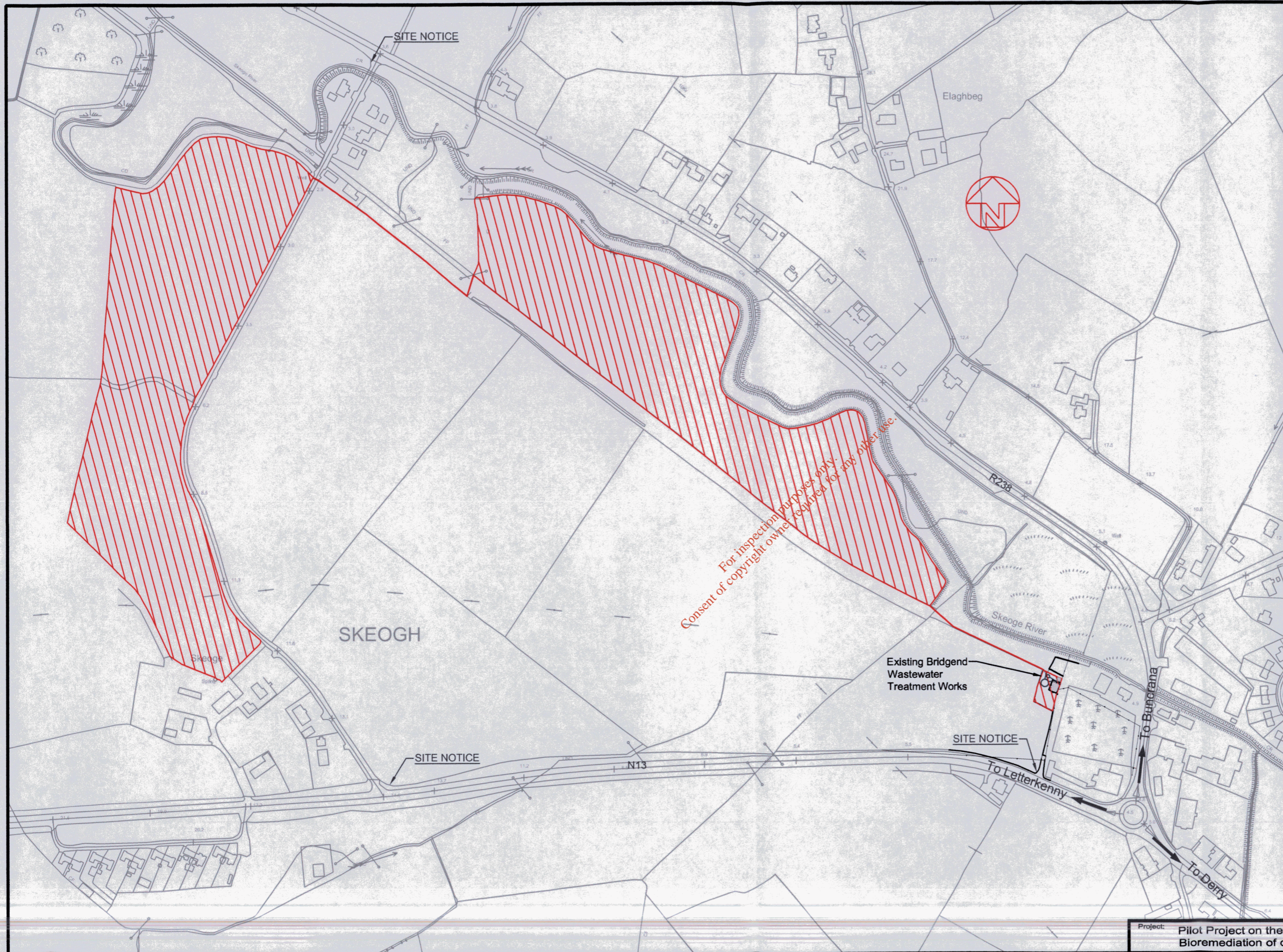
**Donegal County Council**  
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 County House, Lifford.  
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 J. McLaughlin Director of Roads & Transportation.

Revisions	Description	Date

Prepared: JH	Date: January 2012
Checked: CMcL	Date: January 2012
Approved: CMcL	Date: January 2012


Horizontal Scale:	None
Vertical Scale:	None

Project:	Pilot Project on the use of SRC Willow for Bioremediation of discharge at Bridgend WWTW
Location:	Bridgend, Co. Donegal
File No:	Q:W&E ANSWER
Dwg Title:	SITE LOCATION
Rev.:	
Drawing No:	551-001



**Legend:**

Site Extents 

North Arrow 

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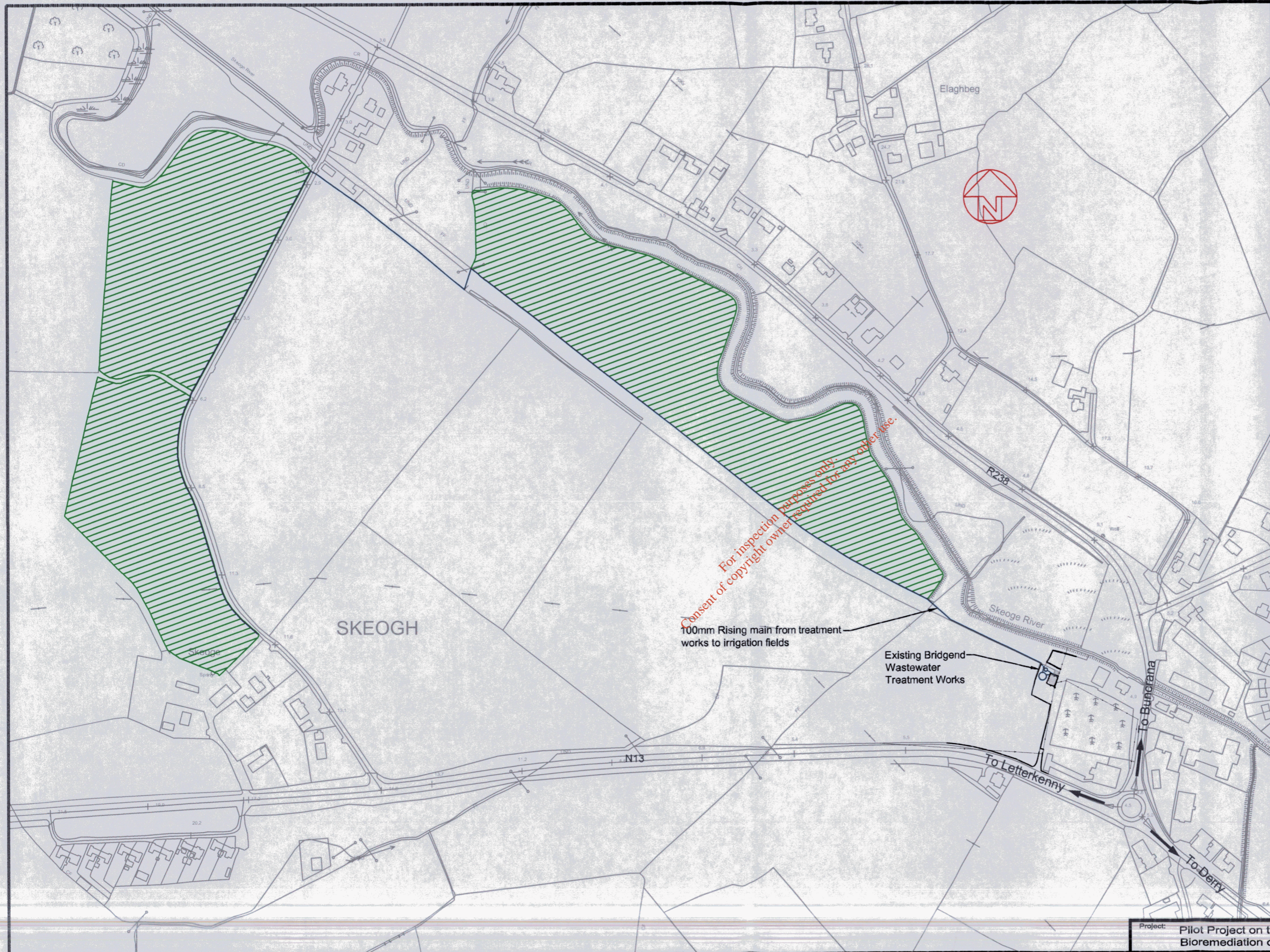
Project: Pilot Project on the use of SRC Willow for Bioremediation of discharge at Bridgend WWTW		Rev.:
Location: Bridgend, Co. Donegal		Drawing No: 551-002
File No: Q:W&E ANSWER		
Dwg Title: SITE EXTENTS		

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Horizontal Scale: 1:4000
Vertical Scale: None



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**Legend**

Lands to be irrigated with effluent and planted with SRC willow

Main Pipeline from WWTW

North Arrow

**Notes:**

The discharge water to be diverted to the willow plantation has been treated in the treatment works and is currently being discharged into the river. This pilot scheme will further treat the effluent through bioremediation using SRC Willows.

The irrigation pump will be operated by time clock and operate automatically by a controller. Independently irrigated zones will be irrigated depending on soil temperature, soil moisture, rainfall etc.

The high density planting, typically 15,000 plants per hectare, and high growth rate mean that the willow readily takes up water and nutrients applied in the wastewater. Irrigation pipe work is installed allowing for 10m un-irrigated margins and buffer zones at the edges of the willow plantation.

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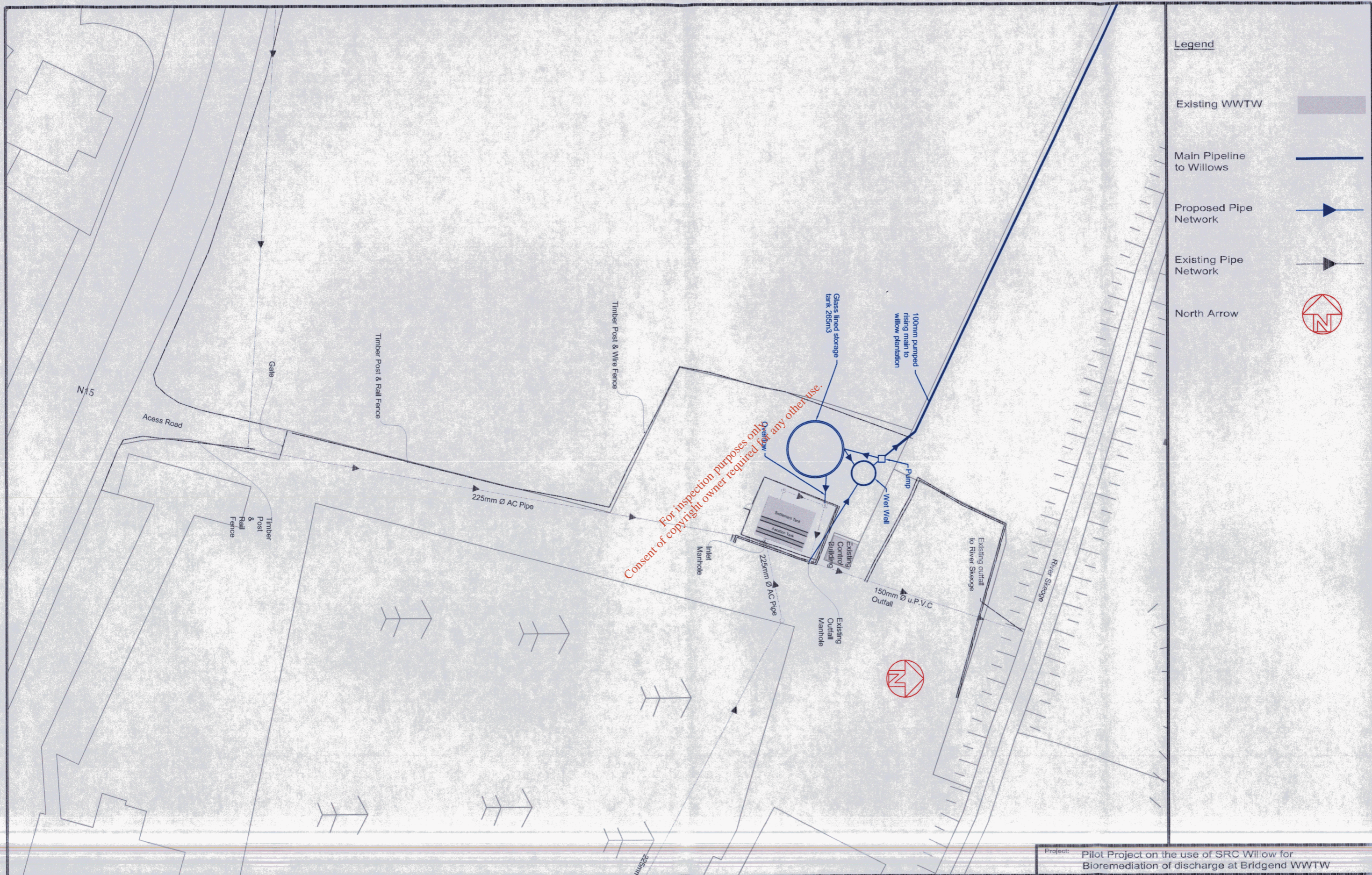
Revisions	Description	Date

Prepared: JH	Date: January 2012
Checked: CMcL	Date: January 2012
Approved: CMcL	Date: January 2012

Horizontal Scale: 1:4000

Vertical Scale: None

Project: Pilot Project on the use of SRC Willow for Bioremediation of discharge at Bridgend WWTW	Rev.:
Location: Bridgend, Co. Donegal	
File No: Q:W&E ANSWER	
Dwg Title: Irrigation Lands	Drawing No. 551-003



**Legend**

Existing WWTW	
Main Pipeline to Willows	
Proposed Pipe Network	
Existing Pipe Network	
North Arrow	

Project:	Pilot Project on the use of SRC Willow for Bioremediation of discharge at Bridgend WWTW	Rev.
Location:	Bridgend	
File No:	Q:W&E ANSWER	
Dwg Title:	Bridgend WWTW	Drawing No: 551-005

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Approved: CMcL	Date: January 2012

Horizontal Scale:	1:500
Vertical Scale:	None