



Administration,  
Environmental Licensing Programme,  
Office of Climate, Licensing & Resource Use,  
Environmental Protection Agency,  
Headquarters,  
PO Box 3000,  
Johnstown Castle Estate,  
County Wexford

1<sup>st</sup> June 2010

**Re: D0172-01 – Rosscarbery/Owenahincha Waste Water Discharge Licence Application – Reply to Notice in accordance with Regulation 18(3)(b) of the Waste Water Discharge (Authorisation) Regulations 2007**

Dear Ms. O'Connor,

I refer to your letter of the 9<sup>th</sup> April 2010 concerning the above. The following is my reply to your request for further information in accordance with Regulation 18(3)(b) dealing in sequence with the points raised:

**1. Classification of Secondary, Stormwater and Emergency Discharges**

There are no secondary discharge points within the agglomeration boundary.

The discharges from the 5 pumping stations are designed for stormwater overflow in accordance with "Formula A" as can be seen in section C1 of the application form.

All 6 points (SW01 – SW06) would also be considered emergency overflows. SW01 has an emergency overflow at the septic tank in the event of heavy storm flows and also is the discharge point for the dedicated stormwater rising main from pumping station P5. SW02-SW06 would also act as emergency overflows in the event of pump failure or a power cut to the 5 pumping stations.

Please see revised drawings B4.01 & B5.01 attached.

**2. Section B.6 – Planning requirements for Proposed Works**

Planning permission for the proposed work is not yet applied for. The Preliminary Report is currently with the Department of Environment and Local Government for approval. The scheme is expected to proceed through the WSIP Planning phase by 2012.

### **3. Section B.10 – Capital Investment Programme**

Rosscarbery/Owenahincha Sewerage Scheme has been included in the WSIP 2010-2012 under the Schemes at Planning Stage. The scheme will be included in Cork County Council's Assessment of Needs for 2013-2015 to proceed to construction.

### **4. Section B.12 – Foreshore Licence**

The Preliminary Report is currently with the Department of Environment and Local Government for approval. The scheme is expected to proceed through the WSIP Planning phase by 2012.

### **5. Hydraulic Model**

Yes, the validation and verification of the hydraulic model has been completed. Section F has been revised appropriately to reflect the verification of the model.

### **6. Bathing Water sampling**

Please see updated results of bathing waters at Warren and Owenahincha Beaches as revised in Section F. The full set of results and the revised summary table F.1.4 shows that both beaches are meeting the Standards of the Bathing Water Regulations.

### **7. Section G.1 Compliance with Directives**

As the discharge is to coastal waters it is deemed that appropriate treatment is currently being provided at Rosscarbery Owenahincha as it is compliant with the Surface Water Directive and the Bathing Water Directive. Both beaches east and west of the primary discharge point have Blue Flag Beach Status indicating that the discharge from the septic tank is not having a negative impact on the waters. There are no designations in the immediate area of the discharge point. Rosscarbery/Owenahincha agglomeration is discharging to a well exchanged body of water with unlimited dilution capacity.

### **8. Assessment of Effects of the Waste Water Discharges**

With reference to Circular L8/08 and the flow diagram in Appendix 1, it can be concluded that the wastewater discharging from the agglomeration will not have significant effects on any relevant European sites in the vicinity. The agglomeration is discharging to a well exchanged body of water with unlimited dilution capacity. The site or discharge is not located within a designated area and the existing or proposed development does not require an EIA.

The Natura 2000 sites in the area are Kilkeran Lake and Castlefreke Dunes SAC (Site Code 001061) which is over 2km away from the discharge point and is designated for its dunes and lagoon. The second site is Galley Head to Duneen Point

SPA (Site Code 004190) and is approximately 4km from the discharge point and is designated for the Chough bird.

### 9. Environmental Quality Objectives Regulations (S.I. No. 272 of 2009)

This application was lodged with the EPA in September 2008 and this regulation did not come into effect until July 2009.

According to the SWRBD Rosscarbery Bay into which the septic tank discharges has an "unassigned status" and the risk assessment overall value of 2a "probable not at risk". The table in attachment F identifies the Criteria for calculating surface water ecological status and ecological potential and compares the results of the ambient water sample taken in the receiving waters.

The results show that the discharge is not having a negative impact on the environment with regard to the requirements of the Environment Quality Objectives regulations.

#### Revised Sections of Application Form:

Section A: Non-Technical Summary  
Section B4, B5  
Section C  
Section F

#### List of Drawing Titles:

Revised Drawings:

ROSS/OWEN B4-01 Rev B - Existing Secondary Discharge Points  
ROSS/OWEN B5-01 Rev B - Existing Storm Water Overflow

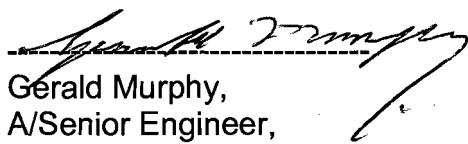
#### List of Attachments

Attachment F1

#### List of Tables

Table D  
Table E4  
Table F

Yours sincerely,

  
Gerald Murphy,  
A/Senior Engineer,  
Cork County Council

Enclosures

## **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.

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

### **Description of the Wastewater Works and the Activities Carried out therein.**

#### **Rosscarbery and Owenahincha Agglomerations**

The villages of Rosscarbery and Owenahincha are on the south coast of Ireland. Rosscarbery is on the western side of an inlet of the sea off Rosscarbery bay, approximately 11km and 53km south west of Clonakilty and Cork City respectively. Owenahincha is a seaside resort approximately 2 kilometres east of Rosscarbery. The population of both villages' increases significantly in the tourist season as both are popular holiday resorts.

#### **The Collection System**

The effluent from the Rosscarbery and Owenahincha agglomerations is collected in a combined sewer network consisting of both gravity and pumped systems. In the Rosscarbery Agglomeration the effluent from the west and south-west of the town centre flow by gravity to pumping station one (P1), whereas the effluent from the north and north east of the town centre flow by gravity to pumping station two (P2). From the pumping stations P1 and P2, the effluent is pumped to the western edge of the causeway. From here the effluent flows by gravity to the main pumping station (P4).

The effluent from the eastern region of the Rosscarbery agglomeration is pumped from pumping station P3 to the highpoint of the pipeline (approximately 360m downstream). From this highpoint the effluent flows by gravity to P4. Furthermore all effluent from the south-east of the Rosscarbery Agglomeration flows to gravity to P4. At P4 all effluent from the Rosscarbery Agglomeration is pumped to the septic tank in Creggane.

In Owenahincha, the waste water flows by gravity to the pumping station five (P5) where it is pumped to the Creggane tank. P5 consists of two sumps, foul and storm sump and two overflows. The effluent in the foul sump is either pumped directly to the septic tank at Creggane or Overflows to the storm sump where two pumps transport it to the discharge point SW01 Ross Owen via a separate storm rising main. The overflow from the storm sumps spills to the Owenahincha stream.

All the pumping stations have overflow channels to the different discharge points. Table A.1.1 below summarizes the pumping capacities of the different pumps and their respective discharge points. The location of the discharges points and pumping stations are showing in Attachment B.4.

**TABLE A.1.1: Details of Pumping Stations.**

Pumping Station	Pumping capacity (l/s)	Emergency and Stormwater Overflow
Pump Station 1	14	Emergency and stormwater overflow: SW02 Ross Owen.
Pump Station 2	28	Emergency and stormwater overflow: SW03 Ross Owen.
Pump Station 3	6.4	Emergency and stormwater overflow: SW04 Ross Owen.
Pump Station 4	11.7	Emergency and stormwater overflow: SW05 Ross Owen.
Pump Station 5 (foul) (duty & assist)	12.4 (& 7.8)	Emergency and stormwater overflow: SW01 Ross Owen. via storm pump.
Pump Station 5 (Storm)	41	Emergency and stormwater overflow: SW06 Ross Owen.

### Wastewater Treatment Plant

The treatment plant is located in Creggane, in front of the Rosscarbery estuary entry. The treatment process is a primary sedimentation system consisting of two identical septic tanks.

The design load on the septic tanks is:

- Capacity = 5,239 peoples
- Current load = 4,051 pe
- Dry Weather Flow = 696 m<sup>3</sup>/day
- BOD load = 243 kg/day

It is proposed that a new treatment plant will be built to upgrade the capacity and the quality of the treatment. The program of proposed work is detailed in the section B.10

### **The Sources of Emissions from the Wastewater Works**

The plant is discharging through an open pipe to the sea. The outfall pipe terminates at low tide.

All the pumping stations have emergency overflows and hence represent sources of emissions. Since the discharge may occur due to pump failure or in the case of an extreme rainfall event, these discharges are considered to be both stormwater overflows and emergency overflows. The overflows are discharging into the coastal water (SW01 Ross Owen, SW05 Ross Owen), transitional water (SW03 Ross Owen, SW04 Ross Owen) or in streams (SW02 Ross Owen, SW06 Ross Owen).

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

It is assumed that the treatment in the septic tank would result in a reduction of up to 30% BOD. The sampled data from the outfall pipe have been included in Attachment F1 and shows an average of 149mg/l of BOD.

It is estimated that the quantity of peak emissions from WWTP will be equal to 3 DWF (2,094m<sup>3</sup>/day). At present the storm water overflows are not quantified. The treated effluent from the septic tank and storm overflows from the pumping stations are discharged to or in the vicinity to the following areas:

- Bathing areas: Owenahincha Beach and Warren Beach.
- Rosscarbery Estuary, candidate National Heritage Area (pNHA).
- The Rosscarbery Harbour (Rosscarbery Lagoon) and the Owenahincha stream are considered to be “possibly at risk of not achieving good status” in the water framework directive.

### **Bathing Areas**

The Bathing Water Regulations give limits on the faecal and total coliform counts in the water. As these limits have never been exceeded and the blue flag beach status has been conserved it is assumed that the impact of the discharges to the bathing areas is negligible.

### **Candidate Special Area of Conservation (pSAC)**

The Kilkeran Lake & Castlefreak dunes are approximately 3,500m away from the primary discharge point. Due to the nature of emissions it can be assumed that there is no negative impact on the Castlefreak dunes. Furthermore as the Kilkeran Lake is 3,500m away from the primary discharge point the level of dilution and dispersion renders the discharge insignificant. Further details of the dilution calculation are given in Section F1.

## Rosscarbery Bay (pNHA)

Due to the high dilution and mixing that takes place in the Rosscarbery Bay the impact of the emissions on the pNHA is negligible. The results from a float study carried during the Owenahincha Preliminary Report further clarify that impact is negligible due to the time taken for the floats to reach the pNHA. Please refer to Section F for further details.

Therefore it can be concluded that there are no significant effects from the primary discharge on the environment due to the distance from sensitive area, high dilution and nature of treatment provided, as confirmed by the recorded data.

The impact of the stormwater overflow discharges from Rosscarbery and Owenahincha is negligible. The results from the hydraulic model simulation using the future flows in the existing network infrastructure indicate that there would be overflow spills for a design one year storm of the critical duration in three of the sub-catchments serving Rosscarbery, SW05, SW02 & SW04. As this discharge is a diluted stormwater discharge and there is no other data available to quantify the impact of the overflows, it is not considered to be significant.

Further information is given in section F.1.

### **The proposed technology and other techniques for preventing or, where this is not possible, reducing emissions from the waste water works.**

A proposed programme of works on the wastewater treatment plant is detailed in Section B.10. A further program will be proposed for the storm water overflow system following completion of modelling and assessment of the network.

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

The complete process will be upgraded in the near future with the construction of a new WWTP. The treatment capacity, the discharge quality and control systems will be improved to ensure that no significant pollution is caused.

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

The emissions from the WWTP can be monitored through the sampling point SW01 Ross/Owen (see Map Ross/Owen B2 - 01 for location).

In the upgraded WWTP, monitoring and sampling of the emissions will be provided in inlet and outlet works (see Map Ross/Owen B10 – 01). The sampling will consist of a composite sample and all emissions will be measured and can be sampled before discharged.

A complete description of the program of work is given in section B.10.

## SECTION B: GENERAL

### 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>
<b>Unique Point Code</b>
<b>Location</b>
<b>Grid ref (6E, 6N)</b>

There are no secondary discharge points within the agglomeration boundary. The discharges previously listed in this section are stormwater overflow discharges and emergency overflows.

**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.

Attachment included	Yes	No
	✓	

### 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>	Outfall pipe
<b>Unique Point Code</b>	SW02 Ross/Owen
<b>Location</b>	Celtic Ross, Rosscarbery
<b>Grid ref (6E, 6N)</b>	128531E, 036287N

<b>Type of Discharge</b>	Outfall pipe
<b>Unique Point Code</b>	SW03 Ross/Owen
<b>Location</b>	Church Road Rosscarbery
<b>Grid ref (6E, 6N)</b>	128819E, 036591N

<b>Type of Discharge</b>	Outfall pipe
<b>Unique Point Code</b>	SW04 Ross/Owen
<b>Location</b>	Mill Road, Burgatia, Rosscarbery
<b>Grid ref (6E, 6N)</b>	129103E, 036897N

<b>Type of Discharge</b>	Outfall pipe
<b>Unique Point Code</b>	SW05 Ross/Owen
<b>Location</b>	Warren Road, Burgatia, Rosscarbery
<b>Grid ref (6E, 6N)</b>	129297E, 036182N



<b>Type of Discharge</b>	Outfall pipe with non return flap valve.
<b>Unique Point Code</b>	SW06 Ross/Owen
<b>Location</b>	Owenahincha Bridge
<b>Grid ref (6E, 6N)</b>	130782E, 035452N

**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>
	√	

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## 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.

#### C.1.1 Storm Water Overflows

For each storm water overflow within the waste water works the following information shall be submitted:

- An assessment to determine compliance with the criteria for storm water overflows, as set out in the DoEHLG 'Procedures and Criteria in Relation to Storm Water Overflows', 1995 and any other guidance as may be specified by the Agency, and
- Identify whether any of the storm water overflows are to be decommissioned, and identify a date by which these overflows will cease, if applicable.

#### C.1.2 Pumping Stations

For each pump station operating within the waste water works, provide details of the following:

- Number of duty and standby pumps at each pump station;
- The measures taken in the event of power failure;
- Details of storage capacity at each pump station;
- Frequency and duration of activation of emergency overflow to receiving waters. Clarify the location where such discharges enter the receiving waters.

### Description of the plant process and design capacity:

Rosscarbery and Owenahincha villages are served by two independent sewerage networks which were constructed in the 1980s and 1970s respectively. Wastewater is pumped to treatment plant at Creggane (adjacent to Owenahincha), from where its discharge to the sea.

The treatment plant is constituted by two identical settlement tanks which provide a primary treatment. Both tanks can be supplied from either village. The capacity of the tanks is 945m<sup>3</sup> (22.5m long by 7meters wide by an average of 3m deep each).

In order to assess the design capacity (design population) of the septic tanks the following calculation was used:

$$C = 180P + 2000,$$

where C is the capacity of the tank (in litres) and P is the design population. Using this formula the combined septic tanks can sufficiently cater for a population of 5,239 persons.

It should be noted that this formulae was obtained from BS6297 1983, this standard has been superseded in 2007 (BS6294 2007); however the new standard does not give any formula for assessing the capacity of septic tanks. So for the basis of this application BS6297 1983 is used.

The septic tanks provide primary settlement only, which according to the National Urban Waste Water Study (NUWWS) reduces the BOD load by approximately 30% and the Suspended Solids load by approximately 50%.

**List of all abatement, treatment or recovery systems:**

There is not currently any abatement, treatment or recovery systems use within the waste water works other than the primary treatment. Each septic tank is desludged on every other year and the sludge is transported off site for treatment.

**Control system description.**

There is not currently any control system. Samples may be taken manually from the outfall chamber manhole, SW01 Ross/Owen (Map Ross/Owen B2 - 01)

**Stormwater Overflows**

As described in the section B.5 of the application the Rosscarbery/Owenahincha sewerage network consist of six storm water overflow discharge points. Details of the stormwater overflow (SWOs) discharge points is given in Table C.1.1.

**TABLE C.1.1 DESCRIPTION OF STORMWATER DISCHARGE POINTS.**

Type of discharge	Unique point code	Receiving Water Body type	Receiving Water Body Name	Grid ref
Open pipe	SW01 Ross Owen	Coastal	Rosscarbery Bay	130186E, 035039N
Outfall pipe	SW02 Ross Owen	River	Rosscarbery Stream	128531E, 036287N
Outfall pipe	SW03 Ross Owen	Transitional Water	Rosscarbery Lagoon	128819E, 036591N
Outfall pipe	SW04 Ross Owen	Transitional Water	Rosscarbery Lagoon	129103E, 036897N
Outfall pipe	SW05 Ross Owen	Coastal	Rosscarbery Bay	129297E, 036182N
Outfall pipe with non return flap valve	SW06 Ross Owen	River	Owenahincha Stream	130782E, 035452N

For each one of these SWO discharge points, an assessment to determine compliance with the criteria for storm water overflows, as set out in the DoEHLG guidance has to be provided. In assessing the operation of an existing SWO's, the guidance requires that one must determine if it:

- *“causes significant visual or aesthetic impact and public complaints,*
- *causes deterioration in water quality in the receiving water,*

- *gives rise to failure in meeting the requirements of national Regulations on foot of EU Directives,*
- *operates in dry weather.”*

The “standards for consenting storm water overflows into or in close proximity to bathing areas and water contact/recreational use waters” set out by the National Rivers Authority in the UK, will be used to take into account the Warren and Owenahincha beaches which are close to the discharge points.

The relevant criteria specified by the National Rivers Authority in the UK can be summarised as follows:

- *“The maximum number of independent storms events discharged via the SWO must not, on average, exceed 3 per bathing season for identified bathing waters unless it can be shown that the design will*
- *achieve the water quality standards of the Bathing Water Directive for at least 98.2% of the time.*
- *The maximum number of independent storm events discharging via storm water overflows affecting water contact/recreational uses waters must not, on average, exceed 7 times per bathing season.*
- *The soffit level of the overflow outfall must be located below the level of the low water mark of mean spring tides (MLWS); otherwise a spill frequency criterion of 1 spill in 5 bathing seasons will apply.*
- *Normally the incoming flow must exceed that calculated from “Formula A” before the storm water overflow spills unless there are high dilutions available.*
- *Discharge flows are required to be screening to at least 10mm and where the frequency of spill is greater than once per year 80% of the volume should be screening to at least 6mm.”*

### **Method of assessment.**

- a) “Formula A” has been calculated for each SWO’s.
- b) Cork County Council has been consulted.
- c) Simulation of flow in network using WinDes Model.

### **SWO’s assessment.**

#### A. Formula A calculations

The “Formula A” is defined as follows:

$$\text{Formula A} = \text{DWF} + 1.36\text{P} + 2\text{E}$$

where ‘P’ is the population served and ‘E’ is the industrial effluent flow. The population served and the industrial effluent flows in the SWO’s catchment have been estimated using the Geodirectory. In the case of 4 of the 5 overflows the discharge point is remote from and upstream of the overflow point (which is in the pumping station). Therefore the capacity of the pumping stations must be at least equal to the respective “Formula A” flow calculation to ensure that overflow does not operate during dry weather flow conditions. Table C.1.2 below summarises the SWO

assessment. It should be noted that the pumping stations capacities were obtained from the Owenahincha Preliminary Report.

**Table C.1.2: Summary of Formula A calculations.**

Discharge Point	Formula A flow (l/s) <sup>1</sup>	Pumping capacity of associate pump (l/s).
SW02 Ross/Owen (Pump Station at Celtic Ross Hotel)	7.5	14
SW03 Ross/Owen (Pump Station at Jetty)	9.5	28
SW04 Ross/Owen (Pump Station at Mill Road)	0.8	6.4
SW05 Ross/Owen (Main Pump Station Rosscarbery)	23.9	11.7
SW06 Ross/Owen (Pump Station at Owenahincha Bridge) (duty pump) (assist pump) cumulative flow rate not calculated	42.6	12.4 7.8

<sup>1</sup> It should be noted that Formula A calculation is in m<sup>3</sup>/day, however this has been converted to l/s in order to compare

In order for the stormwater overflow to spill the incoming flow (Formula A) has to exceed the pumping capacity of the respective pumping station. As can be seen in Table C.1.2 three of the pump capacities are greater than “Formula A” and hence the Stormwater overflows chambers meet the requirement to pass forward “Formula A” under dry weather flow conditions for these 3 pumping stations.

#### B. Cork County Council Consultation.

The curator of the scheme was consulted in order to obtain the necessary information in relation to the storm overflows and pumping stations. The curator informed Fehily Timoney and Company that the storm water overflows have never spilled unless there is a problem with the pumps.

#### C. Simulation of WinDes Model

A hydraulic model for Rosscarbery / Owenahincha sewerage scheme has been built and the flow conditions have been simulated.

The preliminary report indicates that the majority of the overflows meet the Formula A criterion, with the exception of the Warren and Owenahincha PS ie SW05 & SW06. The regulations relevant to discharges from Rosscarbery and Owenahincha are the Bathing water regulations. These stipulate a maximum of 3 or 7 spills per bathing season depending on the designation of the receiving waters. There were no spills from any of the combined manholes in Rosscarbery west (MH’s 151 to 157) from a one year return design storm of any duration.

The results from the hydraulic model simulation using the future flows in the existing network infrastructure indicate that there would be overflow spills for a design one year storm of the critical duration in three of the sub-catchments serving Rosscarbery, SW05, SW02 & SW04. The proposed upgrades in the preliminary report includes any works required to the overflow chambers upstream of the

pumping stations in Rosscarbery and Owenahincha to ensure that all overflows in the system comply with the DEHLG Paper on SWOs for existing and future flows.

## Pumping Stations

As shown in Map Ross Owen B4 – 01 there are five pumping stations throughout the Rosscarbery Owenahincha network. It should be noted that there are no possible measures taken in the event of power failure. However in the proposed works a mobile generator will be provided for pump stations (PS) P4 and P5.

All the five PS have emergency overflows. The discharge point is generally upstream of the pumping station on the network which operates when the PS has either reached capacity or in event of pump failure. The grid reference of the discharge location and other details of the PSs is given in Table C.1.3.

**TABLE C.1.3: DETAILS OF PUMPING STATIONS**

Pumping Station	Approx. Location	Pumping Arrangement	Storage Capacity	Receiving Water	
				Body Name	Grid ref
P1	Celtic Ross Hotel	Duty/Assist	17m <sup>3</sup>	Rosscarbery Stream	128531E, 036287N
P2	Near Boating Jetty	Duty/Assist	6m <sup>3</sup>	Rosscarbery Lagoon	128819E, 036591N
P3	Mill Road	Duty/Assist	14 m <sup>3</sup>	Rosscarbery Lagoon	129103E, 036897N
P4	Strand Road	Duty/Assist	48 m <sup>3</sup>	Rosscarbery Bay	129297E, 036182N
P5 <sup>1</sup>	Owenahincha Bridge	Duty/Standby	39 m <sup>3</sup>	Owenahincha Stream	130782E, 035452N
		Duty/Assist	20m <sup>3</sup>	Rosscarbery Bay	130186E, 035039N

<sup>1</sup> P5 consists of two sumps (storm and foul)

The analysis of the pump stations (Formula A Calculation) indicated that the 3 of the 5 pumps are adequate for the dry weather flow and therefore there is no emergency overflow during normal operation fro these PS. Furthermore, according to Cork County Council there has been no pump failure in the past year.

**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.

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

## 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.

**TABLE C.2.1: DETAILS OF DISCHARGE OUTFALLS**

Discharge	Reference	Location	Design Criteria	Construction Detail
Primary	SW01 Ross/Owen	130186E, 035039N	225mm diameter outlet at a slope of 1 in 1.5	Cast Iron pipe laid to low water level
Stormwater Overflow	SW02 Ross/Owen	128531E, 036287N	200mm overflow pipe. Emergency overflow at 5m OD (poolbeg)	Discharging to Rosscarbery Stream approx. 100m upstream of PS
Stormwater Overflow	SW03 Ross/Owen	128819E, 036591N	200mm overflow pipe. Submerged pumps	Discharging to Lagoon approx. 50m upstream of PS
Stormwater Overflow	SW04 Ross/Owen	129103E, 036897N	200mm overflow pipe. Emergency overflow at 4.5m OD (poolbeg)	Discharging to Lagoon approx. 100m upstream of PS
Stormwater Overflow	SW05 Ross/Owen	129297E, 036182N	300mm overflow pipe. Emergency overflow invert at 5.5m OD (poolbeg)	Discharging to Rosscarbery Bay approx. 75m upstream of PS
Stormwater Overflow	SW06 Ross/Owen	130782E, 035452N	300mm overflow pipe. Emergency overflow invert from storm sump at 5.4m OD (poolbeg)	Discharging directly to Owenahincha stream.

**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.

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

## **SECTION F: EXISTING ENVIRONMENT & IMPACT OF THE DISCHARGE(S)**

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

Detailed information is required to enable the Agency to assess the existing receiving environment. This section requires the provision of information on the ambient environmental conditions within the receiving water(s) upstream and downstream of any discharge(s).

Where development is proposed to be carried out, being development which is of a class for the time being specified under Article 24 (First Schedule) of the Environmental Impact Assessment Regulations, the information on the state of the existing environment should be addressed in the EIS. **In such cases, it will suffice for the purposes of this section to provide adequate cross-references to the relevant sections in the EIS.**

### **F.1. Assessment of Impact on Receiving Surface or Ground Water**

- Give summary details and an assessment of the impacts of any existing or proposed emissions on the environment, including environmental media other than those into which the emissions are to be made.
- Details of all monitoring of the receiving water should be supplied via the following web based link: [http://78.133.100.73/epa\\_wwd\\_licensing/](http://78.133.100.73/epa_wwd_licensing/). Tables F.1(i)(a) & (b) should be completed for the primary discharge point. Surface water monitoring location upstream and downstream of the discharge point shall be screened for those substances listed in Tables F.1(i)(a) & (b). Monitoring of surface water shall be carried out at not less than two points, one upstream from the discharge location and one downstream.
- For discharges from secondary discharge points Tables F.1(ii)(a) & (b) should be completed. Furthermore, provide summary details and an assessment of the impacts of any existing or proposed emissions on the surface water or ground (aquifers, soils, sub-soils and rock environment), including any impact on environmental media other than those into which the emissions are to be made.
- Provide details of the extent and type of ground emissions at the works. For larger discharges to groundwaters, e.g., from Integrated Constructed Wetlands, large scale percolation areas, etc., a comprehensive report must be completed which should include, inter alia, topography, meteorological data, water quality, geology, hydrology, and hydrogeology. The latter must in particular present the aquifer classification and vulnerability. The Geological Survey of Ireland Groundwater Protection Scheme Dept of the Environment and Local Government, Geological Survey of Ireland, EPA (1999) methodology should be used for any such classification. This report should also identify all surface water bodies and water wells that may be at risk as a result of the ground discharge.
- Describe the existing environment in terms of water quality with particular reference to environmental quality standards or other legislative standards. Submit a copy of the most recent water quality management plan or catchment management plan in place for the receiving water body.



Give details of any designation under any Council Directive or Regulations that apply in relation to the receiving water.

- Provide a statement as to whether or not emissions of main polluting substances (as defined in the *Dangerous Substances Regulations S.I. No. 12 of 2001*) to water are likely to impair the environment.
  - In circumstances where water abstraction points exist downstream of any discharge describe measures to be undertaken to ensure that discharges from the waste water works will not have a significant effect on faecal coliform, salmonella and protozoan pathogen numbers, e.g., *Cryptosporidium* and *Giardia*, in the receiving water environment.
  - Indicate whether or not emissions from the agglomeration or any plant, methods, processes, operating procedures or other factors which affect such emissions are likely to have a significant effect on –
    - (a) a site (until the adoption, in respect of the site, of a decision by the European Commission under Article 21 of Council Directive 92/43/EEC for the purposes of the third paragraph of Article 4(2) of that Directive) —
      - (i) notified for the purposes of Regulation 4 of the Natural Habitats Regulations, subject to any amendments made to it by virtue of Regulation 5 of those Regulations,
      - (ii) details of which have been transmitted to the Commission in accordance with Regulation 5(4) of the Natural Habitats Regulations, or
      - (iii) added by virtue of Regulation 6 of the Natural Habitats Regulations to the list transmitted to the Commission in accordance with Regulation 5(4) of those Regulations,
    - (b) a site adopted by the European Commission as a site of Community importance for the purposes of Article 4(2) of Council Directive 92/43/EEC<sup>1</sup> in accordance with the procedures laid down in Article 21 of that Directive,
    - (c) a special area of conservation within the meaning of the Natural Habitats Regulations, or
    - (d) an area classified pursuant to Article 4(1) or 4(2) of Council Directive 79/409/EEC<sup>2</sup>;
- <sup>1</sup>Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ No. L 206, 22.07.1992)
- <sup>2</sup>Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (OJ No. L 103, 25.4.1979)
- Describe, where appropriate, measures for minimising pollution over long distances or in the territory of other states.

- This section should also contain full details of any modelling of discharges from the agglomeration. Full details of the assessment and any other relevant information on the receiving environment should be submitted as **Attachment F.1.**

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

### Details and Assessment of the Impact of Emissions on Receiving Water

As stated in Section B.3, B.4 B.5 there are both primary and stormwater overflow discharge points. The primary discharge point (SW01 Ross/Owen) is at the outfall to the septic tanks as shown on Map B3 - 01. There are 5 emergency and stormwater overflow from the respective pumping stations and shown on Map B5 – 01 Rev B. Please note that:

1. All the discharges are to surface waters and hence the groundwater assessment is not applicable.
2. The background water quality at the primary discharge point is detailed in table F.1.(i) a and b in Attachments. In relation to the remaining background water quality a available data related to the Coliforms and Streptococci and is presented in tables F.1.1 and F.1.2 below.

**TABLE F.1.1: OWENAHINCHA BEACH MONITORING DATA (UPDATED RESULTS).**

<b>Parameter</b>	<b>Faecal Coliforms</b>	<b>Total Coliforms</b>	<b>Faecal Streptococci</b>
Sample Date	cfu/100ml	MPN/100ml	cfu/100ml
11-May-04	0	0	0
25-May-04	0	0	0
08-Jun-04	0	0	17
22-Jun-04	33	40	14
06-Jul-04	4	6	15
20-Jul-04	60	90	0
03-Aug-04	2	2	2
17-Aug-04	40	40	5
31-Aug-04	0	2	0
17-May-05	0	0	0
31-May-05	0	0	1
14-Jun-05	0	1	0
28-Jun-05	4	4	1
12-Jul-05	0	0	0
26-Jul-05	0	2	0
10-Aug-05	2	2	2
23-Aug-05	0	4	0
16-May-06	0	0	0
30-May-06	0	0	0
13-Jun-06	0	1	0
27-Jun-06	0	4	0
11-Jul-06	1	2	0

25-Jul-06	0	0	0
08-Aug-06	0	0	0
22-Aug-06	0	4	2
22-May-07	0	6	4
05-Jun-07	0	0	0
18-Jun-07	0	0	0
03-Jul-07	2	26	1
17-Jul-07	3	3	1
31-Jul-07	2	3	0
13-Aug-07	0	0	0
28-Aug-07	1	10	0
20-May-08	2	2	0
03-Jun-08	1	1	0
17-Jun-08	0	2	0
30-Jun-08	0	0	0
15-Jul-08	1	6	1
29-Jul-08	38	103	9
12-Aug-08	18	46	3
27-Aug-08	34	72	5
19-May-09	3	7	0
03-Jun-09	1	1	0
16-Jun-09	1	5	0
30-Jun-09	3	4	0
15-Jul-09	5	7	0
28-Jul-09	6	66	1
11-Aug-09	7	35	1
25-Aug-09	3	4	0

**TABLE F.1.2: WARREN BEACH MONITORING DATA (UPDATED RESULTS).**

Location Easting	Location Northing	Sample Date	Faecal Coliforms	Total Coliforms	Faecal Streptococci
			cfu/100ml	MPN/100ml	cfu/100ml
129788.4	35117.3	18-May-04	3	5	3
129788.4	35117.3	25-May-04	0	0	0
129788.4	35117.3	08-Jun-04	0	0	1
129788.4	35117.3	22-Jun-04	185	> 600	35
129788.4	35117.3	29-Jun-04	10	10	7
129788.4	35117.3	06-Jul-04	1	3	16
129788.4	35117.3	22-Jul-04	10	35	5
129788.4	35117.3	04-Aug-04	2	40	1
129788.4	35117.3	17-Aug-04	14	16	5
129788.4	35117.3	31-Aug-04	4	8	3
129788.4	35117.3	17-May-05	0	0	2
129788.4	35117.3	31-May-05	0	0	0
129788.4	35117.3	14-Jun-05	67	82	0
129788.4	35117.3	28-Jun-05	8	10	7
129788.4	35117.3	12-Jul-05	0	0	0

129788.4	35117.3	26-Jul-05	7	11	6
129788.4	35117.3	10-Aug-05	1	2	1
129788.4	35117.3	23-Aug-05	2	2	6
129788.4	35117.3	16-May-06	6	34	6
129788.4	35117.3	30-May-06	0	0	1
129788.4	35117.3	13-Jun-06	12	12	0
129788.4	35117.3	27-Jun-06	1	16	6
129788.4	35117.3	11-Jul-06	47	180	65
129788.4	35117.3	25-Jul-06	4	16	5
129788.4	35117.3	08-Aug-06	0	0	2
129788.4	35117.3	22-Aug-06	6	56	44
129788.4	35117.3	28-Aug-06	1	4	5
129788.4	35117.3	22-May-07	0	4	1
129788.4	35117.3	05-Jun-07	0	1	1
129788.4	35117.3	18-Jun-07	0	0	1
129788.4	35117.3	03-Jul-07	8	40	2
129788.4	35117.3	17-Jul-07	1	1	4
129788.4	35117.3	31-Jul-07	17	17	4
129788.4	35117.3	08-Aug-07	5	12	4
129788.4	35117.3	13-Aug-07	8	15	4
129788.4	35117.3	28-Aug-07	32	37	10
129788.4	35117.3	20-May-08	4	11	0
129788.4	35117.3	03-Jun-08	2	3	1
		17-Jun-08	4	8	0
		30-Jun-08	4	4	3
		15-Jul-08	4	5	1
		30-Jul-08	285	295	33
		12-Aug-08	5	10	1
		26-Aug-08	21	106	10
		27-Aug-08	25	88	4
		19-May-09	9	200	4
		03-Jun-09	7	11	1
		16-Jun-09	1	9	2
		30-Jun-09	117	1100	32
		07-Jul-09	6	14	5
		14-Jul-09	43	117	2
		28-Jul-09	24	116	8
		11-Aug-09	7	18	4
		18-Aug-09	63	190	45
		25-Aug-09	0	4	0

The following sections detail the impact of the discharges:

### Impact of Primary Discharge

The primary discharge SW01 Ross/Owen discharges into the Rosscarbery Bay which is adjacent to a designated National Heritage Area (pNHA) and designated Bathing Waters.

The impact on the pNHA, in particular the young oyster that are currently grown in the Rosscarbery Estuary, is minimised by the level of dilution and mixing that takes place in the Rosscarbery Bay. Furthermore results from the floating study (1971) state that floats had not reached the Owenahincha Strand after 9 hours. It can be assumed from this that the primary discharge is negligible impact on the pNHA

Owenahincha Beach and the Warren Beach (Creggane Strand) are designated bathing areas, and hence the provisions of these regulations apply to the receiving waters. Furthermore, both Owenahincha Beach and The Warren Beach (Rosscarbery) are blue flag beaches. Table F.1.3 details the limits specified in the bathing water regulations. As the receiving waters are designated bathing areas these parameters can not be exceeded on two consecutive samples.

**TABLE F.1.3: BATHING WATER REGULATION SPECIFICATIONS.**

Parameter	Unit	To be conformed within 95% or more of samples	To be conformed within 80% or more of samples
Total Coliforms	/100 ml	10,000	5,000
Faecal Coliforms	/100 ml	2,000	1,000
pH		6.0 - 9	
Phenols	Mg/litre	≤ 0.05 and no specific odour.	
Faecal streptococci	No./100ml	≤ 300	
Dissolved Oxygen	% saturation O <sub>2</sub>	≤ 70 and ≤ 120	
Salmonella	No./litre	0	
Enteroviruses	PFU/10 litres	0	

Analyses of the Bathing Waters are summarized in Table F.1.4 below and the data sampled for the Warren and Owenahincha Beaches between May 2004 and June 2008 is given in Table F.1.1 and F.1.2 above. These tables have now been updated to include all results of samples taken in 2008 & 2009.

**TABLE F.1.4: SAMPLES DATA SUMMARY (UPDATED RESULTS).**

Bathing area		Unit	Faecal Coliforms /100 ml	Total Coliforms /100 ml	Faecal Streptococci /100 ml
Warren beach	Average	/100 ml	25.8	66.9	7.5
	Maximum	/100 ml	285	1100	65
Owenahincha beach	Average	/100 ml	7.5	13.6	2.5
	Maximum	/100 ml	103	60	17

As can be seen from Tables F.1.1 to F.1.4 above the amount of pollution did not exceed the standards specified in the Bathing Water Regulations and hence indicates that the primary discharge has negligible impact on the bathing areas in the vicinity.

## Impact of Stormwater Overflow & Emergency Overflow Discharge Points

Stormwater overflow & emergency overflow discharges may occur into Rosscarbery Lagoon (SW03 and SW04 Ross/Owen), into the north of the Rosscarbery estuary (SW05 Ross/Owen) and into the Rosscarbery and Owenahincha Streams, SW02 and SW06 Ross/Owen respectively.

The hydraulic model for Rosscarbery Owenahincha sewerage scheme has been built and the flow conditions have been simulated. The preliminary report indicates that the majority of the overflows meet the Formula A criterion, with the exception of the Warren and Owenahincha PS ie SW05 & SW06. The regulations relevant to discharges from Rosscarbery and Owenahincha are the Bathing water regulations. These stipulate a maximum of 3 or 7 spills per bathing season depending on the designation of the receiving waters. There were no spills from any of the combined manholes in Rosscarbery west (MH's 151 to 157) from a one year return design storm of any duration.

Furthermore, it should be noted that Cork County Council has stated that no discharges, emergency or storm water overflows occurred in the past year.

### Existing environment in terms of water quality

The existing environment in terms of water quality was assessed using all the available data from The Water Framework Directive, Cork County Council Bathing Water Assessment and the float study undertaken in 1971.

#### (i) Owenahincha River:

The river obtained a 1b score in the water framework assessment in 2005. The score 1b means that the water body is "thought to be at risk of failing to meet the objective, pending further investigation". The discharge to this river only occurs when the foul and storm sump have overflowed. The combined capacity of the sumps is 52.7l/s at duty status (an assist pump with 7.8l/s capacity is also in the foul sump). As the preliminary results from the WinDes model suggest that this pump station overflow does not operate in dry weather.

#### (ii) Rosscarbery Bay:

An area adjacent to the discharge point is designated a proposed Natural Heritage Area. The site synopsis for Rosscarbery Bay (001075) states that "The mouth of the inlet is nearly closed by a broad spit of sand behind Creggane Strand but above this there are extensive sand flats where quays and a training wall indicate a former maritime importance. Currently the site is used for growing young oyster stock in cages".

Rosscarbery Bay was assessed to have a score of 2a in the Water Framework Directive which means "body is expected to meet good status in 2015, pending further investigation". The discharges into the bay, via the primary outfall is not considered to be a risk to the water quality in the bay: the volume of water, mixing and dilution available guarantees good assimilation by the sea.

The oyster farms are situated about 2km from the primary discharge point, hence it can be estimated, based the 1971 float survey that the time of travel to the oyster farms would be approximately 30 hours. It is assumed that the percentage of bacteria which may reach the farms is negligible according to the decay rate calculation.

### **(iii) Designated Bathing Waters**

As stated previously the Owenahincha and Warren Beaches are Designated Bathing Waters. For this reason these beaches are monitored for Faecal Coliforms, Total Coliforms and Faecal Streptococci. As can be seen in Tables F.1.1 and F.1.2 above the standards specified in the Bathing Water Directive were not exceeded in the period from May 2004 to May 2010.

It should also be noted that these beaches/bathing areas have restored their blue flag beach status which further illustrates that the emission from the septic tanks has no significant effects on the receiving water body.

The updated results of bathing waters at the warren Beach and Owenahincha Beach are included in the revised tables F.1.1 and F.1.2. (i.e. remainder of 2008 & 2009 results) These confirm that the beaches maintain their Blue Flag Beach Status and meet with the Bathing water regulations as can be seen from the revised table F.1.4.

### **(iv) Rosscarbery Lagoon.**

Rosscarbery Lagoon obtained a score of 1b in the Water Framework Directive i.e. "thought to be at risk of failing to meet the objective, pending further investigation". There are two discharge points into the Rosscarbery Lagoon. Both are stormwater overflow discharges and hence only an intermittent risk of contamination.

The WinDES model indicate that the pumping stations (P3) does not spill into the lagoon on a 1 year storm. As stated previously this discharge is only an infrequent stormwater overflow and hence the impact on the lagoon is negligible.

### **Dangerous Substances Regulations S.I. No. 12 of 2001**

The Danger Substances Regulations define the main polluting pesticides, solvent and metals which have significant effects on the environment. As the load to the WWTP is mainly domestic and tourism with no industrial contribution it can be assumed that the presence of these substances is negligible. The main parameters which impact the receiving environment are limited to BOD, suspended solid and bacteria (total and faecal coliform, faecal Streptococci).

### **Water Abstraction Downstream**

No water abstraction points exists downstream of any of the discharge location (primary or stormwater).

## Habitat Directive 92/43/EEC and Birds Directive 79/409/EEC

The Council Directive 97/11/EC (O.J. No. L73/5, 14 March 1997) was transposed into Irish Legislation via the European Communities (Environmental Impact Assessment) (Amendment) Regulations, 1999, (S.I. No. 93 of 1999). The first schedule of these regulations details the developments that require an EIA by law. Part I (13) of the first schedule specifies the requirement for “*Waste water treatment plants with a capacity exceeding 150,000 population equivalent*” to undergo an EIA. Part II (11) (c) of the schedule specifies the requirement for “*Waste water treatment plants with a capacity greater than 10,000 population equivalent*” to undergo an EIA. These specifications apply under various conditions.

The design population equivalent, in the year 2027, of the Rosscarbery/Owenahincha wastewater treatment plant is 7,100 and, hence, is classified as a sub-threshold development which does not require an EIA. However, in accordance with Article 120 of the Planning and Development Regulations 2001 (S.I. No. 600 of 2001), an EIA should be undertaken for a sub-threshold development under the following circumstances:

- (i) where a Local Authority “*considers that the development would be likely to have significant effects on the environment*” or
- (ii) where the development “*would be located on or in*” an environmentally sensitive site noted in the Wildlife (Amendment) Act, 2000 (No. 38 of 2000) and would “*be likely to have significant effects on the environment of such a site, area or land*”.

While neither the proposed wastewater treatment plant nor the proposed point of discharge (assuming the existing outfall will be extended by approximately 100 m) is a designated site, there are some designated sites in close proximity. Rosscarbery Estuary is designated a proposed Natural Heritage Area (pNHA-1075). The WWTP and outfall are located approximately 250 m and 400 m respectively from the closest designated area (pNHA-1075).

A large Special Protected Area (SPA) is designated along the south west coast of the county - Sheep's Head to Toe Head (SPA-4156). This site supports two bird species listed in Annex 1 of the EU Bird's Directive - Chough and Peregrine – and the nationally important Black Guillemot. This SPA is situated approximately 10 km from the proposed development and as a result, should not be affected by it.

The proposed Natural Heritage Areas (pNHAs) cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wild plant and animal species or a diversity of these natural attributes. It is important that the conservation value of these areas, which are proposed for designation from time to time by the Heritage Service, be maintained.

A candidate Special Area of Conservation (cSACs) is selected based on the support it offers to habitats and plant and animal species that are rare or threatened in Europe and requires particular measures, including the designation of protected sites, to conserve them. The sites are called ‘candidate sites’ because they are currently under consideration by the Commission of the European Union. Together with the SPAs they form part of the ‘Natura 2000’ network of sites throughout Europe.

The development is not considered likely to have significant environmental effects on these sites as a high level of treatment and a high level of dilution and dispersion of



the discharged effluent is proposed. The wastewater will receive secondary treatment once the proposed works are completed and the proposed wastewater treatment plant can also be retrofitted with Ultra-Violet (UV) disinfection to produce an even higher treatment standard if required. The treated effluent will then be discharged to the sea which will ensure significant dilution.

It is concluded that the Rosscarbery/Owenahincha Sewerage Scheme will not cause a significant environmental impact and is not located within a designated area. The development does not require an Environmental Impact Assessment (EIA). The existing and proposed facilities are compliant with the Habitat Directive and the Birds Directive.

## F.2 Tabular Data on Drinking Water Abstraction Point(s)

Applicants should submit the following information for each downstream or downgradient drinking water abstraction point. The zone of contribution for the abstraction point should be delineated and any potential risks from the waste water discharge to the water quality at that abstraction point identified.

ABS_CD	AGG_SERVED	ABS_VOL	PT_CD	DIS_DS	EASTING	NORTHING	VERIFIED
Abstraction Code	Agglomeration served	Abstraction Volume in m <sup>3</sup> /day	Point Code Provide label ID's	Distance Downstream in meters from Emission Point to Abstraction Point	6E-digit GPS Irish National Grid Reference	6N-digit GPS Irish National Grid Reference	Y = GPS used N = GPS not used

**Note:** Attach any risk assessment that may have been carried out in relation to the abstraction point(s) listed.

An individual record (i.e. row) is required for each abstraction point. Acceptable file formats include Excel, Access or other upon agreement with the Agency. A standard Excel template can be downloaded from the EPA website at [www.epa.ie](http://www.epa.ie). This data should be submitted to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, C.1, D.2 and E.3.

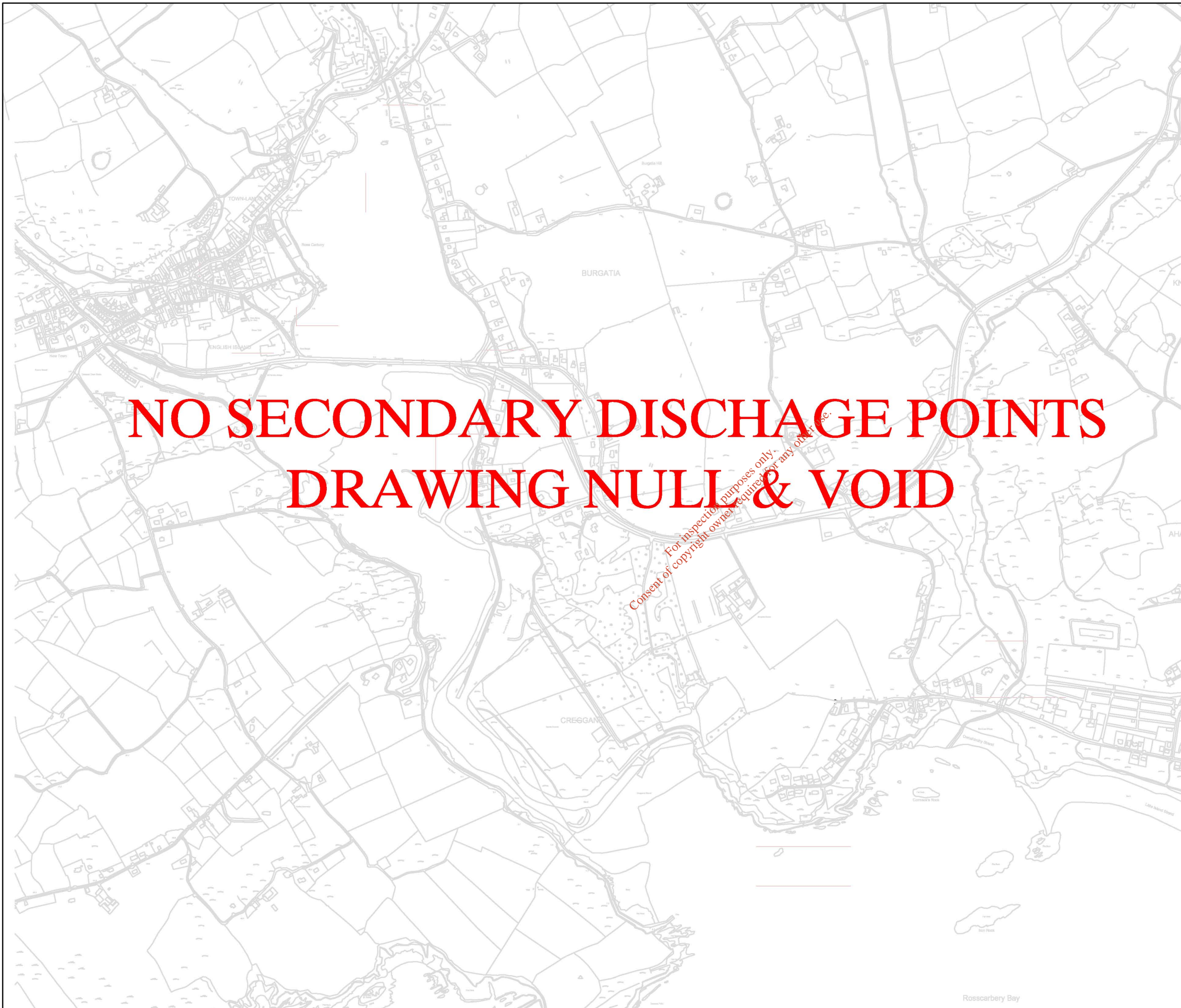
**Attachment F.2** should contain any supporting information.

## **Attachment B4 & B5**

### **Drawing:**

- Ross/Owen B4-01 Rev B - Existing Secondary Discharge Points
- Ross/Owen B5-01 Rev B - Existing Storm Water Overflows

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NO SECONDARY DISCHARGE POINTS  
DRAWING NULL & VOID

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No.	Date	Drawn	Checked	Revision Description
B	04/06/10	OOB	Chid	Issued For Regulation 38 Response
A	17/09/08	FT&Co	FT&Co	Issued For Licence Application

**Cork County Council,  
Western Division.**

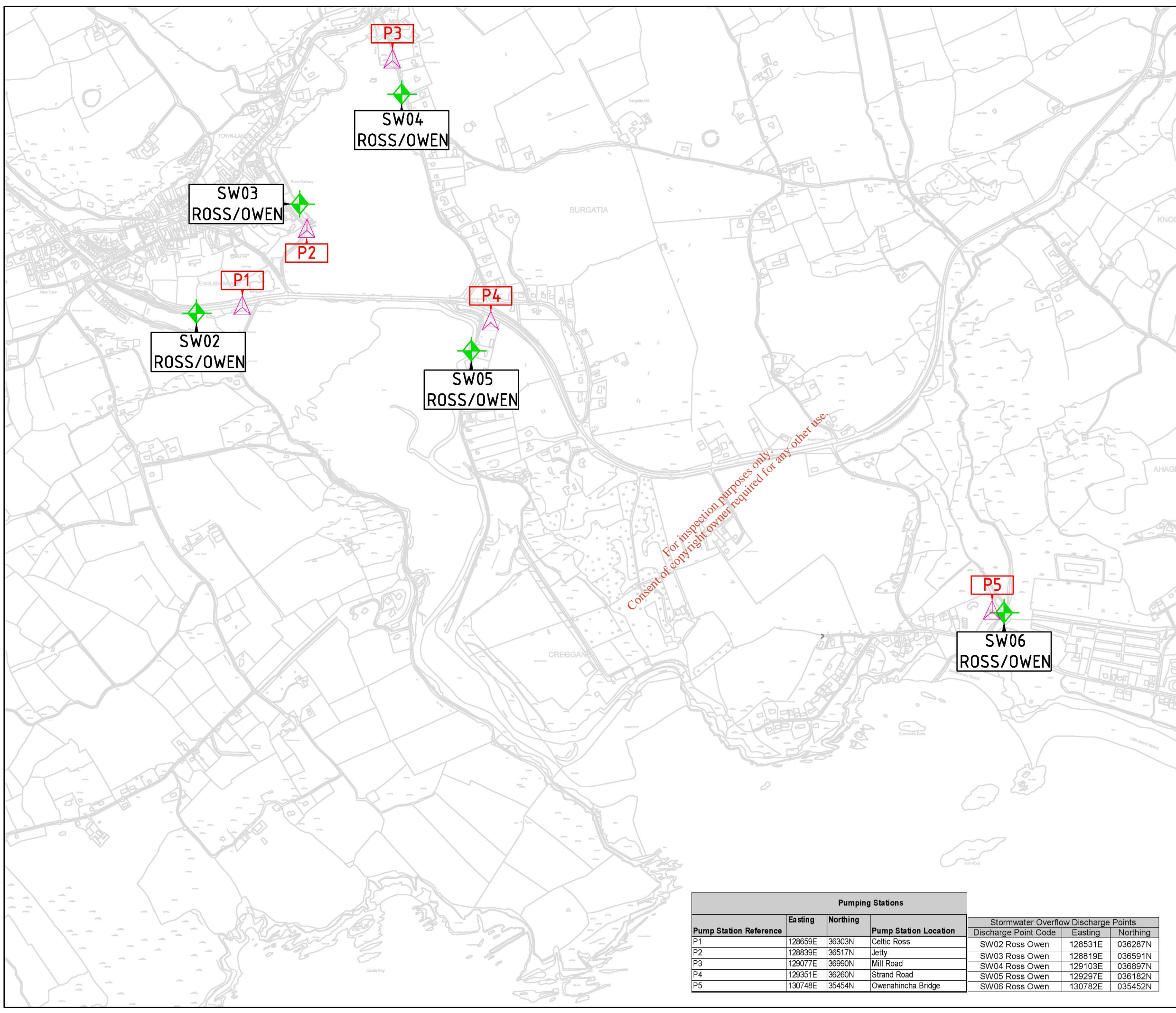
**N.O'MAHONY, B.E.,**  
SENIOR ENGR. (WATER SERVICES),  
COURTHOUSE, SKIBBEREEN.

**M. MURRELL,**  
DIRECTOR OF SERVICES  
WEST CORK

**Job Title:**  
ROSSCARBERY\_OWENAHINCHA  
WASTEWATER\_DISCHARGE  
LICENCE\_APPLICATION

**Drawing Title:**  
ATTACHMENT\_B4-01  
LOCATION\_OF\_SECONDARY  
DISCHARGE\_POINTS

Prepared By: OOB	Checked By: NOM	Date: MAY.2010
Drawing number: ROSS/OWEN_B4_01	Scales: 1/10000	Rev: B



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No.	Date	Drawn	Checked	Revision	Description

**Cork County Council,  
Western Division.**



N.O'MAHONY, B.E.,  
SENIOR ENGR. (WATER SERVICES),  
COURTHOUSE, SKIBBEREEN.  
  
M. MURRELL,  
DIRECTOR OF SERVICES  
WEST CORK

Job Title:  
**ROSSCARBERY\_OWENAHINCHA  
WASTEWATER\_DISCHARGE  
LICENCE\_APPLICATION**

Drawing Title:  
**ATTACHMENT\_B.5  
LOCATION\_OF  
STORMWATER\_OVERFLOW  
DISCHARGE\_POINTS**

Prepared By: OOB	Checked By: NOM	Date: MAY_10
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Drawing number: ROSS/OWEN_B5-01	Scales: 1/10000	Rev: B
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Pumping Stations			Stormwater Overflow Discharge Points			
Pump Station Reference	Easting	Northing	Pump Station Location	Discharge Point Code	Easting	Northing
P1	128659E	36303N	Celtic Ross	SW02 Ross Owen	128531E	036287N
P2	128839E	36517N	Jetty	SW03 Ross Owen	128819E	036591N
P3	129077E	36990N	Mill Road	SW04 Ross Owen	129103E	036897N
P4	129351E	36260N	Strand Road	SW05 Ross Owen	129297E	036182N
P5	130748E	35454N	Owenahincha Bridge	SW06 Ross Owen	130782E	035452N

## **Attachment F1**

### **Supporting Information**

Ambient Coastal water Quality

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## Ambient Coastal Water Quality

<b>Physico-chemical conditions</b>	<b>Ecological quality ratio/standard</b>	<b>2008 ambient sampling results</b>
	<b>Good boundary</b>	
	<b>Coastal (All Types)</b>	
<b>Oxygenation conditions Table 9</b>	<b>Coastal water body</b>	<b>Ambient sampling results</b>
Biochemical Oxygen Demand (BOD) (mgO <sub>2</sub> /l)	No Limit	-
<b>Acidification Status Table 9</b>	<b>Coastal Water Body</b>	<b>Ambient sampling results</b>
pH (individual values)	No Limit	-
<b>Nutrient conditions Table 9</b>	<b>Coastal Water body</b>	<b>Ambient sampling results</b>
Total Ammonia (mg N/l)	No Limit	-
Molybdate Reactive Phosphorus (MRP) (mg P/l)	No Limit	-
<b>Specific pollutants Table 10</b>	<b>Other surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Phenol	46	<0.1µg/L
Toulene	No Limit	-
Xylene	No Limit	-
Arsenic	No Limit	-
Total Chromium	32	1µg/L
Copper (depending on water hardness)	No Limit	-
Cyanide	No Limit	-
Flouride	No Limit	-
Zinc (depending on water hardness)	No Limit	-
<b>Priority Substances Table 11</b>	<b>Other surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	1.0µg/L
Nickel and its compounds	20	1.0µg/L
<b>Priority Hazardous Substances Table 12</b>	<b>Other surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Cadmium and its compounds (depending on water hardness)	0.2	1.0µg/L
Mercury and its compounds	0.05	<0.2µg/L

### Note the following:

The black results are within the EQR/S.

The blue results may break the EQR/S.

The results highlighted grey are at the limit of detection.

## **Tables**

- Table D
- Table E4
- Table F

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

**Discharge Point Code:** SW01 Rosscarbery/Owenahincha

Source of Emission:	Primary Discharge
Location:	Rosscarbery Bay
Grid Ref. (12 digit, 6E, 6N):	130186E 035039N
Name of receiving waters:	Rosscarbery Bay
River Basin District:	South Western River Basin District
Designation of receiving waters:	No designation at discharge location
Flow rate in receiving waters:	Tidal Area 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			
Normal/day	698 m <sup>3</sup>	Maximum/day	3,456m <sup>3</sup>
Maximum rate/hour	144 m <sup>3</sup>	Period of emission (avg)	<u>60</u> min/hr <u>24</u> hr/day <u>365</u> day/yr
Dry Weather Flow	0.008m <sup>3</sup> /sec		



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

**Discharge Point Code: SW 01 Rosscarbery/Owenahincha**

Number	Substance	As discharged	
		Max. daily average	
<b>1</b>	pH	6.0-9.0	
<b>2</b>	Temperature	<30°C	
<b>3</b>	Electrical Conductivity(@25°C)	3000	
		Max. daily average (mg/l)*	kg/day
<b>4</b>	Suspended Solids	250	174.5
<b>5</b>	Ammonia (as N)**	25	17.45
<b>6</b>	Biochemical Oxygen Demand	210	146.58
<b>7</b>	Chemical Oxygen Demand**	460	322.5
<b>8</b>	Total Nitrogen (as N)	100	69.8
<b>9</b>	Nitrite (as N)	Not applicable	Not applicable
<b>10</b>	Nitrate (as N)	Not applicable	Not applicable
<b>11</b>	Total Phosphorus (as P)	12	8.38
<b>12</b>	Orthophosphate (as P) <sup>Note 1</sup>	10	6.98
<b>13</b>	Sulphate (SO <sub>4</sub> )**	100	69.8
<b>14</b>	Phenols (sum) <sup>Note 2</sup> (ug/l)*	<0.1	0.0000698

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(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS Revised**

**Primary Discharge Point - Characteristics of the emission**  
**Discharge Point Code: SW01 Rosscarbery/Owenahincha**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day*	kg/year*
1	Atrazine	<0.01	<0.0000698	<0.00255
2	Dichloromethane	<1	<0.000698	<0.255
3	Simazine	Not Applicable	Not Applicable	Not Applicable
4	Toluene	<1	<0.000698	<0.255
5	Tributyltin	<0.02	<0.0001396	<0.0051
6	Xylenes	<1	<0.000698	<0.255
7	Arsenic	2	<0.001396	<0.50954
8	Chromium**	<10.5	<0.00733	<2.675
9	Copper**	<20	<0.01396	<5.095
10	Cyanide	<5	<0.00349	<1.274
11	Fluoride	<100	<0.0698	<25.477
12	Lead	5.6	0.00391	1.427
13	Nickel**	<5	<0.00349	<1.274
14	Zinc**	<10	<0.00698	<2.5477
15	Boron	<300	<0.2094	<76.43
16	Cadmium**	<1	0.000698	0.255
17	Mercury	<0.2	<0.0001396	<0.051
18	Selenium	3	0.002094	0.7643
19	Barium	<35	<0.02443	<8.917

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(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS Revised**  
**(Storm Water Overflow) (1 table per discharge point)**  
**Discharge Point Code: SW01 Rosscarbery/Owenahincha**

Source of Emission:	Storm Overflow
Location:	Rosscarbery Bay
Grid Ref. (12 digit, 6E, 6N):	130186E 035039N
Name of receiving waters:	Rosscarbery Bay
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <u>Not available</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>Not available</u> 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	Not Available m <sup>3</sup>
Maximum rate/hour	Not Available m <sup>3</sup>	Period of emission (avg)	<u>Not available</u> min/hr ___hr/day ___day/yr

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

**Discharge Point Code:** SW02 Rosscarbery/Owenahincha

Source of Emission:	Storm Overflow
Location:	Celtic Ross, Rosscarbery
Grid Ref. (12 digit, 6E, 6N):	128531E 036287N
Name of receiving waters:	Rosscarbery Stream
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <span style="float: right;">Not available m<sup>3</sup>.sec<sup>-1</sup></span> <sup>1</sup> Dry Weather Flow <span style="float: right;">Not available m<sup>3</sup>.sec<sup>-1</sup> 95%ile flow</span>

**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 Revised**  
**(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code:** SW03 Rosscarbery/Owenahincha

Source of Emission:	Storm Overflow
Location:	Church Road, Rosscarbery
Grid Ref. (12 digit, 6E, 6N):	128819E 036591N
Name of receiving waters:	Rosscarbery Lagoon
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <u>Not available</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>Not available</u> 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)	<u>Not available</u> min/hr ___hr/day__day/yr

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

**Discharge Point Code:** SW04 Rosscarbery/Owenahincha

Source of Emission:	Storm Overflow
Location:	Mill Road, Burgutia, Rosscarbery
Grid Ref. (12 digit, 6E, 6N):	129103E 036897N
Name of receiving waters:	Rosscarbery Lagoon
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <u>Not available</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>Not available</u> 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)	<u>Not available</u> min/hr ___hr/day ___day/yr

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

**Discharge Point Code:** SW05 Rosscarbery/Owenahincha

Source of Emission:	Storm Overflow
Location:	Warren Road, Burgutia, Rosscarbery
Grid Ref. (12 digit, 6E, 6N):	129297E 036182N
Name of receiving waters:	Rosscarbery Bay
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <u>Not available</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>Not available</u> 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)	<u>Not available</u> min/hr ___hr/day ___day/yr

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

**Discharge Point Code:** SW06 Rosscarbery/Owenahincha

Source of Emission:	Storm Overflow
Location:	Owenahincha Bridge
Grid Ref. (12 digit, 6E, 6N):	130782E 035452N
Name of receiving waters:	Owenahincha Stream
River Basin District:	South Western RBD
Designation of receiving waters:	None
Flow rate in receiving waters:	Tidal Area <u>Not available</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>Not available</u> 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)	<u>Not available</u> min/hr ___hr/day ___day/yr



**Table E4 (Updated) D0172-01Roscarberry /Owenahincha Survey and 2008/2009 monitoring data**

Sample Date	22/05/2008	30/07/2008	03/09/2008	24/09/2008	22/01/2009	12/03/2009	23/07/2009	13/08/2009	26/08/2009	01/10/2009	Average for 2008& 2009
location	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	roscarberry& owenahincha outfall	
Sample Code	GS452	GS720	GS838	GS968	GT065	GT333	GT913	GT1007	GT1043	GT1211	
Flow M <sup>3</sup> /Day	500	500	500								500
pH	7.3	7.1	7.3	*	7.2	*	*	*	*	*	7.225
Temperature °C	*	*	*	*	*	*	*	*	*	*	
Cond uS/cm 20°C	3930	580	832		*	*	*	*	*	*	1780.67
SS mg/L	59	37	20	10	14	8	49	29	41	75	34.2
NH <sub>3</sub> mg/L	12.6	5.3	9.0	*	*	*	*	*	*	*	9.0
BOD mg/L	65.4	20.1	14	9.3	2	8	122	126	14	106	48.68
COD mg/L	182	50	37	46	21	23	279	123	58	210	102.9
TN mg/L	137	*	11	*	*	*	*	*	*	*	74
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*	*
Nitrate mg/L		*	*	*	*	*	*	*	*	*	*
TP mg/L	2.83	0.97	1.34	*	*	*	*	*	*	*	1.713
O-PO <sub>4</sub> -P mg/L	1.76	0.07	0.59	*	*	*	*	*	*	*	0.807
SO <sub>4</sub> mg/L	*	45	*	*	*	*	*	*	*	*	45
Phenols µg/L	*	<0.1	*	*	*	*	*	*	*	*	<0.1
Atrazine µg/L	*	<0.01	*	*	*	*	*	*	*	*	<0.01
Dichloromethane	*	<1	*	*	*	*	*	*	*	*	<1
Simazine µg/L	*	<0.01	*	*	*	*	*	*	*	*	<0.01
Toluene µg/L	*	<1	*	*	*	*	*	*	*	*	<1
Tributyltin µg/L	*	<0.02	*	*	*	*	*	*	*	*	<0.02
Xylenes µg/L	*	<1	*	*	*	*	*	*	*	*	<1
Arsenic µg/L	*	2	*	*	*	*	*	*	*	*	2
Chromium µg/L	<20	10.5	*	*	*	*	*	*	*	*	10.5
Copper µg/L	<20	<30	*	*	*	*	*	*	*	*	<20
Cyanide µg/L	*	<5.0	*	*	*	*	*	*	*	*	<5.0
Fluoride µg/L	*	90	*	*	*	*	*	*	*	*	90
Lead µg/L	<20	5.6	*	*	*	*	*	*	*	*	5.6
Nickel µg/L	<20	<5	*	*	*	*	*	*	*	*	<5
Zinc µg/L	<20	<10	*	*	*	*	*	*	*	*	<10
Boron µg/L	268	<200	*	*	*	*	*	*	*	*	268
Cadmium µg/L	<20	<1	*	*	*	*	*	*	*	*	<1
Mercury µg/L	*	<0.2	*	*	*	*	*	*	*	*	<0.2
Selenium µg/L	*	3	*	*	*	*	*	*	*	*	3
Barium µg/L	23	39.6	*	*	*	*	*	*	*	*	31.3

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Revised Attachment E4 - Rosscarbery / Owenahincha Upstream & Downstream

Sample Date	30/07/2008	30/07/2008
location	Ambient location upstream	Ambient location downstream
Sample Code	GS719	GS718
Flow M <sup>3</sup> /Day		
pH	7.4	8.6
Temperature °C		*
Cond uS/cm 20°C	262	35400
SS mg/L	3	17
NH <sub>3</sub> mg/L	0.1	0.5
BOD mg/L	1.15	3.78
COD mg/L	<21	<21
TN mg/L	20.95	*
Nitrite mg/L	0.072	saline interference
Nitrate mg/L	19.2	saline interference
TP mg/L	<0.20	
O-PO <sub>4</sub> -P mg/L	0.05	<0.05
SO <sub>4</sub> mg/L	<30	2009.4
Phenols µg/L	<0.1	<0.1
Atrazine µg/L	<0.01	<0.01
Dichloromethane µg/L	<1	<1
Simazine µg/L	<0.01	<0.01
Toluene µg/L	<1	<1
Tributyltin µg/L	<0.02	<0.02
Xylenes µg/L	<1	
Arsenic µg/L	1	7
Chromium µg/L	1	**1
Copper µg/L	1	1
Cyanide µg/L	<5	<5
Fluoride µg/L	50	620
Lead µg/L	13.5	1**
Nickel µg/L	2	1
Zinc µg/L	1	1
Boron µg/L	59	2209
Cadmium µg/L	2.5	1
Mercury µg/L	<0.2	<0.2
Selenium µg/L	2	22
Barium µg/L	33	27

actual result of 0 ug/l -reported previously as <20ug/l

saline interference

\*\*note - saline interference in previous analysis-spectra examined

Locations
Upstream    Upstream of lagoon @bridge next to church
Downstream    Downstream end of cul de sac leading to beach

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

**Discharge Point Code:** SWO1Ross/Owen  
**MONITORING POINT CODE:** aSWO1u Ross/Owen

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	30/07/08						
pH	7.4	Not available	Not available	Not available	Grab	2	Electrochemical
Temperature	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Electrical Conductivity (@20°C)	262	Not available	Not available	Not available	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	3.0	Not available	Not available	Not available	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	0.10	Not available	Not available	Not available	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	1.15	Not available	Not available	Not available	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	<21	Not available	Not available	Not available	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Total Nitrogen (as N)	20.95	Not available	Not available	Not available	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	0.072	Not available	Not available	Not available	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	19.2	Not available	Not available	Not available	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	<0.20	Not available	Not available	Not available	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	0.05	Not available	Not available	Not available	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	<30	Not available	Not available	Not available	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	<0.1	Not available	Not available	Not available	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.

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

**Discharge Point Code:** SWO1Ross/Owen  
**MONITORING POINT CODE:** aSWO1u Ross/Owen

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	30/07/08						
Atrazine	<0.01	Not available	Not available	Not available	Grab	0.96 µg/L	HPLC
Dichloromethane	<1	Not available	Not available	Not available	Grab	1 µg/L	GC-MS 1
Simazine	<0.01	Not available	Not available	Not available	Grab	0.01 µg/L	HPLC
Toluene	<1	Not available	Not available	Not available	Grab	0.02 µg/L	GC-MS 1
Tributyltin	<0.02	Not available	Not available	Not available	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	<1	Not available	Not available	Not available	Grab	0.96 µg/L	GC-MS 1
Arsenic	1	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-MS
Chromium	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Copper	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Cyanide	<5	Not available	Not available	Not available	Grab	0.01 µg/L	Colorimetric
Fluoride	50	Not available	Not available	Not available	Grab	0.1 mg/L	ISE
Lead	13.5**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Nickel	2**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Zinc	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Boron	59	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Cadmium	2.5**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Mercury	<0.2	Not available	Not available	Not available	Grab	0.02 µg/L	ICP-MS
Selenium	2	Not available	Not available	Not available	Grab	0.74 µg/L	ICP-MS
Barium	33	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES

**\*\*Note Metals reported with actual results which are < LOD for information purposes as results are below LOD**

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

**Discharge Point Code:** SWO1 Ross/Owen  
**MONITORING POINT CODE:** aSWO1d Ross/Owen

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	30/07/08						
pH	8.6	Not available	Not available	Not available	Grab	2	Electrochemical
Temperature	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Electrical Conductivity (@20°C)	35400	Not available	Not available	Not available	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	17	Not available	Not available	Not available	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	0.5	Not available	Not available	Not available	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	3.8	Not available	Not available	Not available	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	<21	Not available	Not available	Not available	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Total Nitrogen (as N)	No result	Not available	Not available	Not available	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	Saline interference	Not available	Not available	Not available	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	Saline interference	Not available	Not available	Not available	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	No result	Not available	Not available	Not available	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	<0.05	Not available	Not available	Not available	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	2009.4	Not available	Not available	Not available	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	<0.1	Not available	Not available	Not available	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.

Note 3 : saline interference in analysis

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

**Discharge Point Code:** SWO1 Ross/Owen

**MONITORING POINT CODE:** aSWO1d Ross/Owen

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	30/07/08						
Atrazine	<0.01	Not available	Not available	Not available	Grab	0.96 µg/L	HPLC
Dichloromethane	<1	Not available	Not available	Not available	Grab	1 µg/L	GC-MS 1
Simazine	<0.01	Not available	Not available	Not available	Grab	0.01 µg/L	HPLC
Toluene	<1	Not available	Not available	Not available	Grab	0.02 µg/L	GC-MS 1
Tributyltin	<0.02	Not available	Not available	Not available	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	<1	Not available	Not available	Not available	Grab	0.96 µg/L	GC-MS 1
Arsenic	7	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-MS
Chromium	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Copper	1**	Not available	Not available	Not available	Grab	5 mg/L	ICP-OES
Cyanide	<5	Not available	Not available	Not available	Grab	0.01 µg/L	Colorimetric
Fluoride	620	Not available	Not available	Not available	Grab	0.1 mg/L	ISE
Lead	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Nickel	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Zinc	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Boron	2209	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Cadmium	1**	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES
Mercury	<0.2	Not available	Not available	Not available	Grab	0.02 µg/L	ICP-MS
Selenium	22	Not available	Not available	Not available	Grab	0.74 µg/L	ICP-MS
Barium	27	Not available	Not available	Not available	Grab	0.02 mg/L	ICP-OES

**\*\*Note Metals reported with actual results which are < LOD for information purposes as results are below LOD**

**Note** saline interference in analysis