

# Comhairle Contae Chorcaí Cork County Council

Halla an Chontae,  
Corcaigh, Éire.  
Fón: (021) 4276891 • Faics: (021) 4276321  
Suíomh Gréasáin: [www.corkcoco.ie](http://www.corkcoco.ie)  
County Hall,  
Cork, Ireland.  
Tel: (021) 4276891 • Fax: (021) 4276321  
Web: [www.corkcoco.ie](http://www.corkcoco.ie)



Administration,  
Environmental Licensing Programme,  
Office of Climate, Licensing & Resource Use,  
Environmental Protection Agency,  
Regional Inspectorate,  
Inniscarra,  
County Cork.



30th September 2010

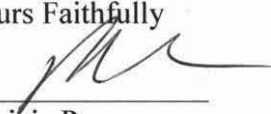
D0328-01

Re: Notice in accordance with Regulation 18(3)(b) of the Waste Water Discharge (Authorisation) Regulations 2007

Dear Mr Huskisson,

With reference to the notice received for the Ladysbridge Waste Water Discharge Licence Application on the 2<sup>nd</sup> of June last and Cork County Council's response of the 24<sup>th</sup> June seeking a revised submission date of the 30<sup>th</sup> of September 2010 please find our response attached.

Yours Faithfully

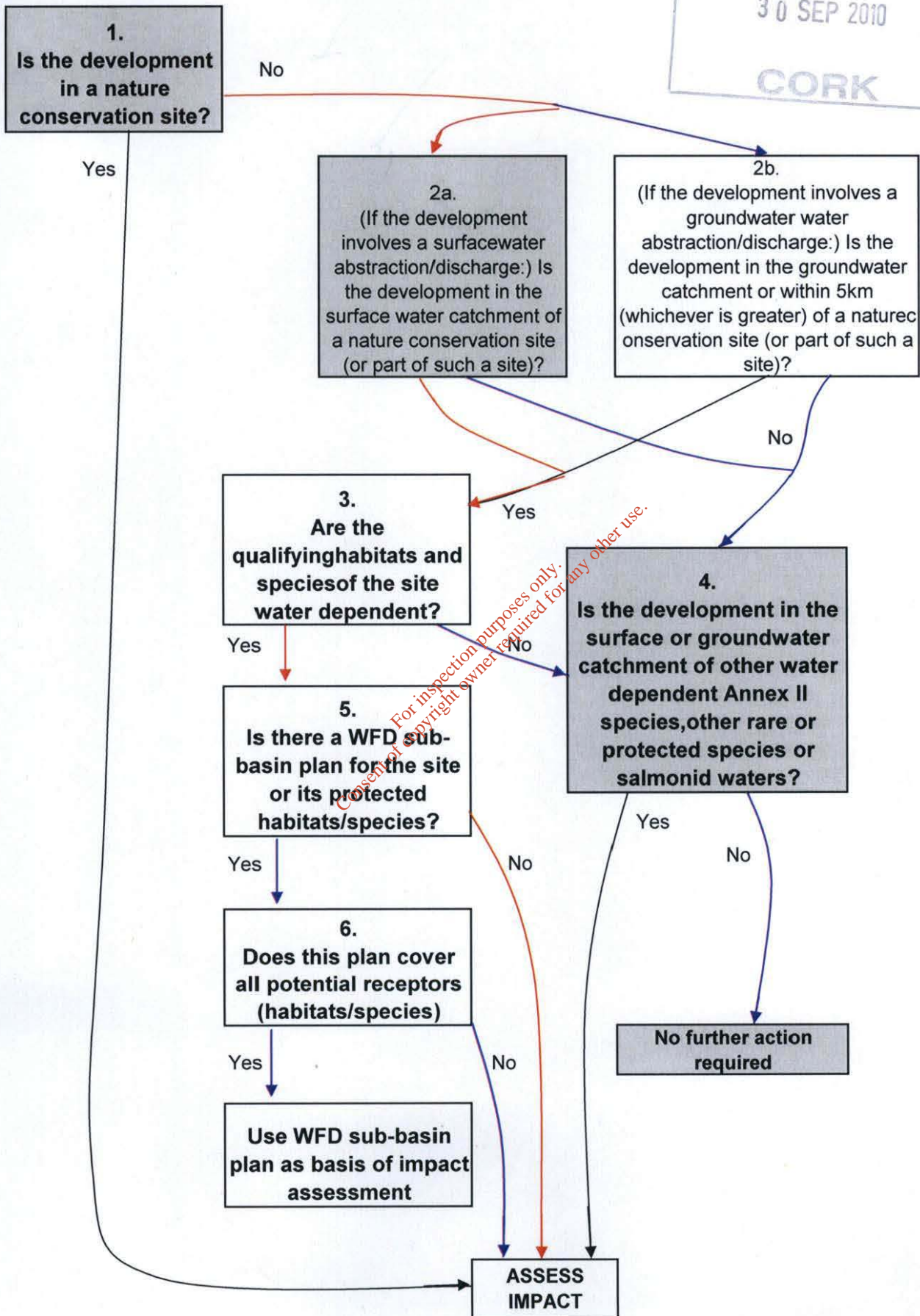
  
Patricia Power  
Director of Services,  
Area Operations South,  
Floor 5,  
County Hall,  
Cork.

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Flow Diagram with Question relating to the Agglomeration of Ladysbridge Shaded Red

The Environmental Protection Agency  
30 SEP 2010  
CORK



Conclusion: An appropriate assessment is required for Ladysbridge

## Wastewater Discharge Licence Application: D0328-01 Ladysbridge

**Circular L8/08 2 September 2008**

### **Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments**

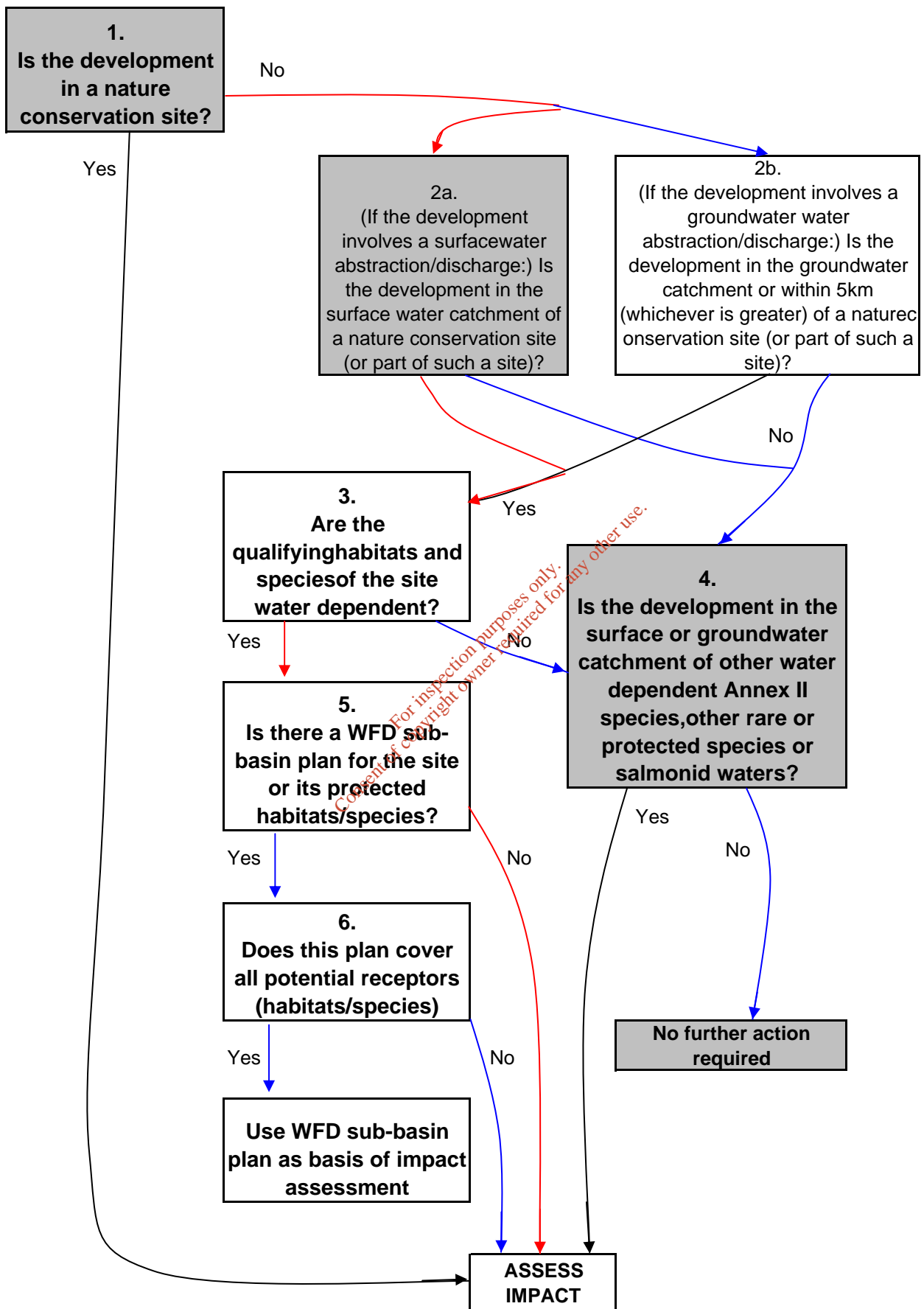
#### **APPENDIX 1**

#### **Water Services Schemes - Natural Heritage Checklist for Local Authorities**

##### **What projects must be screened?**

For new projects and significant changes to any existing operations, if the answer is 'yes' to any of the following, the project (i.e. construction, operation and maintenance) must be screened for its impacts:	
1. Is the development in or on the boundary of a nature conservation site NHA/SAC/SPA?	No
2. Will nationally protected species be directly impacted? Wildlife Acts (1976 and 2000), Flora Protection order (S.I. 94 of 1999)?	No
3. Is the development a surface water discharge or abstraction in the surface water catchment, or immediately downstream of a nature conservation site with water dependant qualifying habitats/ species?	yes
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5 km of a nature conservation site with water-dependant qualifying habitats/species?	No
5. Is the development in the surface water or groundwater catchment of salmonid waters?	No
6. Is the treatment plant in an active or former floodplain or flood zone of a river, lake, etc?	No
7. Is the development a surface discharge or abstraction to or from marine waters and within 3km of a marine nature conservation site?	No
8. Will the project in combination with other projects (existing and proposed) or changes to such projects affect the hydrology or water levels of sites of nature conservation interest or the habitats of protected species?	No

Flow Diagram with Question relating to the Agglomeration of Ladysbridge Shaded Red



Conclusion: An appropriate assessment is required for Ladysbridge



Habitats Directive Assessment (Screening Report) in respect of

Application by Cork County Council to the EPA

for discharge license in respect of the

Ladysbridge Waste Water Treatment Plant.

August, 2010

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# 1 Introduction

1.1 Ladysbridge is located approximately 1.5 kilometres south of Castlemartyr on regional route R632.

Ladysbridge WWTP is designed for a population equivalent (PE) of 1000. The plant was commissioned in 2007.

The waste water is treated by a means of activated sludge in the WWTP. The influent enters the plant via two pumping stations. The influent is screened to remove inorganic matter and then pumped forward to the aeration tank where it receives treatment using an extended aeration process. The waste is then pumped forward to the clarifier where the waste is either drawn off for disposal or recirculated back for further treatment. The final effluent is discharged from the clarifier to the outfall location into the Womanagh River. Based on flow figures recorded between Aug 2009 and July 2010 the average flow received at the plant is 115cu.m/day.

1.2 The plant discharges into the Womanagh River. The Womanagh flows into Youghal Bay at the site of the Clonpriest/Ballymacoda SPA/SAC. This is a designated site under the **EU Birds Directive (79/409/EEC)** as transposed into Irish Law under the European Union (Natural Habitats) Regulations SI 94/1997. As this is the case, and in accordance with requirements under this Directive, the potential impacts of proposed developments that have the potential to impact on Special Protection Areas must be assessed. The procedure to do this is called a **Habitats Directive Assessment**. The purpose of such an assessment is to identify whether there may be potential for elements of the project to have a significant impact on nature conservation sites within its impact zone, and if so, to predict the potential for such impacts to affect the overall integrity of such nature conservation sites. The European Union has provided guidance as to how to make a Habitats Directive Assessment which identifies four main stages in the process as follows:

Stage One: Screening

*The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, wither alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.*

Stage Two: Appropriate assessment

*The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.*

Stage Three: Assessment of alternative solutions

*The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.*

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain.

*An assessment of compensatory measures, where in the light of an assessment of imperative reasons of overriding public interest, it is deemed that the project or plan should proceed.*

- 1.3 This document brings together all of the information necessary to make determination as to whether there are likely to be significant impacts arising from the Ladysbridge Waste Water Treatment Plant on the Clonpriest/Ballymacoda SPA/SAC and represents the first stage of this process (Screening).

*Step 1:*

*Provide a description of the plan and other plans and projects that, in combination, have the potential to have significant effects on Natura 2000 sites within the potential impact zone;*

*Step 2:*

*Identify Natura 2000 sites which may be impacted by the plan, and compile information on their qualifying interests and conservation objectives;*

*Step 3:*

*Determine whether the plan needs to be screened for potential impacts on Natura 2000 sites;*

*Step 4 :*

*Carry out an assessment of likely effects direct, indirect and cumulative - undertaken on the basis of available information as a desk study or field survey or primary research as necessary;*

*Step 5:*

*Assess the significance of any such effects on the Natura 2000 sites within the impact zone.*

- 1.4 The assessment has been prepared in accordance with the following guidance:

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.

Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Environment, Heritage and Local Government, 2009.

## 2 Appropriate Assessment Screening Matrix

2.1 Description of project	
Location	Ladysbridge WWTP, Ladysbridge, East Cork. See location maps section A of original application.
Description of the key components of the project	Ladysbridge WWTP began operating in 2007. The plant is designed to treat waste for an equivalent population of 1000. The average flow entering the plant is 115cu.m/day which is equivalent to a population of approx 500. The treated effluent is discharged into the Womanagh River.
Distance from designated sites in potential impact zone*	Approx. 9.5Km

2.2 Description of the Natura 2000 sites within the potential impact zone <sup>1</sup>	
Name	Ballymacoda/Clonpriest Special Protection Area/Special Area of Conservation
Site Code	000077 (SAC)/004023 (SPA)
Site Description	The site comprises the estuary of the Womanagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and, on the seaward side of the boundary, the site extends to the low tide mark. The inner part of the estuary is well sheltered by a stabilised sandy peninsula (Ring peninsula).
Qualifying Interests of Ballymacoda SPA/SAC	<b>SAC</b> The macro invertebrate fauna of the intertidal flats is well developed, with the following species occurring: <i>Corophium volutator</i> , <i>Hediste diversicolor</i> , <i>Arenicola marina</i> , <i>Macoma balthica</i> , <i>Scrobicularia plana</i> , <i>Cerastoderma edule</i> and <i>Lanice conchilega</i> . In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly <i>Enteromorpha</i> spp), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass ( <i>Spartina anglica</i> ) has spread within the estuary since the 1970's The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The salt marshes are mainly classified as Atlantic salt meadows, with such species as Sea Purslane ( <i>Halimione</i>

<sup>1</sup> Natura 2000 sites within the potential impact zone of the proposed development have been identified in accordance with guidance provided in the NPWS circular L8/08.



	<p><i>portulacoides</i>), Sea Lavender (<i>Limonium humile</i>) and Sea Milkworth (<i>Glaux maritime</i>) Glasswort (<i>Salicornia</i> spp) and Sea Blite (<i>Suaeda maritima</i>) can also be found on the lower levels of the marshes</p> <p><b>SPA</b> The main interests of the site are waterfowl with up to 20,000 regularly present during winter. Golden Plover, Bar-tailed Godwit, Teal, Ringed Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Curlew, Knot, Redshank, Black-tailed Godwit and Turnstone</p>
Other Notable Features of Ballymacoda SPA/SAC	<p>Ballymacoda is one of the most important bird sites in the country and supports a higher number of waders than any other Cork estuary of its size.</p> <p>The salt marshes at the site are of particular note as they are of the scarce "lagoon" type. They are also of good quality and parts of them are in active growth.</p> <p>See appendix 4 for bird count data for Ballymacoda</p>
Conservation Objectives	<p>To avoid deterioration of the habitats of the qualifying species and species of special conservation interest, or significant disturbance to these species, thus ensuring that the integrity of the site is maintained.</p> <p>To ensure for the qualifying species and species of special conservation interest that the following are maintained in the long-term.</p> <ul style="list-style-type: none"> <li>o the population of the species as a viable component of the site;</li> <li>o the distribution and extent of habitats supporting the species;</li> <li>o the structure, function and supporting processes of habitats supporting the species;</li> </ul>

### 2.3 Assessment Criteria

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	<p><b>Discharge from Ladysbridge WWTP:</b> <i>Treated effluent from Ladysbridge Waste Water Treatment Plant is discharged to the Womanagh River. The Womanagh River flows into Youghal Bay at the site of the Ballymacoda SPA/SAC. The estuary of the Womanagh forms part of the designated site.</i></p> <p>The WWTP is in operation since 2007. It is being run for Cork County Council by a private operator. The plant is treating waste at approximately half its design capacity and is functioning well. The treated effluent results consistently meet the standards set by the Urban Wastewater Treatment regulations.</p> <p><b>Other Discharges in the vicinity of the SPA/SAC:</b></p>
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	<p>There are 5 municipal WWTP/Septic tank in the Womanagh river catchment. There is also an IPPC licenced facility at Mogeely which is also in the catchment.</p> <p>Ballymacoda Septic Tank which serves the village of Ballymacoda( approx pop 200) discharges to a tributary of the Womanagh which joins the main river approx 0.5 km upstream of the estuary.</p> <p>Killeagh WWTP (PE 2400) discharges into the Dissour river - a tributary of the Womanagh .The confluence of the Dissour/Womanagh is approximately 6.5 km downstream of the Ladysbridge discharge. Killeagh discharge is approx. 5.5km upstream of the SPA.</p> <p>Mogeely and Castlemartyr WWTP's are further upstream on the River Kiltha - a tributary of the Womanagh -which joins the main river channel immediately upstream of Ladysbridge Mogeely is approximately 13km u/s of site and Castlemartyr is approx.11km u/s of site.</p> <p>There is also a licenced IPPC facility at Mogeely - Dairygold Co Operative. It also discharges into the Kiltha approx.13km u/s of the SPA. Discharge from this facility has been cited in the past as a contributory factor to a localised dip in water quality downstream of the site.</p>
<p>Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site taking into account the following:</p> <ul style="list-style-type: none"> <li>○ Size and scale</li> <li>○ Land-take</li> <li>○ Distance from the Natura 2000 site or key features of the site:</li> <li>○ Resource requirements (water abstraction etc.)</li> <li>○ Emissions (disposal to land, water or air)</li> <li>○ Excavation Requirements</li> <li>○ Transportation Requirements</li> <li>○ Duration of construction, operation, decommissioning</li> <li>○ Other.</li> </ul>	<p>Untreated discharges could give rise to elevated nutrients entering the Womanagh estuary. However if this was to occur at Ladysbridge the available dilutions in the Womanagh upstream of the estuary would greatly reduce the overall impact on the estuary itself. Though increased nutrient levels may impact on the ecology of an area by changing the composition of floral communities and reducing the ability of less robust plants to survive there is no evidence to date that this has occurred at this site. Increased nutrient levels may also result in increasing the invertebrate populations in the estuary, thereby increasing bird population levels.</p> <p>However the potential for the treatment plant discharge to result in elevated nutrients within the SPA/SAC is reduced by the following:</p> <ol style="list-style-type: none"> <li>1. The standard of treated effluent is high.</li> <li>2. The treated effluent enters the SPA after receiving dilution of greater than 1:100 in the Womanagh river.</li> </ol> <p><b>1 The standard of treated effluent is high.</b></p> <p>Treated effluent from Ladysbridge WWTP is monitored by the operator on a weekly basis and by CCC six times per year. Effluent testing demonstrates that treated effluent consistently meets standards set out in the Urban Wastewater Treatment Regulations and meets consistently the even higher standards laid down by Cork Co Council as</p>

	<p>part of the operate contract.</p> <p><b>2 Available dilution capacity</b>  The treated effluent is discharged into the Womanagh River where under max discharge/ low river flow conditions the available dilution is greater than 1:100. Distance from source to SPA i.e 9km would also reduce the effects.</p>
<p>Describe any likely changes to the site arising as a result of:</p> <ul style="list-style-type: none"> <li>○ Reduction in habitat area</li> <li>○ Disturbance to key species</li> <li>○ Habitat or species fragmentation</li> <li>○ Reduction in species density</li> <li>○ Changes in key indicators of conservation value (water quality etc)</li> <li>○ Climate Change</li> </ul>	<p><b>Reduction in habitat area:</b>  Treated effluent complies with standards laid down in the Urban Waste Water Treatment Regulations and is discharging into the SPA via a large well-exchanged body of water where dilution and dispersion potential is high. Cork County Council have no documented evidence that the operation of this facility is having any negative effect on the designated site.</p> <p><b>Disturbance to key species:</b>  There is no evidence that the operation of the WWTP causes any disturbance to species within the SPA. Birdwatch Ireland have been asked to supply data to confirm or disprove this and this data will be forwarded once received.</p> <p><b>Habitat or species fragmentation:</b>  There is no evidence that habitat fragmentation has been caused as a result of the operation of this facility.</p> <p><b>Reduction in species density:</b>  Treated effluent complies with standards laid down in the Urban Waste Water Treatment Regulations and is discharging to a large well-exchanged body of water where dilution and dispersion potential is high. No significant impacts are evident or predicted on species for which the site is designated.</p> <p><b>Changes in key indicators of conservation value eg water quality:</b>  Cork County Council carried out limited monitoring of the Womanagh upstream and downstream of the Ladysbridge discharge location prior to submitting the licence application. The results showed no obvious impacts on water quality. TN levels are higher downstream of the discharge but were recorded at 15mg/l which is allowable under the UWW treatment Regs for sensitive waters. The Womanagh is not classed as sensitive.</p> <p>There is a monitoring site downstream of the Ladysbridge site south of Ballynohock lake. However the last recorded readings taken there were in 2005 and a Q rating of 3 was applied which is moderately polluted. However there are no water quality readings available post 2007 when the WWTP</p>

	was commissioned.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: <ul style="list-style-type: none"> <li>o Interference with the key relationships that define the structure of the site</li> <li>o Interference with key relationships that define the function of the site</li> </ul>	<p><b>Interference with the key relationships that define the structure of the site:</b>  <i>The structure of the SPA/SAC is not impacted by the operation of this facility.</i></p> <p><b>Interference with key relationships that define the function of the site:</b>  <i>The function of the SPA/SAC is not impacted by the operation of this facility.</i></p>
Describe from the above those elements of the project of plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	No significant impacts are predicted.

### 3. Finding of No Significant Effects Report Matrix

<b>Name of project or plan</b>	<b>Ladysbridge WWTP discharge</b>
Name and location of Natura 2000 site	Ballymacoda Special protection Area
Description of the project or plan	Ladysbridge WWTP discharges into the Womanagh river 9 km upstream of where the river flows into the Ballymacoda SPA. The WWTP is designed to treat waste of 1000 population equivalent and is currently working at approx half its design capacity. The plant is in operation since 2007.
Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No
<b>The assessment of significance of effects</b>	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 Site.	There are six WWTP's in total that discharge into the Womanagh river catchment. If untreated waste from Ladysbridge alone or in combination with others was discharged in to the Womanagh at a time when flows were at their lowest this would be seen to be the worst possible case scenario of how the discharge could affect the Natura site. Elevated nutrients from the waste could have a negative affect on the many protected species that are



	found on the site. It is unlikely that elevated nutrients would have a negative effect on the bird population.
Explain why these effects are not considered significant.	The treated effluent discharged from Ladysbridge meets a very strict standard. Since the plant began operating in 2007 it has consistently met the limits set down by the operate contract which are actually stricter than those enforced by the Urban Wastewater treatment regulations. The latest Water Quality rating for the Womagh River taken downstream of Ladysbridge is Q3 - which is a moderately polluted rating. However this rating is in existence since 2005 which is before this treatment plant was constructed.
List of agencies consulted: provide contact name and telephone or email address	National Parks and Wildlife Service - <a href="mailto:Natureconservation@environ.ie">Natureconservation@environ.ie</a> , <a href="mailto:cyril.saich@environ.ie">cyril.saich@environ.ie</a> <a href="mailto:devapp@environ.ie">devapp@environ.ie</a>  Birdwatch Ireland - Data request.
Response to consultation	Cyril Saich acknowledged request and recommended rerouting through <a href="mailto:devapp@environ.ie">devapp@environ.ie</a>  Birdwatch Ireland are to send on Bird count data.

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Data collected to carry out the assessment			
Who carried out the assessment	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed
Madeleine Healy, Cork County Council	IWebs Bird Data supplied by BirdWatch Ireland; Water Quality Monitoring Data CCC;	Desktop review of cited data.	This report.

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## Appendix 1: Ecological Data

### 1 SITE SYNOPSIS

#### SITE NAME: BALLYMACODA BAY SPA

#### SITE CODE: 004023

This coastal site stretches north-east from Ballymacoda to within several kilometres north-east of Youghal, Co. Cork. It comprises the estuary of the Womagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and on the seaward side the boundary extends to the low tide mark. The inner part of the estuary is well sheltered by the Ring peninsula, a stabilised sand spit with sand dunes at its northern end and salt marshes on the landward side. Sediment types vary from muds to muddy sands in the inner part to fine rippled sands in the outer exposed part. The macro-invertebrate fauna of the intertidal flats is well-developed, with the following species occurring: Ragworm (*Hediste diversicolor*), the crustacean *Corophium volutator*, Lugworm (*Arenicola marina*), Baltic Tellin (*Macoma balthica*), Peppery Furrow-shell (*Scrobiculariaplana*), Common Cockle (*Cerastoderma edule*) and the tubeworm *Lanice conchilega*. In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly *Enteromorpha* spp.), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass (*Spartina anglica*) has spread within the estuary since the late 1970s. The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The site is of high ornithological importance, supporting an excellent diversity of wintering waterfowl. The habitats present provide both important feeding and roosting areas for the birds. The site qualifies for international importance on the basis that it regularly supports in excess of 20,000 birds (mean of 23,388 in 5 winters 1994/95 to 1998/99). It also qualifies for international importance for its population of Black-tailed Godwit (899). In addition, it supports nationally important populations of a further 15 species (all figures are average peaks for 5 winters 1995/96 to 1999/2000): Shelduck (150), Wigeon (1,232), Teal (1,170), Ringed Plover (236), Golden Plover (14,480), Grey Plover (688), Lapwing (5,893), Knot (378), Sanderling (147), Dunlin (4,410), Bar-tailed Godwit (792), Curlew (1,621), Redshank (511), Greenshank (24) and Turnstone (191). The presence of large flocks of Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. A number of other species occur in populations of regional or local importance, including Brent Goose (100), Shoveler (29) and Oystercatcher (682). The site is also notable for supporting large concentrations of gulls in autumn and winter. Principal species are Black-headed Gull (2,320), Common Gull (1,220), Lesser Black-backed Gull (6,285), Herring Gull (128) and Great Black-backed Gull (455). A total of 107 wetland species were recorded from this site between 1971 and 1988.

Much of the land adjacent to the estuary has been reclaimed and is subject to intensive agriculture, with cattle grazing and silage being the most common land uses.

Ballymacoda Bay SPA is one of the most important sites in the country for wintering waterfowl. It qualifies for international importance on the basis of regularly exceeding 20,000 wintering birds but also for its Black-tailed Godwit population. In addition, it supports nationally important populations of a further 15 species and also is an important site for gulls. Two of the species which occur, Golden Plover and Bar-tailed Godwit, are listed on Annex I of the E.U. Birds Directive. The site has been well-studied, with detailed counts extending back to 1971.

6.10.2004

## SITE SYNOPSIS

**SITE NAME: BALLYMACODA (CLONPRIEST AND PILLMORE)**

**SITE CODE: 000077**

This coastal site stretches north-east from Ballymacoda to within about 6 km of Youghal, Co. Cork. Though moderate in size, it has a good diversity of coastal habitats, including several listed on Annex I of the E.U. Habitats Directive. The site comprises the estuary of the Womanagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and on the seaward side the boundary extends to the low tide mark. The inner part of the estuary is well sheltered by a stabilised sandy peninsula (Ring peninsula). Sediment types vary from muds to muddy sands in the inner part to fine rippled sands in the outer exposed part. The macro-invertebrate fauna of the intertidal flats is well-developed, with the following species occurring: *Corophium volutator*, *Hediste diversicolor*, *Arenicola marina*, *Macoma balthica*, *Scrobicularia plana*, *Cerastoderma edule* and *Lanice conchilega*. In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly *Enteromorpha* spp.), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass (*Spartina anglica*) has spread within the estuary since the late 1970s. The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The salt marshes are mainly classified as Atlantic salt meadows, with such species as Sea Purslane (*Halimione portulacoides*), Sea Lavender (*Limonium humile*) and Sea Milkwort (*Glaux maritima*). On the lower levels of the marshes, and extending out onto the open sand and mud flats, occur annual salt marsh species such as Glasswort (*Salicornia* spp.) and Sea Blite (*Suaeda maritima*). The salt marshes at the site are of particular note as they are of the scarce 'lagoon' type. They are also of good quality and parts of them are in active growth. Part of the site is also a Special Protection Area for birds; the main interest of the area lies in its waterfowl, with flocks of up to 20,000 regularly present during winter (e.g. 1995-96 peak = 19,725). A total of 107 wetland species have been recorded from this site. Maximum figures for the four winters 1994/95-97/98 show that Golden Plover, a species listed under Annex I of the Birds Directive, almost reached internationally important numbers (9,100) and that the Bar-tailed Godwit, another Annex I species, was present in nationally important numbers (494). Eleven other species also occurred in nationally important numbers: Teal (688), Ringed Plover (163), Grey Plover (504), Lapwing (3800), Sanderling (108), Dunlin (3,373), Curlew (1,378), Knot (280), Redshank (300), Black-tailed Godwit (422) and Turnstone (144). Several additional species occur in regionally or locally important numbers.

Much of the land adjacent to the estuary has been reclaimed and is subject to intensive agriculture, with cattle grazing and silage being the most common land uses.

However, many of these fields remain marshy and are important feeding and roosting areas for wildfowl, Golden Plover and Lapwing. The most serious threat to the site is water pollution, primarily from slurry spreading.

This site's conservation value derives largely from the presence of a number of important coastal habitats listed in Annex I of the E.U. Habitats Directive. But, there is also considerable ornithological interest; Ballymacoda is one of the most important bird sites in the country and supports a higher number of waders than any other Cork



estuary of its size. It also contains important numbers of the Golden Plover and  
Bartailed Godwit, two Annex I Bird Directive species, and nationally important  
numbers of eleven further bird species.

8.10.2001

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## Appendix 2

Map showing Ballymacoda SPA/SAC and discharge location. - attached

## Appendix 3

South Western River Basin District - Report on Dissour and Womanagh Rivers -attached

## Appendix 4

River Basin District - Womanagh River WMU (Water management Unit) - attached

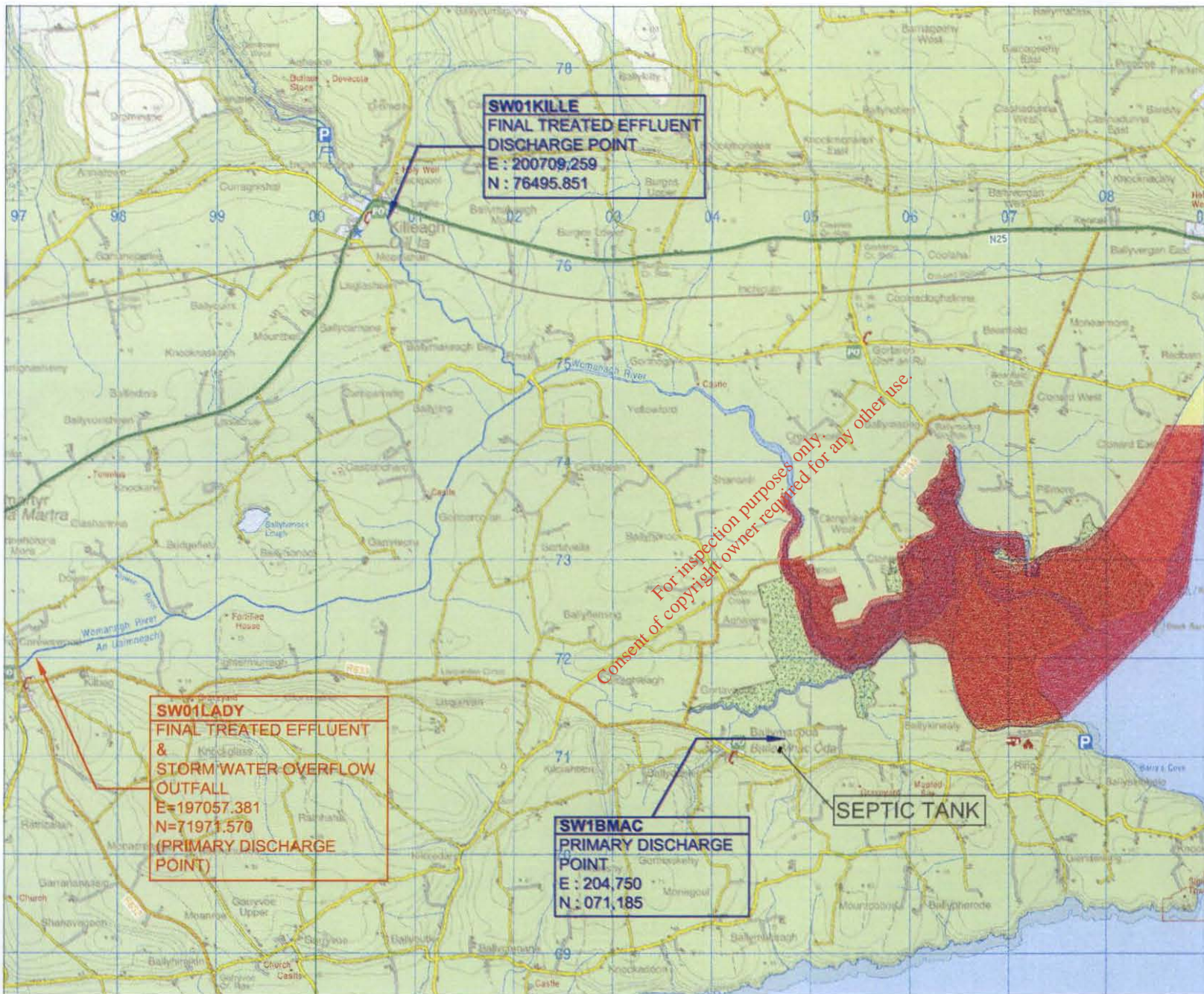
See also

An assessment of Womanagh River Catchment by Dixon Brosnan Environmental Consultants (2005) submitted with original application

Appendix 5: Treated Effluent Quality Data 2009 and 2010

Appendix 6 - Bird count data for Ballymacoda SPA

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**SW01KILLE**  
**FINAL TREATED EFFLUENT**  
**DISCHARGE POINT**  
**E : 200709,259**  
**N : 76495.851**

**SW01LADY**  
**FINAL TREATED EFFLUENT**  
**&**  
**STORM WATER OVERFLOW**  
**OUTFALL**  
**E=197057.381**  
**N=71971.570**  
**(PRIMARY DISCHARGE**  
**POINT)**

**SW1BMAC**  
**PRIMARY DISCHARGE**  
**POINT**  
**E : 204,750**  
**N : 071,185**

**SEPTIC TANK**

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**NOTES:**

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Special Areas of Conservation (S.A.C.)



Special Protected Areas (S.P.A.)



Rev	Date	By	Description

**CORK COUNTY COUNCIL**  
**SOUTHERN DIVISION**

Paul O'Connell, B.Eng. C.Eng. I.Eng. I.E.E. MBE  
 County Engineer  
 Civil, E.I., C.I.B.

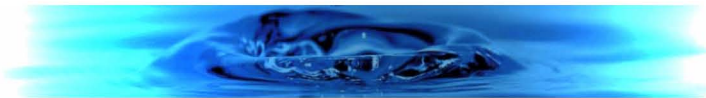
Patricia Power  
 Director of Services  
 Area Operations South

Project: LADYSBRIDGE WWTP  
 WASTE WATER  
 DISCHARGE LICENCE APPLICATION  
 APPROPRIATE ASSESSMENT

Title: BALLYMACODA SPA/SAC  
 LOCATION OF SURROUNDING  
 DISCHARGE POINTS

Checked	ER/MS	Checked	MH	Scale:	NTS @ A3	Drawing No:	Map002
Drawn:	MM	Approved:	MH	Date:	Mar '10	Sheet:	1 of 1



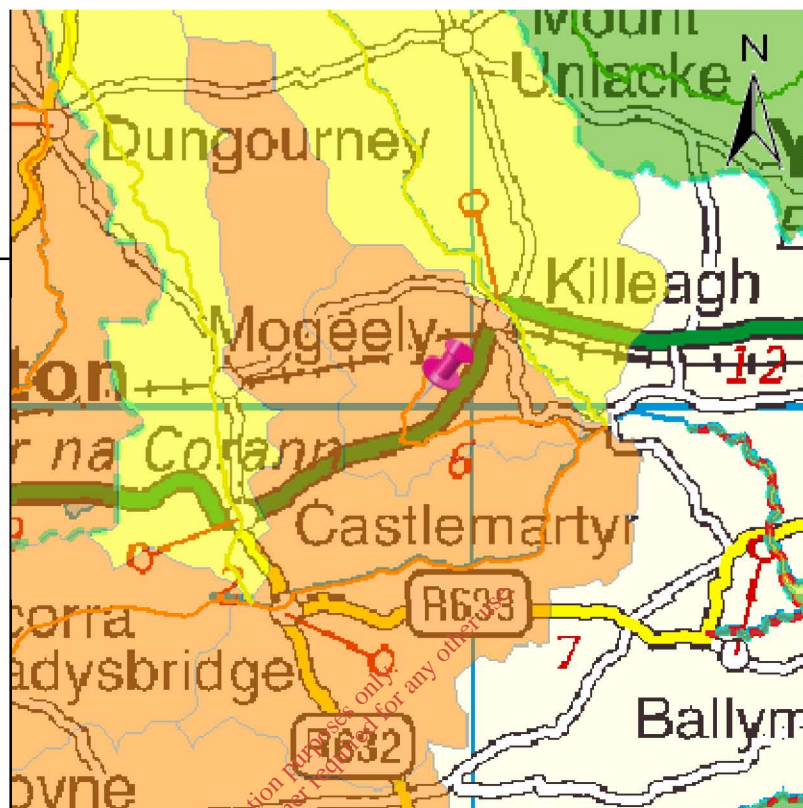


### Full Report for Waterbody Womanagh, Trib of Womanagh



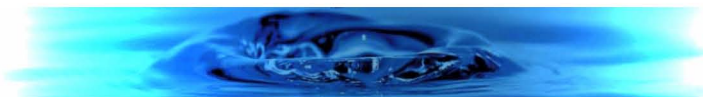
**Legend**

-  High
-  Good
-  Moderate
-  Poor
-  Bad
-  Yet to be determined



Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010



**Summary Information:**

**WaterBody Category:** Subbasin Waterbody

**WaterBody** Womanagh,

**WaterBody** IE\_SW\_19\_1793

**Overall** Poor

**Overall** Restore

**Overall Risk:** At Risk

**Applicable** Unsewered;

**Supplementary** Report data



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Date Report Created 26/08/2010



**Status Report**

**WaterBody Category:** Subbasin  
**WaterBody Name:** Womanagh,  
**WaterBody Code:** IE\_SW\_19\_1793  
**Overall Status Result:** Poor



	<b>Status Element Description</b>	<b>Result</b>
EX	Status from Monitored or Extrapolated Waterbody	
	<b>Biological Elements</b>	
Q	Macroinvertebrates (Q-Value)	Poor
F	Fish	n/a
DI	Phytobenthos (Diatoms)	n/a
FPM	Status value as determined by Margartifera	n/a
	<b>Supporting Elements</b>	
MOR	Hydromorphology	n/a
SP	Specific Pollutants	n/a
PC	General Physico-Chemical	Pass
	<b>Chemical Status</b>	
PAS	Chemical Status	n/a
	<b>Overall Ecological Status</b>	
O	Overall Ecological Status	Poor

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## Risk Report

**WaterBody Category:** Subbasin  
**WaterBody Name:** Womanagh,  
**WaterBody Code:** IE\_SW\_19\_1793  
**Overall Risk Result:** At Risk



<b>Risk Test Description</b>		<b>Risk</b>
<b>Point Risk Sources</b>		
RP1	WWTPs (2008)	Not At Risk
RP2	CSOs	Not At Risk
RP3	IPPCs (2008)	Not At Risk
RP4	Section 4s (2008)	Not At Risk
RPO	Overall Risk from Point Sources - Worst Case (2008)	Not At Risk
<b>Diffuse Risk Sources</b>		
RD1	EPA diffuse model (2008)	At Risk
RD2a	Road Wash - Soluble Copper	Not At Risk
RD2b	Road Wash - Total Zinc	Not At Risk
RD2c	Road Wash - Total Hydrocarbons	Not At Risk
RD3	Railways	Not At Risk
RD4a	Forestry - Acidification (2008)	Not At Risk
RD4b	Forestry - Suspended Solids (2008)	Not At Risk
RD4c	Forestry - Eutrophication (2008)	Probably Not At Risk
RD5a	Unsewered Areas - Pathogens (2008)	Probably Not At Risk
RD5b	Unsewered Phosphorus (2008)	Not At Risk
RD5	Overall Unsewered (2008)	Not At Risk
RD6a	Arable	Probably Not At Risk
RD6b	Sheep Dip	Not At Risk
RD6c	Forestry - Dangerous Substances	Not At Risk
RDO	Diffuse Overall -Worst Case (2008)	At Risk
<b>Morphological Risk Sources</b>		
RM1	Channelisation (2008)	Not At Risk
RM2	Embankments (2008)	Not At Risk
RM3	Impoundments	Not At Risk
RM4	Water Regulation	Not At Risk
RMO	Morphology Overall - Worst Case (2008)	Not At Risk

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**Q/RDI or Point/Diffuse**

QPD Q class/EPA Diffuse Model or worst case of Point and Diffuse (2008) At Risk

**Hydrology**

RHY1 Water balance - Abstraction Not At Risk

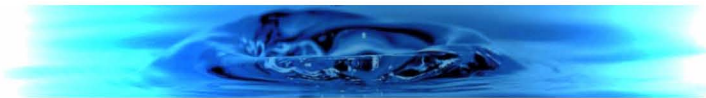
**Overall Risk**

RA Rivers Overall - Worst Case (2008) At Risk

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Date Report Created 26/08/2010



**Objectives Report**

**WaterBody Category:** Subbasin  
 Waterbody

**WaterBody Name:** Womanagh,

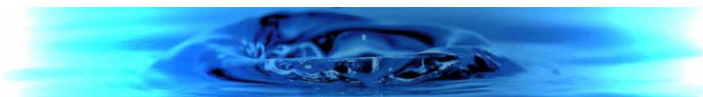
**WaterBody Code:** IE\_SW\_19\_1793

**Overall Objective:** Restore



<b>Objectives Description</b>		<b>Result</b>
<b>Objectives</b>		
OB1	Objective 1 - Protected Areas	Not Applicable
OB2	Objective 2 - Protect High and Good Status	Not Applicable
OB3	Objective 3 - Restore Less Than Good Status	Restore
OB4	Objective 4 - Reduce Chemical Pollution	Not Applicable
OBO	Overall Objective	Restore
<b>Deadline</b>		
YR	Default Year by which the objective must be met	2015
EX	Revised Objective Deadline	2015
OBO	Overall Objective and Deadline	Restore - 2015

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**Basic Measures Report**

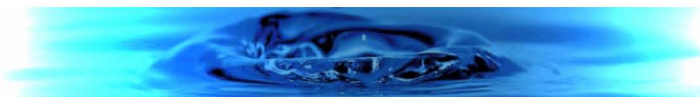
**WaterBody Category:** Subbasin Waterbody  
**WaterBody Name:** Womanagh, Trib of Womanagh  
**WaterBody Code:** IE\_SW\_19\_1793



	<b>Basic Measures Description</b>	<b>Applicable</b>
<b>Key Directives</b>		
BA	Bathing Waters Directive	No
BI	Birds Directive	No
HA	Habitats Directive	No
DW	Drinking Waters Directive	Yes
SEV	Major Accidents and Emergencies (Seveso) Directive	Yes
EIA	Environmental Impact Assessment Directive	Yes
SE	Sewage Sludge Directive	Yes
UW	Urban Waste Water Treatment Directive	No
PL	Plant Protection Products Directive	Yes
NI	Nitrates Directive	Yes
IP	Integrated Pollution Prevention Control Directive	Yes
<b>Other Stipulated Measures</b>		
CR	Cost recovery for water use	Yes
SU	Promotion of efficient and sustainable water use	Yes
DWS	Protection of drinking water sources	Yes
AB	Control of abstraction and impoundments	Yes
PT	Control of point source discharges	Yes
DI	Control of diffuse source discharges	Yes
GWD	Authorisation of discharges to groundwater	No
PS	Control of priority substances	Yes
MOR	Control of physical modifications to surface waters	Yes
OA	Controls on other activities impacting on water status	Yes
AP	Prevention or reduction of the impact of accidental pollution incidents	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010



## Urban and Industrial Discharges Supplementary Measures Report

**WaterBody Category:** Subbasin Waterbody  
**WaterBody Name:** Womanagh, Trib of Womanagh  
**WaterBody Code:** IE\_SW\_19\_1793



	<b>Point discharges to waters from municipal and industrial sources</b>	<b>Result</b>
PINDDIS	Is there one or more industrial discharge (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) contained within the water body?	No
PINDDISR	Are there industrial discharges (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) that cause the receiving water to be 'At Risk' within the water body?	No
PB1	Basic Measure 1 - Measures for improved management.	No
PB2	Basic Measure 2 - Optimise the performance of the waste water treatment plant by the implementation of a performance management system.	No
PB3	Basic Measure 3 - Revise existing Section 4 license conditions and reduce allowable pollution load.	No
PB4	Basic Measure 4 - Review existing IPPC license conditions and reduce allowable pollution load.	No
PB5	Basic Measure 5 - Investigate contributions to the collection system from unlicensed discharges.	No
PB6	Basic Measure 6 - Investigate contributions to the collection system of specific substances known to impact ecological status.	No
PB7	Basic Measure 7 - Upgrade WWTP to increase capacity.	No
PB8	Basic Measure 8 - Upgrade WWTP to provide nutrient removal treatment.	No
PS1	Supplementary Measure 1 - Measures intended to reduce loading to the treatment plant.	No
PS2	Supplementary Measure 2 - Impose development controls where there is, or is likely to be in the future, insufficient capacity at treatment plants.	No
PS3	Supplementary Measure 3 - Initiate investigations into characteristics of treated wastewater for parameters not presently required to be monitored under the urban wastewater treatment directive.	No
PS4	Supplementary Measure 4 - Initiate research to verify risk assessment results and determine the impact of the discharge.	No
PS5	Supplementary Measure 5 - Use decision making tools in point source discharge management.	No
PS6	Supplementary Measure 6 - Install secondary treatment at plants where this level of treatment is not required under the urban wastewater treatment directive.	No
PS7	Supplementary Measure 7 - Apply a higher standard of treatment (stricter emission controls) where necessary.	No
PS8	Supplementary Measure 8 - Upgrade the plant to remove specific substances known to impact on water quality status.	No

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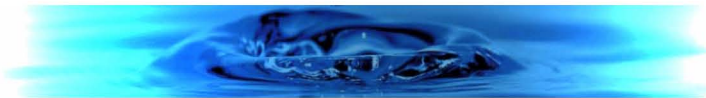


PS9	Supplementary Measure 9 - Install ultra-violet or similar type treatment.	No
PS10	Supplementary Measure 10 - Relocate the point of discharge.	No

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Date Report Created 26/08/2010



**Physical Modifications Supplementary Measures Report**

**WaterBody Category:** Subbasin  
**WaterBody Name:** Womanagh,  
**WaterBody Code:** IE\_SW\_19\_1793



	<b>Physical Modifications Supplementary Measures</b>	<b>Applicable</b>
	<b>Reduce</b>	
SM1	Codes of Practice	Yes
SM2	Support for voluntary initiatives	Yes
	<b>Remediate</b>	
SM3	Channelisation impact remediation schemes	No
SM4	Channelisation investigation	No
SM5	Overgrazing remediation	No
SM6	Impassable barriers, impact confirmed, investigation into feasibility of remediation required	No
SM7	Impassable barriers investigation	Yes

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**Unsewered Properties Supplementary Measures Report**

**WaterBody** Subbasin Waterbody  
**WaterBody Name:** Womanagh, Trib of Womanagh  
**WaterBody** IE\_SW\_19\_1793

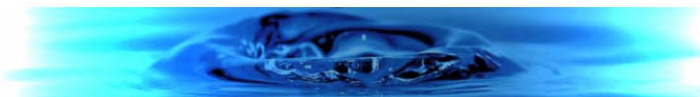


	<b>Supplementary Measures for</b>	<b>Applicable</b>
	<b>Unsewered Properties</b>	
SP1	Amend building regulations	Yes
SP2	Establish certified expert panels for site investigation and certification of installed systems	Yes
SP3	Assess applications for new unsewered systems by applying risk mapping/decision support systems and codes of practice	Yes
SP4	Carry out an inspection programme in prioritised locations for existing systems and record results in an action tracking system	No
SP5	Enforce requirements for percolation	No
SP6	Enforce requirements for de-sludging	Yes
SP7	Consider connection to municipal systems	No

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Date Report Created 26/08/2010



## Forestry Measures Report

**WaterBody Category:** Subbasin Waterbody  
**WaterBody Name:** Womanagh, Trib of Womanagh  
**WaterBody Code:** IE\_SW\_19\_1793



	Forestry Measures for	Applicable
	Forestry	
SF1	Management Instruments - Ensure regulations and guidance are cross referenced and revised to incorporate proposed measures	No
SF2	Acidification - Avoid or limit afforestation on 1st and 2nd order stream catchments in acid sensitive areas	No
SF3	Acidification - Revise the Acidification Protocol to ensure actual minimum alkalinities are detected and revise boundary conditions for afforestation in acid sensitive areas	No
SF10	Pesticide Use - Pre-dip trees in nurseries prior to planting out	No
SF11	Pesticide Use - Maintain registers of pesticide use	No
SF12	Acidification - Restructure existing forests to include open space and structural diversity through age classes and species mix, including broadleaves	No
SF13	Acidification - Mitigate acid impacts symptomatically using basic material	No
SF14	Acidification - Manage catchment drainage to increase residence times and soil wetting	No
SF15	Acidification - Implement measures to increase stream production.	No
SF16	Eutrophication - Establish riparian zone management prior to clearfelling	No
SF17	Eutrophication and Sedimentation - Enhance sediment control	No
SF18	Eutrophication - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF19	Sedimentation - Establish riparian zone management prior to clearfelling	No
SF20	Sedimentation - Enhance sediment control	No
SF21	Sedimentation - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF22	Hydromorphology - Enhance drainage network management, minimise drainage in peat soils	No
SF23	Pesticide Use - Develop biological control methods	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010



SF4	Eutrophication and Sedimentation - Avoid or limit forest cover on peat sites	No
SF5	Eutrophication and Sedimentation - Change the tree species mix on replanting	No
SF6	Eutrophication and Sedimentation - Limiting felling coup size	No
SF7	Eutrophication and Sedimentation - Establish new forest structures on older plantation sites	No
SF8	Hydromorphology - Audit existing drainage networks in forest catchments	No
SF9	Pesticide Use - Reduce pesticide usage	No

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# Womanagh WMU

N



## Legend

- Towns and Villages
- EPA Licensed Facility (IPPC)
- Local Authority Licensed Discharge
- Wastewater Treatment Plants
- Water Treatment Plants
- County Boundary
- River Water Body Boundary

## River Status

- High
- Good
- Moderate
- Poor
- Bad

## Lake Status

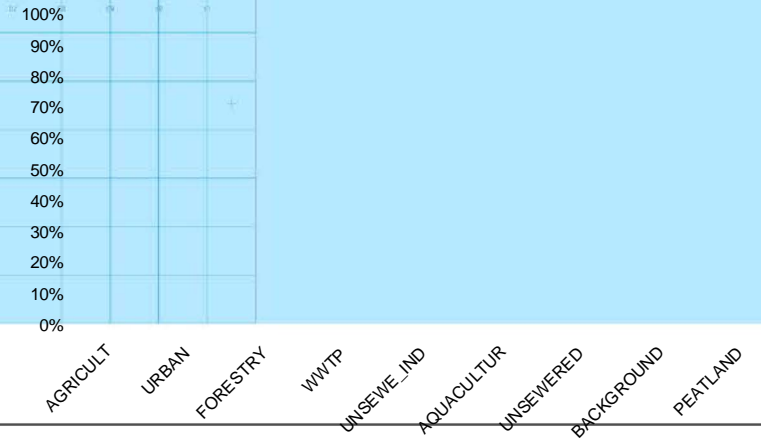
- High
- Good
- Moderate
- Poor
- Bad

Cork



<b>Name</b>	Womanagh Water management Unit
<b>Area</b>	323km <sup>2</sup>
<b>River Basin District</b>	SWRBD
<b>Main Counties</b>	Cork
<b>Protected Areas</b>	4 SPA: Ballymacoda bay and Whitegate Bay; Ballycotton Bay, Blackwater Estuary 1 SAC: BALLYMACODA (CLONPRIEST AND PILLMORE) 1 UWWTD - Blackwater Estuary Dower springs abstraction (Whitegate Regional Water Supply)

## Sectoral Total Phosphorus Sources



0 1.5 3 6 9 12 km

W X CELTIC SEA

Calculated in accordance with OSPAR HARP Guidelines.  
Not an indication of risk, rather an indication of potential to cause risk.



# Womanagh Water Management Unit Action Plan

STATUS/IMPACTS	
Overall status	There are 8 river water bodies in this WMU. 3 Moderate Status, 5 Poor Status.
Status elements	The water bodies with moderate or poor status are dictated by Q score. Physchem is High or Good.
Possible Impacts - EPA Water Quality	<p>DISSOUR – SW_19_1798            2002 - No change. Satisfactory apart from middle reach where treated sewage enters river, from right-hand side, immediately downstream of Killeagh Bridge (0400). *Silt effects.            2005 - Satisfactory throughout in August 2005 following improvement at Killeagh Bridge (0400) since previous survey in September 2002.            2008 - unsatisfactory with only moderate ecological quality representing deterioration since previous survey.            Status of WB 2009: Moderate Status dictated by Q score</p> <p>WOMANAGH – SW_19_1909; SW_19_1793            2002 - EPA noted that in the upper reaches, it was satisfactory except in lower reaches (1000, 1300) where again suspected discharges from Mogeely (industrial) and Castlemartyr (sewage) were responsible, respectively, for the slight and moderate pollution recorded. The lower reaches had large colonies of two American alien plants, the water fern (<i>Azolla filiculoides</i>) and least duckweed (<i>Lemna minuta</i>); these floating species reflect highly eutrophic conditions.            2005 - no change. Continuing slightly and moderately polluted in lower reaches respectively in Castlemartyr (1000) and downstream of Lady's Bridge (1300). Also known as Kiltha River in upper reaches.            2008 - Continuing with just moderate ecological quality in Castlemartyr and with good status again recorded in upper reaches where also known as Kiltha River.            SW_19_1909 Status of WB 2009: Moderate Status dictated by Q score            SW_19_1793 Status of WB 2009: Poor Status dictated by Q score</p>

PRESSURES/RISKS	
Nutrient sources	95% of TP is diffuse of which 88% comes from agriculture. 5% comes from WWTP.
Point pressures	<p>12 WWTP's – Castlemartyr WWTP, Cloyne WWTP, Garryvoe, Killeagh WWTP, Ladysbridge, Mogeely, Rostellan, Saleen, Whitegate/Aghada, Ballycotton, Ringaskiddy Carrigaline Crosshaven, Youghal,</p> <p>5 IPPC's</p> <p>3 Section 4 .</p> <p>1 WTP (Mogeely/Castlemartyr Pws)</p>
Wastewater Treatment Plants (WWTP) and Industrial Discharges	<p>Castlemartyr WWTP – Non-compliant frequency of monitoring or non-compliant effluent standard where sufficient capacity is available; Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area</p> <p>Cloyne WWTP – Non-compliant frequency of monitoring or non-compliant effluent standard where sufficient capacity is available; Insufficient existing capacity, no evidence of impact, discharge to a protected area</p> <p>Killeagh WWTP - Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area; Insufficient future (2015) assimilative capacity (nutrients), discharge not to a protected area</p> <p>Mogeely - Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area</p> <p>Ringaskiddy Carrigaline Crosshaven - PE &gt;2,000, discharge to non-coastal water, no secondary treatment or PE &gt; 10,000, discharge to coastal water, no secondary treatment; Insufficient existing capacity, no evidence of impact, discharge to a protected area</p> <p>Rostellan - Discharge to designated shellfish waters</p> <p>Whitegate/Aghada - Insufficient existing capacity, no evidence of impact, discharge to a protected area</p> <p>Youghal - PE &gt;2,000, discharge to non-coastal water, no secondary treatment or PE &gt; 10,000, discharge to coastal water, no secondary treatment; Insufficient existing capacity, no evidence of impact, discharge to a protected area</p>

PRESSURES/RISKS	
Quarries, Mines & Landfills	4 quarries and 2 landfills. 1 WB at risk from 1 quarry - SW_19_1909.
Agriculture	8 WBs at risk - SW_19_1793, SW_19_1247, SW_19_1843, SW_19_1266, SW_19_1691, SW_19_1742, SW_19_1909, SW_19_1798.
On-site systems	There are 6252 septic tanks in this WMU. 1198 of these are located in areas of very high or extreme risk.
Forestry	None at Risk
Dangerous substances	None at Risk
Morphology	1 WB at risk - SW_19_1266.
Abstractions	None at Risk (local authority note 19-1793; Dower Springs abstraction (PE 10,000, volume 6,700m <sup>3</sup> /day) some recent history of raw water quality problems)
Other	

# Womanagh Water Management Unit Action Plan

SELECTED ACTION PROGRAMME	
<i>NB All relevant basic measures and general supplementary measures/surveys apply</i>	
Point Sources	For WWTP action programme, refer to point source table below Section 4's – Review License.
Diffuse Sources	AGRICULTURE - Good Agricultural Practice Regulations and Enforcement SEPTIC TANKS -At Risk septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests
Sub-basin Plans	Shellfish Waters Pollution Production Programmes: Ballymacoda and Rostellan South Apply Prescribed Measures
Other	Protection of drinking water, abstraction control and future licensing. Ensure licensing of quarries under Section 4 of Water Pollution Act 1977. MORPHOLOGY - Investigation into the impact of historical channelisation on morphological and fish status – Womanagh River (Upper)

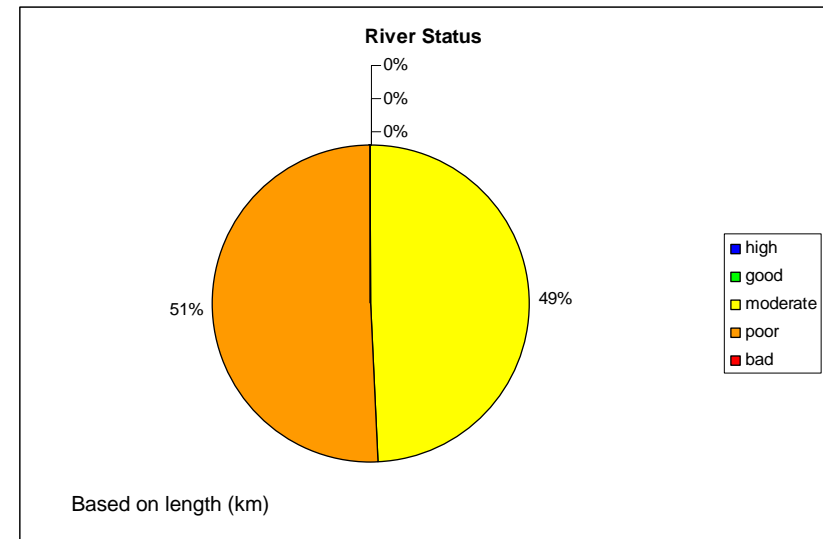
Discharge		Measures							Waterbody	
Point Source Discharge	County	Plants Requiring Capital Works	Agglomerations Requiring Further Investigation Prior to Capital Works	Plants Required to Commence Implementation of Pollution Reduction Programmes for Shellfish Waters	Plants Requiring the Implementation of an Appropriate Performance Management System	Plants Requiring the Investigation of CSO's	Plants Required to Ensure Capacity of Treatment Plant is not Exceeded	Extended Timescale for Measure Implementation	Waterbody Code	Extended Deadline to Achieve Waterbody Objective
Castlemartyr WWTP	Cork South		Yes		Yes			Yes	SW_19_1909	Yes
Cloyne WWTP	Cork South		Yes		Yes			Yes	SW_060_0000	Yes
Killeagh WWTP	Cork South						Yes	No	SW_19_1798	No
Saleen	Cork South			Yes				No	SW_060_0000	No
Whitegate/Aghada	Cork South		Yes	Yes				Yes	SW_060_0000	Yes
Youghal	Cork South	Yes	Yes					Yes	SW_020_0100	Yes

OBJECTIVES	
Good status 2015	Restore 2 waterbodies by 2015
Alternative Objectives	Restore 6 waterbodies by 2021 (SW_19_1247, SW_19_1266, SW_19_1793, SW_19_1798, SW_19_1843, SW_19_1909) – extended deadline for nitrogen losses to surface water via groundwater (SW_19_1909 is also extended to allow measures for wastewater to be put in place)

**Transitional Status** – Refer to separate transitional waters action programme  
**Groundwater Status** – Refer to separate groundwater action programme

### Future Pressures and Developments

Throughout the river basin management cycle future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed.



# Womanagh Water Management Unit Action Plan - Rivers

IE_SW_Womanagh																		
Member State Code	Monitored Y (Extrapolated N)	Donor Waterbody	Biological Elements				Supporting Elements				Protected Areas					Objective	Date objective to be achieved	
			Macros (Q)	Freshwater Mussel	Fish	Phytobenthos (Diatoms)	Morphology	Specific Pollutants	Physio-chemical	Ecological Status	Chemical Status	Special Area of Conservation	Special Protection Area	Nutrient Sensitive Waters	Drinking Water			
SW_19_1247	N	SW_19_1793									P						GES	2021
SW_19_1266	N	SW_19_1793									P						GES	2021
SW_19_1691	N	SW_19_1955									M			Y			GES	2015
SW_19_1742	N	SW_19_1957									P			Y			GES	2015
SW_19_1793	Y		P							G	P						GES	2021
SW_19_1798	Y		M		G					G	M						GES	2021
SW_19_1843	N	SW_19_1793									P			Y			GES	2021
SW_19_1909	Y		M		G					H	M						GES	2021

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Ladysbridge WWTP					COD (mg/l)		BOD <sub>5</sub> (mg/l)		SS (mg/l)		TP(mg/l)		Ortho-P(mg/l)		NH3(mg/l)	
Date	PE (Flow)	PE (BOD)	BOD Load	F:M	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff
<b>Standards</b>								<b>15</b>		<b>35</b>		<b>2</b>		<b>1</b>		
06/01/2010	1606	225	5	#DIV/0!	113	22	42	6	75	20	1.3	0.55	7.6	0.41	13.5	5.5
13/01/2010	1606	310	6	#DIV/0!	140	21	58	6	131	14	0.2	0.75	2.2	0.35	3.5	2.5
19/01/2010	1606	128	3	#DIV/0!	70	3	24	5	92	10.5	0.95	0.19	1.4	0.11	4.25	1.25
26/01/2010	1606	305	6	#DIV/0!	138	4	57	5	656	10.5	1.2	0.65	2.2	0.55	8.50	5.75
<b>Average</b>	<b>1606</b>	<b>242</b>	<b>5</b>	<b>#DIV/0!</b>	<b>115</b>	<b>13</b>	<b>45</b>	<b>6</b>	<b>239</b>	<b>14</b>	<b>0.9</b>	<b>0.54</b>	<b>3.4</b>	<b>0.4</b>	<b>7.4</b>	<b>3.75</b>
<b>Min</b>	<b>1606</b>	<b>128</b>	<b>3</b>	<b>#DIV/0!</b>	<b>70</b>	<b>3</b>	<b>24</b>	<b>5</b>	<b>75</b>	<b>11</b>	<b>0.2</b>	<b>0.19</b>	<b>1.4</b>	<b>0.1</b>	<b>3.5</b>	<b>1.25</b>
<b>Max</b>	<b>1606</b>	<b>310</b>	<b>6</b>	<b>#DIV/0!</b>	<b>140</b>	<b>22</b>	<b>58</b>	<b>6</b>	<b>656</b>	<b>20</b>	<b>1.3</b>	<b>0.75</b>	<b>7.6</b>	<b>0.6</b>	<b>13.5</b>	<b>5.75</b>
<b>% Compliance</b>								<b>100</b>		<b>100</b>		<b>100</b>		<b>100</b>		
02/02/2010	1428	53	5	#DIV/0!	100	2	42	5	40	3.5	0.6	0.24	2.2	0.27	11.75	2.15
16/02/2010	1428	151	13	#DIV/0!	280	4	121	5	81	9	2.3	0.22	9.3	0.04	25.25	8.00
23/02/2010	1428	163	14	#DIV/0!	300	16	130	5	78	14.5	2.3	0.26	9.5	0.08	13.50	5.10
29/2/2010	1428	209	18	#DIV/0!	385	7	167	5	58	12.0	1.9	0.28	8.4	0.07	18.25	3.58
<b>Average</b>	<b>1428</b>	<b>144</b>	<b>13</b>	<b>#DIV/0!</b>	<b>266</b>	<b>7</b>	<b>115</b>	<b>5</b>	<b>64</b>	<b>10</b>	<b>1.8</b>	<b>0.25</b>	<b>7.4</b>	<b>0.1</b>	<b>17.2</b>	<b>4.71</b>
<b>Min</b>	<b>1428</b>	<b>53</b>	<b>5</b>	<b>#DIV/0!</b>	<b>100</b>	<b>2</b>	<b>42</b>	<b>5</b>	<b>40</b>	<b>4</b>	<b>0.6</b>	<b>0.22</b>	<b>2.2</b>	<b>0.04</b>	<b>11.8</b>	<b>2.15</b>
<b>Max</b>	<b>1428</b>	<b>209</b>	<b>18</b>	<b>#DIV/0!</b>	<b>385</b>	<b>16</b>	<b>167</b>	<b>5</b>	<b>81</b>	<b>15</b>	<b>2.3</b>	<b>0.28</b>	<b>9.5</b>	<b>0.3</b>	<b>25.3</b>	<b>8.00</b>
<b>% Compliance</b>								<b>100</b>		<b>100</b>		<b>100</b>		<b>100</b>		
01/03/2010	2483	356	21	#DIV/0!	277	6	110	5	76	13	3.4	0.45	3.2	0.15	20.25	11.25
08/03/2010	2483	534	32	#DIV/0!	364	24	165	5	112	10.5	4.6	1.20	4.1	0.94	32.75	16.25
15/03/2010	2483	1725	104	#DIV/0!	1334	26	533.6	5	596	9.5	9.1	0.17	8.0	0.03	46.25	9.50
22/03/2010	2483	517	31	#DIV/0!	386	11	160	5	61	6.5	1.3	0.08	1.0	0.07	9.25	3.50
29/03/2010	2483	203	12	#DIV/0!	157	1	62.8	5	78	16.0	2.7	0.31	2.3	0.08	20.75	4.75
<b>Average</b>	<b>2483</b>	<b>667</b>	<b>40</b>	<b>#DIV/0!</b>	<b>504</b>	<b>14</b>	<b>206</b>	<b>5</b>	<b>185</b>	<b>11</b>	<b>4.2</b>	<b>0.44</b>	<b>3.7</b>	<b>0.25</b>	<b>25.9</b>	<b>9.05</b>
<b>Min</b>	<b>2483</b>	<b>203</b>	<b>12</b>	<b>#DIV/0!</b>	<b>157</b>	<b>1</b>	<b>63</b>	<b>5</b>	<b>61</b>	<b>7</b>	<b>1.3</b>	<b>0.08</b>	<b>1.0</b>	<b>0.03</b>	<b>9.3</b>	<b>3.50</b>
<b>Max</b>	<b>2483</b>	<b>1725</b>	<b>104</b>	<b>#DIV/0!</b>	<b>1334</b>	<b>26</b>	<b>534</b>	<b>5</b>	<b>596</b>	<b>16</b>	<b>9.1</b>	<b>1.20</b>	<b>8.0</b>	<b>0.94</b>	<b>46.3</b>	<b>16.25</b>
<b>% Compliance</b>								<b>100</b>		<b>100</b>		<b>100</b>		<b>100</b>		
06/04/2010	2869	47	3	#DIV/0!	82	16	34	5	45	8.5	1.5	0.16	2.7	0.07	5.00	0.75
13/4/2010	2869	134	8	#DIV/0!	222	11	97	5	52	11	1.2	0.22	6.8	0.06	13.50	1.75
20/4/2010	2869	142	9	#DIV/0!	247	21	103	5	105	13.5	3.4	0.35	6.1	0.11	13.75	0.75
27/4/2010	2869	214	13	#DIV/0!	322	17	155	5	72	16	4.1	0.36	10.0	0.22	26.75	1.75
<b>Average</b>	<b>2869</b>	<b>135</b>	<b>8</b>	<b>#DIV/0!</b>	<b>218</b>	<b>16</b>	<b>97</b>	<b>5</b>	<b>69</b>	<b>12</b>	<b>2.6</b>	<b>0.27</b>	<b>6.4</b>	<b>0.12</b>	<b>14.8</b>	<b>1.25</b>
<b>Min</b>	<b>2869</b>	<b>47</b>	<b>3</b>	<b>#DIV/0!</b>	<b>82</b>	<b>11</b>	<b>34</b>	<b>5</b>	<b>45</b>	<b>9</b>	<b>1.2</b>	<b>0.16</b>	<b>2.7</b>	<b>0.06</b>	<b>5.0</b>	<b>0.75</b>
<b>Max</b>	<b>2869</b>	<b>214</b>	<b>13</b>	<b>#DIV/0!</b>	<b>322</b>	<b>21</b>	<b>155</b>	<b>5</b>	<b>105</b>	<b>16</b>	<b>4.1</b>	<b>0.36</b>	<b>10.0</b>	<b>0.22</b>	<b>26.8</b>	<b>1.75</b>
<b>% Compliance</b>								<b>100</b>		<b>100</b>		<b>100</b>		<b>100</b>		
<b>Standards</b>								<b>15</b>		<b>35</b>		<b>2</b>		<b>1</b>		
06/01/2010	225	5	#DIV/0!	113	22	42	6	75	20	1.3	0.55	7.6	0.41	13.5	5.5	7.26
13/01/2010	310	6	#DIV/0!	140	21	58	6	131	14	0.2	0.75	2.2	0.35	3.5	2.5	6.80
19/01/2010	128	3	#DIV/0!	70	3	24	5	92	10.5	0.95	0.19	1.4	0.11	4.25	1.25	7.06
26/01/2010	305	6	#DIV/0!	138	4	57	5	656	10.5	1.2	0.65	2.2	0.55	8.50	5.75	7.02
<b>Average</b>	<b>242</b>	<b>5</b>	<b>#DIV/0!</b>	<b>115</b>	<b>13</b>	<b>45</b>	<b>6</b>	<b>239</b>	<b>14</b>	<b>0.9</b>	<b>0.54</b>	<b>3.4</b>	<b>0.4</b>	<b>7.4</b>	<b>3.75</b>	<b>7.04</b>
<b>Min</b>	<b>128</b>	<b>3</b>	<b>#DIV/0!</b>	<b>70</b>	<b>3</b>	<b>24</b>	<b>5</b>	<b>75</b>	<b>11</b>	<b>0.2</b>	<b>0.19</b>	<b>1.4</b>	<b>0.1</b>	<b>3.5</b>	<b>1.25</b>	<b>6.80</b>

Max	310	6	#DIV/0!	140	22	58	6	656	20	1.3	0.75	7.6	0.6	13.5	5.75	7.26
% Compliance							100		100		100		100			
02/06/2010	123	7	#DIV/0!	340	27	148	12	76	8.5	11.2	1.50	5.2	0.7	38.50	0.03	6.91
09/06/2010	176	11	#DIV/0!	507	47	211	20	177	10.5	13.4	1.6	8.4	0.5	32.25	0.55	6.88
15/6/2010	2038	122	#DIV/0!	5625	36	2446	15	1828	14	125.0	0.4	42.0	0.4	67.00	0.20	6.95
25/6/2010	3288	197	#DIV/0!	9075	27	3946	11	1514	9.5	192.0	1.01	62.0	0.9	93.00	0.50	6.99
Average	1406	84	#DIV/0!	3887	34	1688	15	899	11	85.4	1.13	29.4	0.63	57.7	0.32	6.93
Min	123	7	#DIV/0!	340	27	148	11	76	9	11.2	0.40	5.2	0.40	32.3	0.03	6.88
Max	3288	197	#DIV/0!	9075	47	3946	20	1828	14	192.0	1.60	62.0	0.90	93.0	0.55	6.99
% Compliance							100		100		100		100			
06/07/2010	648	39	#DIV/0!	1151	2	480	1	166	7	11.5	1.15	11.1	0.5	40.50	3.50	6.97
13/7/2010	130	8	#DIV/0!	220	32	96	12	232	19	4.5	0.95	8.9	0.7	24.75	0.25	6.74
20/7/2010	80	5	#DIV/0!	141	45	59	8	138	21	3.1	0.78	3.6	0.68	12.50	0.25	6.97
27/7/2010	149	9	#DIV/0!	252	22	110	10	133	12	4.2	0.53	8.3	0.52	14.75	0.13	7.42
Average	251	15	#DIV/0!	441	25	186	8	167	15	5.8	0.85	8.0	0.60	23.1	1.03	7.03
Min	80	5	#DIV/0!	141	2	59	1	133	7	3.1	0.53	3.6	0.52	12.5	0.13	6.74
Max	648	39	#DIV/0!	1151	45	480	12	232	21	11.5	1.15	11.1	0.68	40.5	3.50	7.42
% Compliance							100		100		100		100			
03/08/2010	50	3	#DIV/0!	163	40	71	8	73	15.5	9.8	1.9	2.9	0.98	19.00	2.50	7.46
10/08/2010	128	8	#DIV/0!	421	5	183	5	91	7.5	13.8	0.5	5.2	0.44	28.00	0.02	7.49
16/08/2010	204	12	#DIV/0!	670	26	291	5	162	7.5	16.1	0.90	7.7	0.66	28.50	0.09	7.22
25/08/2010	78	5	#DIV/0!	466	12	111	5	136	4	12.7	0.85	5.9	0.83	24.25	0.09	7.43
Average	115	7	#DIV/0!	430	21	164	6	116	11	13.1	1.0	5.43	0.73	24.9	0.68	7.40
Min	50	3	#DIV/0!	163	5	71	5	73	4	9.8	0.5	2.90	0.44	19.0	0.02	7.22
Max	204	12	#DIV/0!	670	40	291	8	162	18	16.1	1.9	7.70	0.98	28.5	2.50	7.49
% Compliance							100		100		100		100			

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**Appendix B**

Issue Code	PMS CK09	<b>Monthly Status Report Dec-2009</b>	
Date	14/01/2010		
Originator	J.McCarthy		
Authorised by	E. Brennan		

Ladysbridge WWTP				COD (mg/l)		BOD <sub>5</sub> (mg/l)		SS (mg/l)		TP(mg/l)		Ortho-P(mg/l)		NH3(mg/l)		pH			AT					
Date	PE (Flow)	PE (BOD)	BOD Load	F:M	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	AT	Eff	DO	MLSS (mg/l)	SV <sub>30</sub> (ml/l)	SVI (ml/g)	
<b>Standards</b>									<b>15</b>	<b>35</b>		<b>2</b>		<b>1</b>										
05/01/2009	495	950	57	0.037	2350	5	576	1	285	26	27.1	0.5	12.5	0.33	65	0.2	7.19	6.81	7.04		7548	900	119	
12/01/2009	495	708	42	0.026	1151	3	429	1	946	27	6.9	0.2	4.2	0.19	15	0.4	6.66	6.61	6.82		7998	900	113	
19/01/2009	495	300	18	0.009	392	9	182	3	360	7.8	5.7	0.2	3.1	0.09	13	0.12	6.83	7.19	7.24		9876	959	97	
26/01/2009	495	677	41	0.024	948	16	410	4	755	13	13.2	0.3	9.7	0.10	19	0.07	6.77	6.88	7.08		8142	900	111	
<b>Average</b>	495	659	40	0.024	1210	8	399	2	587	18	13	0.3	7.4	0.2	28.0	0.20	6.86	6.87	7.05		8391	915	110	
<b>Min</b>	495	300	18	0.009	392	3	182	1	285	8	6	0.2	3.1	0.1	13.0	0.07	6.66	6.61	6.82		7548	900	97	
<b>Max</b>	495	950	57	0.037	2350	16	576	4	946	27	27	0.5	13	0.3	65.0	0.40	7.19	7.19	7.24		9876	959	119	
<b>% Compliance</b>																								
Consent of copyright owner required for any other use																								
02/02/2009	350	244	15	0.028	433	36	209	9	385	28	4.2	0.1	3.9	0.09	6.5	0.35	7.34	7.10	7.56		2554	950	372	
09/02/2009	350	123	7	0.005	224	11	105	5	52.6	7.4	6.8	0.34	5.3	0.30	14	0.29	7.11	7.04	7.18		7536	900	119	
16/02/2009	350	195	12	0.010	383	10	167	2	133	22	5.6	0.34	2.1	0.28	28.5	0.03	7.41	7.27	7.68		5560	950	171	
23/02/2009	350	91	5	0.004	185	12	78	3	72	7	1.1	0.6	2.6	0.30	17	0.7	7.04	6.99	7.23		6322	900	142	
<b>Average</b>	350	163	10	0.012	306	17	140	5	161	16	3.5	0.4	3.5	0.2	16.5	0.34	7.23	7.10	7.41		5493	925	201	
<b>Min</b>	350	91	5	0.004	185	10	78	2	53	7	3	0.1	2.1	0.1	6.5	0.03	7.04	6.99	7.18		2554	900	119	
<b>Max</b>	350	244	15	0.028	433	36	209	9	385	28	7	0.6	5	0.3	28.5	0.70	7.41	7.27	7.68		7536	950	372	
<b>% Compliance</b>																								
02/03/2009	210	91	5	0.008	276	16	130	3	57	12	4.2	0.5	3.9	0.43	23.75	0.03	7.45	7.20	7.64		3374	900	267	
09/03/2009	210	141	8	0.010	427	1	201	2	80	19	4.4	0.43	4.1	0.32	28.25	0.01	7.18	7.37	7.49		4146	900	217	
16/03/2009	210	272	16	0.018	807	1	389	2	229	18	23.0	0.27	21.5	0.23	19.5	0.02	7.11	7.34	7.55		4376	950	217	
23/03/2009	210	85	5	0.008	307	5	122	3	54	14	10.6	0.8	9.8	0.21	15.75	0.01	7.26	7.42	7.63		3316	950	286	
30/03/2009	210	30	2	0.003	92	9	43	4	24	9	1.1	0.55	0.9	0.37	9.25	0.08	7.36	7.14	7.49		2960	850	287	
<b>Average</b>	210	124	7	0.009	382	6	177	3	89	14	9	0.5	8.0	0.3	19.3	0.03	7.27	7.29	7.56		3634	910	255	
<b>Min</b>	210	30	2	0.003	92	1	43	2	24	9	1	0.3	0.9	0.2	9.3	0.01	7.11	7.14	7.49		2960	850	217	
<b>Max</b>	210	272	16	0.018	807	16	389	4	229	19	23	0.8	22	0.4	28.3	0.08	7.45	7.42	7.64		4376	950	287	
<b>% Compliance</b>																								
06/04/2009	345	168	10	0.019	319	42	146	12	208	30	12	0.7	9.6	0.4	17.72	0.03	7.11	7.34	7.55	2.49	2538	900	355	
13/04/2009	345	308	18	0.025	584	22	268	6	18	9	0.9	0.57	12.24	0.04	24.25	0.02	7.14	7.10	7.25	1.69	3614	950	263	
20/04/2009	345	537	32	0.023	1068	5	467	2	291	7.6	3.7	0.75	2.9	0.50	19.5	0.07	6.75	7.32	7.36	2.31	6742	950	141	
27/04/2009	345	269	16	0.013	500	1	234	1	201	7	7.9	0.35	13.3	0.17	14.75	0.02	6.98	7.55	7.5	0.6	5854	950	162	
<b>Average</b>	345	321	19	0.02	618	18	279	5	180	13	6	0.6	9.5	0.3	19.1	0.04	7.00	7.33	7.42	1.77	4687	938	230	
<b>Min</b>	345	168	10	0.01	319	1	146	1	18	7	1	0.4	2.9	0.04	14.8	0.02	6.75	7.10	7.25	0.60	2538	900	141	
<b>Max</b>	345	537	32	0.02	1068	42	467	12	291	30	12	0.8	13	0.5	24.3	0.07	7.14	7.55	7.55	2.49	6742	950	355	
<b>% Compliance</b>																								
05/05/2009	355	116	7	0.007	212	9	98	2	51	31	3.1	0.9	2.9	0.49	23	0.14	7.32	7.60	7.66	2.10	5194	900	173	
11/05/2009	355	159	10	0.008	283	11	134	4	85	2	3.6	0.8	3.3	0.50	17.75	0.05	7.17	6.77	6.90	1.50	5480	950	173	



18/05/2009	355	71	4	0.004	136	9	60	2	12	2	2.9	0.38	1.8	0.25	10.4	0.25	7.31	7.47	7.51	2.3	4724	900	191
25/05/2009	355	340	20	0.015	608	2	287	<1	15	9	1.8	0.42	0.8	0.30	43	0.03	7.17	7.21	7.56	0.9	6684	950	142
<b>Average</b>	<b>355</b>	<b>171</b>	<b>10</b>	<b>0.01</b>	<b>310</b>	<b>8</b>	<b>145</b>	<b>3</b>	<b>41</b>	<b>11</b>	<b>3</b>	<b>0.6</b>	<b>2.2</b>	<b>0.4</b>	<b>23.5</b>	<b>0.12</b>	<b>7.24</b>	<b>7.26</b>	<b>7.41</b>	<b>1.70</b>	<b>5521</b>	<b>925</b>	<b>170</b>
<b>Min</b>	<b>355</b>	<b>71</b>	<b>4</b>	<b>0.00</b>	<b>136</b>	<b>2</b>	<b>60</b>	<b>2</b>	<b>12</b>	<b>2</b>	<b>2</b>	<b>0.4</b>	<b>0.8</b>	<b>0.25</b>	<b>10.4</b>	<b>0.03</b>	<b>7.17</b>	<b>6.77</b>	<b>6.90</b>	<b>0.90</b>	<b>4724</b>	<b>900</b>	<b>142</b>
<b>Max</b>	<b>355</b>	<b>340</b>	<b>20</b>	<b>0.01</b>	<b>608</b>	<b>11</b>	<b>287</b>	<b>4</b>	<b>85</b>	<b>31</b>	<b>4</b>	<b>0.9</b>	<b>3</b>	<b>0.5</b>	<b>43.0</b>	<b>0.25</b>	<b>7.32</b>	<b>7.60</b>	<b>7.66</b>	<b>2.30</b>	<b>6684</b>	<b>950</b>	<b>191</b>
<b>% Compliance</b>								<b>100</b>	<b>100</b>			<b>100</b>		<b>100</b>									
02/06/2009	220	40	2	0.002	120	25	55	9	17	12	3.7	0.6	3.5	0.53	9.67	0.45	7.6	7.53	7.64	0.56	7778	950	122
08/06/2009	220	29	2	0.002	101	4	40	1	60	24	4.5	0.9	4	0.78	17.7	0.3	7.71	7.60	7.78	0.41	5491	900	164
15/06/2009	220	40	2	0.002	114	17	55	6	15	4	8.9	0.5	6	0.10	8.5	0.25	6.89	7.33	7.50	1.80	5842	900	154
22/06/2009	220	80	5	0.004	234	17	109	6	95	6	7.0	0.8	5.5	0.54	15.25	0.25	7.11	7.24	7.45	1.39	6156	900	146
29/06/2009	220	103	6	0.008	314	37	140	11	78	9	5.9	0.4	4.6	0.36	8.75	0.09	6.99	7.23	7.32	0.63	3662	900	246
<b>Average</b>	<b>220</b>	<b>59</b>	<b>4</b>	<b>0.003</b>	<b>177</b>	<b>20</b>	<b>80</b>	<b>7</b>	<b>53</b>	<b>11</b>	<b>6</b>	<b>0.6</b>	<b>4.7</b>	<b>0.5</b>	<b>12.0</b>	<b>0.27</b>	<b>7.26</b>	<b>7.39</b>	<b>7.54</b>	<b>0.96</b>	<b>5786</b>	<b>910</b>	<b>166</b>
<b>Min</b>	<b>220</b>	<b>29</b>	<b>2</b>	<b>0.002</b>	<b>101</b>	<b>4</b>	<b>40</b>	<b>1</b>	<b>15</b>	<b>4</b>	<b>4</b>	<b>0.4</b>	<b>3.5</b>	<b>0.1</b>	<b>8.5</b>	<b>0.09</b>	<b>6.89</b>	<b>7.23</b>	<b>7.32</b>	<b>0.41</b>	<b>3662</b>	<b>900</b>	<b>122</b>
<b>Max</b>	<b>220</b>	<b>103</b>	<b>6</b>	<b>0.008</b>	<b>314</b>	<b>37</b>	<b>140</b>	<b>11</b>	<b>95</b>	<b>24</b>	<b>9</b>	<b>0.9</b>	<b>6</b>	<b>0.8</b>	<b>17.7</b>	<b>0.45</b>	<b>7.71</b>	<b>7.60</b>	<b>7.78</b>	<b>1.80</b>	<b>7778</b>	<b>950</b>	<b>246</b>
<b>% Compliance</b>								<b>100</b>	<b>100</b>			<b>100</b>		<b>100</b>									
06/07/2009	680	61	4	0.006	58	30	27	7	60	27	12	0.9	11.9	0.63	49.25	0.5	7.31	7.47	7.51	0.46	3178	750	236
13/07/2009	680	403	24	0.027	370	3	178	1	236	34	1.7	0.5	0.4	0.06	10	1.5	7.17	7.21	7.56	1.57	4346	850	196
20/07/2009	680	326	20	0.029	325	2	144	1	106	39	11.2	0.39	10.5	0.33	34.75	0.5	7.31	7.09	7.24	0.53	3262	750	230
27/07/2009	680	138	8	0.011	172	25	61	5	11.5	9	9.6	0.7	8.3	0.31	26.25	0.45	6.90	6.56	6.97	1.72	3816	800	210
<b>Average</b>	<b>680</b>	<b>232</b>	<b>14</b>	<b>0.018</b>	<b>231</b>	<b>15</b>	<b>103</b>	<b>4</b>	<b>103</b>	<b>27</b>	<b>9</b>	<b>0.6</b>	<b>7.8</b>	<b>0.3</b>	<b>30.1</b>	<b>0.74</b>	<b>7.17</b>	<b>7.08</b>	<b>7.32</b>	<b>1.07</b>	<b>3651</b>	<b>788</b>	<b>218</b>
<b>Min</b>	<b>680</b>	<b>61</b>	<b>4</b>	<b>0.006</b>	<b>58</b>	<b>2</b>	<b>27</b>	<b>1</b>	<b>12</b>	<b>9</b>	<b>2</b>	<b>0.4</b>	<b>0.4</b>	<b>0.1</b>	<b>10.0</b>	<b>0.45</b>	<b>6.90</b>	<b>6.56</b>	<b>6.97</b>	<b>0.46</b>	<b>3178</b>	<b>750</b>	<b>196</b>
<b>Max</b>	<b>680</b>	<b>403</b>	<b>24</b>	<b>0.029</b>	<b>370</b>	<b>30</b>	<b>178</b>	<b>7</b>	<b>236</b>	<b>39</b>	<b>12</b>	<b>0.9</b>	<b>12</b>	<b>0.6</b>	<b>49.3</b>	<b>1.50</b>	<b>7.31</b>	<b>7.47</b>	<b>7.56</b>	<b>1.72</b>	<b>4346</b>	<b>850</b>	<b>236</b>
<b>% Compliance</b>								<b>100</b>	<b>100</b>			<b>100</b>		<b>100</b>									
04/08/2009	550	24	1	0.005	38	12	13	4	59.5	31	5.6	0.8	1.5	0.21	8.5	0.5	6.82	6.68	6.80	2.31	1334	600	450
10/08/2009	550	383	23	0.063	427	11	209	3	77	12	5.5	0.5	4.9	0.31	27.25	0.02	7.44	7.20	7.44	1.00	1789	650	363
17/08/2009	550	123	7	0.005	168	2	67	1	20	12	1.9	0.73	0.9	0.44	15.25	0.19	7.13	7.17	7.43	2.49	7916	900	114
24/08/2009	550	304	18	0.017	336	26	166	12	44	15	3.3	1.04	2.9	0.76	17.5	0.2	6.96	7.4	7.18	0.47	5108	700	137
<b>Average</b>	<b>550</b>	<b>209</b>	<b>13</b>	<b>0.022</b>	<b>242</b>	<b>13</b>	<b>114</b>	<b>5</b>	<b>50</b>	<b>18</b>	<b>4</b>	<b>0.8</b>	<b>2.6</b>	<b>0.4</b>	<b>17.1</b>	<b>0.23</b>	<b>7.09</b>	<b>7.11</b>	<b>7.21</b>	<b>1.57</b>	<b>4037</b>	<b>713</b>	<b>266</b>
<b>Min</b>	<b>550</b>	<b>24</b>	<b>1</b>	<b>0.005</b>	<b>38</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>20</b>	<b>13</b>	<b>2</b>	<b>0.5</b>	<b>0.9</b>	<b>0.2</b>	<b>8.5</b>	<b>0.02</b>	<b>6.82</b>	<b>6.68</b>	<b>6.80</b>	<b>0.47</b>	<b>1334</b>	<b>600</b>	<b>114</b>
<b>Max</b>	<b>550</b>	<b>383</b>	<b>23</b>	<b>0.063</b>	<b>427</b>	<b>26</b>	<b>209</b>	<b>12</b>	<b>77</b>	<b>31</b>	<b>6</b>	<b>1.0</b>	<b>5</b>	<b>0.8</b>	<b>27.3</b>	<b>0.50</b>	<b>7.44</b>	<b>7.40</b>	<b>7.44</b>	<b>2.49</b>	<b>7916</b>	<b>900</b>	<b>450</b>
<b>% Compliance</b>								<b>100</b>	<b>100</b>			<b>100</b>		<b>100</b>									
01/09/2009	61	51.0	4	0.001	79	25	38	11	26	11	0.2	1.12	1.7	0.73	3.00	0.66	6.94	6.95	7.08	2.55	4140	700	169
08/09/2009	61	0.0	6	0.001	127	15	51	7	129	15	2.9	0.48	6.6	1.1	8.75	0.66	6.85	6.96	6.97	1.64	5312	750	141
15/09/2009	61	1408	23	0.003	544	1	210	5	42	6	7.3	0.63	12.5	0.61	44.75	0.41	6.98	6.94	7.12	1.21	5050	750	149
22/09/2009	61	0.0	10	0.001	195	1	94	5	51	11	2.2	0.51	6.8	0.40	26.50	0.10	7.22	7.05	7.47	2.2	6342	850	134
29/09/2009	61	0.0	10	0.001	191	6	92	5	53	13	0.5	0.57	4.7	0.46	23.50	0.13	7.08	6.96	7.01	2.25	5142	750	146
<b>Average</b>	<b>550</b>	<b>292</b>	<b>11</b>	<b>0.001</b>	<b>227</b>	<b>10</b>	<b>97</b>	<b>7</b>	<b>60</b>	<b>11</b>	<b>2.6</b>	<b>0.7</b>	<b>6.5</b>	<b>0.7</b>	<b>21.30</b>	<b>0.39</b>	<b>7.01</b>	<b>6.97</b>	<b>7.13</b>	<b>1.97</b>	<b>5197</b>	<b>760</b>	<b>148</b>
<b>Min</b>	<b>61</b>	<b>0</b>	<b>4</b>	<b>0.001</b>	<b>79</b>	<b>1</b>	<b>38</b>	<b>5</b>	<b>26</b>	<b>6</b>	<b>0.2</b>	<b>0.5</b>	<b>1.7</b>	<b>0.4</b>	<b>3.00</b>	<b>0.10</b>	<b>6.85</b>	<b>6.94</b>	<b>6.97</b>	<b>1.21</b>	<b>4140</b>	<b>700</b>	<b>134</b>
<b>Max</b>	<b>61</b>	<b>1408</b>	<b>23</b>	<b>0.003</b>	<b>544</b>	<b>25</b>	<b>210</b>	<b>11</b>	<b>129</b>	<b>15</b>	<b>7.3</b>	<b>1.1</b>	<b>12.5</b>	<b>1.1</b>	<b>44.75</b>	<b>0.66</b>	<b>7.22</b>	<b>7.05</b>	<b>7.47</b>	<b>2.55</b>	<b>6342</b>	<b>850</b>	<b>169</b>
<b>% Compliance</b>								<b>100</b>	<b>100</b>			<b>100</b>		<b>100</b>									
05/10/2009	130	85	21	0.004	489	6	195	5	57.5	14.5	6.8	0.49	25	0.24	30.5	0.44	6.96	6.77	6.74	1.01	5686	750	132
12/10/2009	130	82	21	0.004	389	2	190	5	51	7	4.5	0.2	15.9	0.26	24.5	0.09	7.19	6.99	7.41	1.05	5976	800	134
19/10/2009	130	79	20	0.004	374	7	182	5	49	5.5	5.4	0.18	15.8	0.18	38.5	0.17	7.04	7.22	7.34	2.19	5200	750	144
27/10/2009	130	264	67	0.011	1575	5	610	5	462	5	2.6	0.23	35	0.20	29.75	0.22	7.03	7.46	7.31	1.16	6998	850	121
<b>Average</b>	<b>130</b>	<b>128</b>	<b>32</b>	<b>0.006</b>	<b>707</b>	<b>5</b>	<b>294</b>	<b>5</b>	<b>155</b>	<b>8</b>	<b>5</b>	<b>0.3</b>	<b>22.9</b>	<b>0.2</b>	<b>30.8</b>	<b>0.23</b>	<b>7.06</b>	<b>7.11</b>	<b>7.20</b>	<b>1.35</b>	<b>5965</b>	<b>788</b>	<b>133</b>
<b>Min</b>	<b>130</b>	<b>79</b>	<b>20</b>	<b>0.004</b>	<b>374</b>	<b>2</b>	<b>182</b>	<b>5</b>	<b>49</b>	<b>5</b>	<b>3</b>	<b>0.2</b>	<b>15.8</b>	<b>0.2</b>	<b>24.5</b>	<b>0.09</b>	<b>6.96</b>	<b>6.77</b>	<b>6.74</b>	<b>1.01</b>	<b>5200</b>	<b>750</b>	<b>121</b>
<b>Max</b>	<b>130</b>	<b>264</b>	<b>67</b>	<b>0.011</b>	<b>1575</b>	<b>7</b>	<b>610</b>	<b>5</b>	<b>462</b>	<b>15</b>	<b>7</b>	<b>0.5</b>	<b>35</b>	<b>0.3</b>	<b>38.5</b>	<b>0.44</b>	<b>7.19</b>	<b>7.46</b>	<b>7.41</b>	<b>2.19</b>	<b>6998</b>	<b>850</b>	<b>144</b>







## The Gearagh

Species	1% National	1% International	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	Mean (04/05- 08/09)	Peak (04/05- 08/09)
Mute Swan	110		43	40	60	130	82	80	78	130
Whooper Swan	130	210	67	46	38	72	70	64	58	72
Pink-footed Goose		2,250						2	0	2
Greenland White-fronted Goose	110	270		1					0	1
Greylag Goose	50	870		63	143	143	143	26	104	143
Barnacle Goose	90	560						1	0	1
Shelduck	150	3,000				1			0	1
Wigeon	820	15,000	550	760	270	750	830	1,100	742	1,100
Gadwall	20	600	4	14	5	5	3	20	9	20
Teal	450	5,000	650	2,000	425	1,000	1,000	1,400	1,165	2,000
Mallard	380	20,000	350	300	140	480	700	800	484	800
Pintail	20	600	2	20	2	2	2	6	6	20
Shoveler	25	400	12	50	35	75	130	130	84	130
Pochard	380	3,500	65	40	1	2	2	2	9	40
Ring-necked Duck				1				1	0	1
Tufted Duck	370	12,000	240	600	233	400	320	410	393	600
Scaup	45	3,100		5		3	2	8	4	8
Goldeneye	95	11,500	30	15	27	25	30	37	27	37
Goosander							3	1	1	3
Ruddy Duck			5	1					0	1
Great Crested Grebe	55	3,600		3	1	5	2	4	3	5
Cormorant	140	1,200	12	7		14	4	5	6	14
Little Egret		1,300				5	3	4	2	5
Grey Heron	30	2,700	4	4	2	11	3	3	5	11
Water Rail								1	0	1
Moorhen	20			2		1		4	1	4
Coot	330	17,500	7	276	135	450	80	400	268	450
Golden Plover	1,700	9,300	5,000	3,000	3,000	6,000	2,500	2,000	3,300	6,000
Lapwing	2,100	20,000	750	1,500	2,000	2,000	1,000	2,500	1,800	2,500
Dunlin	880	13,300	4	120	150	200	1	120	118	200
Snipe		20,000	3	10		3	1	2	3	10
Black-tailed Godwit	140	470		54		4			12	54
Curlew	550	8,500	150	250	2	150	92	140	127	250
Common Sandpiper				1					0	1
Green Sandpiper				2		1		2	1	2
Greenshank	20	2,300		1				1	0	1
Redshank	310	3,900		7		2		1	2	7
Little Gull				1					0	1
Black-headed Gull		20,000	8	10		30	10	35	17	35
Common Gull		16,000						2	0	2
Lesser Black-backed Gull		4,500	14	70	10	300	32	280	138	300
Kingfisher				1		1	2	1	1	2

The counts presented in the table refer to the peak counts of species in each I-WeBS season. Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.



## Ballymacoda

Species	1% National	1% International	2003/04	2004/05	2005/06	2006/07	2007/08	Mean (03/04-07/08)	Peak (03/04-07/08)
Kittiwake							20	4	20
Mute Swan	110		8	5	5	6	3	5	8
Bewick's Swan	20	200	6					1	6
Whooper Swan	130	210	4	5	1		4	3	5
Pink-footed Goose		2,250				2	1	1	2
Greenland White-fronted Goose	110	270	6					1	6
Greylag Goose	50	870	6			4		2	6
Barnacle Goose	90	560				1		0	1
Light-bellied Brent Goose		260	94	176	183	124	248	165	248
Black Brant						1		0	1
Shelduck	150	3,000	131	146	57	46	70	90	146
Wigeon	820	15,000	1,376	1,040	1,303	910	834	1,093	1,376
Gadwall	20	600	5		6		2	3	6
Green-winged Teal			1	1				0	1
Teal	450	5,000	953	976	1,082	826	376	843	1,082
Mallard	380	20,000	70	467	17	39	29	124	467
Pintail	20	600	8	12	15	5	1	8	15
Shoveler	25	400	14	24	23	44	27	26	44
Goldeneye	95	11,500			1	1		0	1
Red-breasted Merganser	35	1,700	4	2		1	1	2	4
Red-throated Diver	20	3,000		15			1	3	15
Great Northern Diver		50		1			1	0	1
Little Grebe	25	4,000	3	2	2		3	2	3
Great Crested Grebe	55	3,600	8	9	4	2	13	7	13
Cormorant	140	1,200	38	27	34	23	24	29	38
Little Egret		1,300	9	28	26	28	32	25	32
Grey Heron	30	2,700	7	13	11	11	14	11	14
Water Rail				1			2	1	2
Moorhen	20		5				2	1	5
Oystercatcher	680	10,200	742	440	657	405	396	528	742
Little Ringed Plover					1			0	1
Ringed Plover	150	730	57	84	138	146	97	104	146
Golden Plover	1,700	9,300	8,400	8,780	9,800	8,150	8,500	8,726	9,800
Grey Plover	65	2,500	524	337	396	474	482	443	524
Lapwing	2,100	20,000	2,600	2,610	1,520	2,230	1,603	2,113	2,610
Knot	190	4,500	211	334	125	130	305	221	334
Sanderling	65	1,200	133	164	132	151	122	140	164
Little Stint						1	1	0	1
Pectoral Sandpiper						1	1	0	1
Curlew Sandpiper					7	2	4	3	7
Dunlin	880	13,300	2,640	1,865	1,085	825	1,882	1,659	2,640
Ruff		12,500			1	7	13	4	13
Snipe		20,000	125	25	100	100	105	91	125
Black-tailed Godwit	140	470	820	1,480	801	827	535	893	1,480
Bar-tailed Godwit	160	1,200	592	458	468	436	445	480	592
Whimbrel		2,000		1	1	1	1	1	1
Curlew	550	8,500	1,033	486	770	726	545	712	1,033
Common Sandpiper					6	1		1	6
Green Sandpiper						2		0	2
Greenshank	20	2,300	16	17	9	23	14	16	23
Redshank	310	3,900	251	318	251	257	167	249	318
Turnstone	120	1,500	133	86	85	68	76	90	133
Mediterranean Gull			1	2			1	1	2
Black-headed Gull		20,000	3,325					665	3,325
Common Gull		16,000	361					72	361

The counts presented in the table refer to the peak counts of species in each I-WeBS season.

Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.





Lesser Black-backed Gull	4,500	6,500	445	434	233	460	1,614	6,500
Herring Gull	13,000	31	22	41	64	24	36	64
Yellow-legged Gull				1			0	1
Glaucous Gull					1		0	1
Great Black-backed Gull	4,800	140	31	141	79	62	91	141
Sandwich Tern		28	82				22	82
Common Tern		2					0	2
Kingfisher			2	1	2	1	1	2

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The counts presented in the table refer to the peak counts of species in each I-WeBS season. Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.

**Question 2    Review the assessment of the impact of the discharge in relation to the requirements of the Environmental Quality Objectives regulations (S.I. No. 272 of 2009) and resubmit and update where relevant**

The Womagh River into which the WWTP discharges has a “poor status”. Therefore the lower “good” standard contained in the surface water regulations was used for comparison purposes.

The upstream and downstream sampling results for 2008 at aSW01u and aSW02d were compared to the relevant EQR/S from the surface water regulations in the following tables. The sample results and the EQR/S were included only if there were values for both, to allow comparison.

The upstream and downstream sample results incorporated in the following tables are those laid out in the upstream and downstream sheets of the Revised Table E. However many of these results are at the limit of detection, or are based on averages that include assumed figures. Therefore additional upstream and downstream tables which incorporate actual results for analysis below the Limit of Detection have been included. This “Analysis below the Limit of Detection” is laid out on a separate sheet in the Revised Table E.

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## UPSTREAM COMPARISON TABLE

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 upstream ambient sampling results at aSW01u</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Oxygenation conditions Table 9</i></b>	<b><i>River water body</i></b>	<b><i>Ambient sampling results</i></b>
Biochemical Oxygen Demand (BOD) (mgO <sub>2</sub> /l)	Good status ≤1.5 (mean) or ≤2.6(95%ile)	1.1mg/L (mean) 1.1mg/L (95%ile)
<b><i>Acidification Status Table 9</i></b>	<b><i>River Water Body</i></b>	<b><i>Ambient sampling results</i></b>
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.7
<b><i>Nutrient conditions Table 9</i></b>	<b><i>River Water body</i></b>	<b><i>Ambient sampling results</i></b>
Total Ammonia (mg N/l)	Good status ≤0.065(mean) or ≤0.140(95%ile)	<0.1mg/L (mean) <0.1mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤0.035(mean) or ≤0.075(95%ile)	<0.05mg/L (mean) <0.05mg/L (95%ile)
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<20.0µg/L
Copper (depending on water hardness)	30	<20.0µg/L
Cyanide	10	<5.0µg/L
Flouride	500	41.0µg/L
Zinc (depending on water hardness)	100	<20.0µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	25.0µg/L
Nickel and its compounds	20	<20.0µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.25	<20µg/L
Mercury and its compounds	0.05	<0.2µg/L

### Note the following:

The black results are within the EQR/S.

The red results break the EQR/S.

The blue results may break the EQR/S.

The results highlighted grey are at the limit of detection.

Water hardness in the Womanagh River is 205mgCaCO<sub>3</sub>/L

**UPSTREAM COMPARISON TABLE  
(ANALYSIS BELOW THE LIMIT OF DETECTION)**

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 upstream ambient sampling results at aSW01u</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Nutrient conditions Table 9</i></b>	<b><i>River Water body</i></b>	<b><i>Ambient sampling results</i></b>
Total Ammonia (mg N/l)	Good status ≤ 0.065 (mean) or ≤ 0.140 (95%ile)	0.0505 mg/L (mean) 0.0505 mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤ 0.035 (mean) or ≤ 0.075 (95%ile)	0.0333 mg/L (mean) 0.0339 mg/L (95%ile)
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Total Chromium	8.1	< 1.0 µg/L
Copper (depending on water hardness)	30	< 1.0 µg/L
Zinc (depending on water hardness)	100	< 1.0 µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Lead and its compounds	7.2	25.0 µg/L
Nickel and its compounds	20	< 1.0 µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.25	< 1.0 µg/L

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## DOWNSTREAM COMPARISON TABLE

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 Downstream ambient sampling results at aSW01d</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Oxygenation conditions Table 9</i></b>	<b><i>River water body</i></b>	<b><i>Ambient sampling results</i></b>
Biochemical Oxygen Demand (BOD) (mgO <sub>2</sub> /l)	Good status ≤1.5 (mean) or ≤2.6(95%ile)	1.2mg/L (mean) 1.2mg/L (95%ile)
<b><i>Acidification Status Table 9</i></b>	<b><i>River Water Body</i></b>	<b><i>Ambient sampling results</i></b>
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.7
<b><i>Nutrient conditions Table 9</i></b>	<b><i>River Water body</i></b>	<b><i>Ambient sampling results</i></b>
Total Ammonia (mg N/l)	Good status ≤0.065(mean) or ≤0.140(95%ile)	<0.1mg/L (mean) <0.1mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤0.035(mean) or ≤0.075(95%ile)	<0.05mg/L (mean) <0.05mg/L (95%ile)
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<20.0µg/L Chromium
Copper (depending on water hardness)	30	<20.0µg/L
Cyanide	10	<5.0µg/L
Flouride	500	37.0µg/L
Zinc (depending on water hardness)	100	<20.0µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	20.0µg/L
Nickel and its compounds	20	<20.0µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.25	<20µg/L
Mercury and its compounds	0.05	<0.2µg/L

**Note the following:**

The black results are within the EQR/S.

The red results break the EQR/S.

The blue results may break the EQR/S.

The results highlighted grey are at the limit of detection.

Water hardness in the Womanagh River is 205mg CaCO<sub>3</sub>/L



**DOWNSTREAM COMPARISON TABLE  
(ANALYSIS BELOW THE LIMIT OF DETECTION)**

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 Downstream ambient sampling results at aSW01d</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Nutrient conditions Table 9</i></b>	<b><i>River Water body</i></b>	<b><i>Ambient sampling results</i></b>
Total Ammonia (mg N/l)	Good status ≤ 0.065 (mean) or ≤ 0.140 (95%ile)	0.034 mg/L (mean) 0.034 mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤ 0.035 (mean) or ≤ 0.075 (95%ile)	0.0208 mg/L (mean) 0.0295 mg/L (95%ile)
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Total Chromium	8.1	< 1.0 µg/L
Copper (depending on water hardness)	30	< 1.0 µg/L
Zinc (depending on water hardness)	100	< 1.0 µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Lead and its compounds	7.2	20.0 µg/L
Nickel and its compounds	20	< 1.0 µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.25	< 1.0 µg/L

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# PREDICTED IMPACTS

## MASS BALANCE EQUATIONS FOR BOD:

### Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum BOD in Discharge.

Flow of River (95%ile) = 0.301m<sup>3</sup>/sec

Mean BOD in River (upstream) = 1.1mg/L

Max volume of discharge = 0.0037m<sup>3</sup>/sec

Max value for BOD in discharge = 15.0mg/L (Max from Online Tables)

$$C_{\text{final}} = \frac{(0.301 \times 1.1) + (0.0037 \times 15.0)}{(0.301 + 0.0037)}$$

$$C_{\text{final}} = 1.27\text{mg/l BOD}$$

This is within the 1.5 mg/L Mean and 2.6mg/L 95%ile EQS for BOD.

### Normal Scenario:

Normal Discharge, Median Flow in the River, Mean BOD in Discharge.

Flow of River (Median) = 1.122m<sup>3</sup>/sec

Mean BOD in River (upstream) = 1.1mg/L

Normal volume of discharge = 0.0013m<sup>3</sup>/sec

Mean value for BOD in discharge = 3.38mg/L (2008 Mean from Outlet Table E4)

$$C_{\text{final}} = \frac{(1.122 \times 1.1) + (0.0013 \times 3.38)}{(1.122 + 0.0013)}$$

$$C_{\text{final}} = 1.1\text{mg/l BOD}$$

This is within the 1.5 mg/L Mean and 2.6mg/L 95%ile EQS for BOD.

## MASS BALANCE EQUATIONS FOR AMMONIA:

### Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum Ammonia in Discharge.

Flow of River (95%ile) = 0.301m<sup>3</sup>/sec

Mean Ammonia in River (upstream) = 0.0505mg/L

Max volume of discharge = 0.0037m<sup>3</sup>/sec

Max value for Ammonia in discharge = 1.4mg/L (2008 Max from Outlet Table E4)

$$C_{\text{final}} = \frac{(0.301 \times 0.0505) + (0.0037 \times 1.4)}{(0.301 + 0.0037)}$$

$$C_{\text{final}} = 0.067\text{mg/l Ammonia}$$

This is in breach of the 0.065mg/L Mean EQS for Ammonia. However this is within the 0.14mg/L 95%ile EQS for Ammonia.

### Normal Scenario:

Normal Discharge, Median Flow in the River, Mean Ammonia in Discharge.

Flow of River (Median) = 1.122m<sup>3</sup>/sec

Mean Ammonia in River (upstream) = 0.0505mg/L  
Normal volume of discharge = 0.0013m3/sec  
Mean value for Ammonia in discharge = 0.582mg/L (2008 Mean from Outlet Table E4)

$$C_{\text{final}} = \frac{(1.122 \times 0.0505) + (0.0013 \times 0.582)}{(1.122 + 0.0013)}$$

$C_{\text{final}} = 0.051\text{mg/l}$  Ammonia

This is within the 0.065mg/L Mean and 0.14mg/L 95%ile EQS for Ammonia.

### **MASS BALANCE EQUATIONS FOR ORTHOPHOSPHATE:**

#### **Worst Case Scenario:**

Maximum Discharge, Low Flow in the River, Maximum Orthophosphate in Discharge.

Flow of River (95%ile) = 0.301m3/sec  
Mean Orthophosphate in River (upstream) = 0.0333mg/L  
Max volume of discharge = 0.0037m3/sec  
Max value for Orthophosphate in discharge = 2.0mg/L (Max from Online Tables)

$$C_{\text{final}} = \frac{(0.301 \times 0.0333) + (0.0037 \times 2.0)}{(0.301 + 0.0037)}$$

$C_{\text{final}} = 0.057\text{mg/l}$  Orthophosphate

This is in breach of the 0.035mg/L Mean EQS. However this is within the 0.075mg/L 95%ile EQS for Orthophosphate.

#### **Normal Scenario:**

Normal Discharge, Median Flow in the River, Mean Orthophosphate in Discharge.

Flow of River (Median) = 1.122m3/sec  
Mean Orthophosphate in River (upstream) = 0.0333mg/L  
Normal volume of discharge = 0.0013m3/sec  
Mean value for Orthophosphate in discharge = 0.211mg/L (2008 Mean from Outlet Table E4)

$$C_{\text{final}} = \frac{(1.122 \times 0.0333) + (0.0013 \times 0.211)}{(1.122 + 0.0013)}$$

$C_{\text{final}} = 0.034\text{mg/l}$  Orthophosphate

This is within the 0.035mg/L Mean and 0.075mg/L 95%ile EQS for Orthophosphate

## Attachment E4 Ladysbridge Inlet Table E4

Sample Date	27/11/2008	Average		
Sample	Influent	mg/L	Kg/day	kg/year
Sample Code	GS1284	mg/L	Kg/day	kg/year
Flow M <sup>3</sup> /Day	*	321	*	*
pH	7.5	7.5	*	*
Temperature °C	*	*	*	*
Cond 20°C	601	601	*	*
SS mg/L	131	131	88.425	32275.125
NH <sub>3</sub> mg/L	12.6	12.6	8.505	3104.325
BOD mg/L	65	65	43.875	16014.375
COD mg/L	291	291	196.425	71695.125
TN mg/L	27	27	18.225	6652.125
Nitrite mg/L	0.892	0.892	0.6021	219.7665
Nitrate mg/L	5.77	5.77	3.89475	1421.58375
TP mg/L	3.9	3.9	2.6325	960.8625
O-PO <sub>4</sub> -P mg/L	1.87	1.87	1.26225	460.72125
SO <sub>4</sub> mg/L	39.5	39.5	26.6625	9731.8125
Phenols µg/L	<0.10	<0.0001	<0.0000675	<0.0246375
Atrazine µg/L	<0.01	<0.00001	<0.00000675	<0.00246375
Dichloromethane µg/L	<1	<0.001	<0.000675	<0.246375
Simazine µg/L	<0.01	<0.00001	<0.00000675	<0.00246375
Toluene µg/L	<1	<0.001	<0.000675	<0.246375
Tributyltin µg/L	*	*	*	*
Xylenes µg/L	<1	<0.001	<0.000675	<0.246375
Arsenic µg/L	<0.96	<0.00096	<0.000648	<0.23652
Chromium mg/L	<0.02	<0.02	<0.0135	<4.9275
Copper mg/L	0.064	0.064	0.0432	15.768
Cyanide µg/L	<5	<0.005	<0.003375	<1.231875
Fluoride µg/L	70	0.07	0.04725	17.24625
Lead mg/L	<0.02	<0.02	<0.0135	<4.9275
Nickel mg/L	<0.02	<0.02	<0.0135	<4.9275
Zinc mg/L	0.045	0.045	0.030375	11.086875
Boron mg/L	<0.02	<0.02	<0.0135	<4.9275
Cadmium mg/L	<0.02	<0.02	<0.0135	<4.9275
Mercury µg/L	<0.2	<0.0002	<0.000135	<0.049275
Selenium µg/L	2.4	0.0024	0.00162	0.5913
Barium mg/L	0.024	0.024	0.0162	5.913

Maximum Flow

values recorded as 1/2 Of LOD for statistical purposes



### Attachment E4 Ladysbridge Discharge Outlet Table E4

Sample Date	17/01/2007	30/05/2007	04/07/2007	08/08/2007	17/10/2007	22/11/2007	03/04/2008	22/05/2008	10/07/2008	03/09/2008	09/10/2008	27/11/2008	Average		
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent			
Sample Code							GS273	GS441	GS646	GS831	GS1016	GS1283	mg/L	Kg/Day	Kg/year
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*	*	*	*	*	321	*	*
pH	7.3	7.4	7.4	7.5	7.6	7.2	*	7.5	*	7.9	7.6	7.4	7.6	*	*
Temperature °C	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Cond 20°C	*	*	*	*	*	*	508	539	472	516	*	570	521	*	*
SS mg/L	25	31	11	20	18	10	5	10	20	26	23	24	18	12.15	4434.75
NH <sub>3</sub> mg/L	*	*	<0.1	0.2	4	<0.1	<0.1	<0.1	<0.1	1.4	<0.1	0.1	0.582	0.39285	143.39025
BOD mg/L	45	22	1.1	5.3	4.86	2.54	1.32	3.34	5.55	4.34	2.41	3.3	3.3766667	2.27925	831.92625
COD mg/L	70	67	<21	<21	30	<21	<21	28	35	<21	<21	33	24.5	16.5375	6036.1875
TN mg/L	12	16.5	*	17.5	19.3	24.5	12.9	19.7	12.9	14	19	26	17.416667	11.75625	4291.03125
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*	*	0.0201	0.021	0.014175	5.173875
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*	*	*		0	0
TP mg/L	1.54	1.84	<0.2	0.73	*	0.38	0.26	0.53	0.73	0.9	4.3	1.1	1.3033333	0.87975	321.10875
O-PO <sub>4</sub> -P mg/L	*	*	<0.05	0.4	0.56	0.13	<0.05	0.19	0.08	0.11	0.22	0.37	0.211	0.142425	51.985125
SO <sub>4</sub> mg/L	*	*	98.1	<30	35.8	87.3	*	*	*	*	<30	67.5	53.12	35.856	13087.44
Phenols µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.10	<0.0001	<0.0000675	<0.0246375
Atrazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.00001	<0.00000675	<0.00246375
Dichloromethane µg/L	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.000675	<0.246375
Simazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.00001	<0.00000675	<0.00246375
Toluene µg/L	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.000675	<0.246375
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.000675	<0.246375
Arsenic µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.96	<0.00096	<0.000648	<0.23652
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	*	<0.02	*	<0.02	<0.02	<0.0135	<4.9275
Copper mg/L	*	*	<0.02	0.021	<0.02	0.029	<0.02	*	*	<0.02	*	<0.02	0.0167	0.0112725	4.1144625
Cyanide µg/L	*	*	*	*	*	*	*	*	*	*	*	<5	<0.005	<0.003375	<1.231875
Fluoride µg/L	*	*	*	*	*	*	*	*	*	*	*	73	0.073	0.049275	17.985375
Lead mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	*	<0.02	*	<0.02	<0.02	<0.0135	<4.9275
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	*	<0.02	*	<0.02	<0.02	<0.0135	<4.9275
Zinc mg/L	*	*	0.03	0.025	0.023	0.06	<0.02	*	*	<0.02	*	<0.02	<0.02	<0.0135	<4.9275
Boron mg/L	*	*	*	*	*	<0.02	<0.02	*	*	0.045	*	<0.02	0.0188	0.01269	4.63185
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	*	<0.02	*	<0.02	<0.02	<0.0135	<4.9275
Mercury µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.2	<0.0002	<0.000135	<0.049275
Selenium µg/L	*	*	*	*	*	*	*	*	*	*	*	2.3	0.0023	0.0015525	0.5666625
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	*	0.022	*	0.022	0.012	0.0081	2.9565

Maximum Flow

values recorded as 1/2 of LOD for statistical purposes



## Attachment E4 Ladysbridge Upstream Table E4

Sample Date	09/10/2008	27/11/2008	Average
Sample	River	River	
Sample Code	GS1017	GS1285	
Flow M <sup>3</sup> /Day	*	*	*
pH	*	7.7	7.7
Temperature °C	*	*	*
Cond 20°C	*	318	318
SS mg/L	*	<2.5	<2.5
NH <sub>3</sub> mg/L	*	<0.1	<0.1
BOD mg/L	*	1.1	1.1
COD mg/L	*	<21	<21
TN mg/L	*	9	9
Nitrite mg/L	*	0.0241	0.0241
Nitrate mg/L	*	6.77	6.77
TP mg/L	*	<0.20	<0.20
O-PO <sub>4</sub> -P mg/L	<0.05	<0.05	<0.05
SO <sub>4</sub> mg/L	*	<30	<30
Phenols µg/L	*	<0.10	<0.10
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	*	*	*
Xylenes µg/L	*	<1	<1
Arsenic µg/L	*	<0.96	<0.96
Chromium mg/L	*	<0.02	<0.02
Copper mg/L	*	<0.02	<0.02
Cyanide µg/L	*	<5	<5
Fluoride µg/L	*	41	41
Lead mg/L	*	0.025	0.025
Nickel mg/L	*	<0.02	<0.02
Zinc mg/L	*	<0.02	<0.02
Boron mg/L	*	<0.02	<0.02
Cadmium mg/L	*	<0.02	<0.02
Mercury µg/L	*	<0.2	<0.2
Selenium µg/L	*	1.6	1.6
Barium mg/L	*	0.029	0.029

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## Attachment E4 Ladysbridge Downstream Table E4

Sample Date	09/10/2008	27/11/2008	Average
Sample	River	River	
Sample Code	GS1018	GS1286	
Flow M <sup>3</sup> /Day	*	*	*
pH	*	7.7	7.7
Temperature °C	*	*	*
Cond 20°C	*	403	403
SS mg/L	*	<2.5	<2.5
NH <sub>3</sub> mg/L	*	<0.1	<0.1
BOD mg/L	*	1.2	1.2
COD mg/L	*	<21	<21
TN mg/L	*	15	15
Nitrite mg/L	*	0.0238	0.0238
Nitrate mg/L	*	7	7
TP mg/L	*	<0.20	<0.20
O-PO <sub>4</sub> -P mg/L	<0.05	<0.05	<0.05
SO <sub>4</sub> mg/L	*	<30	<30
Phenols µg/L	*	<0.10	<0.10
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	*	*	*
Xylenes µg/L	*	<1	<1
Arsenic µg/L	*	<0.96	<0.96
Chromium mg/L	*	<0.02	<0.02
Copper mg/L	*	<0.02	<0.02
Cyanide µg/L	*	<5	<5
Fluoride µg/L	*	37	37
Lead mg/L	*	0.02	0.02
Nickel mg/L	*	<0.02	<0.02
Zinc mg/L	*	<0.02	<0.02
Boron mg/L	*	<0.02	<0.02
Cadmium mg/L	*	<0.02	<0.02
Mercury µg/L	*	<0.2	<0.2
Selenium µg/L	*	1.5	1.5
Barium mg/L	*	0.027	0.027

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Parameter	Temperature	Dissolved O <sub>2</sub>	Nitrite	Molybdate	Ammonium	Appearance	Dissolved O <sub>2</sub>
		O <sub>2</sub>	NO <sub>2</sub>	P	NH <sub>4</sub>		
Max.	--	15	0.05	Varies	Varies	--	150
Target	--	--	--	--	--	--	--
Min.	--	5	--	--	--	--	50

Project	Project Ref	Location	Location R	Location E	Location N	Sample Template	Sample Ref	Sample Date	Sample Time	Comments	Degrees C	mg/l	mg/l	mg/l	mg/l	Descriptive	% O <sub>2</sub>
Womanagh		Br Castlemartyr	19W01100	196422	73207	Phosphate Regs	2008/1125	04-Jun-08	12:00			<b>0.22</b>	<b>0.117</b>	0.252			
Womanagh		Br Castlemartyr	19W01100	196422	73207	Phosphate Regs	2008/1340	02-Jul-08	12:30		22.3	12.5	<b>0.086</b>	<b>0.088</b>	0.098	clear	121
Womanagh		Br Castlemartyr	19W01100	196422	73207	Phosphate Regs	2008/2095	03-Sep-08	12:15		12.2	11.8	<b>0.062</b>	<b>0.056</b>	0.17		111
Womanagh		Br Castlemartyr	19W01100	196422	73207	Phosphate Regs	2008/2501	01-Oct-08	10:55		11.5	10.2	0.035	<b>0.033</b>	0.07	clear	95
Womanagh		Br Castlemartyr	19W01100	196422	73207	WFD Operational	2008/2962	05-Nov-08	11:45		94	10.1	0.024	0.026	0.03		95
Womanagh		Br Castlemartyr	19W01100	196422	73207	Phosphate Regs	2008/3368	10-Dec-08	11:50		5.8	12.8	0.043	<b>0.046</b>	0.037		100
										Sample Coun	5	5	6	6	6	-	5
										Maximum	94	12.8	0.22	0.117	0.252	-	121
										Minimum	5.8	10.1	0.024	0.026	0.03	-	95
										Mean	29.2	11.5	0.078	0.061	0.11	-	104
										Median	12.2	11.8	0.052	0.051	0.084	-	100
										Std. Deviator	36.7	1.27	0.073	0.035	0.086	-	11.4
Womanagh		Br. in Ladysbridge				WFD Operational	2008/2961	05-Nov-08	11:25		9.1	10.1	<b>0.082</b>	<b>0.063</b>	0.248	good	88
Womanagh		Br. in Ladysbridge				Phosphate Regs	2008/3367	10-Dec-08	12:00		5.8	11.4	<b>0.08</b>	<b>0.04</b>	0.149		90
										Sample Coun	2	2	2	2	2	-	2
										Maximum	9.1	11.4	0.082	0.063	0.248	-	90
										Minimum	5.8	10.1	0.08	0.04	0.149	-	88
										Meag.	7.45	10.8	0.081	0.052	0.198	-	89
										Median	7.45	10.8	0.081	0.052	0.198	-	89
										Std. Deviator	2.33	0.922	0.001	0.016	0.07	-	1.41

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**D0328-01 Attachment E4 Tabulation of monitoring results for compliance purposes against SI 272 of 2009 for comparison purposes where results are below LOD for analytical method**

Sample Date	09/10/2008	27/11/2008	Average	95% percentile
Sample	Upstream River	Upstream River		
Sample Code	GS1017	GS1285		
NH <sub>3</sub> mg/L	*	0.0505	<b>0.0505</b>	<b>0.0505</b>
O-PO <sub>4</sub> -P mg/L	0.0325	0.034	<b>0.03325</b>	<b>0.033925</b>
Chromium ug/L	*	<1	<1	n/a
Copper ug/L	*	<1	<1	n/a
Lead ug/L	*	25	<b>25</b>	n/a
Nickel ug/L	*	<1	<1	n/a
Zinc ug/L	*	<1	<1	n/a
Boron ug/L	*	<1	<1	n/a
Cadmium ug/L	*	<1	<1	n/a
Barium ug/L	*	29	<b>29</b>	n/a

Sample Date	09/10/2008	27/11/2008	Average	95% percentile
Sample	Downstream River	Downstream River		
Sample Code	GS1018	GS1286		
NH <sub>3</sub> mg/L	*	0.034	<b>0.034</b>	<b>0.034</b>
O-PO <sub>4</sub> -P mg/L	0.011	0.0305	<b>0.02075</b>	<b>0.029525</b>
Chromium ug/L	*	<1	<1	n/a
Copper ug/L	*	<1	<1	n/a
Lead ug/L	*	20	<b>20</b>	n/a
Nickel ug/L	*	<1	<1	n/a
Zinc ug/L	*	<1	<1	n/a
Boron ug/L	*	<1	<1	n/a
Cadmium ug/L	*	<1	<1	n/a
Barium ug/L	*	27.0	<b>27</b>	n/a

<1 Note values of 0ug/l recorded as <1ug/l