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

24th September 2010

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

Register No. D0427-01 Coachford Agglomeration

I refer to the above and to a letter received from the Agency dated 31st May 2010 requiring further information in accordance with Regulation 18(3)(b) of the regulations.

I enclose a submission to the Agency in response to the matters raised in said letter.

This information is supplied in the form of one original plus one copy and a CD-ROM of the information in electronic searchable PDF format as requested.

Yours Sincerely,

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

Coachford Flow Chart – D0427-01

Is the development in a nature conservation site - **No**

Is the development in the surface water catchement of a nature conservation site (or part of such a site – **Yes**

Are the qualifying habitats and species of the site water dependent – **Yes**

Is there a WFD sub basin plan for the site or its protected habitats /species - **Yes**

Does the plan cover all potential receptors (habitats /species) – **No**

Assess Impacts

Question 1: Assess the likelihood of significant effects of the waste water discharge on the relevant European sites.

Habitats Directive Assessment (Screening Report) in respect of

Application by Cork County Council to the EPA

for Wastewater Discharge License

for Coachford Septic Tank.

Licence Register Number D0427-01

September, 2010

1 Introduction

1.1 Coachford is a village located approximately 15 miles from Cork City and 9 miles from Macroom. It is located North of the River Lee on the R618. Coachford Septic tank is located in the town land of Clontead Beg within a Cork County Council storage yard. The Septic tank was constructed in the 1950's and provides primary treatment only which according to the National Urban Waste Water Study (NUWWS) reduces the BOD load by approximately 30% and the Suspended Solids load by approximately 50%. It has been determined by using a formula obtained from BS6297:1983 that the septic tank can sufficiently cater for a population of 402 persons. The actual PE currently entering the existing treatment plant is approximately 726.

At present the effluent enters the plant by gravity from 2 separate directions. The effluent combines in the inlet channel and then separates into 2 concrete channels and enters the septic tank. There are two chambers within the septic tank of equal size. The treated effluent discharges from each chamber of the septic tank into an open channel. The open channel discharges into a closed outfall pipe of diameter 225mm. The treated effluent flows from the open channel to the outfall, a distance of approximately 1.4km. The treated effluent discharges to the River Lee in the town land of Nadrid. The area was flooded in 1957 as part of the River Lee Hydro-electricity Scheme and the outfall pipe is no longer visible. The River Lee flows Easterly for approximately 32 Km before flowing into the Cork Harbour.

1.2 The plant is located approx. 32km upstream from the Cork Harbour Special Protection Area which is designated 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 discharge from Coachford Septic Tank on the adjacent Cork Harbour Special Protection Area 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	Coachford Septic Tank, Clontead Beg, Coachford, County Cork.
Description of the key components of the project	The Septic tank was constructed in the 1950's. The septic tank provides primary treatment only which according to the National Urban Waste Water Study (NUWWS) reduces the BOD load by approximately 30% and the Suspended Solids load by approximately 50%. On average approx. 131cu.m./day of effluent is discharged to the River Lee.
Distance from designated sites in potential impact zone*	Approx. 32 Km distance from the Discharge point to the Cork Harbour SPA.

2.2 Description of the Natura 2000 sites within the potential impact zone[1]	
Name	Cork Harbour Special Protection Area
Site Code	4130
Site Description	The Cork Harbour SPA is an estuarine complex which is primarily comprised of intertidal habitats, mainly mudflats as well as some other coastal and marine habitats. These habitats support very high numbers of wintering waterfowl that feed on the macro invertebrates inhabiting the mudflats. The Harbour regularly supports in excess of 20,000 wintering birds, making it an internationally important site and the fifth most important wintering waterfowl site in the country. Discharges from the Coachford Septic Tank enter the River Lee 32 Km upstream from the Cork Harbour SPA. The River Lee meets the Cork Harbour SPA at the North Western end of the Lough Mahon estuary where the main habitats of importance are intertidal mudflats. More information on the Cork Harbour SPA is contained appendix 1 of this document. Bird count data is provided in appendix 3.
Qualifying Interests of Cork Harbour SPA.	Internationally important numbers of Black-tailed Godwit and Redshank; Nationally important numbers of Cormorant, Shelduck, Oystercatcher, Golden Plover, Lapwing, Dunlin

[1] 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.

	and Curlew; 20,000 wintering water birds. *Source - National Parks and Wildlife Service* See appendix 3 for bird count data for Cork Harbour 1998/2000 – 2007/2008.
Other Notable Features of Cork Harbour SPA	Little Grebe, Great-crested Grebe, Grey Heron, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Grey Plover, Black-headed Gull, Common Gull, Lesser Black-backed Gull, wetland and water birds. Source - *National Parks and Wildlife Service* See appendix 3 for bird count data for Cork Harbour 1998/2000 – 2007/2008.
Conservation Objectives	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. To ensure for the qualifying species and species of special conservation interest that the following are maintained in the long-term. ○ the population of the species as a viable component of the site; ○ the distribution and extent of habitats supporting the species; ○ the structure, function and supporting processes of habitats supporting the species; *Source – National Parks and Wildlife Service*

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.	**Discharge from Coachford Septic Tank:** The treated effluent discharges from the septic tank into the River Lee in the town land of Nadrid. The River Lee enters the Cork Harbour SPA approx 32 km from the point of discharge. The discharge consists primarily of treated effluent from the Septic Tank but can also include untreated overflows in times of heavy rain. **Other Significant Discharges to the River Lee between Cork Harbour SPA and Coachford Septic Tank:** Treated Wastewater from the Ballincollig agglomeration discharges to the river Lee approx 13Km upstream of the Cork Harbour SPA. It should be noted that this facility has a Waste Water Discharge Licence (D0043-01). Treated Wastewater from the Blarney agglomeration discharges approx 19Km upstream of the Cork Harbour SPA

	to the river Shournagh which combines with the River Lee. It should be noted that this facility has a Waste Water Discharge Licence (D0049-01). Treated Wastewater from Dripsey village discharges approx 27Km upstream of the Cork Harbour SPA to the river Dripsey which combines to the River Lee. Treated Wastewater from Killeens discharges approx 24Km upstream of the Cork Harbour SPA to the river Blarney which flows to the River Lee.
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: ○ Size and scale ○ Land-take ○ Distance from the Natura 2000 site or key features of the site: ○ Resource requirements (water abstraction etc.) ○ Emissions (disposal to land, water or air) ○ Excavation Requirements ○ Transportation Requirements ○ Duration of construction, operation, decommissioning ○ Other.	Discharges could give rise to elevated nutrients entering the Western portion of Cork Harbour. 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. Increased nutrient levels may also result in increasing the invertebrate populations in the estuary, thereby increasing bird population levels. However the potential for the Septic Tank discharge to result in elevated nutrients within the harbour is reduced by the following factors: 1. The discharge from the Septic Tank enters the River Lee at a distance of 32km upstream from Cork Harbour SPA and from the monitoring data available there is no deterioration in water quality in the River Lee from the discharge. 2. The River Lee enters the Cork Harbour SPA at the North Western end of Lough Mahon which is a large and well exchanged body of water with unlimited dilution capacity. **1 No deterioration in water quality in the River Lee** The effluent enters the River Lee which has a large dilution capacity at a distance of 32km upstream from the Cork Harbour SPA. According to the upstream and downstream monitoring already carried out as part of the WWDL application process, there is no deterioration in water quality associated with the Coachford Septic Tank discharge. It should also be noted that at Leemount Cross a point further downstream of the discharge the Q value is 4-5 (Unpolluted) and that the lake quality around the discharge location is moderately eutrophic. See appendix 2 for effluent quality results for 2008 and 2009. **2 Treated effluent discharges into Harbour body** The treated effluent enters the Cork Harbour SPA at the North Western End of the Lough Mahon Estuary which is a large and well exchanged body of water with unlimited dilution capacity. The endless dilution capability of the harbour body of water means that the discharge is properly diluted once within the SPA

Describe any likely changes to the site arising as a result of: ○ Reduction in habitat area ○ Disturbance to key species ○ Habitat or species fragmentation ○ Reduction in species density ○ Changes in key indicators of conservation value (water quality etc) ○ Climate Change	**Reduction in habitat area:** Effluent 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 habitats within the Cork Harbour arising from the operation of this facility. **Disturbance to key species:** The operation of the Septic Tank does not cause any disturbance to species within the SPA. **Habitat or species fragmentation:** No habitat fragmentation has been caused as a result of the operation of this facility. **Reduction in species density:** Effluent 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 SPA is designated. **Changes in key indicators of conservation value e.g. water quality:** Monitoring of the River Lee water quality indicates that there is no deterioration in water quality associated with the Coachford discharge. This is confirmed by the EQS comparison tables attached. It should also be noted that at Leemount Cross a point further downstream of the discharge the Q value is 4-5 (Unpolluted) and that the lake quality around the discharge location is moderately eutrophic.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: ○ Interference with the key relationships that define the structure of the site ○ Interference with key relationships that define the function of the site	**Interference with the key relationships that define the structure of the site:** The structure of the SPA is not impacted by the operation of this facility. **Interference with key relationships that define the function of the site:** The function of the SPA is not impacted by the operation of this facility.
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
Cork Harbour Special Protection Area

Name of project or plan	Coachford Septic Tank discharge.
Name and location of Natura 2000 site	Cork Harbour Special Protection Area
Description of the project or plan	The Septic tank was constructed in the 1950's. The septic tank provides primary treatment only which according to the National Urban Waste Water Study (NUWWS) reduces the BOD load by approximately 30% and the Suspended Solids load by approximately 50%. The actual PE currently entering the existing treatment plant is approximately 726. The treated effluent discharges to the River Lee approx 32Km upstream of Cork Harbour SPA. On average approx 131cu.m./day is discharged to the River.
Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No
The assessment of significance of effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 Site.	Discharges from the Coachford Septic Tank either alone or in combination with discharges from other sources could give rise to elevated nutrients entering the Western portion of Cork Harbour. 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. Increased nutrient levels may also result in increasing the invertebrate populations in the estuary, thereby increasing bird population levels. Effluent discharged from Saleen Septic tank or from the discharge points from the Whitegate/Aghada agglomeration may be having a negative impact on the Cork Harbour SPA, it is considered that the discharge from Coachford Septic Tank is not contributing to this impact. because of its distance from Cork Harbour SPA and because of the large dilution capacity of the River Lee.
Explain why these effects are not considered significant.	Treated effluent discharges to the River Lee 32Km upstream of the SPA and the river discharges 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 SPA is designated.
List of agencies consulted: provide contact name and telephone or email address	National Parks and Wildlife Service - Natureconservation@environ.ie, cyril.saich@environ.ie Birdwatch Ireland – Data request.
Response to consultation	Draft Conservation Objectives and a copy of Intention to Designate Cork Harbour as SPA was received previously from

	the NPWS. Bird count data was received previously from Birdwatch Ireland.

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**
Tim O'Farrell, Madeleine Healy and Sharon Casey, Cork County Council	IWebs Bird Data supplied by BirdWatch Ireland; Water Quality Monitoring Data CCC;	Desktop review of cited data.	This report.

Question 2: Review of the Impact of the Discharge in relation to the requirements of the Environmental Quality Objectives.

Coachford
Licence Register Number D0427-01

Provide a comparison of the predicted receiving water concentrations (based on the waste water treatment plant discharging at maximum average concentration) with the values included in the European Communities Environmental Objectives (Surface Waters) Regulations. 2009 SI No 272/2009.

The River Lee 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 2009 at aSW01u and aSW01d 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 results based on averages that include assumed figures. Therefore additional upstream and downstream tables with 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.

UPSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2009 upstream ambient sampling results at aSW01u***
Oxygenation conditions Table 9	***River water body***	***Ambient sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	<1.0mg/L (mean) <1.0mg/L (95%ile)
Acidification Status Table 9	***River Water Body***	***Ambient sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.3
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
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)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
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)	5	<20.0µg/L
Cyanide	10	<5.0µg/L
Flouride	500	38.0µg/L
Zinc (depending on water hardness)	50	<20.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
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
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<20.0µg/L
Mercury and its compounds	0.05	<0.2 µg/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 River Lee is 59mg$CaCO_3$/L

UPSTREAM COMPARISON TABLE
(ANALYSIS BELOW LIMIT OF DETECTION)

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2009 upstream ambient sampling results at aSW01u***
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	0.0375mg/L (mean) 0.0375mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	0.00925mg/L (mean) 0.0144mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Total Chromium	8.1	<1.0µg/L
Copper (depending on water hardness)	5	<1.0µg/L
Zinc (depending on water hardness)	50	<1.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	<1.0µg/L
Nickel and its compounds	20	<1.0µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<1.0µg/L

DOWNSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2009 Downstream ambient sampling results at aSW01d***
Oxygenation conditions Table 9	***River water body***	***Ambient sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	<1.0mg/L (mean) <1.0mg/L (95%ile)
Acidification Status Table 9	***River Water Body***	***Ambient sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.2
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
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)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<20µg/L Chromium
Copper (depending on water hardness)	5	<20µg/L
Cyanide	10	<5µg/L
Flouride	500	<33µg/L
Zinc (depending on water hardness)	50	<20µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	<20µg/L
Nickel and its compounds	20	<20µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<20µg/L
Mercury and its compounds	0.05	<0.2 µg/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 River Lee is 59mg $CaCO_3$/L

DOWNSTREAM COMPARISON TABLE
(ACTUAL METAL RESULTS)

Physico-chemical conditions	***Ecological quality ratio/standard***	***2009 Downstream ambient sampling results at aSW01d***
	Good boundary	
	Rivers (All Types)	
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Total Chromium	8.1	<1.0µg/L
Copper (depending on water hardness)	5	<1.0µg/L
Zinc (depending on water hardness)	50	<1.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	2.5µg/L
Nickel and its compounds	20	<1.0µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<1.0µg/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 River Lee is 59mg $CaCO_3$/L

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) = 2.704m3/sec
Mean BOD in River (upstream) = 0.5mg/L (Half of LOD for Calculation Purposes)
Max volume of discharge = 0.0062m3/sec
Max value for BOD in discharge = 210mg/L

$$C_{final} = \frac{(2.704 \times 0.5) + (0.0062 \times 210)}{(2.704 + 0.0062)}$$

C_{final} = 0.98mg/l BOD

This is within the 1.5mg/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) = 20.248m3/sec
Mean BOD in River (upstream) = 0.5mg/L (Half of LOD for Calculation Purposes)
Normal volume of discharge = 0.0021m3/sec
Mean value for BOD in discharge = 60.3mg/L

$$C_{final} = \frac{(20.248 \times 0.5) + (0.0021 \times 60.3)}{(20.248 + 0.0021)}$$

C_{final} = 0.51mg/l BOD

This is within the 1.5mg/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) = 2.704m3/sec
Mean Ammonia in River (upstream) = 0.05mg/L (Half of LOD for Calculation Purposes)
Max volume of discharge = 0.0062m3/sec
Max value for Ammonia in discharge = 25mg/L

$$C_{final} = \frac{(2.704 \times 0.05) + (0.0062 \times 25)}{(2.704 + 0.0062)}$$

C_{final} = 0.107mg/l Ammonia

This is in breach of the 0.065mg/L mean EQS for Ammonia but 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) = 20.248m3/sec
Mean Ammonia in River (upstream) = 0.05mg/L (Half of LOD for Calculation Purposes)
Normal volume of discharge = 0.0021m3/sec
Mean value for Ammonia in discharge = 8.23mg/L

$$C_{final} = \frac{(20.248 \times 0.05) + (0.0021 \times 8.23)}{(20.248 + 0.0021)}$$

C_{final} = 0.051mg/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) = 2.704m3/sec
Mean Orthophosphate in River (upstream) = 0.025mg/L (Half of LOD for Calculation Purposes)
Max volume of discharge = 0.0062m3/sec
Max value for Orthophosphate in discharge = 10mg/L

$$C_{final} = \frac{(2.704 \times 0.025) + (0.0062 \times 10)}{(2.704 + 0.0062)}$$

C_{final} = 0.048mg/l Orthophosphate

This is in breach of the 0.035mg/L mean EQS for Orthophosphate but 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) = 20.248m3/sec
Mean Orthophosphate in River (upstream) = 0.025mg/L (Half of LOD for Calculation Purposes)
Normal volume of discharge = 0.0021m3/sec
Mean value for Orthophosphate in discharge = 1.175mg/L

$$C_{final} = \frac{(20.248 \times 0.025) + (0.0021 \times 1.175)}{(20.248 + 0.0021)}$$

C_{final} = 0.025mg/l Orthophosphate

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

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas and Owenacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas Estuary, inner Lough Mahon, Lough Beg, Whitegate Bay and the Rostellan inlet.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Salt marsh species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Lax-flowered Sea-lavender (*Limonium humile*) and Sea Arrowgrass (*Triglochin maritima*). Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre. Rostellan lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. The five-year average annual core count for the entire harbour complex was 34,661 for the period 1996/97-2000/01. Of particular note is that the site supports an internationally important population of Redshank (1,614) - all figures given are average winter means for the 5 winters 1995/96-1999/00. A further 15 species have populations of national importance, as follows: Great Crested Grebe (218), Cormorant (620), Shelduck (1,426), Wigeon (1,750), Gadwall (15), Teal (807), Pintail (84), Shoveler (135), Red-breasted Merganser (90), Oystercatcher (791), Lapwing (3,614), Dunlin (4,936), Black-tailed Godwit (412), Curlew (1,345) and Greenshank (36). The Shelduck population is the largest in the country (9.6% of national total), while those of Shoveler (4.5% of total) and Pintail (4.2% of total) are also very substantial. The site has regionally or locally important populations of a range of other species, including Whooper Swan (10), Pochard (145), Golden Plover (805), Grey Plover (66) and Turnstone (99). Other species using the site include Bat-tailed Godwit (45), Mallard (456), Tufted Duck (97), Goldeneye (15), Coot (77), Mute Swan (39), Ringed Plover (51), Knot (31), Little Grebe (68) and Grey Heron (47). Cork Harbour is an important

site for gulls in winter and autumn, especially Common Gull (2,630) and Lesser Black-backed Gull (261); Black-headed Gull (948) also occurs.

A range of passage waders occur regularly in autumn, including Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

The wintering birds in Cork Harbour have been monitored since the 1970s and are counted annually as part of the I-WeBS scheme.

Cork Harbour has a nationally important breeding colony of Common Tern (3-year mean of 69 pairs for the period 1998-2000, with a maximum of 102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Extensive areas of estuarine habitat have been reclaimed since about the 1950s for industrial, port-related and road projects, and further reclamation remains a threat. As Cork Harbour is adjacent to a major urban centre and a major industrial centre, water quality is variable, with the estuary of the River Lee and parts of the Inner Harbour being somewhat eutrophic. However, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Cork Harbour is a general threat. Recreational activities are high in some areas of the harbour, including jet skiing which causes disturbance to roosting birds.

Cork Harbour has is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its population of Redshank. In addition, there are at least 15 wintering species that have populations of national importance, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover, Bar-tailed Godwit, Ruff and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it.

4.7.2004

Attachment E4 Coachford Inlet Table E4

Sample Date	28/01/2009	
Sample	Influent	Average
Sample Code	GT147	
Flow M^3/Day	*	*
pH	6.9	7.9
Temperature ℃	*	*
Cond 20℃	328	328
SS mg/L	13	13
NH_3 mg/L	4.3	4.3
BOD mg/L	27	27
COD mg/L	42	42
TN mg/L	12.4	12.4
Nitrite mg/L	0.0527	0.0527
Nitrate mg/L	9.5	9.5
TP mg/L	3	3
O-PO4-P mg/L	0.36	0.36
SO4 mg/L	<30	<31
Phenols µg/L	<0.10	<0.10
Atrazine µg/L	<0.01	<0.01
Dichloromethane µg/L	<1	<2
Simazine µg/L	<0.01	<0.02
Toluene µg/L	<1	<2
Tributyltin µg/L	not required	not required
Xylenes µg/L	<1	<2
Arsenic µg/L	<0.96	<0.97
Chromium ug/L	<20	<20
Copper ug/L	<20	<20
Cyanide µg/L	<5	<5
Fluoride µg/L	31	32
Lead ug/L	<20	<20
Nickel ug/L	<20	<20
Zinc ug/L	<20	<20
Boron ug/L	<20	<20
Cadmium ug/L	<20	<20
Mercury µg/L	2	2
Selenium µg/L	1.4	1.4
Barium ug/L	62	62

Attachment E4 Coachford Discharge Outlet Table E4

Sample Date	07/02/2008	19/06/2008	10/07/2008	03/09/2008	09/10/2008	16/10/2008	22/01/2009	28/01/2009	12/02/2009	02/04/2009	06/05/2009	
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Average
Sample Code	GS059	GS576	GS631	GS846	GS1035	GS1091	GT070	GT146	GT199	GT440	GT621	
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	
pH	6.9	7.3	*	7.3	*	7	6.7	6.8	*	7.4	7.3	7.0875
Temperature ℃	*	*	*	*	*	*	*	*	*	*	*	
Cond 20℃	*	587	449	345	*	*	*	335	*	*	480	439.2
SS mg/L	15	69	63	103	46	33	18	17	57	71	35	47.90909
NH_3 mg/L	5.1		10.8	12.9	*	14.3	1.4	4.9	*	*	*	8.233333
BOD mg/L	29.05	127	40	83	1.3	57	22	30	67	135	72	60.30455
COD mg/L	60	336	133	191	324	99	40	55	108	310	125	161.9091
TN mg/L	40	*	16.9	28	*	*	11.2	12.1	16	56.7	*	25.84286
Nitrite mg/L	*	*	*	*	*	*	*	0.077	*	*	*	0.077
Nitrate mg/L	*	*	*	*	*	*	*	9.42	*	*	*	9.42
TP mg/L	0.8	4.5	2.3	2.3	*	*	1.9	3.3	1.6	4.2	*	2.6125
O-PO4-P mg/L	0.43	2.74	<0.05	*	*	1.14	*	0.39	*	*	*	1.175
SO4 mg/L	<30	*	*	*	*	*	<30	<30	*	*	*	<30
Phenols µg/L	*	*	*	*	*	*	*	<0.10	*	*	*	<0.10
Atrazine µg/L	*	*	*	*	*	*	*	<0.01	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	*	<1	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	*	<0.01	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	*	<1	*	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*	not required	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	<1	*	*	*	<1
Arsenic µg/L	*	*	*	*	*	*	*	<0.96	*	*	*	<0.96
Chromium ug/L	<20	<20	<20	<20	*	*	<20	<20	<20	*	*	<20
Copper ug/L	10	10	50	10	*	*	10	10	10	*	*	15.71429
Cyanide µg/L	*	*	*	*	*	*	*	<5	*	*	*	<5
Fluoride µg/L	*	*	*	*	*	*	*	31	*	*	*	31
Lead ug/L	25	61	10	10	*	*	10	10	10	*	*	19.42857
Nickel ug/L	<20	<20	<20	<20	*	*	<20	<20	<20	*	*	<20
Zinc ug/L	10	45	43	10	*	*	10	10	307	*	*	62.14286
Boron ug/L	10	444	132	10	*	*	46	10	10	*	*	94.57143
Cadmium ug/L	<20	<20	<20	<20	*	*	<20	<20	<20	*	*	<20
Mercury µg/L	*	*	*	*	*	*	*	<0.2	*	*	*	<0.2
Selenium µg/L	*	*	*	*	*	*	*	2.5	*	*	*	2.5
Barium ug/L	61	115	144	67	*	*	74	65	77	*	*	86.14286

1/2 LOD for statistical purposes

Attachment E4 Coachford Upstream Table E4

Sample Date	28/01/2009	02/04/2009	
Sample	River	River	Average
Sample Code	GT148	GT441	
Flow M^3/Day	*	*	*
pH	7.3	*	7.3
Temperature ℃	*	*	*
Cond 20℃	114	*	114
SS mg/L	<2.5	*	<2.5
NH_3 mg/L	<0.1	*	<0.1
BOD mg/L	<1	*	<1
COD mg/L	<21	*	<21
TN mg/L	1.6	*	1.6
Nitrite mg/L	0.00478	*	0.00478
Nitrate mg/L	1.4	*	1.4
TP mg/L	<0.20	*	<0.20
O-PO4-P mg/L	<0.05	<0.05	<0.05
SO4 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	not required	not required	not required
Xylenes µg/L	<1	*	<1
Arsenic µg/L	<0.96	*	<0.96
Chromium ug/L	<20	<20	<20
Copper ug/L	<20	<20	<20
Cyanide µg/L	<5	*	<5
Fluoride µg/L	38	*	38
Lead ug/L	<20	<20	<20
Nickel ug/L	<20	<20	<20
Zinc ug/L	<20	<20	<20
Boron ug/L	<20	<20	<20
Cadmium ug/L	<20	<20	<20
Mercury µg/L	<0.2	*	<0.2
Selenium µg/L	1	*	1
Barium ug/L	62	75.7	68.85

Attachment E4 Coachford Downstream Table E4

Sample Date	28/01/2009	02/04/2009	
Sample	River	River	Average
Sample Code	GT149	GT442	
Flow M^3/Day	*	*	*
pH	7.2	*	7.2
Temperature ℃	*	*	*
Cond 20℃	116	*	116
SS mg/L	<2.5	*	<2.5
NH_3 mg/L	<0.1	*	<0.1
BOD mg/L	<1	*	<1
COD mg/L	<21	*	<21
TN mg/L	1.8	*	1.8
Nitrite mg/L	0.00502	*	0.00502
Nitrate mg/L	1.64	*	1.64
TP mg/L	<0.20	*	<0.20
O-PO4-P mg/L	<0.05	<0.5	<0.05
SO4 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	not required	not required	not required
Xylenes µg/L	<1	*	<1
Arsenic µg/L	<0.96	*	<0.96
Chromium ug/L	<20	<20	<20
Copper ug/L	<20	<20	<20
Cyanide µg/L	<5	*	<5
Fluoride µg/L	33	*	33
Lead ug/L	<20	<20	<20
Nickel ug/L	<20	<20	<20
Zinc ug/L	<20	<20	<20
Boron ug/L	<20	<20	<20
Cadmium ug/L	<20	<20	<20
Mercury µg/L	<0.2	*	<0.2
Selenium µg/L	0.8	*	0.8
Barium ug/L	62	<20	62

D0427-01 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	28/01/2009	02/04/2009	Average	95% percentile
Sample	Upstream River	Upstream River		
Sample Code	GT148	GT441		
NH_3 mg/L	0.0375	*	**0.0375**	**0.0375**
O-PO4-P mg/L	0.015	0.0035	**0.00925**	**0.014425**
Chromium ug/L	<1	<1	**<1**	**n/a**
Copper ug/L	<1	<1	**<1**	**n/a**
Lead ug/L	<1	<1	**<1**	**n/a**
Nickel ug/L	<1	<1	**<1**	**n/a**
Zinc ug/L	<1	<1	**<1**	**n/a**
Boron ug/L	<1	<1	**<1**	**n/a**
Cadmium ug/L	<1	<1	**<1**	**n/a**
Barium ug/L	62	75.7	**68.85**	**n/a**

Sample Date	28/01/2009	02/04/2009	Average	95% percentile
Sample	Downstream River	Downstream River		
Sample Code	GT149	GT442		
NH_3 mg/L	0.043	*	**0.043**	**0.043**
O-PO4-P mg/L	0.016	0.004	**0.01**	**0.0154**
Chromium ug/L	<1	<1	**<1**	**n/a**
Copper ug/L	<1	<1	**<1**	**n/a**
Lead ug/L	4	<1	**2.5**	**n/a**
Nickel ug/L	<1	<1	**<1**	**n/a**
Zinc ug/L	<1	<1	**<1**	**n/a**
Boron ug/L	4	<1	**2.5**	**n/a**
Cadmium ug/L	<1	<1	**<1**	**n/a**
Barium ug/L	62	<1	**31.5**	**n/a**

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

I-WeBS

Cork Harbour

Species	1% National	1% International	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Mean (03-07)	Peak (03-07)
Mute Swan	110	110	46	42	25	15	42	56	71	54	73	68	64	73
Bewick's Swan	20	200	6					2					0	2
Whooper Swan	130	210			12	14	12	15	7			3	5	15
Black Swan			3								2		0	2
Pink-footed Goose		2,250			1							2	0	2
Greenland White-fronted Goose	110	270			1								0	0
Greylag Goose	50	870			3	4	4	1	1	3	1	6	2	6
Canada Goose			10	6	13	8	2	21	23	11	13	22	18	23
Light-bellied Brent Goose	220	260			4		6	12	16	26	11	17	16	26
Feral/hybrid Goose									2			5	1	5
Shelduck	150	3,000	1,875	1,870	722	1,108	1,903	1,946	1,391	1,350	918	823	1,286	1,946
Wigeon	820	15,000	1,683	1,402	1,272	1,519	1,931	2,926	2,043	2,332	1,492	1,259	2,010	2,926
Gadwall	20	600	4		6	8	67	17	13	13	7		10	17
Green-winged Teal					1	1							0	0
Teal	450	5,000	778	1,214	1,139	1,079	1,492	1,611	1,169	1,302	667	644	1,079	1,611
Mallard	380	20,000	671	572	431	362	489	539	628	406	423	484	496	628
Pintail	20	600	52	41	2	74	73	46	20	14	2		16	46
Shoveler	25	400	103	148	74	48	103	33	24	45	62	51	43	62
Red Crested Pochard			1										0	0
Pochard	380	3,500	38	11	19	21	27	18	7	7	2	3	7	18
Ring-necked Duck							1						0	0
Tufted Duck	370	12,000	34	20	46	36	29	33	14	14	19	16	19	33
Scaup	45	3,100	2							2			0	2
Long-tailed Duck		20,000					2						0	0
Eider	30	12,830						1		15	1		3	15
Common Scoter	230	16,000		2			1	1	3	7		1	2	7
Surf Scoter			2										0	0
Velvet Scoter												3	1	3
Goldeneye	95	11,500	18	14	18	28	11	14	7	10	5	14	10	14
Red-breasted Merganser	35	1,700	110	128	64	77	95	88	85	80	68	72	79	88
Red-throated Diver	20	3,000								1	1		0	1
Black-throated Diver		3,750											0	0
Great Northern Diver		50	1	8	3	1	1	1			4	3	2	4
Pied-billed Grebe			1										0	0

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.

I-WeBS

Little Grebe	25	4,000	56	50	58	59	60	88	80	69	58	65	72	88
Great Crested Grebe	55	3,600	166	218	171	287	240	132	105	137	63	106	109	137
Slavonian Grebe		55	4		1			3	1	2			1	3
Black-necked Grebe			3	3	2	2							0	0
Cormorant	140	1,200	283	556	244	392	326	357	370	308	163	285	297	370
Shag									2		2	8	2	8
Little Egret		1,300	20	18	27	39	61	83	166	126	143	151	134	166
Grey Heron	30	2,700	54	61	114	57	97	68	135	76	84	72	87	135
Spoonbill												1	0	1
Water Rail			3	3		1	1	1	2	2	2	2	2	2
Moorhen	20		28	21	21	19	24	46	24	33	55	25	37	55
Coot	330	17,500	34	96	24	13	26	31	23	16	19	7	19	31
Oystercatcher	680	10,200	1,584	1,421	1,698	1,061	1,570	2,021	1,857	2,076	1,061	1,590	1,721	2,076
Ringed Plover	150	730	59	52	78	66	28	68	25	67	17	27	41	68
Golden Plover	1,700	9,300	3,000	3,432	4,009	6,888	4,262	5,702	6,200	3,002	3,266	5,232	4,560	6,200
Grey Plover	65	2,500	72	44	5	6	108	37	4	24	12	39	23	39
Lapwing	2,100	20,000	4,386	4,116	7,267	2,816	4,176	4,864	4,133	4,096	3,321	3,321	3,947	4,864
Knot	190	4,500	16	17	80	79	306	114	85	117	124	111	110	124
Sanderling	65	1,200					135	350		33			77	350
Curlew Sandpiper				15		2	1		3	4	1		2	4
Dunlin	880	13,300	8,277	8,240	6,632	5,155	3,979	4,785	4,325	3,874	4,456	3,579	4,204	4,785
Ruff		12,500		1			1	1		1		3	1	3
Snipe		20,000	43	47	5	20	20	54	14	49	32	75	45	75
Long-billed Dowitcher						1	1						0	0
Black-tailed Godwit	140	470	2,508	1,692	1,615	2,128	3,162	1,518	2,937	3,337	1,433	2,823	2,410	3,337
Bar-tailed Godwit	160	1,200	16	52	351	419	477	405	298	218	383	257	312	405
Whimbrel		2,000	2	1		1	1	3	1	4	1	1	2	4
Curlew	550	8,500	2,927	2,223	1,297	1,329	1,817	1,083	2,317	1,809	1,363	1,607	1,636	2,317
Common Sandpiper			3	3	1	2	2	2	2	2	1	4	2	4
Green Sandpiper			2	1		1	1	1	1	1			1	1
Spotted Redshank		900	3	2	1	1	2	1	2	1	1	1	1	2
Greenshank	20	2,300	46	61	31	25	60	47	83	68	72	71	68	83
Redshank	310	3,900	2,243	2,269	1,005	1,138	2,170	1,591	2,295	1,543	1,459	1,725	1,723	2,295
Turnstone	120	1,500	166	146	93	66	145	131	161	136	129	214	154	214
Mediterranean Gull			5	7	1	2	12	11	13	15	24	48	22	48
Sabine's Gull								1					0	1
Bonaparte's Gull											1		0	1
Black-headed Gull		20,000	2,493	1,609	2,288	1,180	1,811	2,954	2,170	2,627	2,010	2,103	2,373	2,954

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.

Ring-billed Gull		2	3	2	1		1	1				0	1
Common Gull	16,000	676	378	1,264	1,725	459	200	290	188	214	207	220	290
Lesser Black-backed Gull	4,500	753	118	177	106	63	254	496	31	630	72	297	630
Herring Gull	13,000	53	68	36	16	37	32	36	40	123	51	56	123
Iceland Gull			1	1								0	0
Glaucous Gull											1	0	1
Great Black-backed Gull	4,800	120	238	141	76	110	150	385	157	137	98	185	385
Unidentified gull					2,123							0	0
Sandwich Tern		2	12	2	34	5		2	225	2	17	49	225
Common Tern			18			2	1		1	1	1	1	1
Arctic Tern											1	0	1
Unidentified Tern							3					1	3
Kingfisher			1	1	2	1	3	3	3	1	2	2	3

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.

I-WeBS

Saleen

Species	1% National	1% International	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Mean (03-07)	Peak (03-07)
Mute Swan	110	110	1	2	2	2	1	1		3			1	3
Canada Goose									13				3	13
Light-bellied Brent Goose	220	260			4								0	0
Shelduck	150	3,000	59	75	42	52	30	41	60	44	34	29	42	60
Wigeon	820	15,000	129	95	122	73	173	102	97	179	149	124	130	179
Green-winged Teal							1						0	0
Teal	450	5,000	72	101	81	168	199	223	188	248	184	226	214	248
Mallard	380	20,000	29	26	28	56	41	46	39	46	91	82	61	91
Shoveler	25	400					4	7		4			2	7
Goldeneye	95	11,500		2									0	0
Red-breasted Merganser	35	1,700			2	8	8	9	2	1	2		3	9
Red-throated Diver	20	3,000								1			0	1
Black-throated Diver		3,750											0	0
Little Grebe	25	4,000	11	13	9	11	9	9	5	8	14	8	9	14
Great Crested Grebe	55	3,600	13	6	5	8	6	16	7	13	4	5	9	16
Slavonian Grebe		55			1								0	0
Cormorant	140	1,200	7	7	6	4	6	3	6	6	7	7	6	7
Little Egret		1,300	9	4	7	10	10	10	23	17	17	18	17	23
Grey Heron	30	2,700	7	4	8	6	5	7	6	6	4	5	6	7
Moorhen	20						2			1			0	1
Oystercatcher	680	10,200	129	172	136	150	175	147	135	137	94	176	138	176
Ringed Plover	150	730	14		14		19		13	41			11	41
Lapwing	2,100	20,000	36	8	7	2		2	12		1		3	12
Knot	190	4,500								5		1	1	5
Curlew Sandpiper				9									0	0
Dunlin	880	13,300	256	31	26	10	164	28	64	6	37	54	38	64
Ruff		12,500										1	0	1
Snipe		20,000						2	6	2	5	1	3	6
Long-billed Dowitcher							1						0	0
Black-tailed Godwit	140	470	61	22	16	55	75	52	121	72	129	101	95	129
Bar-tailed Godwit	160	1,200	1	2	4	4	2	1	13	5	1	1	4	13
Whimbrel		2,000				1	1						0	0
Curlew	550	8,500	121	81	82	89	96	91	103	90	115	152	110	152
Common Sandpiper										1	1		0	1

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Spotted Redshank		900	3	2								1	0	1
Greenshank	20	2,300	8	10	13	11	12	4	9	12	8	10	9	12
Redshank	310	3,900	123	106	135	129	116	116	144	126	173	161	144	173
Turnstone	120	1,500	61	26	52	33	35	12	26	73	54	17	36	73
Mediterranean Gull						1		4	4	5	6	48	13	48
Bonaparte's Gull											1		0	1
Black-headed Gull		20,000	190	177	167	107	176	57	187	184	221	212	172	221
Ring-billed Gull					1								0	0
Common Gull		16,000	7	47	41	88	264	39	103	21	65	84	62	103
Lesser Black-backed Gull		4,500	7	42	3	77	1	1	2	1	5	9	4	9
Herring Gull		13,000	2	3	4	1	6	3	7	3	5	3	4	7
Great Black-backed Gull		4,800	1	4	1	14	4	9	8	4	3	4	6	9
Sandwich Tern				2		22			2	6		3	2	6
Kingfisher					1		1		1	1	1	1	1	1

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I-WeBS

Owenboy Estuary

Species	1% National	1% International	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Mean (03-07)	Peak (03-07)
Mute Swan	110	110	5	2	2				2			4	2	4
Feral/hybrid Goose									2				1	2
Shelduck	150	3,000	111	122	97		167	206	141	76		45	117	206
Wigeon	820	15,000	13										0	0
Teal	450	5,000	88	50	5		80	50	75	29		25	45	75
Mallard	380	20,000	58	49	36		51	115	77	18		49	65	115
Red-breasted Merganser	35	1,700	15	5			12	12	7	9		3	8	12
Little Grebe	25	4,000					1					7	2	7
Great Crested Grebe	55	3,600						1				1	1	1
Cormorant	140	1,200	10	38	20		9	8	6	1		5	5	8
Little Egret		1,300		1				1	6			8	4	8
Grey Heron	30	2,700	4	6	18		6	13	12	6		11	11	13
Oystercatcher	680	10,200	119	54	40		91	80	82	27		105	74	105
Ringed Plover	150	730			6								0	0
Golden Plover	1,700	9,300	450	60	1,050								0	0
Lapwing	2,100	20,000	426	200	150		150	30	117	73		94	79	117
Knot	190	4,500			1				16			10	7	16
Curlew Sandpiper									1				0	1
Dunlin	880	13,300	460	115	55		120	63	170	107		125	116	170
Snipe		20,000		8				3		10		1	4	10
Black-tailed Godwit	140	470	75	194	145		210	100	233			250	146	250
Curlew	550	8,500	98	85	99		54	39	51	31		83	51	83
Common Sandpiper								1	1			2	1	2
Greenshank	20	2,300	4	9	2		30	12	23	17		11	16	23
Redshank	310	3,900	138	92	152		150	148	280	120		370	230	370
Turnstone	120	1,500	10	4			20	20	76	10		10	29	76
Black-headed Gull		20,000	397	156	147		80	200	226	253		305	246	305
Common Gull		16,000	82	90	65		80	50	50	90		183	93	183
Lesser Black-backed Gull		4,500	158	15					40			51	23	51
Herring Gull		13,000	6		1		5		2			17	5	17
Iceland Gull					1								0	0
Great Black-backed Gull		4,800	5	1	2		8		20			3	6	20
Sandwich Tern												2	1	2
Kingfisher							1						0	0

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