

REGULATION 18 3(b) RESPONSE
CLARIFICATION ON POINTS OF INFORMATION RAISED BY
THE ENVIRONMENTAL PROTECTION AGENCY & NATIONAL
PARKS & WILDLIFE SERVICE

WASTE WATER DISCHARGE LICENCE APPLICATION

D0057-01

RINGASKIDDY



SUBMITTED TO:
LICENSING UNIT,
ENVIRONMENTAL PROTECTION AGENCY,
WEXFORD

DATE RESPONSE PROVIDED : FEBRUARY 20TH 2009

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APPENDICES

APPENDIX A – FURTHER INFORMATION SUBMITTED TO AN BORD PLEANÁLA

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RESPONSE PART A – FURTHER INFORMATION SUBMITTED TO AN BORD PLEANÁLA

A1 – FURTHER INFORMATION SUBMITTED TO AN BORD PLEANÁLA

An requested further information on 25th August 2008 and again on 19th January 2009. Copies of the information supplied are included in Appendix 1 of this document.

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RESPONSE PART B – THE EIS APPROVAL NOTICE & PERMISSION ETC

B1 – EIS APPROVAL

The Environment Impact Statement for the project was lodged with An Bord Pleanála on 10th March 2008. The reference for the EIS for the Proposed Waste water Treatment Plant at Shanbally, County Cork, is case ref PL04 .YA0005. The case is currently listed as “Proposed decision date not available at this time”.

ABP requested a copy of the Preliminary Report for the Cork Lower harbour Sewerage Scheme in order to assist the Inspector in making his decision. A copy of the Preliminary Report was issued by Cork County Council on 22nd January 2009, with confirmation of receipt issued by An Bord on 26th January 2009.

It is the policy of the Department of the Environment, Heritage and Local Government, that a Preliminary Report cannot be approved prior to the approval of the EIS, as to do so would be pre-empting the decision on the EIS.

Based on the original programme, the likely timelines, (assuming the Department of the Environment, Heritage and Local Government approve the Preliminary Report without a number of requests for clarification) are now:

DEHLG Approval: June 2009

Appoint Consultants: Dec 2009/Jan 2010

Appoint Contractors: Jan 2012

Construction of Collection System Completion: Dec 2014

Construction of WWTP Completion: May 2015

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RESPONSE PART C – COMPLETED TABLES FOR THE PROPOSED DISCHARGES

C1 – BACKGROUND

C1.1 – EXISTING IPPC LICENCES

A number of IPPC licensed industries currently discharge to the existing outfall at the Dognose Bank. The relevant licence holders are listed in Table C1 below. The licence limits are included as mg/l in Table C6, as kg/d in Table C7 and as a worst case combined discharge in Table C8.

Table C1 – IPPC Licence Holders discharging to Dognose Bank

Reg No.	Name	Address
P0006-03	Novartis Ringaskiddy Limited	Ringaskiddy
P0010-04	Pfizer Overseas Pharmaceuticals and C.P. Pharmaceuticals International C.V.	Loughbeg, Ringaskiddy
P0013-04	Pfizer Overseas Pharmaceuticals and C.P. Pharmaceuticals International C.V.	Ballintaggart, Ringaskiddy
P0476-02	Recordati Ireland Limited	Ringaskiddy
P0778-01	Centocor Biologics (Ireland) Limited	Ringaskiddy

C1.2 – CORK COUNTY COUNCIL MONITORING

Cork County Council carries out sampling of the discharges through the Dognose Bank outfall at the terminal pump station. The average results from the available data for the period 2006-2008 inclusive are included in Table C2 below.

Table C2 – Existing Dognose Bank Discharge

BOD	COD	SS	Volume
mg/l			m ³
83	239	118	8,896
kg/d			
738	2,126	1,050	8,896

The existing discharge in Table C2 above shows the average combined discharge from the IPPC licenced industries discharging to the IDA sewer and the combined flows from Carrigaline & Crosshaven which are currently pumped to the IDA sewer.

The application for the discharge license included tables of sample data for the pumping station in Carrigaline and the terminal pumping station on the outfall for 24th October 2007. The data from these tables has been combined in Table C9 and the loading from the IPPC licenced industries has been estimated.

C2 – FUTURE DISCHARGES – POST COMPLETION OF WWTP

In order to quantify the effects of the treated waste water discharge from the proposed WWTP, the design loading for the Base Year (BY 2001) and the Design Year (DY 2030) are included in Table C10. The receiving waters of Outer Cork Harbour are not designated as a sensitive area under the Urban Waste Water Treatment Regulations 2001 and as amended in 2004. Nutrient removal or reduction is not required. The treated discharge for both loadings is given in Table C3 below.

Table C3 – WWTP Treated Discharge

			2001 kg/d	2030 kg/d
Biochemical Oxygen Demand (BOD)	25	mg/l	288	371
Chemical Oxygen Demand (COD)	125	mg/l	1,440	1,855
Total Suspended Solids (SS)	35	mg/l	403	519
Ammonia	12.5	mg/l	144	189
Total Nitrogen	28.5	mg/l	328	423

The figures in Table C3 above when combined with the worst case scenario of all industries discharging at the full IPPC licence limits at the same time (see Table C7) gives the following discharge at the Dognose Bank outfall.

Table C4 – Combined IPPC (Maximum) & WWTP (2030) Treated Discharge

BOD kg/d	COD kg/d	SS kg/d	Total N kg/d	Volume m ³
4,274	12,125	1,219	2,010	21,341

As discussed in Section C1.2 above, the existing discharge at the Dognose Bank includes the combined flows from Carrigaline & Crosshaven. The estimated actual IPPC discharges combined with the WWTP treated discharge are shown in Table C5.

Table C5 – Combined IPPC (Typical based on 24/10/07) & WWTP (2030) Treated Discharge

BOD kg/d	COD kg/d	SS kg/d
885	3,171	1,149

Table C6 – Relevant IPPC Licence Limits (mg/l) (Volume m³)

Reg No.	Name	pH	Toxicity	BOD	COD	SS	Total N	Ammonia	Total P	Heavy Metals	Sulphates	FOG	VOC	Anionic Detergents	Detergents	Manganese	Copper	Zinc	Volume	Max Vol./Hr
P0006-03	Novartis	6-9	10	250	700	500	70	10	22								0.5	1	900	48
P0010-04	Pfizer	6-9	10	2000	3000	250	100	50	200	1	700	10			5			1	1800	135
P0013-04	Pfizer	6-9	10		5500	500	500	75	60							60	0.5	0.5	2900	
P0476-02	Recordati	6.5-9	10	300	1000	100	100		200	1	1000	10	1	5					100	10
P0778-01	Centocor Biologics	6-9	10	60	300	50	80		20		200	20								

Table C7 – Relevant IPPC Licence Limits kg/d

Reg No.	Name	BOD	COD	SS	Total N	Ammonia	Total P	Manganese
P0006-03	Novartis			225	32	9	10	
P0010-04	Pfizer							
P0013-04	Pfizer		3900	1333	1333	200	160	160
P0476-02	Recordati	30	100	10				
P0778-01	Centocor Biologics	48	240	40				

Table C8 – Total IPPC Discharge to Harbour with all IPPC Operating at Licence Limits (kg/d) (Volume m³)

pH	Toxicity	BOD	COD	SS	Total N	Ammonia	Total P	Heavy Metals	Sulphates	FOG	VOC	Anionic Detergents	Detergents	Manganese	Copper	Zinc	Volume
6-9	10	3,903	10,270	700	1,587	1,423	556	1.9	1,520	35	0.1	0.5	9	160	1.9	4.15	6,500

Table C9 – Carrigaline Loading (Carrigaline PS) – Carrigaline & IPPC Loading (Outfall PS Ringaskiddy) and IPPC Loading Estimate

Location	pH	BOD	COD	SS	TP	TN	NH3	SO4	O-PO4-P	Flow	Cond 20C	Cadmium	Chromium	Copper	Lead	Nickle	Zinc	Barium	Bornon	Flouride	N03 as N
Ringaskiddy mg/l	7.6	106.0	311.0	112.0	2.2	21.0	14.2	160.0	6.4	8248	2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.7	3.9
Ringaskiddy kg/d		874.3	2565.1	923.8	18.2	173.2	117.1	1319.7	52.5			0.1	0.1	0.1	0.1	0.1	0.1	0.1	42.1	5.4	32.3
Carrigaline mg/l	8.2	103.0	357.0	84.0	6.4	54.0	36.4	108.0	11.2	3500	1679	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		8.0
Carrigaline kg/d		360.5	1249.5	294.0	22.3	189.0	127.4	378.0	39.2			0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	28.0
IPPC Loading Kg/d		513.8	1315.6	629.8	-4.1	-15.8	-10.3	941.7	13.3			0.0	0.0	0.0	0.0	0.0	-0.1	0.0	41.9	5.4	4.4

Some of the results in the above table have negative values as water quality sampling can only reflect an instant in time.

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Table C10 – WWTP Loading

LOADING ^{Note1}		Cobh		Passage West & Monkstown		Ringaskiddy Shanbally & Coolmore		Carrigaline		Crosshaven		Total	
Category	Parameter	BY	DY	BY	DY	BY	DY	BY	DY	BY	DY	BY	DY
Domestic	Flow	1,608	3,076	760	1437	179	202	1,917	3,496	300	485	4,764	8,696
	BOD	643	1230	304	575	71	81	767	1398	120	194	1,905	3,478
	SS	750	1,435	355	671	83	94	895	1,631	140	226	2,223	4,057
Infiltration	Flow	> 697	1025	> 1,000	479	60	67	3,130	1165	100	162	> 4,987	2,898
Commercial	Flow	293	492	122	230	29	32	342	559	48	78	834	1,391
	BOD	117	197	49	92	11	13	139	224	19	31	335	557
	SS	136	230	57	107	13	15	162	261	22	36	390	649
Institutional	Flow	178	146	37	43	5	28	114	120	Incl.	36	334	374
	BOD	72	56	19	22	3	14	57	60	Incl.	18	151	170
	SS	84	65	22	25	3	16	66	70	Incl.	21	175	197
Industrial	Flow	0	344	0	0	0	0	607	1,138	0	0	607	1,482
	BOD	0	138	0	0	0	0	16	456	0	0	16	594
	SS	0	2300	0	0	0	0	22	531	0	0	22	2,831
Total	Flow	> 2,776	5,083	> 1,919	2,189	273	329	6,105	6,478	448	761	>11,521	14,841
	BOD	832	1,621	371	689	86	108	978	2,138	139	243	2,406	4,799
	SS	971	4,030	433	803	100	125	1,145	2,493	162	283	2,811	7,734
	Pop. Equiv.	13,865	27,020	6,189	11,478	1,426	1,798	16,305	35,636	2,317	4,050	40,102	79,982

Flow (m³/day), BOD (kg/day), SS (kg/day)

Note 1 Loadings are based on figures calculated in Cork Harbour Main Drainage Preliminary Report (Mott MacDonald Pettit, 2007)
Base Year (BY) = 2001, Design Year (DY) = 2030

Note 2 The effluent loadings relating to Institutional sources is not quantified separately from that of the other categories from sources of effluent loadings in Crosshaven.

Note 3 Design treatment capacity is taken as 80,000 P.E.

RESPONSE PART D – IMPACT ASSESSMENT OF THE PROPOSED DISCHARGES – TROPHIC STATUS, SHELLFISH & BATHING WATERS

D1 – BACKGROUND

An assessment of the impacts of the proposed discharges on the receiving waters has been included in Volume 1 of the Environmental Impact Statement (EIS) as Section 3 - Receiving Environment, Sub Section 3.3 Water Quality.

A computer model of the receiving waters was developed for the scheme and the results are included in Volume 2 of the EIS as Appendix 3A. The model estimates the relative changes to the quality of the receiving waters of the provision of the treatment plant, relative to the existing untreated discharges, excluding background concentrations of the modelled substances. Hence the model demonstrates the positive impact of the provision of the treatment plant on the receiving waters.

As part of the correspondence with statutory bodies, the following issues were raised, and included in the EIS.

- South Western Regional Fisheries Board
 - physical impacts of waters containing fisheries
 - effects of sediment disturbance, and impact on commercial/amenity fisheries from the marine crossing
 - Impact on shellfisheries
 - Impacts on fish habitats & water quality (chemical & microbiological)
 - Assessment of the potential for untreated effluent to discharge to harbour waters and Monkstown Creek.
 - Nutrient loading effects on Cork Lower Harbour which is periodically affected by phytoplankton blooms.
 - Measures to avoid and prevent pumping station overflow discharges during operation.

These items are addressed in Chapter 2 - Section 2.11 and Chapter 3 - Section 3.1, 3.2 and 3.3.

- Department of Communications, Marine and Natural Resources
 - noise and vibration details should be noted and limited in accordance with relevant legislation
 - specify in the EIS if dredging for the marine crossing is required
 - details to be provided on proposed pipelines in the foreshore incl. timing/duration
 - refer to the designation of Shellfish Waters
 - potential impacts on navigational safety and passage of migratory fish.

These items are addressed in Chapter 3 - Section 3.1, 3.2, 3.3, 3.4 and 3.7.

The Environmental Protection Agency have asked that additional information be provided in relation to:

“The impact assessment of the proposed discharges having regard to the trophic status of the receiving water and the current uses (shellfish, bathing)”

These impacts were addressed in the EIS, as outlined above, and have been summaries in Section D2 of this response.

D2 – BATHING & SHELLFISH WATERS

D2.1 – EXISTING BATHING WATERS & STANDARDS

The EIS states that “there are no designated bathing areas within the study area, however, Fountainstown beach is a designated bathing area and is located 5.25km from the existing IDA outfall, which is proposed as the sole outfall for discharges from the WWTP.”

Cork Lower Harbour is not designated a sensitive water under the *Bathing Water Regulations* of 1992 however, it is used for recreational purposes. A map showing the locations of bathing waters used for recreational purposes, but not designated as such, is included in this response.

The Bathing Water Regulations (S.I. No. 155 of 1992) a limit is set of:

- ≤ 1000 faecal coliforms/100mls in ≥ 80% of samples
- ≤ 2000 faecal coliforms/100mls in ≥ 95% of samples.

Currently the waters of the Lower Harbour are below these limits. The new Bathing Water Directive 2006/7/EC specifies a standard, in a 95-percentile evaluation for excellent quality coastal waters, of:

- ≤ 100 intestinal enterococci (cfu/100ml)
- ≤ 250 *Escherichia coli* (cfu/100ml).

D2.2 – EXISTING SHELLFISH WATERS & STANDARDS

Cork Lower Harbour is not designated as sensitive water under Statutory Instruments S.I. No. 268 of 2006 – European Communities (Quality of Shellfish Waters) Regulations 2006. The regulations specifies a limit in the shellfish flesh and intervalvular liquid of:

- ≤ 300 Faecal coliforms

Cork Harbour is a shellfish production area (Code CK-CH). This area lies north of a point from Roberts Head to Roches Point up to and including the mean high water mark. In Ireland the main bivalve species are mussels, native and pacific oysters, razorfish, scallops, clams and cockles. Shellfish areas are classified by the microbiological quality of the water. Areas are assigned a classification of A, B or C by the DAFF based on microbiological monitoring.

Table 3.2.5 Designated Bivalve Mollusc Production Areas in Ireland (October, 2005) included in Volume 2 of the EIS lists the shellfish production areas in Cork Harbour based on information contained on the FSAI (Food Safety Authority of Ireland) website. A map showing the locations of these is included as Figure 3.2.5 of the EIS.

D 2.3 – MODEL OF BACTERIA CONCENTRATIONS

The computer model of the receiving waters developed as part of the EIS included consideration of Faecal coliforms and Intestinal Enterococci and *Escherichia coli* in the modelling. The results of the faecal coliform modelling were used to estimate the Intestinal Enterococci and *Escherichia coli* concentrations. The improvement in conditions due to the provision of the waste water treatment plant have been modelled, not actual concentrations of bacteria as background concentrations were not considered.

The model considered 15 no. specific locations, some but not all of which, coincide with the locations identified as bathing waters within the Lower Harbour Area. The model locations are tabulated below and included in Chapter 4 - Figure 4.13 of Appendix 3A of the EIS.

Table D1 – List of locations used to model bacteria concentrations

Fountainstown	Shoreline closest to Outfall	Oyster Farm – Outer Harbour
Myrtleville	Spike Island	Marlogue Point
Roches Point	Ringaskiddy Ferry	Oyster Farm – North Channel
Crosshaven	Monkstown Creek	West Passage
200m upstream of Outfall*	Cobh	Lough Mahon

* This point is just outside the near field mixing zone.

The model concluded that, for both 2010 & 2030 population projections that provision of the treatment plant would lead to a reduction in levels of faecal coliforms by between 80 and 95%, depending on the location within the study area. The points with the lowest concentrations at Fountainstown and the oyster farm in the North Channel.

Concentrations of Intestinal Enterococci were modelled giving a maximum of 27.44 cfu/100ml at a location 200m North of the proposed outfall based on 2030 population estimates. Concentrations of Escherichia coli at this location would be expected to be the same as the concentrations of faecal coliforms.

With the exception of the area immediately surrounding the outfall the maximum concentrations of Escherichia coli are modelled at less than 250 cfu/100ml, the average concentrations at this location were modelled at 76.3 cfu/100ml. Further details of the predicted concentrations are included in Tables 4-9 and 4-10 and Sections 4.5, 4.6 and 4.7 of Chapter 4 of Appendix 3A.

It can be concluded that the provision of the Waste Water Treatment Plant at Shanbally will result in a significant improvement in the water quality within the Lower Harbour, improving the potential for use for recreation and shellfish farming.

D3 – TROPHIC STATUS

The computer model was also used to estimate the effects of nitrogen on the receiving waters by modelling organic nitrogen, ammonia and nitrate. The results of the modelling are discussed in detail in Chapter 6 of the Appendix. As with the bacteria modelling, the results have been presented for the 15 locations tabulated in Section D2.3 above.

The reduction in concentrations of the various forms of Nitrogen are included in Tables 6-2 to 6-4 with spatial mapping demonstrating the reduced concentrations included as Figures 6-17 to 6-20 of the Appendix to the EIS.

The provision of the treatment plant shows considerable reductions in the predicted nitrogen levels in the Lough Mahon (designated sensitive waters) and in the North Channel. It also leads to improvement of the waters in the Outer Harbour.

D4 – CONCLUSIONS

The conclusions of the modelling report are included as Chapter 7 of the Appendix, and are summarised below. It should be noted that

- 1) The concentrations of Faecal Coliforms in the raw sewage were assumed to be 4.5 times greater than those used for a similar study in Galway.
- 2) The assumed efficiency of bacteria removal for the treatment plant used in the model is 90%, the efficiency of the existing plant in Midleton is in the region of 98%.
- 3) 98% removal of bacteria would lead to a treated concentration of 5 times less than the concentration assumed for the model purposes.
- 4) The model is therefore extremely conservative. A less conservative model, based on 98% efficiency would lead to reductions in coliforms concentrations of between 96 and 99% when compared with the untreated discharges.

D4.1 – FAECAL COLIFORMS

The proposed treatment plant will reduce the number of faecal coliforms in Cork Harbour and the waters outside Roches point.

- The untreated discharge has been modelled giving concentrations of between 2 and 1500 cfu/100ml
- The treated discharge has been modelled giving concentrations of between 2 and 400 cfu/100ml
- The average untreated concentration modelled as 140 cfu/100ml is reduced to 40 cfu/100ml
- Areas including Lough Mahon, the Inner Harbour, East & West Passages and Ringaskiddy show a 95% reduction in coliform levels. Elsewhere the reduction is modelled as 80%.

D4.2 – ESCHERICHIA COLI

The proposed treatment plant would lead to reductions in concentrations of Escherichia coli of the same magnitude as those outlined in 4.1 above for Faecal Coliforms.

D4.3 – INTESTINAL ENTEROCOCCI

The proposed treatment plant, at the conservative model, would lead to reductions in concentrations of Intestinal Enterococci to levels several orders of magnitude lower than those required by Bathing Water Directive 2006/7/EC. The levels of Intestinal Enterococci associated with a less conservative model have not been predicted, but would be, as with the results for Faecal Coliforms and Escherichia coli, significantly less than those predicted by the model.

D4.4 – TROPHIC STATUS

The model shows a marked reduction in the levels of Nitrogen as organic nitrogen, ammonia and nitrate within the study area, particularly in the predicted nitrogen levels in the Lough Mahon (designated sensitive waters) and in the North Channel. The provision of the proposed treatment plant will have a significant positive influence on the trophic status of the receiving waters.

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RESPONSE PART E – THE APPROPRIATE ASSESSMENT REQUESTED BY NPWS

Response is in 2 separate parts:

- **E(1) – Proposed Waste Water discharge effects on Cork Harbour PSPA (4030)**
- **E(2) – Appropriate Assessment of Proposed Waste Water Discharge and it's effect on Cork Harbour PSPA (4030) in accordance with Articles 6 & 7 of EC Directive 92/43/EEC**

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RESPONSE PART E(1) – PROPOSED WASTE WATER DISCHARGE EFFECTS ON CORK HARBOUR pSPA (4030)

E(1) 1 – BACKGROUND

The National Parks & Wildlife Service have suggested that “the proposed Waste water discharge is considered likely to have significant adverse effects on a European site” due to uncertainty associated with the:

“Ability of WWTP to accommodate extra projected population equivalent loading, taking into account potential effects in combination with other WWTP discharges into the Inner Harbour including the Cork City WWTP”

An assessment of the impacts of the proposed Waste water Treatment Plant (WWTP), including discharges to the receiving waters, has been included in Environmental Impact Statement (EIS) for the Cork Lower Harbour Sewerage Scheme. Relevant information has been extracted and included in the sections below to demonstrate the positive effects of the proposed waste water treatment plant.

E(1) 2 – EXISTING AND PROPOSED WASTE WATER DISCHARGES

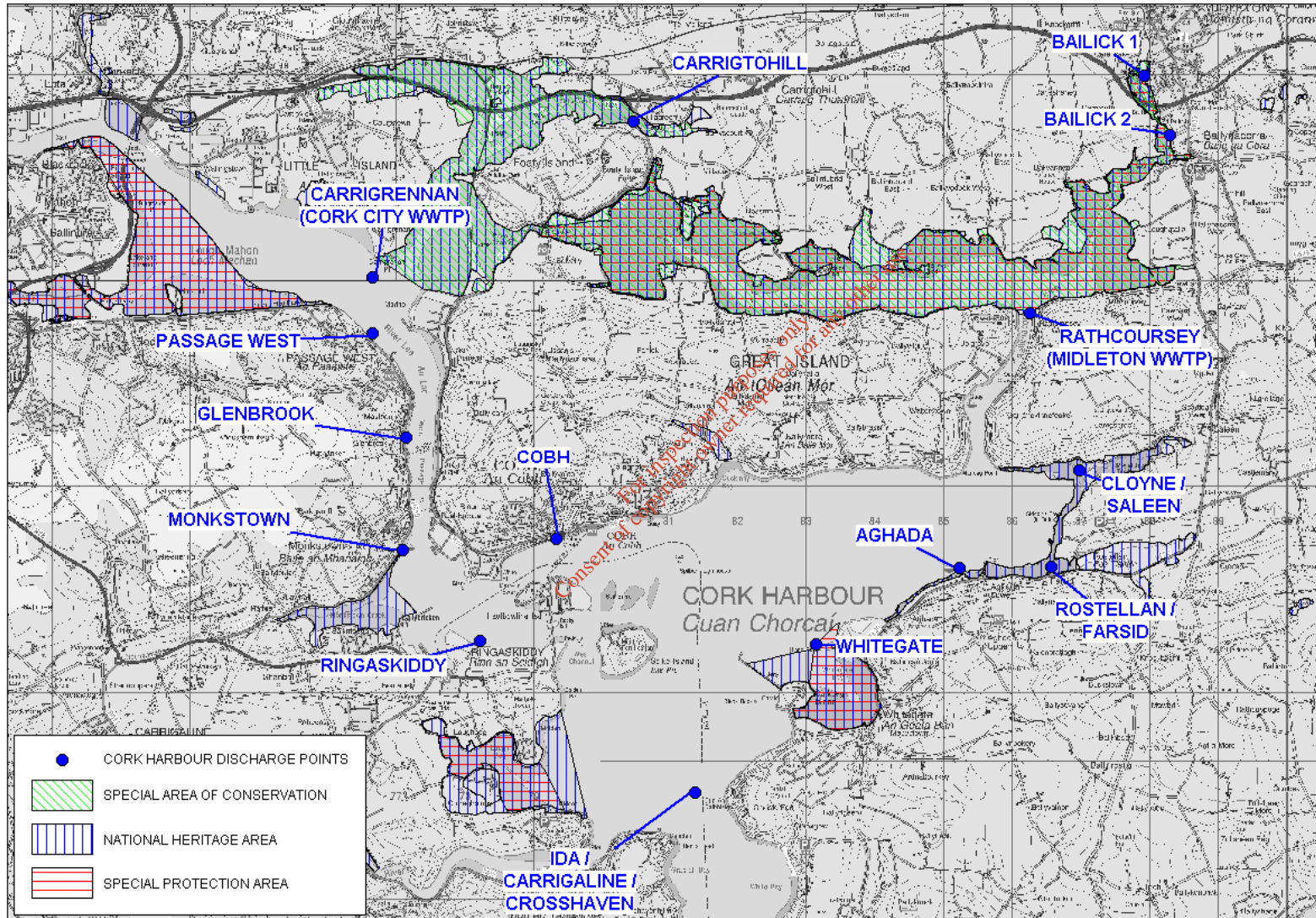
A report was completed for Cork County Council in November 2007 relating to modelling Norovirus contamination in Cork Harbour. The report compiled a list of the treated and untreated discharges to the harbour. These are tabulated below and included indicatively on a drawing overleaf.

Table E(1)1 – List of Discharges to Cork Harbour

Location	Treatment	Location	Treatment
Cork City – Carrigrennan	Secondary	Passage West/ Glenbrook/ Monkstown	None
Midleton	Secondary	Whitegate/ Agahda	None
Carrigtohill	Secondary	Ringaskiddy	None
Cloyne	Secondary	Saleen	None
Carrigaline/ Crosshaven	None	Rostellan/ Farsid	None
Cobh	None	Houses -North Channel	None

The modelling completed for the EIS for the Cork Lower Harbour Sewerage Scheme did not consider the background concentrations of coliforms, nitrogen, etc but modelled the improvement in water quality due to the provision of the waste water treatment plant on the existing untreated discharges at Carrigaline/Crosshaven, Cobh, Passage West/ Glenbrook/ Monkstown and Ringaskiddy.

Figure E(1)/1 – Existing Treated and Untreated Discharges to Cork Harbour.



The proposed WWTP will initially be sized for a population equivalent (P.E.) of 50,000. The plant will allow for further expansion to 80,000 P.E., the estimated loading for the year 2030. The discharge standards for the treatment plant are:

- < 25 mg/l BOD
- < 125 mg/l COD
- < 35 mg/l SS

The 2001 loading on the harbour from the untreated discharges of the agglomerations of Carrigaline/Crosshaven, Cobh, Passage West/ Glenbrook/ Monkstown and Ringaskiddy has been estimated as:

Table E(1)2 – Estimated Untreated Discharge Loadings (2001)

Parameter	Cobh	Passage West & Monkstown	Ringaskiddy Shanbally & Coolmore	Carrigaline	Crosshaven	Total
Flow (m ³ /day)	> 2,776	> 1,919	273	6,105	448	> 11,521
BOD (kg/day)	832	371	86	978	139	2,406
Ss (kg/day)	971	433	100	1,145	162	2,811
Pop. Equiv.	13,865	6,189	1,426	16,305	2,317	40,102

The estimated loading on the treatment plant by the year 2030 has been estimated as:

Table E(1)3 – Estimated Loading on WWTP, Year 2030

Parameter	Cobh	Passage West & Monkstown	Ringaskiddy Shanbally & Coolmore	Carrigaline	Crosshaven	Total
Flow (m ³ /day)	5,083	2,189	329	6,478	761	14,841
BOD (kg/day)	1,621	689	108	2,138	243	4,799
Ss (kg/day)	4,030	803	125	2,493	283	7,734
Pop. Equiv.	27,020	11,478	1,798	35,636	4,050	79,982

The predicted 2030 flow rate of 14,841 m³/day equates to a treated discharge of 371 kg/day BOD. Untreated sewage is estimated to average 60g BOD per person per day. Therefore the treated discharge at the 2030 population estimate is equivalent to an untreated discharge of 6,180 P.E. (BOD). By comparison, the 2006 Census records the population of Passage West as 5,203.

The current untreated discharge from Crosshaven and Carrigaline to the existing IDA outfall discharging at the Dognose Bank (i.e. the proposed outfall for the Cork Lower Harbour Waste water Treatment Plant) was estimated, based on 2001 figures, at 26,449 P.E.

E(1) 3 – TERRESTRIAL AND MARINE ECOLOGY

A terrestrial and marine ecology assessment and report was prepared by Ecofact Environmental Consultants Ltd. to address the potential impacts of the proposed WWTP and upgraded collection system on the ecology of the receiving environment. The terrestrial and marine ecology report is presented in full in Volume 2, Appendix 2A, and has been summarised as Section 3 - Receiving Environment, Sub Section 3.2 Terrestrial and Marine Ecology, of Volume 1 of the EIS.

Section 3.2.4 of the terrestrial and marine ecology assessment dealt with the impacts of the proposed scheme, and concluded that with correct mitigation measures the construction impacts would be minimal. The report further concluded, in relation to the operational phase impacts:

“Current nutrient inputs by foul water outfalls into the affected aquatic areas would be significantly reduced during the operation of the proposed scheme. Such inputs result in increased primary production and turbidity, indirectly suppressing filter feeder activity. Phytoplankton blooms are expected to be less frequent with the expected reduction in nutrient loading due to the proposed development and restrictions on the edibility of shellfish would ease considerably due to the reduction in associated biotoxins. Water quality around the shorelines within the Harbour and along the Owenboy Estuary is expected to improve, encouraging an increase in diversity of infauna (polychaete worms, bivalves, etc.) and epifauna (crabs, crustaceans, snails, etc.).”

“The reduction of nutrients into the affected aquatic areas would improve water quality, habitats and diversity, and consequently add to the conservation status of Cork Harbour SPA, Owenboy River pNHA and Monkstown Creek pNHA.”

E(1) 4 – WATER QUALITY

A computer model of the receiving waters was also developed for the scheme and the results are included in Volume 2 of the EIS as Appendix 3A. The model estimates the relative changes to the quality of the receiving waters of the provision of the treatment plant, relative to the existing untreated discharges, excluding background concentrations of the modelled substances. Hence the model demonstrates the positive impact of the provision of the treatment plant on the receiving waters.

The model concluded that, for both 2010 & 2030 population projections that provision of the treatment plant would lead to a reduction in levels of faecal coliforms by between 80 and 95%, depending on the location within the study area.

The computer model was also used to estimate the effects of nitrogen on the receiving waters by modelling organic nitrogen, ammonia and nitrate. The results of the modelling are discussed in detail in Chapter 6 of the Appendix.

The provision of the treatment plant shows considerable reductions in the predicted nitrogen levels in the Lough Mahon (designated sensitive waters) and in the North Channel. It also leads to improvement of the waters in the Outer Harbour.

E(1) 5 – CONCLUSIONS

E(1) 5.1 – TERRESTRIAL AND MARINE ECOLOGY

The terrestrial and marine ecology assessment and report prepared by Ecofact Environmental Consultants Ltd concluded that the provision of the waste water treatment plant would improve water quality, habitats and diversity, and consequently add to the conservation status of Cork Harbour SPA, Owenboy River pNHA and Monkstown Creek pNHA.

E(1) 5.2 – WATER QUALITY

The conclusions of the modelling report are included as Chapter 7 of the Appendix. The model used was extremely conservative, yet showed a significant decrease in coliform levels when compared with the untreated discharges. Areas including Lough Mahon, the Inner Harbour, East & West Passages and Ringaskiddy show a 95% reduction in coliform levels. Elsewhere the reduction is modelled as 80%.

A less conservative model, based on 98% efficiency of the treatment plant (the efficiency currently achieved by the Midleton plant) would lead to reductions in coliforms concentrations of between 96 and 99% when compared with the untreated discharges.

The model also showed a marked reduction in the levels of Nitrogen as organic nitrogen, ammonia and nitrate within the study area, particularly in the predicted nitrogen levels in the Lough Mahon (designated sensitive waters) and in the North Channel. The provision of the proposed treatment plant will have a significant positive influence on the trophic status of the receiving waters.

The loading on the receiving waters from the treated waste water discharged to the harbour at the 2030 population prediction of 80,000 P.E. will be similar to that from the untreated discharge from Passage West in 2006.

E(1) 5.3 – SUMMARY

The proposal for the plant has adequate capacity to cater for future population increases. The provision of the plant will not have an adverse impact on the Cork Harbour SPA. The provision of the Waste water Treatment Plant at Shanbally, combined with the elimination of other untreated discharges through the provision of additional waste water treatment plants in the East of the Harbour, will result in a significant improvement in the water quality within the Lower Harbour, and add to the conservation status of Cork Harbour SPA, Owenboy River pNHA and Monkstown Creek pNHA.

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RESPONSE PART E(2) – APPROPRIATE ASSESSMENT

Proposed Waste Water Discharge and its effect on Cork Harbour pSPA (4030) in accordance with Articles 6 & 7 of EC Directive 92/43/EEC

E(2) 1 – BACKGROUND

The National Parks & Wildlife Service have suggested that “the proposed Waste water discharge is considered likely to have significant adverse effects on a European site” because of uncertainty associated with the discharge due to:

“Industrial and other discharges potentially leading to elevated concentrations of heavy metals and persistent organic compounds, which can bioaccumulate and have ecotoxicological effects of bird populations; on the following qualifying habitats and species:

Black-tailed godwit (overwintering);

Redshank (overwintering);

Curlew (overwintering);

Regularly occurring migratory bird wintering assemblage;”

An assessment of the impacts of the proposed Waste water Treatment Plant (WWTP), including discharges to the receiving waters, has been included in Environmental Impact Statement (EIS) for the Cork Lower Harbour Sewerage Scheme. Relevant information has been extracted and included in the sections below to demonstrate the positive effects of the proposed WWTP.

The assessment included reference to the Department of the Marine Shellfish monitoring programme in relation to heavy metal concentrations but did not address the effect of the treatment plant on the concentrations of heavy metals in the harbour, or the bioaccumulation of persistent organic compounds. These are considered in the sections below.

E(2) 2 – PROPOSED WASTE WATER DISCHARGES

As highlighted in a previous response, the proposed WWTP will initially be sized for a population equivalent (P.E.) of 50,000. The plant will allow for further expansion to 80,000 P.E., the estimated loading for the year 2030. The discharge standards for the treatment plant are:

- < 25 mg/l BOD
- < 125 mg/l COD
- < 35 mg/l SS

The predicted 2030 flow rate of 14,841 m³/day equates to a treated discharge 6,180 P.E. (BOD). By comparison, the 2006 Census records the population of Passage West as 5,203.

The current untreated discharge from Crosshaven and Carrigaline to the existing IDA outfall discharging at the Dognose Bank (i.e. the proposed outfall for the Cork Lower Harbour WWTP) was estimated, based on 2001 figures, at 26,449 P.E.

E(2) 3 – EXISTING STUDIES

E(2) 3.1 – IRISH MARINE INSTITUTE

The Marine Institute monitors the levels of priority hazardous substances in shellfish from selected sites around the Irish coast on an annual basis. This monitoring programme is undertaken to comply with the requirements of EU legislation and to contribute to the Joint Assessment and Monitoring Programme required by the 1994 OSPAR convention. The following are extracts from Marine Institute publications:

“European Regulation 466/2001/EC came into effect on 5th April 2002. It sets maximum levels for mercury, lead and cadmium in foodstuffs, including bivalve mussels. While the monitoring presented here was carried out prior to the adoption of this regulation, results are compared with the values set in the regulation.”

“There are no internationally agreed standards or guidelines for copper, chromium, zinc or chlorinated hydrocarbons in shellfish for human consumption. However there is a compilation of standard and guidance values for contaminants in shellfish, applied by Contracting Parties to OSPAR (Anon 1992). Samples analysed here are compared with these values. None of the countries have set guidance values or standards for chromium in shellfish.”

The results of the Marine Institute Studies including Trace Metal and Chlorinated Hydrocarbon Concentrations in Shellfish from Irish Waters 1997 – 2002 and Trace Metal Concentrations in Shellfish from Irish Waters 2003 – 2005 are available from the National Food Residue Data <http://nfrd.teagasc.ie/>

These studies have included examination of concentrations of pollutants in oysters in Cork Harbour, and are summarised in Table E(2)1 of this report. All samples were below permissible levels. It is worth noting that after 2002 the levels of Chlorinated Hydrocarbons, PCBs and Pesticides which had been tested for in earlier surveys were below the limits of detection. This is coincidental, although not necessarily attributable to, with the provision of the Cork City WWTP.

Table E(2)1 – Trace Metal and Chlorinated Hydrocarbon Concentrations in Shellfish from Irish Waters 1997-2002 & Trace Metal Concentrations in Shellfish from Irish Waters 2003-2005 in Edible Tissue of oysters in Cork Harbour, 25 samples per annum

Residue	Units	1997	1998	1999	2000	2001	2002	2003	2005
		Residue Concentration							
Cadmium	mg/kg (ppm) wet wt.	0.19	0.26	0.32	0.25	0.23	0.29	0.16	0.12
Chromium	mg/kg (ppm) wet wt.	0.1	0.14	0.31	0.19*	0.23	0.19	0.22	0.14
Copper	mg/kg (ppm) wet wt.	10.9	23.9	22.6	11.4	11.1	24.8	7.37	8.62
Lead	mg/kg (ppm) wet wt.	0.23	0.15	0.08	0.25	0.45	0.12	0.29	0.21
Mercury	mg/kg (ppm) wet wt.	0.03	0.03	0.03	0.03	0.03*	0.03	0.04	0.04
Nickel	mg/kg (ppm) wet wt.					0	-	-	0.13*
Silver	mg/kg (ppm) wet wt.					0	1.21	0.3	0.33
Zinc	mg/kg (ppm) wet wt.	157	270	286	169	165	437	202	162
PCB-028	ug/kg (ppb) wet wt.	0.49	0.82	0.51	0.39	0	0.06		
PCB-031	ug/kg (ppb) wet wt.	0.5	0.79	0.09	0.39	0	0.06		
PCB-052	ug/kg (ppb) wet wt.	0.83	1.61	0.74	0.79	0	0.13		
PCB-101	ug/kg (ppb) wet wt.	0.96	1.37	0.85	1.07	1.1	0.53		
PCB-105	ug/kg (ppb) wet wt.	0.22	-	-	-	0.18	0.11		
PCB-118	ug/kg (ppb) wet wt.	0.7	1.24	0.82	0.64	0.63	0.47		
Pcb-138	ug/kg (ppb) wet wt.	0.92	1.34	1.09	0.61	1.17	0.62		
Pcb-153	ug/kg (ppb) wet wt.	1.57	1.9	1.49	1.53	1.18	1.12		

		1997	1998	1999	2000	2001	2002	2003	2005
Residue	Units	Residue Concentration							
Pcb-156	ug/kg (ppb) wet wt.	0.05	0.07	0.05*	0.06*	0.03	0.02*	-	
Pcb-180	ug/kg (ppb) wet wt.	0.13	0.22	0.15	0.11	0.04	0.01*	-	
Aldrin	ug/kg (ppb) wet wt.					-			
Cis-Chlordane	ug/kg (ppb) wet wt.	0.06*	0.06*	-	0.03	0.04	0.01**	-	
Dieldrin	ug/kg (ppb) wet wt.	0.83	0.97	2.31	0.12	0	0.54		
Endrin	ug/kg (ppb) wet wt.					0.09	0.05*	-	
Hexachlorobenzene	ug/kg (ppb) wet wt.	0.24	0.05	0.09	0.07	0.03*	0.01*	-	
Hexachlorohexane-alpha (HCH-alpha)	ug/kg (ppb) wet wt.	0.09	0.07	0.04		0	0.12		
Hexachlorohexane-beta (HCH-beta)	ug/kg (ppb) wet wt.					0	0.17*	-	
Isodrin	ug/kg (ppb) wet wt.					0.03*	-	-	
Lindane (HCH-gamma)	ug/kg (ppb) wet wt.	-	0.22	0.26	0.43	0.47	0.04		
op' DDT	ug/kg (ppb) wet wt.				0.04	0	0.01*	-	
pp' DDD	ug/kg (ppb) wet wt.	0.42	0.87	0.48	0.39	0.31	0.21		
pp' DDE	ug/kg (ppb) wet wt.	1.33	2.4	0.91	1.39	1.3	0.76		
pp' DDT	ug/kg (ppb) wet wt.	0.06	0.54	0.24	0.04	0.34	0.11*	-	
Trans-Chlordane	ug/kg (ppb) wet wt.	-	-	-	0.05	0.04	0.04		
Trans-nonachlor	ug/kg (ppb) wet wt.			0.04	0.07	0.09	-	-	

*Residue Concentration is below the Limit of Quantisation

Table E(2)1 – Trace Metal and Chlorinated Hydrocarbon Concentrations in Shellfish from Irish Waters 1997-2002 & Trace Metal Concentrations in Shellfish from Irish Waters 2003-2005 in Edible Tissue of Oysters in Cork Harbour, 25 samples per annum

E(2) 3.2 – ENVIRONMENTAL PROTECTION AGENCY

The following are extracts from Water Quality in Ireland 2004-2006 published by the EPA:

“MONITORING OF TOXIC CONTAMINANT LEVELS IN ESTUARINE AND COASTAL WATERS

The Marine Institute monitors the levels of priority hazardous substances in a range of commercial fish species landed at Irish ports and also in shellfish from selected sites around the Irish coast. These are substances, such as mercury, that have been identified as being of particular concern to the marine environment and to consumers of seafood. Levels of such substances in fish and shellfish are a good indicator of contamination in the marine environment as a whole. Inter alia, the monitoring is part of Ireland's contribution to the Joint Assessment and Monitoring Programme (JAMP) of the OSPAR Convention.”

“Environmental Contaminants in Shellfish

Concentrations of environmental contaminants such as metals, hydrocarbons and persistent organic pollutants in bivalve molluscs are very good indicators of ambient water quality with respect to these parameters. The Marine Institute monitors contaminants in mussels and oysters from shellfish growing waters but supplements this with additional samples from areas where shellfish are not harvested to give a more representative picture of the status of waters along the Irish coast.”

“Seawater samples were collected from the 14 designated shellfish areas twice annually and analysed for trace metals and organochlorines. All organohalogenes (PCBs and pesticides) results were below limits of detection (Marine Institute, 2007). The metal results varied

substantially as would be expected for seawater samples, and a number of samples exceeded current Irish standards (Water Quality (Dangerous Substances) Regulations (S.I. No. 12 of 2001)). Individual results do not in themselves imply a breach as these standards apply as annual average concentrations. However, no samples exceed the Imperative values (maximum allowable concentrations) for shellfish waters as set out in SI 268 of 2006."

E(2) 3.3 – ENVIRONMENTAL RESEARCH INSTITUTE, UNIVERSITY COLLEGE CORK

University College Cork completed a number of studies as part of the VITOX/BIOMASSTOX projects. These included "An assessment of the pollutant status of surficial sediment in Cork Harbour in the South East of Ireland with particular reference to polycyclic aromatic hydrocarbons"

The assessment, [http://zae.ucc.ie/biomasstox/Kilemade%20et%20al%20\(2004\).pdf](http://zae.ucc.ie/biomasstox/Kilemade%20et%20al%20(2004).pdf), examined the pollution concentrations of heavy metals, PHAs, PCBs, OCPs, BFRs and organotins in surficial, inter-tidal sediments at 3 points within Cork Harbour with the results for the sites compared to a "clean" site at Ballymacoda outside the harbour. Figure 1 of the report which shows the test sites is included overleaf.

The assessment together with additional studies completed by UCC (available at <http://zae.ucc.ie/biomasstox/>) on the effects of the toxic compound discovered in the sediment on clams and turbot concluded that Cork Harbour is polluted principally with PHAs on a scale comparable to levels determined previously for both western and eastern Irish Sea sediments, and that "levels of PCBs, OCPs, BFRs and organotins were on the whole quite low, with the majority of the individual compounds being on or below the detection limit of the method."

Of the 3 sites within Cork Harbour, Whitegate, Aghada and Douglas, the site a Douglas was significantly more polluted than the other sites. The sum of PHAs in Douglas was 3 times that of the other sites and > 5 times that of Ballymacoda. By comparison the sum of PHAs in Whitegate and Aghada was less than twice that of the Ballymacoda.

The Douglas site also showed moderately elevated levels of heavy metals.

The reports note:

"Many sources may contribute to sediment PAHs. The relatively constant abundance of most of the PAHs at all sites, together with the special PAH compound ratios, has demonstrated that the sediments owed their PAH loading to a predominantly single mode of origin, i.e. anthropogenic combustion or pyrolysis processes via run-off, industrial and sewage discharges, and atmospheric input rather than petrogenic sources such as oil spills. However, evidence for the input of PAHs from petroleum appeared at one site within Cork Harbour, Whitegate, the site of an oil refinery, which exhibited the highest P/A and Chry/BaA ratios. These indices indicated slight over-impositions of petrogenic inputs into Cork Harbour at the Whitegate site."

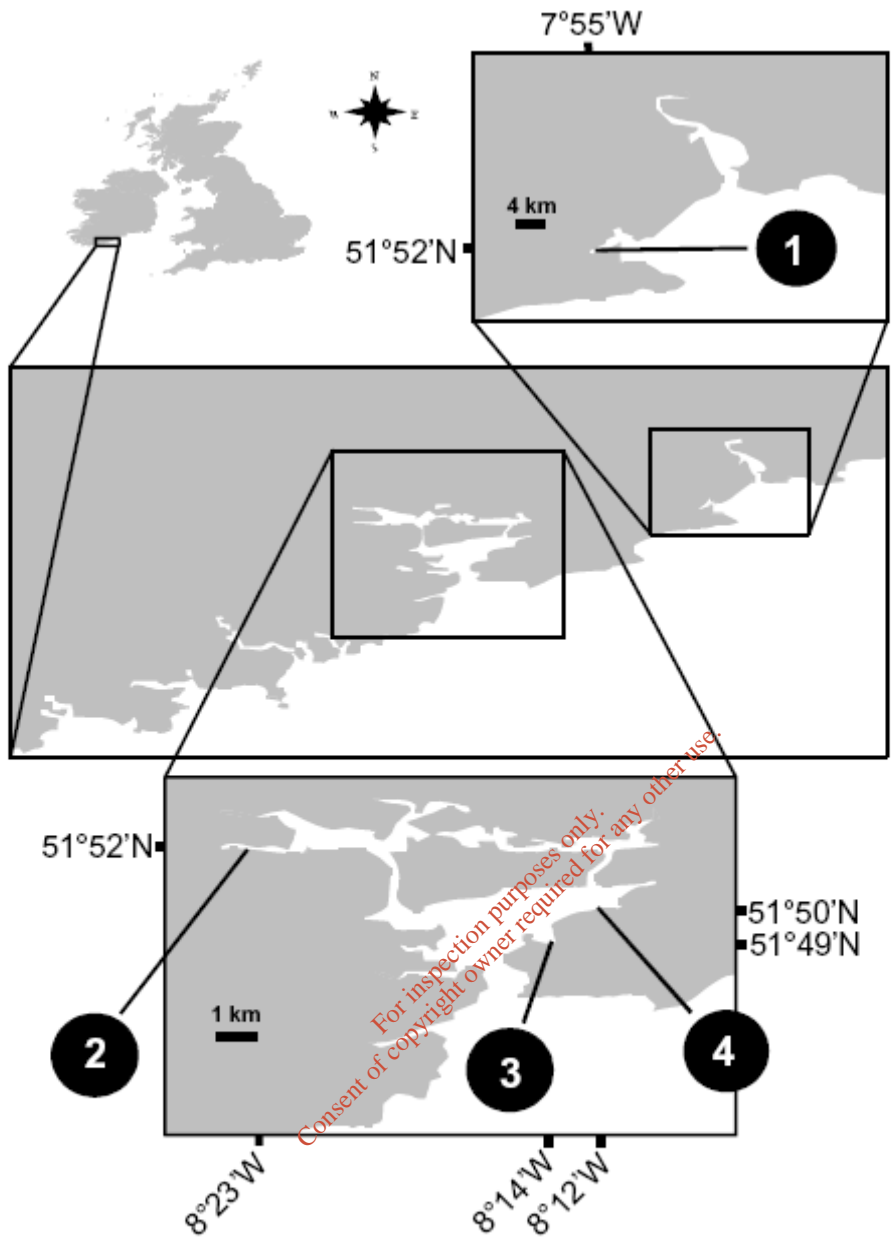


Fig. 1. Map of the sediment sampling sites: (1) Reference site, Ballymacoda and the contaminated sites in Cork Harbour (2) Douglas, (3) Whitegate and (4) Aghada.

E(2) 4 – CONVENTIONAL SEWERAGE TREATMENT & REMOVAL OF HEAVY METALS

“Sewage sludge composition – a multifunctional information” by Vienna University of Technology; Inst. for Water Quality, Resources and Waste Management and available in full at <http://www.bvsde.paho.org/bvsaar/cdlodos/pdf/sewagesludge1003.pdf> examined the reduction in heavy metals for the Vienna WWTP. “The treatment process in the period of the sampling campaign consists of conventional mechanical treatment with primary settling and a secondary treatment with 80% BOD removal only. P-precipitation was conducted by pre-precipitation in the primary settling and simultaneous precipitation in the secondary treatment.” The plant has a daily loading of approximately 550 000 m³ waste water.

The assessment showed, while the removal efficiency decreased with increasing flow, the following were the removal rates for heavy metals:

“The removal efficiency of the WWTP is lowest for Zn (58%), followed by Cu (73%) and Cd (67%). 80 to 90% of the Ag-, Hg- and Cr-load are retained in the sludge. The highest removal efficiency was found for Pb (92%) and for Al (> 97%).”

A similar study, <http://www.springerlink.com/content/a512424m3k328562/fulltext.pdf>, in Brazil showed the percentages of removal efficiency (RE) as:

“Hg 61.5%, Cd 60.0%, Zn 44.9%, Cu 44.2%, Pb 39.7%, Cr 16.5% and Mn 10.4%”

A study http://www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/142.pdf of the activated sludge WWTP for Bangkok concluded that the removal of metals was directly proportional to initial metal concentration in the influent. The study gave the order and range of percentage removal efficiency as:

“Ni (3.6-27.6) < As (6.8-31.7) < Mo (24.0-43.9) < Mn (31.3-66.6) < Zn (36.1-66.0) < Hg (24.9-79.0) < Cd (0.4-87.3) < Cr (3.2-79.5) < Cu (37.3-74.5) < Pb (54.2-78.9) < Fe (80.5-88.3)”

Health Risk and Environmental Pollution In Relation To Removal Of Heavy Metals By Waste Water Treatment http://www.isah-soc.org/documents/2005/sections/77_vol_2.pdf considered the removal of heavy metals in two WWTPs, the second treating urban waste waters from a conglomeration of approx. 100 000 inhabitants with very little proportion of industrial pre-treated waste waters (WWTP-2). Both treatment systems include mechanical and aerobic biological stages. The study concluded that “Approximately 70-75% of Zn, Cu, Cd, Cr, Hg and other metals in raw sewage is removed and transformed to the sludge”

Table E(2)2 shows the transfer coefficients for two small treatment plants in Austria, which have been investigated in detail over one year (Zessner 1999).

TP	A, 2-stage ASP ("ts" ~25 d)				B, 1stage ASP (ts ~ 8d)			
	Influent + chemicals for Pprec.		sludge	effluent	influent		sludge	effluent
	g/PE/d	g/Inh/d	%	%	g/PE/d	g/Inh/d	%	%
CSB	110	224	28	7	110	92	43	12
N	8,2	16,7	17	18	1,5	1,3	15	67
P	1,05	2,1	86	14	12,5	10,5	26	74
	mg/PE/d	mg/Inh/d	%	%	mg/PE/d	mg/Inh/d	%	%
Zn	59	120	51	46	127	106	45	53
Cu	17	34	77	19	15	12,6	56	42
Pb	2,5	5	72	16	3,9	3,2	79	16
Cd	0,13	0,27	53	44	0,19	0,16	38	59
Cr	3	6,1	80	18	3,4	2,9	49	46
Ni	2,5	5,1	68	30	2,9	2,4	34	62
Hg	0,03	0,06	> 46	< 52	0,14	0,11	(55)	(45)

Table E(2)2 – Specific loads in the influent and their distribution to the different end products based on a mass balance over one year

E(2) 5 – CONVENTIONAL SEWERAGE TREATMENT & REMOVAL OF PERSISTENT ORGANIC POLLUTANTS/COMPOUNDS

Persistent organic pollutants (POPs) are organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes. They can persist in the environment, are capable of long-range transport, and can bioaccumulate in human and animal tissue.

In May 1995, the United Nations Environment Programme Governing Council began investigating POPs, initially beginning with a short list of aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, polychlorinated biphenyls, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and toxaphene.

A number of studies have investigated the removal of persistent organic pollutants/compounds through conventional sewerage treatment.

One study, <http://www.springerlink.com/content/b61512402715w265/fulltext.pdf>, "The Fate of Dissolved Organic Carbon (DOC) in the Waste water Treatment Process and its Importance in the Removal of Waste water Contaminants" showed the reductions in pollutant levels, following secondary treatment (SSE) compared with the raw water (RW) entering the treatment plant in Table E(2)3 overleaf.

Table E(2)3 – Reductions in pollutant levels, following secondary treatment (SSE) compared with the raw water (RW)

POPs	RW	PSE	SSE
Hexachlorobutadine	ND (4.7)	ND (2.4)	ND (1.2)
Dichlobenil	ND (11)	ND (5.7)	ND (2.8)
Quintozene	20 (4.2)	18 (2.1)	12 (1.1)
Hexachlorobenzene	6.7 (4.7)	3.8 (2.4)	12 (1.2)
α-HCH	23 (6.0)	13 (3.0)	5.8 (1.5)
β-HCH	19 (6.5)	4.1 (3.2)	6.1 (1.6)
γ-HCH	ND (3.6)	ND (1.8)	ND (0.9)
Isobenzan	ND (10)	ND (5.0)	ND (2.5)
α-Endosulfan	39 (6.0)	17 (3.0)	2.7 (1.5)
Aldrin	ND (6.5)	ND (3.2)	ND (1.6)
Isodrin	ND (4.0)	ND (2.0)	ND (1.0)
Dieldrin	15 (5.5)	12 (2.7)	5.7 (1.4)
Endrin	ND (4.0)	ND (2.0)	2.8 (1.0)
Heptachlor	25 (3.7)	4.3 (1.7)	2.3 (0.9)
Heptachlor-exo-epoxide	110 (5.5)	79 (2.7)	18 (1.4)
Heptachlor-endo-epoxide	ND (5.0)	ND (2.5)	ND (1.2)
p-p'-DDE	2.4 (4.5)	1.3 (2.2)	0.73 (1.1)
p-p'-DDD	9.8 (4.7)	7.8 (2.4)	4.7 (1.2)
p-p'-DDT	ND (7.0)	ND (3.5)	ND (1.7)
PCB-28	2.5 (6.0)	3.6 (3.0)	2.7 (1.5)
PCB-52	210 (4.7)	110 (2.4)	88 (1.2)
PCB-101	140 (10)	72 (5.0)	37 (2.6)
PCB-118	8.6 (6.0)	6.3 (3.0)	4.6 (1.5)
PCB-153	5.7 (4.0)	4.6 (2.0)	0.7 (0.4)
PCB-138	2.7 (4.5)	1.8 (2.2)	1.5 (1.1)
PCB-180	160 (5.5)	140 (2.7)	41 (1.4)

ND: Not detected. The detection limits for individual POPs in wastewater (ng l^{-1}), calculated as signal-to-noise ratio of three, are given in parentheses (Katsoyiannis and Samara 2002)

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E(2) 6 – CONCLUSIONS

The Environmental Protection Agency have confirmed that “*Concentrations of environmental contaminants such as metals, hydrocarbons and persistent organic pollutants in bivalve molluscs are very good indicators of ambient water quality with respect to these parameters.*” It is appropriate to take surveys shown existing lack of contamination in Oysters in Cork Harbour into consideration in the assessment of the impact of the proposed WWTP. These surveys do not show elevated pollution levels within the harbour.

E(2) 6.1 – HEAVY METAL CONCENTRATIONS IN CORK HARBOUR

Cork Lower Harbour is regularly tested for concentrations of heavy metals and it has been concluded by the Department of the Marine, the Environmental Protection Agency and University College Cork that there is not an issue with heavy metals pollution in the harbour. Section E(2)4 above clearly shows that the provision of primary and secondary treatment with a conventional activated sludge process, as with the proposed WWTP at Shanbally, leads to significant reductions in the levels of heavy metals in the treated waste water. This is as a coincidental part of the process as the metal ions, being heavier than water, tend to settle out into the sludge as part of the treatment process.

The provision of the treatment plant will significantly decrease the levels of heavy metals released to the harbour when compared with the current release of untreated sewage. The provision of the WWTP will not have an adverse effect on the Cork Harbour SPA as it will lead to reduced discharge of heavy metals, not the elevated discharge suggested by the NPWS.

E(2) 6.2 – PERSISTENT ORGANIC COMPOUNDS

As with the concentrations of heavy metals, Cork Lower Harbour is regularly tested for persistent organic pollutants. It has been demonstrated by the Department of the Marine, the Environmental Protection Agency and University College Cork that there is no longer an issue with persistent organic pollutants in the water in the harbour. Since 2002, coincidental with the provision of the Cork City WWTP, the levels of all organohalogens (PCBs and pesticides) were below limits of detection in the water samples. The study completed in 2004 by UCC of inter-tidal sediments concluded that levels of PCBs, OCPs, BFRs and organotins were on the whole quite low, with the majority of the individual compounds being on or below the detection limit of the method.

The UCC study did however confirm that the harbour does have a pollution issue with the levels of PAHs in the sediment of the harbour on a scale comparable to levels determined previously for both western and eastern Irish Sea sediments. The study also concluded that, with the exception of Whitegate where some PAH concentrations were clearly associated with the oil refinery, the “relatively constant abundance of most of the PAHs at all sites, together with the special PAH compound ratios, has demonstrated that the sediments owed their PAH loading to a predominantly single mode of origin” i.e. the PAHs at the clean site came from the same source as the PAH within the harbour. The actual source could not however be defined.

As Section E(2)5 above demonstrates, the provision of the treatment plant will significantly decrease the levels of for persistent organic pollutants released to the harbour when compared with the release of untreated sewage. The provision of the WWTP will not have an adverse effect on the Cork Harbour SPA as it will lead to reduced discharge of for persistent organic pollutants, not the elevated discharge suggested by the NPWS.

E(2) 6.3 – SUMMARY

The provision of the proposed WWTP at Shanbally will not have a significant adverse effect on the Cork Harbour SPA. It will in fact have a positive effect on the SPA through the reduction in the levels of heavy metals and persistent organic pollutants/compounds released to the harbour.

The harbour does not currently have an issue with the accumulation of heavy metals or persistent organic compounds (other than PHAs) in the sediment of the harbour. There is no evidence of accumulations of either metals or persistent organic pollutants/compounds in the flesh of shellfish which are tested in the harbour every year.

As it has been demonstrated that the provision of the treatment plant will have a positive effect on the SPA no further investigation is required.

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RESPONSE PART F – HANDLING OF TREATED TRADE EFFLUENT AND UNTREATED WASTE WATER

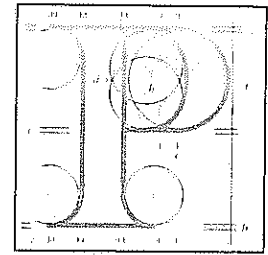
F1 – HANDLING OF TREATED & UNTREATED WASTE WATER

Following completion of the proposed Waste Water Treatment Plant at Shanbally only effluent discharging directly to the IDA sewer from IPPC Licenced Industry will be discharged without treatment in the WWTP. The quality of this effluent is dictated by the IPPC licence limits. All waste water collected from the agglomerations of Cobh, Passage West/Glenbrook/Monkstown, Ringaskiddy, Carrigaline & Crosshaven, from domestic and non-domestic sources will be treated in the proposed WWTP.

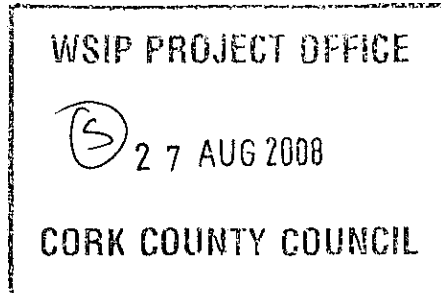
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**APPENDIX A – FURTHER INFORMATION SUBMITTED TO AN
BORD PLEANÁLA**

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Claire Foley
Cork County Council
W.S.I.P. Project Office
Model Business Park
Model Farm Road
Cork



25th August 2008

Re: Proposed Wastewater Treatment Plant at Shanbally, County Cork.

Dear Madam,

I refer to the above-mentioned proposed development which is before the Board for approval. Please be advised that the Board, in accordance with section 175(5)(a) of the Planning and Development Act, 2000 hereby requires you to furnish further information in relation to the effects on the environment of the proposed development, details of which are supplied on the enclosed document.

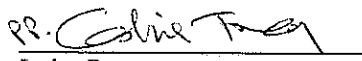
Please also note that following its examination of any information lodged in response to this request for additional information, the Board will then decide whether to invoke its powers under sub-section 5(b)(i) of section 175 of the Planning and Development Act, 2000 to require you to publish newspaper notice of the furnishing of any additional information and to allow for inspection or purchase of same and the making of further written submissions in relation to same to the Board.

Your response to this letter should be received not later than 5.30 p.m. on the 15th of September, 2008.

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully


Luke Ryan
Executive Officer

encl

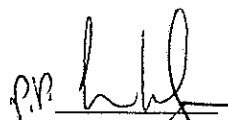
64 Sráid Maoilbhríde,
Baile Átha Cliath 1.

Tel: (01) 858 8100
LoCall: 1890 275 175
Fax: (01) 872 2684
Web: <http://www.pleanala.ie>
email: bord@pleanala.ie

64 Marlborough Street,
Dublin 1.

Additional information is required in relation to the following:-

1. Information on Sewerage collection system in Cobh with reference to the type of sewers as between combined and separate system. Comment particularly on storm water overflows and their basis in Cobh both currently and in the future proposal. An estimate on likely storm flows as a multiple of dry weather flow for the Cobh catchment is requested if measured flows are not available. Indicate proposals to comply with likely requirements of a discharge licence from EPA as it would apply to storm overflows and the likely frequency of same. Information submitted should refer to DoEHLG guidelines "Procedures and Criteria in relation to Stormwater Overflows"(Reference is made in guidelines to numbers of overflows permitted in a year)
2. Information on likely residence time for sewage from Cobh to be in transit to the proposed treatment works. Confirm if sewage from Cobh would be transferred through four pumping stations in series. Comment on likely capacity of storm tanks in Cobh in relation to the expected storm flows.
3. Indicate size of proposed Rafeen Pumping station, together with capacity, design year flows and volume of stormwater storage. Indicate route and discharge point of overflow pipe.
4. Comment on impact of disproportionate rise in energy costs since preparation of the EIS and particularly confirm the preference for the chosen solution, given that it involves additional pumping over and above that for the second short-listed option.
5. Indicate location and approximate size of other outfalls to Cork Harbour and indicate the location of the outfall to the Cork City WWTP.
6. Give details of consultations with the South Western River Basin District group (or their successors if the project is completed) in relation to compliance of the proposal with the objectives of the Water Framework Directive as it relates to Cork Harbour.
7. Baseline information on water quality in Lower Cork Harbour to put in context comments regarding Health and Safety on page 79 and regarding Tourism and Recreation on page 85 of Volume 2 of the EIS with respect to impacts from the current discharges on the environment. Clarify, in relation to Appendix 3A , Volume III of EIS if faecal coliform, norovirus and nitrogen results are related to measured values in the Lower Harbour.


D.O'Connor
22/08/2008.

An Bord Pleanála,
64 , Marlborough Street,
Dublin 1

12/09/08

Attn: Luke Ryan, Executive Officer.

Re : Proposed Wastewater Treatment Plant at Shanbally, County Cork.

ABP Ref 04.YA0005

A Chara,

I refer to your letter of 25th August 2008 requesting further information in relation to the above and I wish to respond as follows:

- 1 Information on Sewerage collection system in Cobh with reference to the type of sewers as between combined and separate system. Comment particularly on storm water overflows and their basis in Cobh both currently and in the future proposal. An estimate on likely storm flows as a multiple of dry weather flow for the Cobh catchment is requested if measured flows are not available. Indicate proposals to comply with likely requirements of a discharge licence from EPA as it would apply to storm overflows and the likely frequency of same. Information submitted should refer to DoEHLG guidelines "Procedures and Criteria in relation to Stormwater Overflows"(Reference is made in guidelines to numbers of overflows permitted in a year)***

The existing sewerage collection system in Cobh consists almost entirely of combined sewers with over 16km of combined sewer included in the hydraulic model prepared for the preliminary report. Presently these flows discharge through various outfalls. The main outfalls currently in use in Cobh are

summarized in the table below, together with flows at the time of the preparation of the Preliminary Report.

Outfall Location	Foul Flow (DWF)	Estimated Storm Runoff (2yr 30min storm)
	m³/day	m³
Pilots Pier Outfall	354	563
Corbett Outfall	178	282
Kings Quay Outfall	445	481
West Beach Outfall	668	953
White Point Outfall	635	1,066
Total Catchment	2,280	

With the exception of White Point Outfall all flows are discharged untreated. Flows from White Point Outfall are discharged via a comminutor station.

The proposed collection system includes for the provision of an extensive surface water collection system (almost 20km) so as to remove surface water from the combined sewers where practicable. The existing combined sewers will be intercepted with foul flows directed towards the proposed West Beach and Carrigaloe pumping stations, for onward pumping to the proposed wastewater treatment plant.

A small number of developments which are below the proposed interceptor sewer will be pumped to the interceptor sewer. These areas would have separate sewer systems and are not envisaged to have stormwater overflows.

The proposed scheme will include two stormwater overflows in Cobh. At the proposed West Beach pumping station flows will be pumped forwards at 6DWF, while flows in excess of this would overflow to the harbour via 6mm screens and a storm water holding tank. The holding tank will be sized to cater for the 'first foul flush'. The receiving waters at this location are not designated bathing waters or sensitive waters. As such any references in the DoEHLG Guidelines "Procedures and Criteria in relation to Stormwater Overflows" to a number of permitted overflows per year are not considered applicable to this overflow. The estimated discharge through this overflow in a 2 year 30 minute storm is 757m³.

The second stormwater overflow will be located on the foul sewer at Lake Road near White Point. Flows in excess of 6DWF in this sewer would overflow via 6mm screens to the proposed storm sewer at this location. This storm sewer will discharge via the existing 750mm diameter White Point Outfall. The receiving waters at this location are not designated bathing waters or sensitive waters. As such any references in the DoEHLG Guidelines "Procedures and Criteria in relation to Stormwater Overflows" to a number of permitted overflows per year are not considered applicable to this overflow. The estimated discharge through this overflow in a 2 year 30 minute storm is 499.5m³.

2 Information on likely residence time for sewage from Cobh to be in transit to the proposed treatment works. Confirm if sewage from Cobh would be transferred through four pumping stations in series. Comment on likely capacity of storm tanks in Cobh in relation to the expected storm flows.

The residence time for flow from West Beach pumping station in Cobh to the inlet works of the wastewater treatment plant has been calculated at 9 hours and 44 minutes (Ref Table 2.1 attached).

It is confirmed almost 30% of the flows from Cobh would be transferred through four pumping stations in series.

The storm tanks at West Beach in Cobh have been sized based on holding the 'first foul flush' in the storm tanks. The effective volume of the storm tanks is 640m³. The estimated overflow volume in a 2 year 30 minute storm is 757m³.

Indicate size of proposed Rafeen Pumping station, together with capacity, design year flows and volume of stormwater storage. Indicate route and discharge point of overflow pipe.

The wet well of the pump station will have a plan area of 53m² (10.6m x 5.0m). The difference between the pump cut-in level and the pump cut-out level will be 1.0m, giving an effective volume of 53m³. The proposed pump rate from the pump station is 569 l/s. The design year flow is 569 l/s, comprising of 557 l/s pumped onwards from Monkstown pumping station and 12 l/s from local foul sewers. The height between the pump cut-in level and the emergency overflow is 2.778m, giving an effective storage volume of 147m³.

The route and discharge point of the overflow pipe are as indicated on Figure 3.1 attached.

3 Comment on impact of disproportionate rise in energy costs since preparation of the EIS and particularly confirm the preference for the chosen solution, given that it involves additional pumping over and above that for the second short-listed option.

The detailed evaluation of ten options for the scheme described in Section 2.3.1 of the EIS included a spreadsheet which allowed the costs for the various options to be compared. This spreadsheet allowed a sensitivity analysis to be carried out to examine the impact of an increase in, for example, civil, M&E, power or transport costs. This sensitivity analysis was used to assess the impact of the disproportionate rise in energy costs since the preparation of the EIS, with published indices used to determine the percentage increase in the various costs since the initial option selection was carried out in 2001. The output from this sensitivity analysis is included as Figure 4.1 and indicates that Option 2 (the currently proposed option) is still the most cost effective option.

To assess the impact of possible further increases in energy costs, the cost for energy was increased by a further 20%, with all other costs left at current prices. In this case Option 2 is still the preferred option (Ref. Figure 4.2).

4 Indicate location and approximate size of other outfalls to Cork Harbour and indicate the location of the outfall to the Cork City WWTP.

Figure 5.1 illustrates the location and volume of the following known discharges to Cork Harbour :

- 10 nr. existing wastewater outfalls in Cork Lower Harbour as part of the Cork Harbour Drainage Scheme;
- Discharges from Midleton, Carrigtwohill and Carrigrennan WWTPs;
- Discharges from Cloyne, Saleen, Rostellan and Farsid;
- IPPC discharges; and
- Section 4 discharges.

The location of Cork City WWTP (Carrigrennan) and the location of the proposed primary outfall for Cork Lower Harbour are indicated in red on Figure 5.1.

Available information on the discharge volumes and outfall pipe sizes are indicated in Table 5.1 attached.

5 Give details of consultations with the South Western River Basin District group (or their successors if the project is completed) in relation to compliance of the proposal with the objectives of the Water Framework Directive as it relates to Cork Harbour.

The Consultants engaged to prepare the EIS for the Cork Harbour Main Drainage Scheme on behalf of Cork County Council are the lead consultants working on the South Western River Basin District. The Consultants considered the objectives of the Water Framework Directive but could not comment on same in the EIS because the work on the River Basin project was not sufficiently advanced at that time to determine the implications, if any, for the objectives of the Water Framework Directive as a result of the proposed development.

The objectives of the Water Framework Directive are to achieve Good Status in all bodies of water by 2015. The proposed wastewater treatment plant will discharge through an existing outfall pipeline to Cork Harbour. The water body which receives the discharges from the outfall pipeline has been designated 'at risk' of not achieving the objectives of the Water Framework Directive. One of the criteria which has put the water body at risk is the lack of a wastewater treatment plant. At present, wastewater from Carrigaline and Crosshaven is untreated prior to discharge through the existing outfall.

Water bodies which are 'at risk' must be subject to measures. The Water Framework Directive requires that the 'Basic Measures' are implemented and where necessary 'Supplementary Measures'. The Basic Measure in respect of the proposed development includes the Urban Waste Water Treatment

Directive which requires urban wastewater to be treated prior to discharge. The proposed development is consistent with the requirements of the Urban Waste Water Treatment Directive and is a positive step in achieving the objectives of Water Framework Directive at this location. It is not known at this time if any supplementary measures need to be implemented which would have implications for the proposed development.

If it transpires that supplementary measures are required, possible measures in respect of the wastewater treatment plant could include the incorporation of a higher level of treatment than is required under the Urban Waste Water Treatment Directive. In the EIS it is stated that the plant will be designed such that nutrient removal can be provided in an upgrade if required (page 145 of the EIS). An area within the site has been allocated to allow sufficient space for same should the future requirement be realised.

- 6 *Baseline information on water quality in Lower Cork Harbour to put in context comments regarding Health and Safety on page 79 and regarding Tourism and Recreation on page 85 of Volume 2 of the EIS with respect to impacts from the current discharges on the environment. Clarify, in relation to Appendix 3A, Volume III of EIS if faecal coliform, norovirus and nitrogen results are related to measured values in the Lower Harbour.*

Baseline Information on water quality in Cork Harbour was received from Cork City Council and is enclosed for your information. The extracted data for faecal coliforms in Cork Harbour from 2005-2007 is also enclosed.

The comments made on Health and Safety and Tourism and Recreation on pages 79 and 85 of the EIS were made with regard to the existing situation whereby untreated waste water is currently being discharged via 10 nr. outfalls into Cork Harbour. The outfalls do not discharge into designated bathing areas, however, some of these locations are used for recreational purposes. For example the outfall at Monkstown is adjacent to Monkstown Pier which is used frequently by locals for recreational activities. Water quality data in the vicinity of the current discharge outfalls is not available, however, it can be expected that microbiological and nutrient levels are higher in the vicinity of the discharge locations near the shore compared with the deeper waters further from the shoreline following dispersion and dilution. The proposed WWTP and upgrade of the collection system will involve the decommissioning of 9 nr. discharge outfalls around Cork Harbour. Emergency and stormwater overflows will remain at some of these locations but will be designed in accordance with the DoEHLG guidelines "Procedures and Criteria in relation to Storm Water Overflows".

A computer model was developed for Cork Harbour to simulate the release, transport and decay of faecal coliforms, norovirus and nitrogen from the Lower Harbour catchment. Four cases were simulated:

Case 1: No treatment (flows for 2001)

Case 2: No treatment (flows for 2010)

Case 3: With treatment (flows for 2010)

Case 4: With treatment (flows for 2030)

A comprehensive model does not exist in relation to the overall nutrient and microbiological contribution to Cork Harbour and the overall water quality in the Harbour and as such, the most practical approach was to identify the inputs into the harbour which will be addressed as part of the proposed development.

Inputs into the harbour from the collection system and its current discharges were modelled and compared with the future scenario to demonstrate the relative change in water quality expected to arise following the proposed development. As a consequence the data presented provides an accurate representation of the relative improvement in water quality which will be addressed as part of the proposed scheme.

Claire Foley,
Senior Staff Officer.

Encl.

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Table 2.1 - Calculation of Residence Time from Cobh (West Beach PStn) to Wastewater Treatment Plant

West Beach Pumping Station		
Wet well width (m)	7 m	
Wet well length (m)	3.5 m	
Wet well effective depth (m)	1 m	
Wet Well effective volume	24.5 m3	
Incoming flow rate (1 DWF)	17.5 l/s	Design Year, 1 DWF
Pump Rate	35 l/s	D/A pumps at 105 l/s, assume duty pumps at 1/3 of this
Time to fill wet well	1400 sec	
Time to empty wet well	1400 sec	
Total Residence Time	2800 sec	

Monkstown Pumping Station		
Wet well width (m)	5 m	
Wet well length (m)	10.6 m	
Wet well effective depth (m)	1 m	
Wet Well effective volume	53 m3	
Incoming flow rate (1 DWF)	92.8 l/s	Design Year, 1 DWF
Pump Rate	278.5 l/s	D/A pumps at 557 l/s, assume duty pumps at 1/2 of this
Time to fill wet well	571 sec	
Time to empty wet well	285 sec	
Total Residence Time	856 sec	

West Beach Rising Main		
Length of Rising Main	540 m	
Internal Diameter of Rising Main	250 mm	
Total volume of Rising Main	26.5 m3	
Pumped velocity	0.71 m/s	
Total volume pumped per cycle	49 m3	Rising main empties in one pump cycle
Nr of pump cycles	0.54	
0 full pump cycles take	0 sec	
Time to start of next pump cycle	1400 sec	
Time of pumping	756 sec	
Total time in rising main	756 sec	

Monkstown Rising Main		
Length of Rising Main	1187 m	
Internal Diameter of Rising Main	700 mm	
Total volume of Rising Main	456.6 m3	
Pumped velocity	0.72 m/s	
Total volume pumped per cycle	79.4 m3	
Nr of pump cycles	5.75	
5 full pump cycles take	4280 sec	
Time to start of next pump cycle	571 sec	
Time of pumping	5064.8 sec	
Total time in rising main	5064.8 sec	

Gravity Sewer to Carrigaloe Pump Station		
Length of gravity sewer	3160 m	
Average Velocity	0.75 m/s	assumed average velocity
Time of Flow	4213 s	

Gravity Sewer to Raffeen Pump Station		
Length of gravity sewer	1030 m	
Average Velocity	0.75 m/s	assumed average velocity
Time of Flow	1373 s	

Carrigaloe Pumping Station		
Wet well width (m)	4 m	
Wet well length (m)	9.6 m	
Wet well effective depth (m)	1 m	
Wet Well effective volume	38.4 m3	
Incoming flow rate (1 DWF)	61.5 l/s	Design Year, 1 DWF
Pump Rate	185 l/s	D/A pumps at 370 l/s, assume duty pumps at 1/2 of this
Time to fill wet well	624 sec	
Time to empty wet well	311 sec	
Total Residence Time	935 sec	

Raffeen Pumping Station		
Wet well width (m)	5 m	
Wet well length (m)	10.6 m	
Wet well effective depth (m)	1 m	
Wet Well effective volume	53 m3	
Incoming flow rate (1 DWF)	94.8 l/s	Design Year, 1 DWF
Pump Rate	284.5 l/s	D/A pumps at 569 l/s, assume duty pumps at 1/2 of this
Time to fill wet well	559 sec	
Time to empty wet well	279 sec	
Total Residence Time	838 sec	

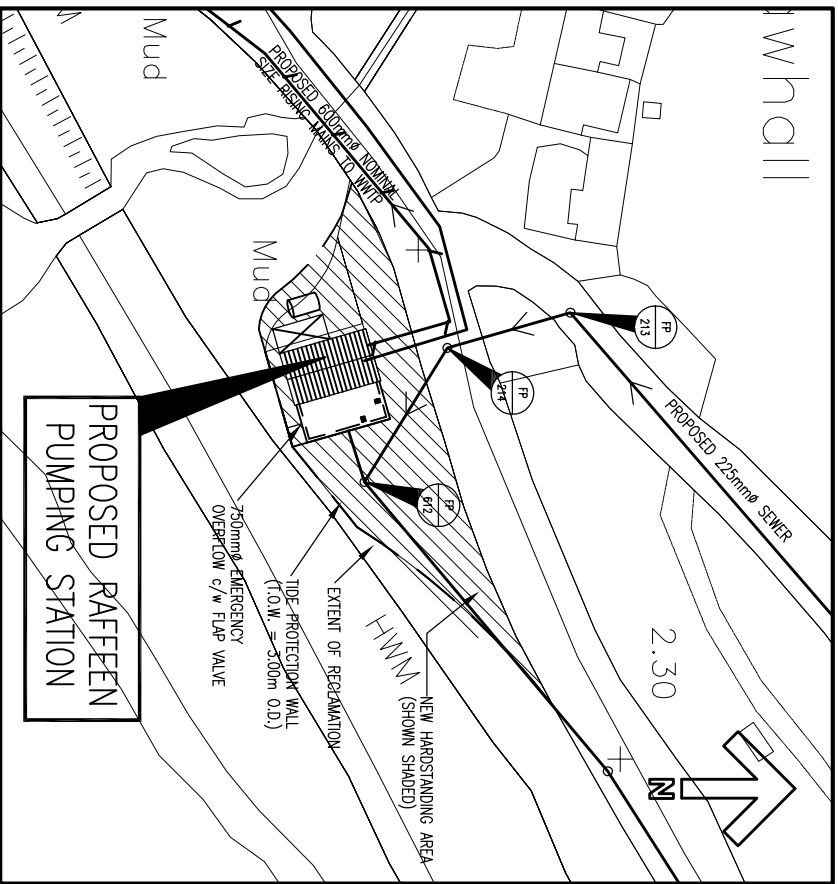
Carrigaloe Rising Main		
Length of Rising Main	1091 m	
Internal Diameter of Rising Mains	500 2x (mm)	
Total volume of Rising Main	428.2 m3	
Pumped velocity	0.94 m/s	per rising main
Total volume pumped per cycle	57.5 m3	
Nr of pump cycles	7.45	
7 full pump cycles take	6545 sec	
Time to start of next pump cycle	624 sec	duty/assist rising mains
Time of pumping	7309 sec	
Total time in rising main	7309 sec	

Raffeen Rising Main		
Length of Rising Main	2278 m	
Internal Diameter of Rising Main	700 mm	
Total volume of Rising Main	876.2 m3	
Pumped velocity	0.74 m/s	
Total volume pumped per cycle	79.4 m3	
Nr of pump cycles	11.04	
11 full pump cycles take	9218 sec	
Time to start of next pump cycle	559 sec	
Time of pumping	9788.2 sec	
Total time in rising main	9788.2 sec	

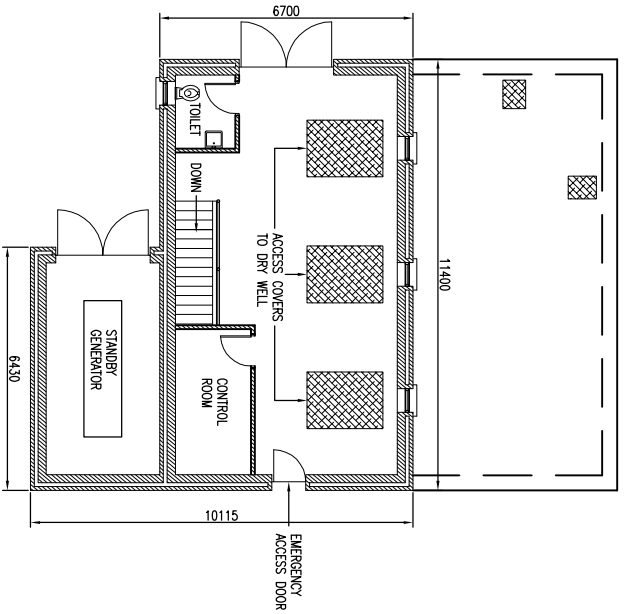
Gravity Sewer to Monkstown Pump Station		
Length of gravity sewer	850 m	
Average Velocity	0.75 m/s	assumed average velocity
Time of Flow	1133 s	

Total Time from West Beach Pumping Station to Wastewater Treatment Plant

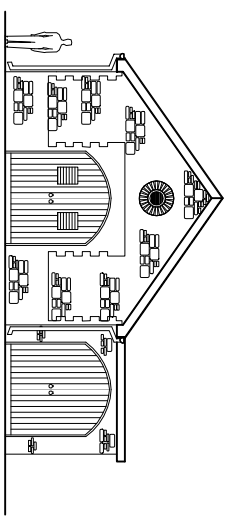
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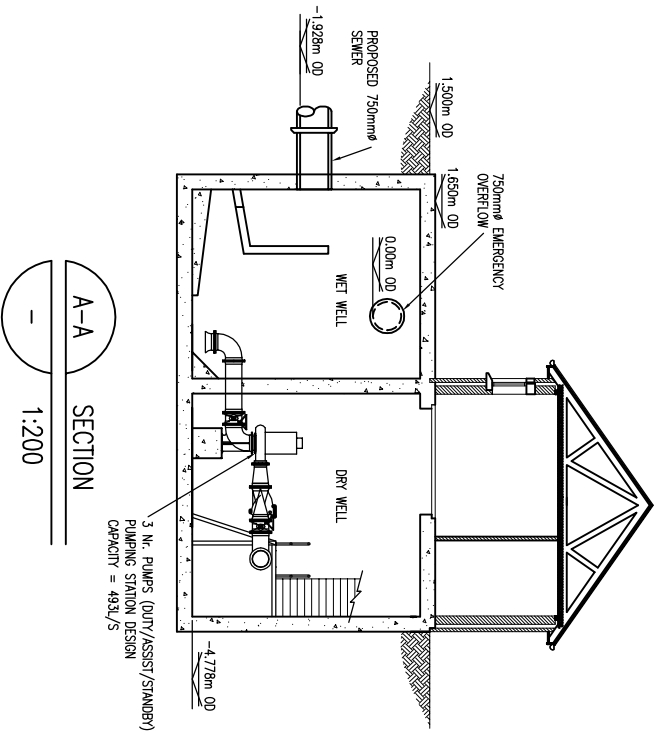
LOCATION PLAN
SCALE 1:1,000



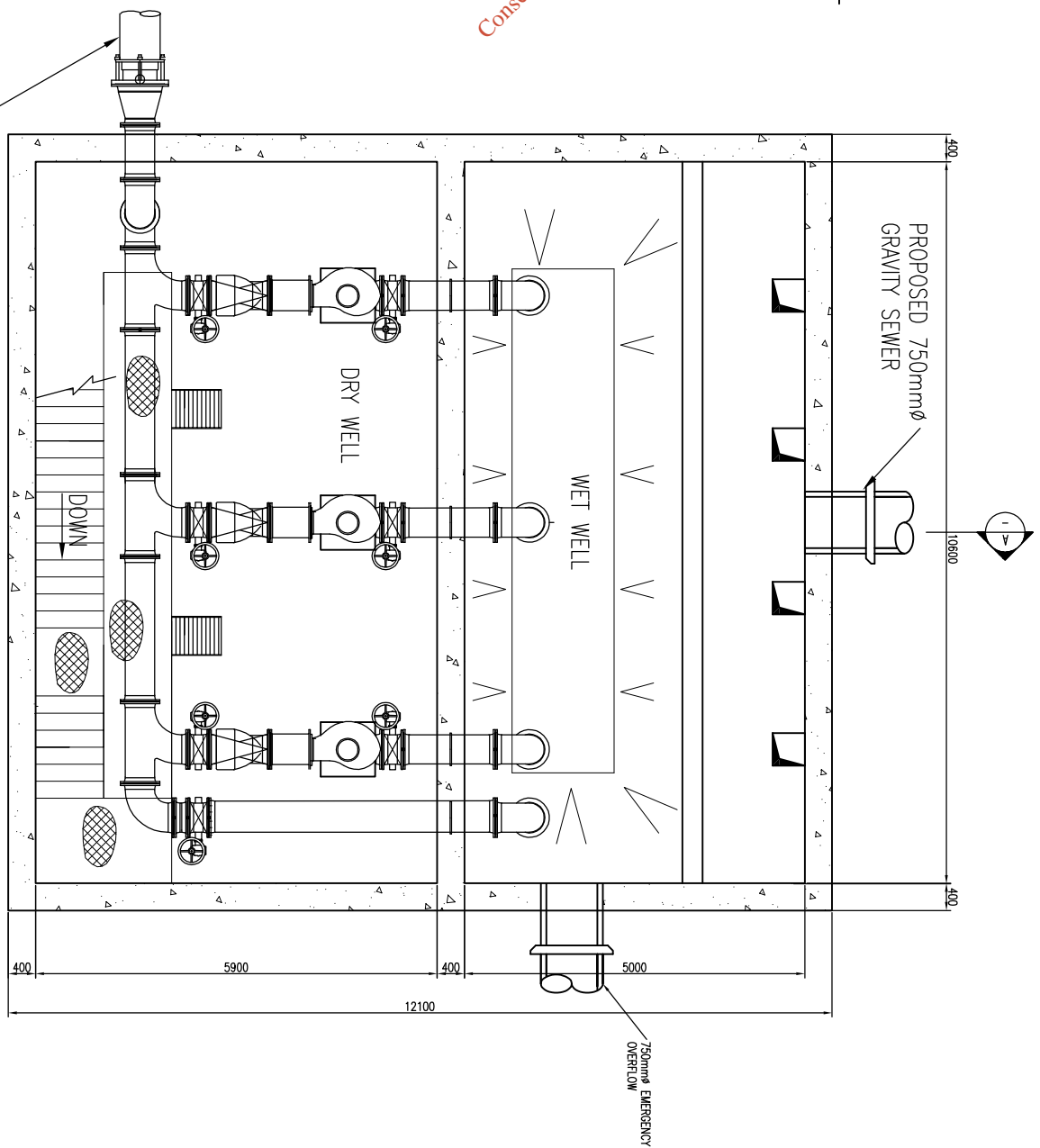
SECTIONAL PLAN AT GROUND LEVEL
SCALE 1:200



NORTHERN ELEVATION
SCALE 1:100



A-A SECTION
SCALE 1:200



PLAN
SCALE 1:100

NOTES:
1. ALL LEVELS TO ORDINANCE DATUM MALIN HEAD

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FIG. 3.1 – PROPOSED RAFFEEEN PUMPING STATION

Sensitivity analysis

Figure 4.1 Inflation to June 2008

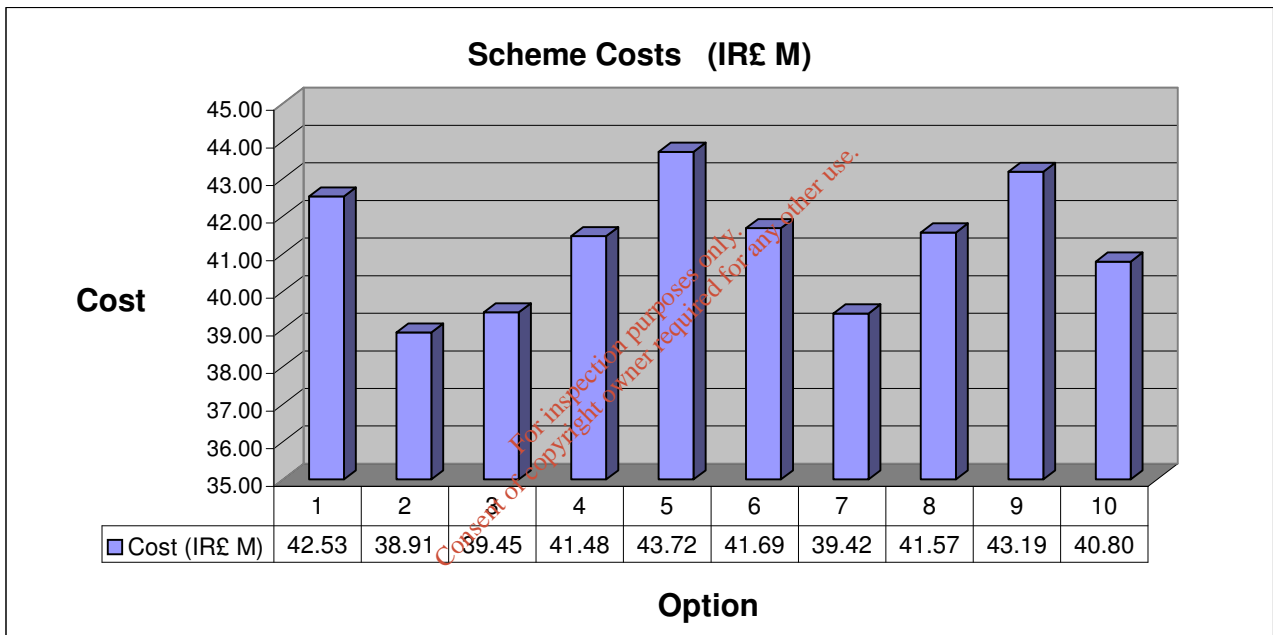
Base case

Option	1	2	3	4	5	6	7	8	9	10
Base Case Cost (IR£ M)	30.01	27.59	27.81	29.24	30.70	29.48	28.54	30.27	30.30	28.70
Base Rank	7	1	2	5	10	6	3	8	9	4

Option	1	2	3	4	5	6	7	8	9	10
Cost (IR£ M)	42.53	38.91	39.45	41.48	43.72	41.69	39.42	41.57	43.19	40.80

Current Rank	8	1	3	5	10	7	2	6	9	4
Change in Rank	-1	0	-1	0	0	-1	1	2	0	0

Cost Diferential	12.52	11.32	11.64	12.24	13.02	12.21	10.88	11.30	12.88	12.10
Cost Diferential Rank	8	3	4	7	10	6	1	2	9	5



M&E %	143	◀	▶
Civil - Terrestrial %	143	◀	▶
Civil - Marine %	143	◀	▶
WwTW %	100	◀	▶
Pumping Stations %	100	◀	▶
Chemicals (RM) %	88	◀	▶
Pipework %	100	◀	▶
Power %	165	◀	▶
Labour %	164	◀	▶
Transport %	131	◀	▶
Telemetry & Control %	143	◀	▶

Sensitivity analysis

Figure 4.2 Inflation to June 2008, Additional 20% increase in Power Costs

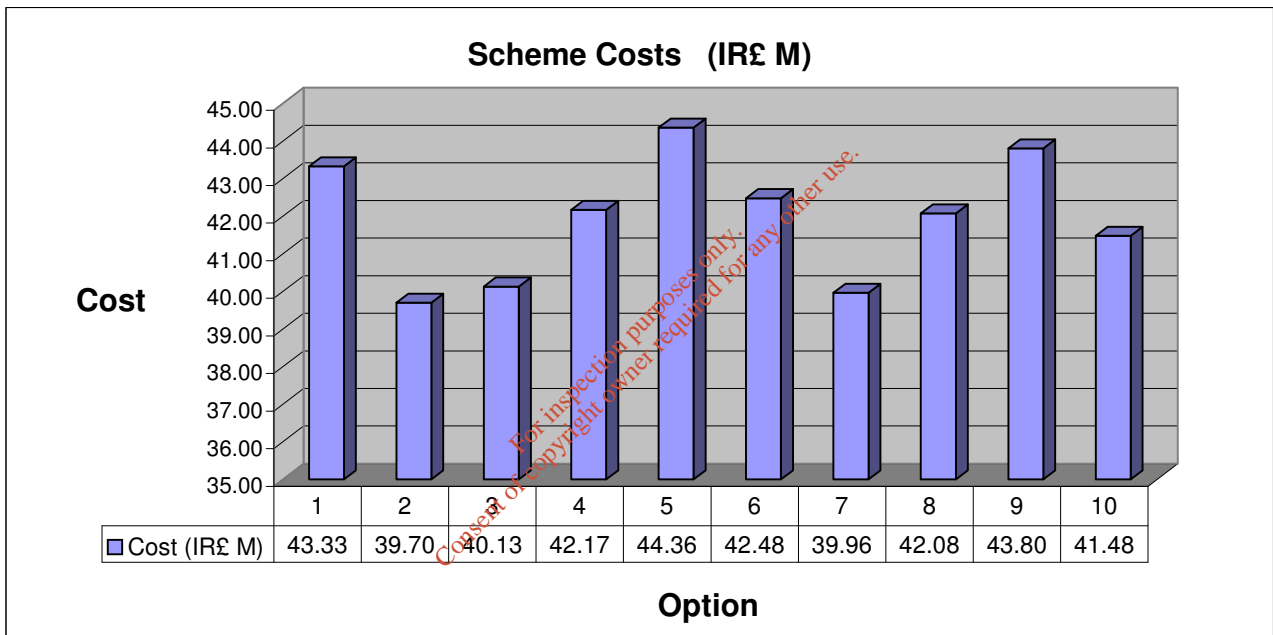
Base case

Option	1	2	3	4	5	6	7	8	9	10
Base Case Cost (IR£ M)	30.01	27.59	27.81	29.24	30.70	29.48	28.54	30.27	30.30	28.70
Base Rank	7	1	2	5	10	6	3	8	9	4

Option	1	2	3	4	5	6	7	8	9	10
Cost (IR£ M)	43.33	39.70	40.13	42.17	44.36	42.48	39.96	42.08	43.80	41.48

Current Rank	8	1	3	6	10	7	2	5	9	4
Change in Rank	-1	0	-1	-1	0	-1	1	3	0	0

Cost Diferential	13.32	12.12	12.32	12.93	13.66	13.00	11.42	11.80	13.50	12.78
Cost Diferential Rank	8	3	4	6	10	7	1	2	9	5



M&E %	143	◀	▬	▶
Civil - Terrestrial %	143	◀	▬	▶
Civil - Marine %	143	◀	▬	▶
WwTW %	100	◀	▬	▶
Pumping Stations %	100	◀	▬	▶
Chemicals (RM) %	88	◀	▬	▶
Pipework %	100	◀	▬	▶
Power %	200	◀	▬	▶
Labour %	164	◀	▬	▶
Transport %	131	◀	▬	▶
Telemetry & Control %	143	◀	▬	▶



WW 1 WASTEWATER DISCHARGES

#	NAME
1	CARRIGRENAN (CORK CITY WWTP)
2	I.D.A. OUTFALL (CORK LOWER HARBOUR WWTP)
3	PASSAGE WEST
4	GLENBROOK
5	MONKSTOWN
6	PILOT'S PIER
7	CORBETT
8	KING'S QUAY
9	WEST BEACH
10	WHITE POINT
11	RINGASKIDDY VILLAGE
12	MIDLETON
13	CARRIGTWOHILL
14	CLOYNE
15	SALEEN
16	ROSTELLAN
17	FARSID

IPPC 1 IPPC DISCHARGES

#	NAME
1	CONOCO PHILLIPS REFINERY
2	CONOCO PHILLIPS REFINERY
3	E.S.B.
4	E.S.B.
5	E.S.B.
6	E.S.B.
7	E.S.B.
8	SMITHKLINE BEECHAM
9	DYNEA IRELAND

SEC4 1 SECTION 4 DISCHARGES

#	NAME
1	HAULBOWLINE NAVAL BASE
2	THE ISLAND CREMATORIUM

FIG. 5.1 – EXISTING INDUSTRIAL AND WASTE WATER DISCHARGES SCALE 1:80,000

Table 5.1 Discharges to Cork Harbour

WW No.	Waste Water Discharges	Available Information	Information Source
1	Carrigrennan (Cork City WWTP)	94000 m3/day; outfall pipe diameter of 1600 mm	WWDLA
2	I.D.A. Outfall	4075 m3/day	Preliminary Report
3	Passage West	547 m3/day; outfall pipe diameter of 450 mm	Preliminary Report
4	Glenbrook	327 m3/day; outfall pipe diameter of 1400 mm	Preliminary Report
5	Monkstown	185 m3/day	Preliminary Report
6	Pilot's Pier	353 m3/day; outfall pipe diameter of 450 mm	Preliminary Report
7	Corbett	178 m3/day; outfall pipe diameter of 300 mm	Preliminary Report
8	King's Quay	444 m3/day	Preliminary Report
9	West Beach	668 m3/day; outfall pipe diameter of 600 mm	Preliminary Report
10	White Point	634 m3/day; outfall pipe diameter of 600 mm	Preliminary Report
11	Ringaskiddy Village	101 m3/day	Preliminary Report
12	Midleton	11994 m3/day; tidal holding tank	WWDLA
13	Carrigtwohill	2226 m3/day; outfall pipe diameter of 1200 mm	WWDLA
14	Cloyne	225 m3/day (PE-1000 Average flow of 225 l/person/day)	Cork County Council
15	Saleen	68 m3/day (PE-300 Average flow of 225 l/person/day)	Cork County Council
16	Rostellan	7 m3/day (PE-30 Average flow of 225 l/person/day)	Cork County Council
17	Farsid	5 m3/day (PE-200 Average flow of 225 l/person/day)	Cork County Council
IPPC No.	IPPC Discharges	Available Information	Information Source
1	Conoco Philips Whitegate Refinery Ltd.	Maximum discharge per day - 1200 m3/day	IPPC Licence
2	Conoco Philips Whitegate Refinery Ltd.	No information available	IPPC Licence
3	Electricity Supply Board (Aghada)	Maximum discharge per day - 76,8000 m3/day	IPPC Licence
4	Electricity Supply Board (Aghada)	Maximum discharge per day - 79,2000 m3/day	IPPC Licence
5	Electricity Supply Board (Aghada)	Maximum discharge per day - 500 m3/day	IPPC Licence
6	Electricity Supply Board (Aghada)	Maximum discharge per day - 400 m3/day	IPPC Licence
7	Electricity Supply Board (Aghada)	No information available	IPPC Licence
8	SmithKline Beecham (Manufacturing) Ltd.	Maximum discharge per day - 1300 m3/day	IPPC Licence
9	Dynea Ireland Ltd.	Maximum discharge per day - 720 m3/day	IPPC Licence
Section 4 No.	Section 4 Discharges	Available Information	Information Source
1	Department of Defence - Haulbowline Naval Base	160 m3/day	Cork County Council
2	The Island Crematorium Ltd.	Maximum discharge per day - 4 m3/day	Cork County Council

Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (W)	GPS(N)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity (mS/cm @25°C)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/l P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
8719K1	C16	Anglers Rest	Top	High	16-May-05			10.20		12.0	11.7	11.7	1.000	270 µS/cm		8.0	34	20	<2	15	31669	30	770
8719K2	C14	Waterworks	Top	High	16-May-05			10.35		12.0	9.9	9.9	1.000	213 µS/cm		7.5	45	24	<2	26	17232	30	387
8719K3		Field Control						10.15				0.0		49.4	32.5	8.0	32	26	<2	131	1953	210	<1
8719K4	C9	Tivoli	Bottom	High	16-May-05	70174	72203	10.30	8	16.5	9.6	8.1	0.841	43.9	28.4	8.3	77	<5	4	99	2117	39	20
8719K5	C9	Tivoli	Top	High	16-May-05	70174	72203	10.30	Total 8	16.4	9.3	9.0	0.972	8.5	4.8	7.8	61	29	<2	117	16182	53	6440
8719K6	C7	Blackrock Castle	Bottom	High	16-May-05	72655	72101	10.15	7.5	15.5	10.7	9.0	0.844	43.0	28.7	8.3	81	<5	4	9	2250	39	47
8719K7	C7	Blackrock Castle	Middle	High	16-May-05	72655	72101	10.15	3.5	14.3	11.0	9.3	0.847	41.9	27.0	8.3	77	<5	5	8	2865	43	75
8719K8	C7	Blackrock Castle	Top	High	16-May-05	72655	72101	10.15	Total 9	14.0	10.2	9.8	0.961	10.9	6.2	7.9	70	37	<2	140	16093	53	3300
8719K9	C8	Mid L. Mahon	Bottom	High	16-May-05	74336	70846	9.45	9	15.0	11.5	9.7	0.844	43.2	27.9	8.4	74	<5	5	15	2073	39	45
8719K10	C8	Mid L. Mahon	Middle	High	16-May-05	74336	70846	9.45	4.5	14.3	11.5	9.9	0.862	38.3	24.3	8.5	72	<5	5	5	4318	49	221
8719K11	C8	Mid L. Mahon	Top	High	16-May-05	74336	70846	9.45	Total 10	13.4	14.0	12.3	0.880	33.1	20.8	8.5	31	<5	4	5	6390	56	250
8719K12	C6	End L. Mahon	Bottom	High	16-May-05	76742	67407	9.30	12	13.5	11.3	9.3	0.827	47.0	30.6	8.3	14	<5	4	12	1205	23	14
8719K13	C6	End L. Mahon	Middle	High	16-May-05	76742	67407	9.30	6	13.2	11.4	9.5	0.830	46.0	29.8	8.3	52	<5	4	9	1798	30	31
8719K14	C6	End L. Mahon	Top	High	16-May-05	76742	67407	9.30	Total 13.5	13.0	13.0	10.9	0.842	42.8	27.6	8.4	52	<5	4	4	2383	39	41
8719K15	C5	Haubowline	Bottom	High	16-May-05	78050	65301	9.00	13	15.4	10.8	8.9	0.824	46.7	30.5	8.3	45	<5	4	5	1395	23	14
8719K16	C5	Haubowline	Middle	High	16-May-05	78050	65301	9.00	6.5	15.5	10.8	9.1	0.844	43.2	27.9	8.4	58	<5	6	5	2254	36	38
8719K17	C5	Haubowline	Top	High	16-May-05	78050	65301	9.00	Total 15	15.4	11.4	9.9	0.870	36.4	23.1	8.5	61	<5	4	6	5204	49	146
8719K18	C4	Lower Harbour	Bottom	High	16-May-05	81736	66052	8.30	12	14.1	11.4	9.3	0.820	49.2	32.3	8.3	27	<5	4	9	354	13	2
8719K19	C4	Lower Harbour	Middle	High	16-May-05	81736	66052	8.30	6	13.8	12.2	10.0	0.820	42.6	31.8	8.3	36	<5	5	13	589	16	4
8719K20	C4	Lower Harbour	Top	High	16-May-05	81736	66052	8.30	Total 13	14.0	12.2	10.0	0.820	47.0	30.6	8.4	36	<5	5	9	1054	23	6
8719K21	C3	End Cork Harbour	Bottom	High	16-May-05	81242	62182	8.00	22	13.1	11.1	9.1	0.819	50.1	33.0	8.2	18	<5	3	9	246	10	<1
8719K22	C3	End Cork Harbour	Middle	High	16-May-05	81242	62182	8.00	12	13.1	11.1	9.1	0.819	49.9	32.8	8.2	18	<5	3	6	177	10	1
8719K23	C3	End Cork Harbour	Top	High	16-May-05	81242	62182	8.00	Total 23	13.3	11.4	9.3	0.839	48.6	31.8	8.3	32	<5	5	9	686	20	4
8719K24		Field Blank												48.3	31.6	8.1	1231	1215	<2	1243	6089	214	<1
sample 24-3		Field Control-Field B															1199	1189	0	1112	4136	4	0
Min								3.5		12.0	9.3	0.0	0.8	8.5	4.8	7.5	14.0	<5	<2	4.0	177.0	10.0	<1
Max								22.0		16.5	14.0	12.3	1.0	50.1	33.0	8.5	81.0	37.0	6.0	140.0	31669.0	210.0	6440.0
Mean								9.4		14.1	11.3	9.3	0.9	41.3	26.8	8.2	48.0	6.0	3.4	29.0	5238.6	40.6	515.0

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Sample Registration 1471

Client Reference

Lab #	Station	Station	Depth	Tide	Date	GPS(N)	GPS (W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	Coliforms (MPN/100m ls)
8718K1	C16	Anglers Res	Top	Low	24-May-05					Not Determined	10.8	10.8	1.000	195µS/cm	Not App	7.9	Not Determined	19	3	12	10815	26	770
8718K2	C14	Waterworks	Top	Low	24-May-05					Not Determined	9.3	9.3	1.000	216µS/cm	Not App	7.6	Not Determined	53	2	15	15921	49	1733
8718K3		Field Contro																					
8718K4	C9	Tivoli	Bottom	Low	24-May-05	5154101N	0826028W	11.48	6	14.0	7.8	6.6	0.847	42.4	27.4	8.1	Not Determined	43	2	345	2546	49	488
8718K5	C9	Tivoli	Top	Low	24-May-05	5154095N	0826978W	11.49	Total 6	15.0	7.9	7.5	0.947	15.4	9.0	7.9	Not Determined	57	2	201	11607	62	12740
8718K6	C7	Blackrock C	Bottom	Low	24-May-05	5154066N	0824169W	11.31	6	14.2	8.4	7.1	0.847	42.5	27.4	8.1	Not Determined	28	2	175	3042	43	107
8718K7	C7	Blackrock C	Middle	Low	24-May-05	5154085N	0824127W	11.31	3	14.0	9.5	8.1	0.854	39.7	25.3	8.1	Not Determined	29	3	174	3702	46	436
8718K8	C7	Blackrock C	Top	Low	24-May-05	5154077N	0824112W	11.31	Total 7.5	14.2	8.8	7.8	0.892	29.9	18.6	8.1	Not Determined	36	2	202	6926	53	3840
8718K9	C8	Mid L. Maho	Bottom	Low	24-May-05	5153169N	0822114W	11.06	7	14.4	9.5	7.9	0.835	45.0	29.2	8.2	Not Determined	22	2	105	2143	39	67
8718K10	C8	Mid L. Maho	Middle	Low	24-May-05	5153183N	0822137W	11.08	3.5	15.0	9.5	8.0	0.840	44.0	28.4	8.2	Not Determined	28	2	113	2600	43	73
8718K11	C8	Mid L. Maho	Top	Low	24-May-05	5153180N	0822146W	11.12	Total 8.3	14.8	9.4	8.0	0.848	42.5	27.4	8.2	Not Determined	27	2	125	2724	49	167
8718K12	C6	End L. Maho	Bottom	Low	24-May-05	5152593N	0820049W	10.23	11	14.0	9.4	7.9	0.839	43.9	28.4	8.2	Not Determined	22	<2	105	2422	43	167
8718K13	C6	End L. Maho	Middle	Low	24-May-05	5152576N	0820017W	10.23	5.5	14.0	9.7	8.2	0.843	42.5	27.5	8.2	Not Determined	28	2	130	2905	46	344
8718K14	C6	End L. Maho	Top	Low	24-May-05	5152533N	0820944W	10.23	Total 12.2	14.0	9.4	7.9	0.843	42.7	27.5	8.1	Not Determined	23	2	122	2954	43	344
8718K15	C5	Haubowline	Bottom	Low	24-May-05	5150517N	0818588W	9.48	21	13.0	10.4	8.5	0.819	48.7	31.9	8.2	Not Determined	6	2	42	988	20	7
8718K16	C5	Haubowline	Middle	Low	24-May-05	5150514N	0818628W	9.52	10.5	13.0	10.3	8.4	0.819	49.1	32.0	8.2	Not Determined	6	<2	42	983	20	7
8718K17	C5	Haubowline	Top	Low	24-May-05	5150551N	0818528W	9.21	Total 22.9	13.0	10.1	8.3	0.819	48.8	31.9	8.2	Not Determined	8	3	55	1014	20	7
8718K18	C4	Lower Harb	Bottom	Low	24-May-05	5150907N	0815891W	9.21	10	13.9*	10.1	8.2	0.811	51.1	33.7	8.1	Not Determined	<5	2	24	447	10	1
8718K19	C4	Lower Harb	Middle	Low	24-May-05	5150907N	0815932W	9.23	6	15.1*	9.6	7.8	0.811	50.7	33.3	8.1	Not Determined	<5	3	30	500	10	<1
8718K20	C4	Lower Harb	Top	Low	24-May-05	5150917N	0815874W	9.25	Total 13.1	12.6*	11.0	8.9	0.811	50.5	33.2	8.1	Not Determined	<5	3	24	514	10	2
8718K21	C3	End Cork Ha	Bottom	Low	24-May-05	5148694N	0816089W	9	26	13.7*	10.2	8.2	0.807	52.4	34.5	8.1	Not Determined	5	<2	33	255	7	<1
8718K22	C3	End Cork Ha	Middle	Low	24-May-05	5148797N	0816133W	9.03	13	Not Determined	10.5	8.5	0.807	51.9	34.2	8.1	Not Determined	<5	<2	27	261	7	3
8718K23	C3	End Cork Ha	Top	Low	24-May-05	5148694N	0816051W	9.05	Total 27	Not Determined	10.5	8.5	0.807	51.8	34.2	8.1	Not Determined	<5	2	26	306	7	<1
8718K24		Field Blank																					
sample 24-3		Field Contro	Field B																				
Min									3.0	13.0	7.8	6.6	0.8	15.4	9.0	7.6	Not Determined	<5	<2	12.0	255.0	7.0	<1
Max									26.0	15.0	11.0	10.8	1.0	52.4	34.5	8.2	Not Determined	57.0	3.0	345.0	15921.0	460.0	12740.0
Mean									9.9	14.0	9.6	8.2	0.9	44.5	28.9	8.1	Not Determined	24.0	1.7	93.0	3370.6	50.5	516.0

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/O2) Direct	DO (mg/O2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/l P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	Coliforms (MPN/100mls)
1455L1	C16	Anglers Res	Top	High	21-Jun-05					not measured on site	10.3	10.3	1.000	184.0	n/a	8.1	37	33	<2	15	8676	53	236
1455L2	C14	Waterworks	Top	High	21-Jun-05					not measured on site	10.8	10.8	1.000	204.0	n/a	7.8	39	37	<2	24	12298	76	687
1455L3		Field Control																					
1455L4	C9	Tivoli	Bottom	High	21-Jun-05			17	8	17.1	8.9	8.0	0.898	45.2	29.4	8.1	72	34	<2	156	1661	43	12
1455L5	C9	Tivoli	Top	High	21-Jun-05			17.03	Total 9.1	18.0	8.2	7.8	0.952	22.3	13.5	7.9	241	171	<2	1952	11877	92	6170
1455L6	C7	Blackrock C	Bottom	High	21-Jun-05			16.32	10	17.0	8.5	7.6	0.894	46.3	30.2	8.1	219	31	<2	99	1470	43	18
1455L7	C7	Blackrock C	Middle	High	21-Jun-05			16.36	5	17.3	8.8	7.9	0.898	44.2	28.6	8.2	66	33	<2	108	2037	46	18
1455L8	C7	Blackrock C	Top	High	21-Jun-05			16.4	Total 10.6	18.2	8.3	7.6	0.917	37.0	23.5	8.1	70	36	<2	180	3375	59	29
1455L9	C8	Mid L. Maho	Bottom	High	21-Jun-05			16.11	10	16.5	9.3	8.3	0.891	47.8	31.2	8.1	50	19	<2	54	1098	30	6
1455L10	C8	Mid L. Maho	Middle	High	21-Jun-05			16.15	5	16.7	9.2	8.2	0.891	47.1	30.6	8.2	52	21	<2	54	1236	36	14
1455L11	C8	Mid L. Maho	Top	High	21-Jun-05			16.18	Total 10.6	16.7	9.5	8.5	0.894	46.6	30.4	8.2	59	22	<2	51	1860	39	6
1455L12	C6	End L. Maho	Bottom	High	21-Jun-05			15.54	14	16.1	9.1	8.1	0.886	49.2	32.3	8.2	44	11	<2	21	762	20	1
1455L13	C6	End L. Maho	Middle	High	21-Jun-05			15.59	7	16.1	9.6	8.5	0.886	49.3	32.2	8.1	39	11	<2	19	802	20	9
1455L14	C6	End L. Maho	Top	High	21-Jun-05			16.03	Total 14.3	16.1	9.4	8.3	0.886	48.6	31.8	8.2	39	13	<2	30	970	26	4
1455L15	C5	Haubowline	Bottom	High	21-Jun-05			15.31	11	15.9	9.8	8.6	0.882	50.7	33.3	8.1	30	<5	<2	<6	310	<16	1
1455L16	C5	Haubowline	Middle	High	21-Jun-05			15.35	6.5	15.8	9.8	8.6	0.882	50.5	33.2	8.2	27	<5	<2	<6	337	<16	2
1455L17	C5	Haubowline	Top	High	21-Jun-05			15.39	Total 11.6	16.3	9.9	8.8	0.886	48.5	31.8	8.2	37	10	<2	6	926	23	2
1455L18	C4	Lower Harb	Bottom	High	21-Jun-05			15.09	13	14.6	9.2	8.0	0.874	52.2	34.5	8.1	19	<5	<2	<6	102	<16	5
1455L19	C4	Lower Harb	Middle	High	21-Jun-05			15.13	6.5	14.8	9.3	8.2	0.878	52.0	34.3	8.1	17	<5	<2	<6	97	<16	4
1455L20	C4	Lower Harb	Top	High	21-Jun-05			15.15	Total 14	15.2	9.4	8.3	0.878	51.8	34.0	8.1	19	<5	<2	<6	106	<16	<1
1455L21	C3	End Cork Harb	Bottom	High	21-Jun-05			14.48	24	13.9	8.9	7.8	0.873	52.9	34.9	8.0	20	<5	<2	<6	47	<16	1
1455L22	C3	End Cork Harb	Middle	High	21-Jun-05			14.52	12	13	9.1	7.9	0.872	53.0	34.9	8.0	16	<5	<2	<6	<22	<16	1
1455L23	C3	End Cork Harb	Top	High	21-Jun-05			14.55	Total 25	13	9.5	8.3	0.872	52.9	34.9	8.1	18	<5	<2	<6	<22	<16	<1
1455L24		Field Blank																					
sample 24-3		Field Control	Field B																				
Min									5.0	13.2	8.2	7.6	0.9	22.3	13.5	7.8	16.0	<5	<2	6.0	47.0	20.0	<1
Max									24.0	18.2	10.8	10.8	1.0	53.0	34.9	8.2	241.0	171.0	2.0	1952.0	12298.0	92.0	6170.0
Mean									10.2	15.9	9.3	8.4	0.9	47.4	31.0	8.1	55.9	22.0	<2	197.8	2502.4	43.3	516.0

Consent of copy right owner is hereby acknowledged

Sample Registration 1471

Client Reference

Lab #	Station	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100 mls)	
1439L1	C16	Anglers Rd	Top	Low	21-Jun-05					not measured on site	8.9	8.9	1.000	183µS/cm	Not App	7.7	21	13	<2	22	9099	51	179	
1439L2	C14	Waterworks	Top	Low	21-Jun-05					not measured on site	8.9	8.9	1.000	202µS/cm	Not App	7.8	47	46	<2	31	12852	92	517	
1439L3		Field Control											0.822	49.5	32.3	7.9	82	83	<2	233	2879	<16	<1	
1439L4	C9	Tivoli	Bottom	Low	21-Jun-05			12.5	5	17.7	8.0	7.2	0.899	44.6	28.9	8.1	78	37	<2	260	1792	46	30	
1439L5	C9	Tivoli	Top	Low	21-Jun-05			12.6	Total 6	17.7	7.7	7.2	0.931	31.8	19.9	7.9	92	55	2	336	4685	72	1733	
1439L6	C7	Blackrock	Bottom	Low	21-Jun-05			12.3	7	17.6	8.9	8.0	0.902	43.7	28.3	8.1	69	34	<2	168	1984	46	39	
1439L7	C7	Blackrock	Middle	Low	21-Jun-05			12.4	3.5	18.1	8.9	8.1	0.909	40.1	25.6	8.1	67	37	<2	203	2498	53	94	
1439L8	C7	Blackrock	Top	Low	21-Jun-05			12.4	Total 7.5	18.6	8.4	7.8	0.928	32.7	20.5	8.1	73	45	<2	283	4212	62	756	
1439L9	C8	Mid L. Marsh	Bottom	Low	21-Jun-05			12.1	5	18.1	8.9	8.0	0.902	42.9	27.6	8.2	58	31	<2	103	1838	49	37	
1439L10	C8	Mid L. Marsh	Middle	Low	21-Jun-05			12.2	2.5	17.9	9.2	8.3	0.902	43.0	27.7	8.2	66	31	<2	65	2166	49	40	
1439L11	C8	Mid L. Marsh	Top	Low	21-Jun-05			12.2	Total 5.8	17.7	9.2	8.4	0.913	39.7	25.3	8.2	69	35	<2	139	2586	53	61	
1439L12	C6	End L. Marsh	Bottom	Low	21-Jun-05			11.5	10	17.7	9.2	8.2	0.895	46.1	29.9	8.2	64	27	<2	75	1351	43	24	
1439L13	C6	End L. Marsh	Middle	Low	21-Jun-05			11.6	5	17.7	9.2	8.2	0.895	45.4	29.5	8.2	67	27	<2	75	1280	43	16	
1439L14	C6	End L. Marsh	Top	Low	21-Jun-05			12	Total 11	17.6	9.3	8.4	0.899	44.9	29.1	8.2	61	27	<2	71	1457	46	27	
1439L15	C5	Haubowlin	Bottom	Low	21-Jun-05			11.2	10	16.2	9.7	8.6	0.890	47.3	31.0	8.2	46	16	<2	46	824	30	21	
1439L16	C5	Haubowlin	Middle	Low	21-Jun-05			11.3	5	16.1	9.8	8.7	0.890	47.3	30.8	8.2	45	17	<2	41	1174	30	11	
1439L17	C5	Haubowlin	Top	Low	21-Jun-05			11.3	Total 11.4	16.1	9.8	8.7	0.890	47.0	30.7	8.2	48	17	<2	39	1360	33	15	
1439L18	C4	Lower Harbor	Bottom	Low	21-Jun-05			10.6	10	15.5	9.6	8.5	0.882	50.3	32.9	8.2	33	6	<2	6	478	16	1	
1439L19	C4	Lower Harbor	Middle	Low	21-Jun-05			11	5	15.3	9.7	8.6	0.882	50.0	32.8	8.2	33	9	<2	12	496	16	2	
1439L20	C4	Lower Harbor	Top	Low	21-Jun-05			11.1	Total 11.6	15.5	9.7	8.6	0.886	49.2	32.2	8.2	31	10	<2	14	633	20	3	
1439L21	C3	End Cork	Bottom	Low	21-Jun-05			10.2	26	14.7	9.8	8.6	0.878	51.7	34.0	8.1	25	7	<2	<6	217	<16	6	
1439L22	C3	End Cork	Middle	Low	21-Jun-05			10.30	13	15.1	9.9	8.7	0.878	51.2	33.7	8.2	27	6	2	8	283	<16	1	
1439L23	C3	End Cork	Top	Low	21-Jun-05			10.4	Total 27.5	14.9	10.0	8.8	0.882	50.7	33.4	8.2	23	5	<2	<6	292	<16	<1	
1439L24		Field Control B												49.9	32.7	8.1	31	29	<2	<6	1993	<16	<1	
sample 24-3		Field B-A															51	54	<2	233	886	<16	<1	
Min										2.5	14.7	7.7	7.2	0.8	31.8	19.9	7.7	21.0	5.0	<2	<6	217.0	16.0	<1
Max										26.0	18.6	10.0	8.9	1.0	51.7	34.0	8.2	92.0	83.0	2.0	336.0	12852.0	92.0	1733.0
Mean										8.2	16.8	9.2	8.3	0.9	45.4	29.5	8.1	52.3	27.1	<2	91.0	2453.7	44.7	516.0

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Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
2930L1	C16	Anglers Rest	Top	Low	19-Jul-05					19.9	8.3	8.3	1.000	170.0	7.8	18	15	<2	23	6329	36	172	
2930L2	C14	Waterworks	Top	Low	19-Jul-05					19.9	7.8	7.8	1.000	189.0	7.7	42	56	<2	23	9898	49	160	
2930L3		Field Control A												50.0	32.5	8.2	69	77	<2	32	2391	<16	<1
2930L4	C9	Tivoli	Bottom	Low	19-Jul-05			11:50	5.2	19.6	6.6	5.6	0.849	43.4	28.0	8.0	120	58	3	890	1550	39	11
2930L5	C9	Tivoli	Top	Low	19-Jul-05			11:50	Total 6.2	19.6	6.5	5.6	0.864	38.8	24.8	8.0	97	54	3	903	2502	49	28
2930L6	C7	Blackrock Castle	Bottom	Low	19-Jul-05			11:30	6.2	19.1	7.2	6.0	0.837	45.8	29.8	8.2	89	42	3	404	965	26	13
2930L7	C7	Blackrock Castle	Middle	Low	19-Jul-05			11:30	3.5	19.0	7.6	6.4	0.844	43.8	28.2	8.1	99	43	3	477	1448	33	16
2930L8	C7	Blackrock Castle	Top	Low	19-Jul-05			11:30	Total 7.2	19.1	7.4	6.3	0.855	41.0	26.3	8.1	105	47	3	557	2104	39	35
2930L9	C8	Mid L. Mahon	Bottom	Low	19-Jul-05			11:09	6.5	18.5	7.8	6.5	0.833	47.4	30.9	8.2	79	27	3	154	523	30	10
2930L10	C8	Mid L. Mahon	Middle	Low	19-Jul-05			11:09	3.5	18.4	8.0	6.7	0.832	46.6	30.4	8.3	81	28	3	171	735	33	19
2930L11	C8	Mid L. Mahon	Top	Low	19-Jul-05			11:09	Total 7.5	18.4	7.9	6.6	0.836	46.3	30.2	8.3	73	28	4	170	757	36	23
2930L12	C6	End L. Mahon	Bottom	Low	19-Jul-05			10:50	11	18.2	8.4	7.0	0.829	48.0	31.4	8.3	66	21	3	89	368	26	9
2930L13	C6	End L. Mahon	Middle	Low	19-Jul-05			10:50	6	18.3	8.3	6.9	0.832	47.4	31.0	8.3	75	24	4	122	487	30	5
2930L14	C6	End L. Mahon	Top	Low	19-Jul-05			10:50	Total 12.0	18.4	8.2	6.8	0.832	47.2	30.8	8.3	78	23	4	121	536	30	14
2930L15	C5	Haubowline	Bottom	Low	19-Jul-05			10:22	13.1	17.7	8.9	7.3	0.821	49.5	32.5	8.3	51	8	<2	50	213	<16	7
2930L16	C5	Haubowline	Middle	Low	19-Jul-05			10:22	7	17.9	8.6	7.1	0.825	49.0	32.0	8.3	42	10	2	69	261	16	6
2930L17	C5	Haubowline	Top	Low	19-Jul-05			10:22	Total 14.1	18.0	8.5	7.0	0.825	48.8	32.0	8.3	43	10	2	69	275	16	20
2930L18	C4	Lower Harbour	Bottom	Low	19-Jul-05			09:53	7.5	17.1	8.7	7.1	0.816	50.7	33.4	8.2	26	<5	<2	<6	66	<16	3
2930L19	C4	Lower Harbour	Middle	Low	19-Jul-05			09:53	4.5	17.1	8.5	6.9	0.816	50.7	33.3	8.2	26	<5	<2	<6	62	<16	1
2930L20	C4	Lower Harbour	Top	Low	19-Jul-05			09:53	Total 8.5	17.0	9.2	7.5	0.816	50.7	33.3	8.2	26	<5	<2	<6	58	<16	4
2930L21	C3	End Cork Harbour	Bottom	Low	19-Jul-05			09:26	25	16.3	8.9	7.2	0.811	51.8	34.1	8.1	15	<5	<2	<6	31	<16	3
2930L22	C3	End Cork Harbour	Middle	Low	19-Jul-05			09:25	13	16.1	9.3	7.6	0.815	51.2	33.9	8.2	18	<5	<2	<6	27	<16	5
2930L23	C3	End Cork Harbour	Top	Low	19-Jul-05			09:24	Total 26	15.8	8.7	7.1	0.815	51.3	33.8	8.2	25	<5	<2	<6	27	<16	28
2930L24		Field Control B												48.2	31.7	8.2	121	131	<2	228	2533	<16	<1
sample 24-3		Field B-A															52	54	0	196	142	0	0
Min									3.5	15.8	6.5	5.6	0.8	38.8	24.8	7.7	15.0	8.0	2.0	23.0	27.0	16.0	1.0
Max									25.0	19.9	9.3	8.3	1.0	51.8	34.1	8.3	120.0	77.0	4.0	903.0	9898.0	49.0	172.0
Mean									8.6	18.2	8.2	6.9	0.8	47.6	31.1	8.2	61.8	39.0	3.1	252.9	1422.8	32.5	26.9

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Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
2977L1	C16	Anglers Rest	Top	High	19-Jul-05					22.0	9.3	9.3	1.000	169.0	7.9	28	26	<2	22	6900	40	150	
2977L2	C14	Waterworks	Top	High	19-Jul-05					22.0	8.3	8.3	1.000	188.0	7.7	43	53	<2	27	8525	49	162	
2977L3		Field Control A																					
2977L4	C9	Tivoli	Bottom	High	19-Jul-05			15:52	8	19.1	8.1	6.8	0.841	45.4	29.3	8.2	104	46	3	504	996	26	8
2977L5	C9	Tivoli	Top	High	19-Jul-05			15:52	Total 9.0	19.5	7.7	6.6	0.860	40.4	26.0	8.0	125	53	3	886	2644	43	25
2977L6	C7	Blackrock Castle	Bottom	High	19-Jul-05			15:34	8.7	19.0	8.4	7.0	0.837	46.1	29.8	8.3	75	31	3	258	908	36	10
2977L7	C7	Blackrock Castle	Middle	High	19-Jul-05			15:34	5	18.9	8.3	6.9	0.837	46.1	29.9	8.3	83	31	3	240	788	36	11
2977L8	C7	Blackrock Castle	Top	High	19-Jul-05			15:34	Total 9.7	19.1	8.4	7.1	0.841	45.0	29.4	8.2	95	33	4	301	1019	36	18
2977L9	C8	Mid L. Mahon	Bottom	High	19-Jul-05			15:15	8.8	18.4	8.3	6.8	0.825	49.1	32.2	8.3	50	13	2	85	292	16	1
2977L10	C8	Mid L. Mahon	Middle	High	19-Jul-05			15:15	5	18.5	8.5	7.1	0.830	48.2	31.8	8.3	61	15	3	84	310	23	4
2977L11	C8	Mid L. Mahon	Top	High	19-Jul-05			15:15	Total 9.8	18.6	8.6	7.1	0.830	48.3	31.5	8.3	64	14	4	82	323	23	7
2977L12	C6	End L. Mahon	Bottom	High	19-Jul-05			14:58	13.3	18.0	8.6	7.1	0.821	50.1	32.9	8.2	47	7	2	26	151	<16	4
2977L13	C6	End L. Mahon	Middle	High	19-Jul-05			14:58	7.2	18.0	8.7	7.1	0.821	49.8	32.4	8.3	39	5	2	26	190	<16	5
2977L14	C6	End L. Mahon	Top	High	19-Jul-05			14:58	Total 14.3	18.0	8.8	7.3	0.825	49.4	32.5	8.3	46	6	3	35	204	<16	10
2977L15	C5	Haubowline	Bottom	High	19-Jul-05			14:37	11.2	17.3	8.9	7.3	0.816	51.3	33.4	8.2	25	<5	2	<6	<22	<16	<1
2977L16	C5	Haubowline	Middle	High	19-Jul-05			14:37	6.1	17.6	9.0	7.4	0.817	50.8	33.6	8.3	25	<5	2	<6	<22	<16	3
2977L17	C5	Haubowline	Top	High	19-Jul-05			14:37	Total 12.2	17.6	8.9	7.3	0.817	51.0	33.4	8.3	27	<5	2	<6	<22	<16	3
2977L18	C4	Lower Harbour	Bottom	High	19-Jul-05			14:15	9.4	15.5	9.1	7.4	0.811	51.7	34.2	8.1	20	<5	<2	<6	<22	<16	<1
2977L19	C4	Lower Harbour	Middle	High	19-Jul-05			14:15	5.2	15.6	9.0	7.3	0.811	51.9	34.0	8.2	15	<5	<2	<6	<22	<16	2
2977L20	C4	Lower Harbour	Top	High	19-Jul-05			14:15	Total 10.4	15.5	9.0	7.3	0.811	51.6	34.2	8.2	16	<5	<2	<6	<22	<16	1
2977L21	C3	End Cork Harbour	Bottom	High	19-Jul-05			13:30	27.5	14.2	8.8	7.1	0.809	52.3	34.5	8.1	11	<5	<2	<6	<22	<16	1
2977L22	C3	End Cork Harbour	Middle	High	19-Jul-05			13:30	14	14.2	8.9	7.2	0.809	52.1	34.5	8.1	11	<5	<2	<6	<22	<16	<1
2977L23	C3	End Cork Harbour	Top	High	19-Jul-05			13:30	Total 28.5	14.0	9.1	7.3	0.809	52.1	34.5	8.1	10	<5	<2	<6	<22	<16	1
2977L24		Field Control B																					
sample 24-3		Field B-A																					
Min									5.0	14.0	7.7	6.6	0.8	40.4	26.0	7.7	10.0	<5	<2	<6	<22	<16	<1
Max									27.5	22.0	9.3	9.3	1.0	188.0	34.5	8.3	125.0	53.0	4.0	886.0	8525.0	49.0	162.0
Mean									10.0	17.8	8.7	7.3	0.8	60.9	32.2	8.2	46.4	25.6	2.7	198.2	1788.5	32.8	22.4

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Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
4478L1	C16	Anglers Rest	Top	Low	17-Aug-05					18.0	9.2	9.2	1.000	198.0		7.8	20	10	<2	12	6041	36	109
4478L2	C14	Waterworks	Top	Low	17-Aug-05					18.0	8.2	8.2	1.000	193.0		7.6	30	28	<2	31	8620	39	214
4478L3		Field Control A												48.9	32.3	7.9	22	27	<2	14	2657	<16	<1
4478L4	C9	Tivoli	Bottom	Low	17-Aug-05	51.54.030	8.25.380	11.45	6	18.4	9.8	8.8	0.895	46.1	29.9	8.1	51	15	3	109	1045	53	10
4478L5	C9	Tivoli	Top	Low	17-Aug-05	51.54.030	8.25.380	11.47	Total 6.7	18.6	8.9	8.5	0.956	13.2	7.6	7.9	52	39	<2	139	7785	62	14210
4478L6	C7	Blackrock Castle	Bottom	Low	17-Aug-05	51.54.080	8.24.140	11.26	7.5	18.0	9.7	8.1	0.832	46.8	30.5	8.1	59	30	3	174	983	53	7
4478L7	C7	Blackrock Castle	Middle	Low	17-Aug-05	51.54.080	8.24.140	11.28	4	18.1	9.8	8.2	0.840	45.5	29.5	8.1	69	15	3	103	1253	53	22
4478L8	C7	Blackrock Castle	Top	Low	17-Aug-05	51.54.080	8.24.140	11.32	Total 8.7	18.6	9.2	8.7	0.945	15.6	9.2	7.9	45	26	<2	112	7400	59	9580
4478L9	C8	Mid L. Mahon	Bottom	Low	17-Aug-05	51.53.170	8.22.100	11.02	7.5	17.9	10.3	8.6	0.833	47.3	30.8	8.1	72	15	2	104	837	56	7
4478L10	C8	Mid L. Mahon	Middle	Low	17-Aug-05	51.53.170	8.22.100	11.06	4	18.0	10.2	8.5	0.832	47.1	30.7	8.1	69	15	3	60	828	56	19
4478L11	C8	Mid L. Mahon	Top	Low	17-Aug-05	51.53.170	8.22.100	11.08	Total 8.6	18.1	10.2	8.6	0.840	45.2	29.3	8.2	68	13	3	24	1377	62	29
4478L12	C6	End L. Mahon	Bottom	Low	17-Aug-05	51.52.570	8.20.030	10.35	12	17.7	10.4	8.6	0.829	47.8	31.2	8.1	74	26	<2	127	2068	53	56
4478L13	C6	End L. Mahon	Middle	Low	17-Aug-05	51.52.570	8.20.030	10.40	6	17.7	10.3	8.6	0.832	46.8	30.5	8.1	58	23	2	104	1541	56	53
4478L14	C6	End L. Mahon	Top	Low	17-Aug-05	51.52.570	8.20.030	10.44	Total 13.2	17.6	10.6	9.2	0.869	37.2	23.6	8.1	60	22	2	64	4375	62	345
4478L15	C5	Haubowline	Bottom	Low	17-Aug-05	51.50.470	8.18.700	10.07	21	17.0	10.7	8.8	0.820	49.9	32.7	8.1	35	15	<2	64	328	30	10
4478L16	C5	Haubowline	Middle	Low	17-Aug-05	51.50.470	8.18.700	10.11	11	17.1	10.7	8.8	0.820	49.5	32.4	8.1	35	16	<2	81	549	36	12
4478L17	C5	Haubowline	Top	Low	17-Aug-05	51.50.470	8.18.700	10.16	Total 22	17.1	10.9	9.0	0.824	49.1	32.1	8.1	39	14	<2	59	1160	39	10
4478L18	C4	Lower Harbour	Bottom	Low	17-Aug-05	51.50.900	8.15.930	9.38	12	16.5	10.9	8.9	0.815	51.1	33.5	8.1	20	<5	<2	13	204	<16	2
4478L19	C4	Lower Harbour	Middle	Low	17-Aug-05	51.50.900	8.15.930	9.43	6.5	16.5	10.9	8.9	0.815	51.0	33.5	8.1	24	<5	<2	12	142	<16	2
4478L20	C4	Lower Harbour	Top	Low	17-Aug-05	51.50.900	8.15.930	9.47	Total 13	16.5	11.0	9.0	0.815	51.0	33.5	8.1	21	<5	<2	12	140	<16	1
4478L21	C3	End Cork Harbour	Bottom	Low	17-Aug-05	51.49.179	8.16.182	9.10	31	16.2	10.4	8.4	0.811	51.5	34.0	8.1	17	6	<2	17	<22	<16	2
4478L22	C3	End Cork Harbour	Middle	Low	17-Aug-05	51.49.179	8.16.182	9.15	16	16.1	10.6	8.6	0.815	51.4	33.8	8.1	18	<5	<2	<6	89	<16	<1
4478L23	C3	End Cork Harbour	Top	Low	17-Aug-05	51.49.179	8.16.182	9.19	Total 32	16.1	11.3	9.2	0.815	51.2	33.7	8.1	18	<5	<2	14	89	<16	1
4478L24		Field Control B												48.7	31.6	7.9	107	123	<2	363	3410	<16	<1
sample 24-3		Field B-A															-85	-96	<2	14	-753	<16	<1
Min									4.0	16.1	8.2	8.1	0.8	13.2	7.6	7.6	17.0	6.0			89.0	30.0	
Max									31.0	18.6	11.3	9.2	1.0	51.5	34.0	8.2	74.0	39.0	3.0	174.0	8620.0	62.0	14210.0
Mean									11.1	17.4	10.2	8.7	0.9	45.1	29.4	8.0	45.1	25.2			2250.5	50.3	

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
4510L1	C16	Anglers Rest	Top	High	17-Aug-05					19.0	11.3	11.3	1.000	175.0		8.5	35	34	<2	9	6244	30	131
4510L2	C14	Waterworks	Top	High	17-Aug-05					19.0	9.4	9.4	1.000	191.0		7.9	32	25	<2	23	9854	35	178
4510L3		Field Control A															29.000						
4510L4	C9	Tivoli	Bottom	High	17-Aug-05	51.51.100	8.26.020	16.05	9	18.2	9.0	7.5	0.836	46.3	30.1	8.0	182	6	<4	224	1019	46	16
4510L5	C9	Tivoli	Top	High	17-Aug-05	51.54.100	8.26.020	16.10	Total 10	18.7	9.2	7.9	0.855	40.9	26.2	8.1	75	21	4	72	2073	49	1300
4510L6	C7	Blackrock Castle	Bottom	High	17-Aug-05	51.54.070	8.24.160	15.42	10	18.2	9.5	8.1	0.855	40.7	30.6	8.1	79	7	2	152	886	59	12
4510L7	C7	Blackrock Castle	Middle	High	17-Aug-05	51.54.070	8.24.160	15.48	5.5	18.3	9.9	8.3	0.836	46.4	30.1	8.2	81	<5	3	82	806	56	22
4510L8	C7	Blackrock Castle	Top	High	17-Aug-05	51.54.070	8.24.160	15.51	Total 11.3	19.0	9.9	8.6	0.870	37.0	23.4	8.2	74	21	4	24	3826	56	687
4510L9	C8	Mid L. Mahon	Bottom	High	17-Aug-05	51.53.180	8.22.100	15.21	10	18.2	9.8	8.1	0.825	48.6	31.6	8.1	67	17	2	105	647	43	20
4510L10	C8	Mid L. Mahon	Middle	High	17-Aug-05	51.53.180	8.22.100	15.26	5.5	18.3	9.9	8.2	0.829	48.0	31.3	8.2	71	9	4	73	717	46	46
4510L11	C8	Mid L. Mahon	Top	High	17-Aug-05	51.53.180	8.22.100	15.30	Total 11.1	18.7	9.7	8.1	0.837	45.7	29.6	8.2	63	10	3	30	1058	53	11
4510L12	C6	End L. Mahon	Bottom	High	17-Aug-05	51.52.510	8.19.970	15.04	14.5	17.5	10.1	8.3	0.821	49.8	32.6	8.1	45	10	<2	54	390	26	5
4510L13	C6	End L. Mahon	Middle	High	17-Aug-05	51.52.510	8.19.970	15.08	7	17.5	9.9	8.1	0.821	49.9	32.6	8.1	45	9	2	54	372	30	9
4510L14	C6	End L. Mahon	Top	High	17-Aug-05	51.52.510	8.19.970	15.10	Total 15.5	17.8	9.9	8.1	0.821	49.8	32.6	8.1	41	<5	2	54	368	30	6
4510L15	C5	Haubowline	Bottom	High	17-Aug-05	51.50.490	8.18.680	14.35	24	17.2	10.3	8.4	0.816	51.0	33.4	8.1	29	<5	3	26	97	<16	<1
4510L16	C5	Haubowline	Middle	High	17-Aug-05	51.50.490	8.18.680	14.39	12.5	16.9	10.1	8.2	0.816	51.0	33.5	8.1	24	<5	2	21	115	<16	2
4510L17	C5	Haubowline	Top	High	17-Aug-05	51.50.490	8.18.680	14.42	Total 25.4	17.0	10.0	8.2	0.816	51.1	33.5	8.1	24	<5	2	35	106	<16	1
4510L18	C4	Lower Harbour	Bottom	High	17-Aug-05	51.50.900	8.15.920	14.16	14	16.3	10.3	8.4	0.811	51.8	33.9	8.1	19	<5	<2	31	75	<16	6
4510L19	C4	Lower Harbour	Middle	High	17-Aug-05	51.50.900	8.15.920	14.19	8	16.2	10.2	8.3	0.811	51.7	34.0	8.1	18	<5	3	27	62	<16	7
4510L20	C4	Lower Harbour	Top	High	17-Aug-05	51.50.900	8.15.920	14.22	Total 15.6	16.2	10.0	8.1	0.811	51.8	34.0	8.1	20	<5	<2	29	42	<16	2
4510L21	C3	End Cork Harbour	Bottom	High	17-Aug-05	51.49.000	8.16.350	13.52	32	16.3	9.9	8.0	0.811	52.1	34.2	8.1	128	<5	<2	24	<22	<16	7
4510L22	C3	End Cork Harbour	Middle	High	17-Aug-05	51.49.000	8.16.350	13.57	16	15.9	10.3	8.4	0.811	52.0	34.3	8.1	13	<5	<2	26	31	<16	1
4510L23	C3	End Cork Harbour	Top	High	17-Aug-05	51.49.000	8.16.350	14.00	Total 33.3	15.6	10.4	8.4	0.811	52.1	34.3	8.1	16	<5	<2	26	<22	<16	3
4510L24		Field Control B																					
sample 24-3		Field B-A																					
Min										5.5	15.6	9.0	0.8	37.0	23.4	7.9	13.0	6.0			31.0	26.0	
Max										32.0	19.0	11.3	1.0	52.1	34.3	8.5	182.0	34.0	4.0	224.0	9854.0	59.0	1300.0
Mean										12.9	17.5	10.0	0.8	48.4	31.8	8.1	53.7	16.5			1439.4	43.0	

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
6000L1	C16	Anglers Rest	Top	Low	14-Sep-05					18.0	10.0	10.0	1.000	182.0	7.8		35	34	<2	13	7298	12	488
6000L2	C14	Waterworks	Top	Low	14-Sep-05					18.0	9.6	9.6	1.000	190.0	7.8		43	41	<2	26	9553	14	238
6000L3		Field Control A																					
6000L4	C9	Tivoli	Bottom	Low	14-Sep-05	51.54.10	8.26.010	13.25	7.0	18.0	7.7	6.4	0.836	45.9	29.8	7.8	74	44	<2	228	350	21	15
6000L5	C9	Tivoli	Top	Low	14-Sep-05	51.54.10	8.26.010	13.30	Total 8.3	19.0	7.9	7.6	0.956	12.8	7.4	7.6	62	53	<2	189	8016	20	15290
6000L6	C7	Blackrock Castle	Bottom	Low	14-Sep-05	51.54.08	8.23.960	13.40	9.0	18.4	8.1	6.8	0.836	46.3	30.1	8.0	70	36	<2	154	394	23	21
6000L7	C7	Blackrock Castle	Middle	Low	14-Sep-05	51.54.08	8.23.960	13.44	5.0	18.6	8.2	6.9	0.841	44.5	28.7	8.0	77	32	3	127	655	23	22
6000L8	C7	Blackrock Castle	Top	Low	14-Sep-05	51.54.08	8.23.960	13.49	Total 10.2	19.7	8.2	7.4	0.900	29.2	18.1	7.8	70	46	<2	194	5133	21	1120
6000L9	C8	Mid L. Mahon	Bottom	Low	14-Sep-05	51.53.35	8.22.380	14.00	9.5	18.1	8.6	7.2	0.832	47.3	30.8	8.0	65	33	<2	144	266	20	27
6000L10	C8	Mid L. Mahon	Middle	Low	14-Sep-05	51.53.35	8.22.380	14.03	5.5	18.4	8.8	7.4	0.836	46.1	29.9	8.0	70	31	2	130	310	23	45
6000L11	C8	Mid L. Mahon	Top	Low	14-Sep-05	51.53.35	8.22.380	14.07	Total 10.6	19.0	8.9	7.5	0.844	43.8	28.3	8.0	71	29	2	85	979	26	12
6000L12	C6	End L. Mahon	Bottom	Low	14-Sep-05	51.52.67	8.20.120	14.15	12.5	18.0	8.4	6.9	0.825	49.1	32.1	8.0	37	21	<2	90	62	12	12
6000L13	C6	End L. Mahon	Middle	Low	14-Sep-05	51.52.67	8.20.120	14.17	7.0	18.0	8.4	7.0	0.829	48.4	31.7	8.0	43	21	<2	94	<22	14	8
6000L14	C6	End L. Mahon	Top	Low	14-Sep-05	51.52.67	8.20.120	14.20	Total 13.5	18.3	8.7	7.2	0.832	46.5	30.3	8.0	46	25	<2	82	399	19	9
6000L15	C5	Haubowline	Bottom	Low	14-Sep-05	51.50.40	8.19.030	14.41	14.5	17.8	8.4	6.9	0.821	50.0	32.7	8.0	35	12	<2	48	<22	8	6
6000L16	C5	Haubowline	Middle	Low	14-Sep-05	51.50.40	8.19.030	14.43	8.0	18.1	8.5	7.0	0.825	49.8	32.1	8.0	40	14	<2	44	<22	11	3
6000L17	C5	Haubowline	Top	Low	14-Sep-05	51.50.40	8.19.030	14.47	Total 15.8	18.6	8.6	7.2	0.833	46.6	30.4	8.0	51	18	2	51	523	17	6
6000L18	C4	Lower Harbour	Bottom	Low	14-Sep-05	51.50.93	8.16.120	15.00	15.0	17.5	9.0	7.4	0.817	51.2	33.8	8.0	24	9	<2	32	<22	<5	<1
6000L19	C4	Lower Harbour	Middle	Low	14-Sep-05	51.50.93	8.16.120	15.03	8.0	17.7	8.7	7.1	0.817	51.1	33.6	8.0	27	24	<2	58	<22	<5	1
6000L20	C4	Lower Harbour	Top	Low	14-Sep-05	51.50.93	8.16.120	15.05	Total 16.0	17.4	8.9	7.3	0.816	51.1	33.6	8.0	31	7	<2	20	<22	<5	1
6000L21	C3	End Cork Harbour	Bottom	Low	14-Sep-05	51.48.75	8.16.340	15.18	27.5	16.9	9.0	7.3	0.812	51.7	34.1	8.0	21	9	<2	19	<22	<5	13
6000L22	C3	End Cork Harbour	Middle	Low	14-Sep-05	51.48.75	8.16.340	15.22	14.5	17.0	8.7	7.1	0.812	51.5	33.9	8.0	27	6	<2	19	<22	5	23
6000L23	C3	End Cork Harbour	Top	Low	14-Sep-05	51.48.75	8.16.340	15.25	Total 28.5	17.4	8.5	6.9	0.816	51.4	33.8	8.0	32	5	<2	22	115	<5	1
6000L24		Field Control B																					
sample 24-3		Field B-A																					
Min									5.0	16.9	7.7	6.4	0.8	12.8	7.4	7.6	21.0	5.0	<2	13.0	<22	<5	<1
Max									27.5	19.7	10.0	10.0	1.0	51.7	34.1	8.0	77.0	53.0	3.0	228.0	9553.0	26.0	15290.0
Mean									11.0	18.1	8.6	7.4	0.9	45.7	29.8	7.9	47.8	25.0	2.3	85.0	2432.4	17.0	826.7

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100m ls)	
6000L1	C16	Anglers Rest	Top	Low	14-Sep-05					18.0	10.0	10.0	1.000	182.0		7.8	35	34	<2	13	7298	12	488	
6000L2	C14	Waterworks	Top	Low	14-Sep-05					18.0	9.6	9.6	1.000	190.0		7.8	43	41	<2	26	9553	14	238	
6000L3		Field Control A																						
6000L4	C9	Tivoli	Bottom	Low	14-Sep-05	51.54.100	8.26.010	13.25	7.0	18.0	7.7	6.4	0.836	45.9	29.8	7.8	74	44	<2	228	350	21	15	
6000L5	C9	Tivoli	Top	Low	14-Sep-05	51.54.100	8.26.010	13.30	Total 8.3	19.0	7.9	7.6	0.956	12.8	7.4	7.6	62	53	<2	189	8016	20	15290	
6000L6	C7	Blackrock Castle	Bottom	Low	14-Sep-05	51.54.080	8.23.960	13.40	9.0	18.4	8.1	6.8	0.836	46.3	30.1	8.0	70	36	<2	154	394	23	21	
6000L7	C7	Blackrock Castle	Middle	Low	14-Sep-05	51.54.080	8.23.960	13.44	5.0	18.6	8.2	6.9	0.841	44.5	28.7	8.0	77	32	3	127	655	23	22	
6000L8	C7	Blackrock Castle	Top	Low	14-Sep-05	51.54.080	8.23.960	13.49	Total 10.2	19.7	8.2	7.4	0.900	29.2	18.1	7.8	70	46	<2	194	5133	21	1120	
6000L9	C8	Mid L. Mahon	Bottom	Low	14-Sep-05	51.53.350	8.22.380	14.00	9.5	18.1	8.6	7.2	0.832	47.3	30.8	8.0	65	33	<2	144	266	20	27	
6000L10	C8	Mid L. Mahon	Middle	Low	14-Sep-05	51.53.350	8.22.380	14.03	5.5	18.4	8.8	7.4	0.836	46.1	29.9	8.0	70	31	2	130	310	23	45	
6000L11	C8	Mid L. Mahon	Top	Low	14-Sep-05	51.53.350	8.22.380	14.07	Total 10.6	19.0	8.9	7.5	0.844	43.8	28.3	8.0	71	29	2	85	979	26	12	
6000L12	C6	End L. Mahon	Bottom	Low	14-Sep-05	51.52.670	8.20.120	14.15	12.5	18.0	8.4	6.9	0.825	49.1	32.1	8.0	37	21	<2	90	62	12	12	
6000L13	C6	End L. Mahon	Middle	Low	14-Sep-05	51.52.670	8.20.120	14.17	7.0	18.0	8.4	7.0	0.829	48.4	31.7	8.0	43	21	<2	94	<22	14	8	
6000L14	C6	End L. Mahon	Top	Low	14-Sep-05	51.52.670	8.20.120	14.20	Total 13.5	18.3	8.7	7.2	0.832	46.5	30.3	8.0	46	25	<2	82	399	19	9	
6000L15	C5	Haubowline	Bottom	Low	14-Sep-05	51.50.400	8.19.030	14.41	14.5	17.8	8.4	6.9	0.821	50.0	32.7	8.0	35	12	<2	48	<22	8	6	
6000L16	C5	Haubowline	Middle	Low	14-Sep-05	51.50.400	8.19.030	14.43	8.0	18.1	8.5	7.0	0.825	49.0	32.1	8.0	40	14	<2	44	<22	11	3	
6000L17	C5	Haubowline	Top	Low	14-Sep-05	51.50.400	8.19.030	14.47	Total 15.8	18.6	8.6	7.2	0.833	46.6	30.4	8.0	51	18	2	51	523	17	6	
6000L18	C4	Lower Harbour	Bottom	Low	14-Sep-05	51.50.930	8.16.120	15.00	15.0	17.5	9.0	7.4	0.817	51.2	33.8	8.0	24	9	<2	32	<22	<5	<1	
6000L19	C4	Lower Harbour	Middle	Low	14-Sep-05	51.50.930	8.16.120	15.03	8.0	17.7	8.7	7.1	0.817	51.1	33.6	8.0	27	24	<2	58	<22	<5	1	
6000L20	C4	Lower Harbour	Top	Low	14-Sep-05	51.50.930	8.16.120	15.05	Total 16.0	17.4	8.9	7.3	0.816	51.1	33.6	8.0	31	7	<2	20	<22	<5	1	
6000L21	C3	End Cork Harbour	Bottom	Low	14-Sep-05	51.48.750	8.16.340	15.18	27.5	16.9	9.0	7.3	0.812	51.7	34.1	8.0	21	9	<2	19	<22	<5	13	
6000L22	C3	End Cork Harbour	Middle	Low	14-Sep-05	51.48.750	8.16.340	15.22	14.5	17.0	8.7	7.1	0.812	51.5	33.9	8.0	27	6	<2	19	<22	5	23	
6000L23	C3	End Cork Harbour	Top	Low	14-Sep-05	51.48.750	8.16.340	15.25	Total 28.5	17.4	8.5	6.9	0.816	51.4	33.8	8.0	32	5	<2	22	115	<5	1	
6000L24		Field Control B																						
sample 24-3		Field B-A																						
Min										5.0	16.9	7.7	6.4	0.8	12.8	7.4	7.6	21.0	5.0	<2	13.0	<22	<5	<1
Max										27.5	19.7	10.0	10.0	1.0	51.7	34.1	8.0	77.0	53.0	3.0	228.0	9553.0	26.0	15290.0
Mean										11.0	18.1	8.6	7.4	0.9	45.7	29.8	7.9	47.8	25.0	2.3	85.0	2432.4	17.0	826.7

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
7400L1	C16	Anglers Rest	Top	Low	12-Oct-05					13.3	9.9	9.9	1.000	189.0	7.8	7.8	24	24	<2	24	8125	51	378
7400L2	C14	Waterworks	Top	Low	12-Oct-05					13.2	9.2	9.2	1.000	178.0	7.6	7.6	21	28	2	31	8299	53	173
7400L3		Field Control A												48.6	31.8	8.0	184	181	<2	534	3543	<16	<1
7400L4	C9	Tivoli	Bottom	Low	12-Oct-05	N/A	N/A	08:29	6	12.7	9.5	8.1	0.853	40.0	25.7	7.9	47	44	<2	230	2166	69	156
7400L5	C9	Tivoli	Top	Low	12-Oct-05	N/A	N/A	08:29	Total 7	12.5	9.6	9.4	0.983	5.0	2.7	7.7	25	30	<2	114	6594	69	3790
7400L6	C7	Blackrock Castle	Bottom	Low	12-Oct-05	51°20'	08°22'	08:50	8	12.7	9.2	7.6	0.830	46.4	30.3	7.9	48	47	<2	217	1718	62	19
7400L7	C7	Blackrock Castle	Middle	Low	12-Oct-05	51°20'	08°22'	08:50	4	12.9	9.2	7.7	0.834	45.0	29.1	7.9	51	48	<2	257	1993	66	41
7400L8	C7	Blackrock Castle	Top	Low	12-Oct-05	51°20'	08°22'	08:50	Total 9	12.3	9.3	9.0	0.968	8.5	4.8	7.7	25	31	<2	153	5779	82	3450
7400L9	C8	Mid L. Mahon	Bottom	Low	12-Oct-05	51°25'	08°03'	09:10	8	12.4	8.6	7.4	0.856	39.2	24.9	7.8	50	48	<2	207	2422	76	122
7400L10	C8	Mid L. Mahon	Middle	Low	12-Oct-05	51°25'	08°03'	09:10	4	12.6	8.4	7.1	0.850	41.4	26.7	7.8	52	51	<2	238	2108	79	160
7400L11	C8	Mid L. Mahon	Top	Low	12-Oct-05	51°25'	08°03'	09:10	Total 9	12.0	8.5	7.5	0.887	30.8	19.2	7.8	46	43	<2	215	3246	89	1414
7400L12	C6	End L. Mahon	Bottom	Low	12-Oct-05	N/A	N/A	09:30	13	12.6	8.8	7.2	0.823	48.0	31.4	7.9	40	38	<2	158	1382	62	23
7400L13	C6	End L. Mahon	Middle	Low	12-Oct-05	N/A	N/A	09:30	7	12.6	8.6	7.1	0.830	45.9	29.8	7.9	51	46	<2	231	1802	69	42
7400L14	C6	End L. Mahon	Top	Low	12-Oct-05	N/A	N/A	09:30	Total 14	11.6	9.1	8.0	0.883	32.0	20.2	7.8	47	43	<2	204	3397	76	770
7400L15	C5	Haubowline	Bottom	Low	12-Oct-05	51°50'	08°18'	09:55	15	12.5	10.0	8.2	0.815	49.7	32.5	7.9	30	24	<2	72	992	39	11
7400L16	C5	Haubowline	Middle	Low	12-Oct-05	51°50'	08°18'	09:55	8	12.6	9.5	7.9	0.827	47.0	30.7	7.9	34	31	<2	104	1528	56	28
7400L17	C5	Haubowline	Top	Low	12-Oct-05	51°50'	08°18'	09:55	Total 17	12.0	9.2	7.9	0.860	37.7	24.0	7.9	46	43	<2	201	2821	76	403
7400L18	C4	Lower Harbour	Bottom	Low	12-Oct-05	N/A	N/A	10:20	14	12.6	9.9	8.1	0.815	50.2	33.1	7.9	22	22	<2	54	872	39	6
7400L19	C4	Lower Harbour	Middle	Low	12-Oct-05	N/A	N/A	10:20	7	12.6	9.7	7.9	0.819	49.0	32.0	7.9	26	26	<2	84	1262	43	6
7400L20	C4	Lower Harbour	Top	Low	12-Oct-05	N/A	N/A	10:20	Total 15	12.3	9.7	8.0	0.822	47.8	31.3	7.9	29	29	<2	107	1455	46	13
7400L21	C3	End Cork Harbour	Bottom	Low	12-Oct-05	51°48'	08°16'	10:50	28	13.0	9.9	8.0	0.807	52.0	34.2	8.0	14	13	<2	<6	416	46	1
7400L22	C3	End Cork Harbour	Middle	Low	12-Oct-05	51°48'	08°16'	10:50	14	13.0	9.7	7.8	0.807	51.9	34.3	8.0	19	15	<2	21	487	30	5
7400L23	C3	End Cork Harbour	Top	Low	12-Oct-05	51°48'	08°16'	10:50	Total 29	12.7	9.5	7.7	0.811	51.2	33.6	8.0	18	17	<2	28	731	36	8
7400L24		Field Control B												49.2	32.5	8.0	16	23	<2	<6	2347	<16	<1
sample 24-3		Field B-A												49.2	32.5	8.0	168	158	<2	534	1196	<16	<1
Min									4.0	11.6	8.4	7.1	0.5	0.0	2.7	7.6	14.0	13.0	<2	<6	416.0	30.0	1.0
Max									28.0	13.3	10.0	9.9	1.0	52.0	34.3	8.0	184.0	181.0	2.0	534.0	8299.0	89.0	3790.0
Mean									10.5	12.6	9.3	8.0	0.9	40.9	26.8	7.9	41.3	40.1	2.0	158.4	2745.1	59.7	500.9

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/l) Direct	DO (mg/l) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/l P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
7438L1	C16	Anglers Rest	Top	Low	12-Oct-05					14.0	10.1	10.1	1.000	149.0	7.7		15	13	<2	27	5226	66	61
7438L2	C14	Waterworks	Top	Low	12-Oct-05					13.9	10.1	10.1	1.000	153.0	7.7		18	17	<2	26	5491	66	93
7438L3		Field Control A																					
7438L4	C9	Tivoli	Bottom	Low	12-Oct-05	51°54'	08°26'	12:40	8	13.9	8.9	7.4	0.828	46.8	30.5	7.9	54	49	<2	243	1559	66	23
7438L5	C9	Tivoli	Top	Low	12-Oct-05	51°54'	08°26'	12:40	Total 9	13.6	9.0	8.7	0.972	8.2	4.5	7.7	36	41	<2	116	5310	69	4500
7438L6	C7	Blackrock Castle	Bottom	Low	12-Oct-05	51°54'	08°24'	12:50	9	13.5	8.8	7.3	0.835	44.7	29.0	7.9	53	48	<2	225	1918	66	24
7438L7	C7	Blackrock Castle	Middle	Low	12-Oct-05	51°54'	08°24'	12:50	5	13.5	8.6	7.2	0.839	44.2	28.6	7.9	58	51	<2	249	1940	72	28
7438L8	C7	Blackrock Castle	Top	Low	12-Oct-05	51°54'	08°24'	12:50	Total 11	13.6	8.7	8.3	0.958	12.4	7.1	7.8	34	36	<2	174	5483	72	2310
7438L9	C8	Mid L. Mahon	Bottom	Low	12-Oct-05	51°53'	08°22'	13:10	9	13.5	8.8	7.4	0.843	43.0	28.0	7.9	48	44	<2	194	2241	59	27
7438L10	C8	Mid L. Mahon	Middle	Low	12-Oct-05	51°53'	08°22'	13:10	5	13.3	8.8	7.4	0.842	42.5	27.4	7.9	49	46	<2	224	1771	66	26
7438L11	C8	Mid L. Mahon	Top	Low	12-Oct-05	51°53'	08°22'	13:10	Total 10	12.9	8.7	7.5	0.865	36.7	23.3	7.9	66	48	<2	222	2648	72	122
7438L12	C6	End L. Mahon	Bottom	Low	12-Oct-05	51°52'	08°20'	13:30	14	13.5	8.9	7.3	0.824	48.2	31.4	7.9		29	<2	108	1284	43	16
7438L13	C6	End L. Mahon	Middle	Low	12-Oct-05	51°52'	08°20'	13:30	7	13.3	8.8	7.3	0.834	45.1	29.3	7.9	41	34	<2	149	1926	53	25
7438L14	C6	End L. Mahon	Top	Low	12-Oct-05	51°52'	08°20'	13:30	Total 15	12.6	9.1	8.0	0.880	32.9	20.6	7.9	57	44	<2	228	3042	76	230
7438L15	C5	Haubowline	Bottom	Low	12-Oct-05	51°50'	08°19'	13:50	15	13.3	9.1	7.4	0.815	50.2	33.1	7.9	37	24	<2	73	859	39	8
7438L16	C5	Haubowline	Middle	Low	12-Oct-05	51°50'	08°19'	13:50	8	13.1	8.9	7.3	0.819	49.1	32.1	7.9	40	27	<2	96	1129	43	7
7438L17	C5	Haubowline	Top	Low	12-Oct-05	51°50'	08°19'	13:50	Total 16	13.1	8.8	7.3	0.834	44.8	29.0	7.9	49	36	<2	158	1909	59	15
7438L18	C4	Lower Harbour	Bottom	Low	12-Oct-05	51°50'	08°16'	14:10	13	13.6	8.9	7.2	0.809	51.8	34.0	8.0	67	18	<2	32	496	33	1
7438L19	C4	Lower Harbour	Middle	Low	12-Oct-05	51°50'	08°16'	14:10	7	13.6	8.5	6.9	0.812	51.0	33.6	8.0	34	20	<2	50	664	39	2
7438L20	C4	Lower Harbour	Top	Low	12-Oct-05	51°50'	08°16'	14:10	Total 14	13.6	8.8	7.1	0.812	50.6	33.3	7.9	24	22	<2	63	859	33	3
7438L21	C3	End Cork Harbour	Bottom	Low	12-Oct-05	51°48'	08°16'	14:35	24	13.3	9.3	7.5	0.811	50.3	33.9	8.0	20	18	<2	37	585	36	1
7438L22	C3	End Cork Harbour	Middle	Low	12-Oct-05	51°48'	08°16'	14:35	13	13.1	8.8	7.1	0.811	51.2	33.6	8.0	29	18	<2	49	664	30	2
7438L23	C3	End Cork Harbour	Top	Low	12-Oct-05	51°48'	08°16'	14:35	Total 25	12.8	8.8	7.2	0.819	48.5	31.8	7.9	39	27	<2	99	1275	43	5
7438L24		Field Control B																					
sample 24-3		Field B-A																					
Min									5.0	12.6	8.5	6.9	0.8	8.2	4.5	7.7	15.0	13.0	<2	26.0	496.0	30.0	1.0
Max									24.0	14.0	10.1	10.1	1.0	51.8	34.0	8.0	67.0	51.0	<2	249.0	5491.0	76.0	4500.0
Mean									10.5	13.4	9.0	7.7	0.9	42.7	27.7	7.9	41.3	32.3	<2	129.2	2194.5	54.6	342.2

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Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/lO2) Direct	DO (mg/lO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
8754L1	C16	Anglers Rest	Top	High	7-Nov-05						10.5	10.5	1.000	148.0		7.2	Not Tested	36	<2	68	12652	43	96
8754L2	C14	Waterworks	Top	High	7-Nov-05						9.9	9.9	1.000	167.0		7.3	Not Tested	40	<2	64	16319	49	152
8754L3		Field Control A												50.4	33.2	8.0	Not Tested	24	<2	6	2834	<16	N/A
8754L4	C9	Tivoli	Bottom	High	7-Nov-05	51.54.107	8.25.98	9.2	8.5	11.7	12.9	12.1	0.939	16.5	9.8	7.9	Not Tested	41	<2	105	13184	59	980
8754L5	C9	Tivoli	Top	High	7-Nov-05	51.54.107	8.25.98	9.2	Total 9.3	11.2	13.2	12.8	0.971	7.8	4.3	7.5	Not Tested	44	<2	94	15465	59	687
8754L6	C7	Blackrock Castle	Bottom	High	7-Nov-05	51.54.089	8.24.01	9.36	9.5	12.6	12.9	11.0	0.850	40.6	26.1	7.9	Not Tested	37	<2	136	5230	62	76
8754L7	C7	Blackrock Castle	Middle	High	7-Nov-05	51.54.089	8.24.01	9.36	5	12.2	12.4	11.2	0.902	27.4	16.9	7.8	Not Tested	42	<2	136	9783	69	816
8754L8	C7	Blackrock Castle	Top	High	7-Nov-05	51.54.089	8.24.01	9.36	Total 10.8	11.5	12.1	11.7	0.968	9.4	5.3	7.6	Not Tested	44	<2	100	15101	66	1300
8754L9	C8	Mid L. Mahon	Bottom	High	7-Nov-05	51.53.34	8.22.41	9.5	10	12.5	12.6	10.6	0.838	43.8	28.3	7.9	Not Tested	28	<2	90	4136	53	46
8754L10	C8	Mid L. Mahon	Middle	High	7-Nov-05	51.53.34	8.22.41	9.5	5	12.0	12.4	11.0	0.890	30.4	18.9	7.9	Not Tested	41	<2	143	9158	72	517
8754L11	C8	Mid L. Mahon	Top	High	7-Nov-05	51.53.34	8.22.41	9.5	Total 10.6	11.5	12.0	11.3	0.939	16.9	10.0	7.7	Not Tested	46	<2	135	13179	79	921
8754L12	C6	End L. Mahon	Bottom	High	7-Nov-05	51.52.68	8.20.13	10.09	13	12.5	12.5	10.5	0.842	42.5	27.4	7.9	Not Tested	34	<2	122	4615	59	59
8754L13	C6	End L. Mahon	Middle	High	7-Nov-05	51.52.68	8.20.13	10.09	6.5	12.2	12.3	10.7	0.868	36.2	23.0	7.9	Not Tested	34	<2	111	7002	62	178
8754L14	C6	End L. Mahon	Top	High	7-Nov-05	51.52.68	8.20.13	10.09	Total 13.5	11.1	11.5	10.9	0.946	14.5	8.5	7.7	Not Tested	47	<2	129	14473	72	1733
8754L15	C5	Haubowline	Bottom	High	7-Nov-05	51.50.39	9.19.03	10.32	14.5	13.1	12.4	10.1	0.815	50.2	33.0	8.0	Not Tested	17	<2	33	1652	36	14
8754L16	C5	Haubowline	Middle	High	7-Nov-05	51.50.39	9.19.03	10.32	7.5	13.0	12.3	10.1	0.823	48.0	31.4	8.0	Not Tested	20	<2	46	2600	43	17
8754L17	C5	Haubowline	Top	High	7-Nov-05	51.50.39	9.19.03	10.32	Total 15.4	12.4	11.4	9.8	0.860	38.1	24.3	7.9	Not Tested	31	<2	95	6430	59	55
8754L18	C4	Lower Harbour	Bottom	High	7-Nov-05	51.50.93	8.16.02	10.5	13.5	13.1	11.9	9.7	0.811	50.9	33.5	8.0	Not Tested	16	<2	27	1413	33	5
8754L19	C4	Lower Harbour	Middle	High	7-Nov-05	51.50.93	8.16.02	10.5	7	12.7	12.1	10.1	0.834	44.8	28.7	8.0	Not Tested	23	<2	63	3879	46	33
8754L20	C4	Lower Harbour	Top	High	7-Nov-05	51.50.93	8.16.02	10.5	Total 14.3	12.5	11.4	9.6	0.842	43.4	28.1	8.0	Not Tested	26	<2	75	4406	49	44
8754L21	C3	End Cork Harbour	Bottom	High	7-Nov-05	51.48.77	8.16.32	11.19	29	12.6	12.4	10.2	0.823	42.5	31.0	8.0	Not Tested	20	<2	49	2890	41	17
8754L22	C3	End Cork Harbour	Middle	High	7-Nov-05	51.48.77	8.16.32	11.19	14	12.5	12.3	10.3	0.838	44.0	28.5	8.0	Not Tested	25	<2	71	4269	53	36
8754L23	C3	End Cork Harbour	Top	High	7-Nov-05	51.48.77	8.16.32	11.19	Total 29.7	12.5	11.8	9.9	0.838	43.8	28.3	8.0	Not Tested	24	<2	68	4274	49	33
8754L24		Field Control B												49.7	32.6	8.1	Not Tested	178	<2	531	4340	<16	N/A
sample 24-3		Field B-A															#VALUE!	154	0	525	1506	0	
Min									5.0	11.1	9.9	9.6	0.8	7.8	4.3	7.2	0.0	16.0	<2	6.0	1413.0	33.0	5.0
Max									29.0	13.1	13.2	12.8	1.0	50.9	33.5	8.0	0.0	47.0	<2	143.0	16319.0	79.0	1733.0
Mean									11.0	12.3	12.1	10.6	0.9	34.4	22.8	7.8	#DIV/0!	32.2	<2	85.5	7606.3	55.1	355.2

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Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
9588L1	C16	Anglers Rest	Top	Low	23-Nov-05						10.6	10.6	1.000	218.0	7.6	Not Tested	53	<2	20	18729	36	397	
9588L2	C14	Waterworks	Top	Low	23-Nov-05						10.8	10.8	1.000	237.0	7.5	Not Tested	34	<2	22	24127	39	308	
9588L3		Field Control A												49.8	32.6	8.1	Not Tested	52	<2	8	2679	16	<1
9588L4	C9	Tivoli	Bottom	Low	23-Nov-05	51°54'107	08°26'020	13:52	6	10.2	11.2	9.6	0.854	39.4	25.2	7.8	Not Tested	52	<2	280	6727	69	575
9588L5	C9	Tivoli	Top	Low	23-Nov-05	51°54'107	08°26'020	13:52	Total 7	9.4	9.8	9.3	0.949	13.9	8.1	7.6	Not Tested	59	<2	258	18162	62	2420
9588L6	C7	Blackrock Castle	Bottom	Low	23-Nov-05	51°54'089	08°24002	13:34	7	10.0	10.7	8.9	0.835	43.8	28.3	7.8	Not Tested	60	<2	212	4876	62	42
9588L7	C7	Blackrock Castle	Middle	Low	23-Nov-05	51°54'089	08°24002	13:34	4	10.1	10.1	8.5	0.839	42.8	27.6	7.9	Not Tested	65	<2	216	5319	62	52
9588L8	C7	Blackrock Castle	Top	Low	23-Nov-05	51°54'089	08°24002	13:34	Total 9	9.2	10.3	10.0	0.967	8.8	4.9	7.6	Not Tested	61	<2	152	17856	59	1733
9588L9	C8	Mid L. Mahon	Bottom	Low	23-Nov-05	51°53'140	08°22'012	13:11	7	10.0	9.7	8.2	0.846	41.3	26.5	7.9	Not Tested	65	<2	225	6067	66	58
9588L10	C8	Mid L. Mahon	Middle	Low	23-Nov-05	51°53'140	08°22'012	13:11	4	9.8	10.5	9.0	0.854	38.7	24.6	7.8	Not Tested	68	<2	230	7298	72	208
9588L11	C8	Mid L. Mahon	Top	Low	23-Nov-05	51°53'140	08°22'012	13:11	Total 8	9.6	10.0	9.0	0.897	27.7	17.1	7.8	Not Tested	58	<2	202	11417	72	1733
9588L12	C6	End L. Mahon	Bottom	Low	23-Nov-05	51°52'670	08°20'108	12:51	11	10.1	10.9	9.2	0.843	41.9	27.0	7.9	Not Tested	61	<2	208	5762	62	44
9588L13	C6	End L. Mahon	Middle	Low	23-Nov-05	51°52'670	08°20'108	12:51	6	9.6	10.5	9.1	0.870	35.1	22.1	7.8	Not Tested	61	<2	188	8769	66	177
9588L14	C6	End L. Mahon	Top	Low	23-Nov-05	51°52'670	08°20'108	12:51	Total 12	9.4	10.4	9.3	0.896	27.9	17.2	7.8	Not Tested	63	<2	222	11373	72	1120
9588L15	C5	Haubowline	Bottom	Low	23-Nov-05	51°50'420	08°19'046	12:23	14	10.6	10.9	8.9	0.813	49.8	32.7	7.9	Not Tested	41	<2	49	2294	39	4
9588L16	C5	Haubowline	Middle	Low	23-Nov-05	51°50'420	08°19'046	12:23	7	10.5	11.0	9.0	0.817	48.6	31.8	7.9	Not Tested	46	<2	63	2777	43	3
9588L17	C5	Haubowline	Top	Low	23-Nov-05	51°50'420	08°19'046	12:23	Total 15	10.3	10.8	8.9	0.827	45.7	29.7	7.9	Not Tested	50	<2	103	4096	49	39
9588L18	C4	Lower Harbour	Bottom	Low	23-Nov-05	51°50'890	08°16'050	11:56	13	10.8	10.7	8.7	0.813	50.3	33.1	7.9	Not Tested	41	<2	30	<22	43	3
9588L19	C4	Lower Harbour	Middle	Low	23-Nov-05	51°50'890	08°16'050	11:56	6	10.6	10.7	8.7	0.817	48.8	31.8	7.9	Not Tested	46	<2	55	2693	39	4
9588L20	C4	Lower Harbour	Top	Low	23-Nov-05	51°50'890	08°16'050	11:56	Total 14	10.6	10.5	8.6	0.820	47.8	31.2	7.9	Not Tested	48	<2	68	3087	43	23
9588L21	C3	End Cork Harbour	Bottom	Low	23-Nov-05	51°48'790	08°16'035	11:33	27	10.8	10.7	8.7	0.809	50.7	33.4	7.9	Not Tested	48	<2	27	<22	36	3
9588L22	C3	End Cork Harbour	Middle	Low	23-Nov-05	51°48'790	08°16'035	11:33	14	10.6	11.0	8.9	0.813	50.0	32.9	7.9	Not Tested	46	<2	40	<22	36	1
9588L23	C3	End Cork Harbour	Top	Low	23-Nov-05	51°48'790	08°16'035	11:33	Total 28	10.1	10.4	8.6	0.831	45.4	29.5	7.9	Not Tested	51	<2	96	4229	49	12
9588L24		Field Control B												48.5	31.8	8.0	Not Tested	145	<2	1050	4783	<16	<1
sample 24-3		Field B-A															#VALUE!	93	0	1042	2104	16	0
Min									4.0	9.2	9.7	8.2	0.8	8.8	4.9	7.5	0.0	34.0	<2	8.0	2294.0	16.0	1.0
Max									27.0	10.8	11.2	10.8	1.0	50.7	33.4	8.1	0.0	68.0	<2	280.0	24127.0	72.0	2420.0
Mean									9.7	10.1	10.6	9.1	0.9	40.3	26.1	7.8	#DIV/0!	53.4	<2	129.3	8416.9	51.8	407.2

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/IO2) Direct	DO (mg/IO2) Corrected	Salinity Factor	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
1448M1	C16	Anglers Rest	Top	High	12-Dec-05					13.8	11.4	11.4	1.000	228.0	7.5	7.5	Not Tested	35	<2	29	18481	24	128
1448M2	C14	Waterworks	Top	High	12-Dec-05					14.0	11.2	11.2	1.000	245.0	7.5	7.5	Not Tested	34	<2	27	24428	30	148
1448M3		Field Control A												47.5	31.0	7.9	Not Tested	2192	<2	>600 (~2000)	4446	<16	*
1448M4	C9	Tivoli	Bottom	High	12-Dec-05	51°54'	08°26'	13:40	7.5	Not Tested	11.7	9.9	0.849	39.6	25.3	7.8	Not Tested	44	<2	222	5846	50	34
1448M5	C9	Tivoli	Top	High	12-Dec-05	51°54'	08°26'	13:40	Total 8.5	Not Tested	12.0	11.7	0.978	5.5	3.0	7.6	Not Tested	48	<2	133	18826	46	5370
1448M6	C7	Blackrock Castle	Bottom	High	12-Dec-05	51°54'	08°23'	13:20	8.5	Not Tested	11.2	9.4	0.839	43.4	28.0	7.9	Not Tested	45	<2	229	4433	48	40
1448M7	C7	Blackrock Castle	Middle	High	12-Dec-05	51°54'	08°23'	13:20	5	Not Tested	10.8	9.2	0.849	40.0	25.7	7.9	Not Tested	45	<2	224	5846	51	84
1448M8	C7	Blackrock Castle	Top	High	12-Dec-05	51°54'	08°23'	13:20	Total 9.5	Not Tested	11.5	11.0	0.960	10.7	6.1	7.7	Not Tested	40	<2	139	14703	48	1553
1448M9	C8	Mid L. Mahon	Bottom	High	12-Dec-05	51°53'	08°22'	13:00	8.5	Not Tested	10.6	8.8	0.827	45.5	29.5	7.9	Not Tested	43	<2	195	3246	40	55
1448M10	C8	Mid L. Mahon	Middle	High	12-Dec-05	51°53'	08°22'	13:00	5	Not Tested	10.9	9.1	0.838	43.3	28.0	7.9	Not Tested	44	<2	207	4437	44	52
1448M11	C8	Mid L. Mahon	Top	High	12-Dec-05	51°53'	08°22'	13:00	Total 9.5	Not Tested	11.6	10.5	0.903	25.7	115.8	7.8	Not Tested	42	<2	169	11674	64	530
1448M12	C6	End L. Mahon	Bottom	High	12-Dec-05	51°52'	08°20'	12:15	11.5	Not Tested	10.0	8.2	0.823	47.0	30.7	7.9	Not Tested	31	<2	103	2901	32	17
1448M13	C6	End L. Mahon	Middle	High	12-Dec-05	51°52'	08°20'	12:15	6	Not Tested	10.5	8.6	0.823	46.6	30.4	7.9	Not Tested	31	<2	112	3162	37	13
1448M14	C6	End L. Mahon	Top	High	12-Dec-05	51°52'	08°20'	12:15	Total 12.5	Not Tested	10.6	9.2	0.865	35.6	22.4	7.8	Not Tested	39	<2	176	7825	59	165
1448M15	C5	Haubowline	Bottom	High	12-Dec-05	51°50'	08°19'	11:50	12.9	Not Tested	10.8	8.8	0.815	48.5	31.7	7.9	Not Tested	26	<2	68	2378	25	6
1448M16	C5	Haubowline	Middle	High	12-Dec-05	51°50'	08°19'	11:50	7	Not Tested	11.0	9.2	0.834	43.7	28.2	7.9	Not Tested	32	<2	121	4442	39	20
1448M17	C5	Haubowline	Top	High	12-Dec-05	51°50'	08°19'	11:50	Total 13.9	Not Tested	11.2	9.8	0.871	35.4	22.4	7.8	Not Tested	40	<2	171	7794	49	195
1448M18	C4	Lower Harbour	Bottom	High	12-Dec-05	51°59'	08°16'	11:30	12.9	Not Tested	10.0	8.1	0.807	50.7	33.3	7.9	Not Tested	23	<2	50	726	22	3
1448M19	C4	Lower Harbour	Middle	High	12-Dec-05	51°59'	08°16'	11:30	7	Not Tested	10.2	8.3	0.811	49.5	32.5	7.9	Not Tested	25	<2	60	2338	23	5
1448M20	C4	Lower Harbour	Top	High	12-Dec-05	51°59'	08°16'	11:30	Total 13.9	Not Tested	10.4	8.6	0.823	46.7	30.4	7.9	Not Tested	29	<2	91	3127	30	7
1448M21	C3	End Cork Harbour	Bottom	High	12-Dec-05	51°48'	08°16'	10:55	26	Not Tested	11.0	8.9	0.805	52.2	34.4	7.9	Not Tested	20	<2	24	<22	19	2
1448M22	C3	End Cork Harbour	Middle	High	12-Dec-05	51°48'	08°16'	10:55	13	Not Tested	10.7	8.6	0.805	51.5	33.9	7.9	Not Tested	21	<2	35	1205	20	1
1448M23	C3	End Cork Harbour	Top	High	12-Dec-05	51°48'	08°16'	10:55	Total 30	Not Tested	10.5	8.6	0.815	49.0	32.1	7.9	Not Tested	25	<2	64	2290	26	3
1448M24		Field Control B												50.5	33.1	8.1	Not Tested	25	<2	28	2670	<16	*
sample 24-3		Field B-A															#VALUE!	2167	<2	#VALUE!	1776	<16	*
Min										5.0	13.8	10.0	8.1	5.5	3.0	7.5	0.0		20.0		726.0	19.0	
Max										26.0	14.0	12.0	11.7	52.2	115.8	8.1	0.0	2192.0	0.0	229.0	24428.0	64.0	5370.0
Mean										10.1	13.9	10.9	9.4	41.3	31.3	7.8	#DIV/0!	124.1		7025.2	37.5		

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temperature (°C)	DO (mg/l)O2 Direct	DO (mg/l)O2 Corrected	Salinity Factor	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
1530M1	C16	Anglers Rest	Top	Low	13-Dec-05					15.8	11.7	11.7	1.000	218.0	7.6	Not Tested	34	<2	36	18299	33	308	
1530M2	C14	Waterworks	Top	Low	13-Dec-05					17.8	11.4	11.4	1.000	226.0	7.5	Not Tested	35	<2	37	22922	32	276	
1530M3		Field Control A																					
1530M4	C9	Tivoli	Bottom	Low	13-Dec-05	51.54.105	08.26.017	10:30	5.5	Not Tested	Not Tested	Not Tested	0.849	39.8	25.5	7.8	Not Tested	47	<2	268	4832	51	154
1530M5	C9	Tivoli	Top	Low	13-Dec-05	51.54.105	08.26.017	10:35	Total 6	Not Tested	Not Tested	Not Tested	0.974	6.6	3.6	7.6	Not Tested	65	<2	122	17927	61	7280
1530M6	C7	Blackrock Castle	Bottom	Low	13-Dec-05	51.54.080	08.23.957	10:50	7	Not Tested	Not Tested	Not Tested	0.844	40.7	26.1	7.9	Not Tested	42	<2	209	4832	57	218
1530M7	C7	Blackrock Castle	Middle	Low	13-Dec-05	51.54.080	08.23.957	10:52	3.5	Not Tested	Not Tested	Not Tested	0.872	34.0	21.4	7.8	Not Tested	46	<2	197	7573	54	361
1530M8	C7	Blackrock Castle	Top	Low	13-Dec-05	51.54.080	08.23.957	10:55	Total 7.7	Not Tested	Not Tested	Not Tested	0.967	8.7	4.9	7.7	Not Tested	53	<2	117	15947	52	1414
1530M9	C8	Mid L. Mahon	Bottom	Low	13-Dec-05	51.53.134	08.22.054	11:05	7.5	Not Tested	Not Tested	Not Tested	0.837	43.0	27.7	7.9	Not Tested	45	<2	204	4260	50	178
1530M10	C8	Mid L. Mahon	Middle	Low	13-Dec-05	51.53.134	08.22.054	11:08	3.5	Not Tested	Not Tested	Not Tested	0.852	39.1	25.0	7.9	Not Tested	47	<2	218	6151	59	268
1530M11	C8	Mid L. Mahon	Top	Low	13-Dec-05	51.53.134	08.22.054	11:10	Total 8.1	Not Tested	Not Tested	Not Tested	0.871	33.7	21.3	7.8	Not Tested	49	<2	227	8658	72	1986
1530M12	C6	End L. Mahon	Bottom	Low	13-Dec-05	51.52.675	08.20.101	11:25	10.5	Not Tested	Not Tested	Not Tested	0.833	43.9	28.4	7.9	Not Tested	49	<2	187	3915	42	173
1530M13	C6	End L. Mahon	Middle	Low	13-Dec-05	51.52.675	08.20.101	11:27	5.5	Not Tested	Not Tested	Not Tested	0.844	41.4	26.6	7.9	Not Tested	50	<2	207	5274	51	189
1530M14	C6	End L. Mahon	Top	Low	13-Dec-05	51.52.675	08.20.101	11:30	Total 11	Not Tested	Not Tested	Not Tested	0.875	32.6	20.5	7.9	Not Tested	42	<2	176	9517	57	1203
1530M15	C5	Haubowline	Bottom	Low	13-Dec-05	51.50.420	08.19.029	12:30	13	Not Tested	Not Tested	Not Tested	0.822	47.1	30.8	8.0	Not Tested	28	<2	67	2515	28	10
1530M16	C5	Haubowline	Middle	Low	13-Dec-05	51.50.420	08.19.029	12:33	6.5	Not Tested	Not Tested	Not Tested	0.830	44.9	28.9	8.0	Not Tested	25	<2	85	3742	37	26
1530M17	C5	Haubowline	Top	Low	13-Dec-05	51.50.420	08.19.029	12:35	Total 13.8	Not Tested	Not Tested	Not Tested	0.860	37.3	23.7	7.9	Not Tested	37	<2	140	7267	50	188
1530M18	C4	Lower Harbour	Bottom	Low	13-Dec-05	51.50.925	08.16.073	12:50	13	Not Tested	Not Tested	Not Tested	0.811	50.1	32.9	8.0	Not Tested	20	<2	33	797	20	3
1530M19	C4	Lower Harbour	Middle	Low	13-Dec-05	51.50.925	08.16.073	12:54	6.5	Not Tested	Not Tested	Not Tested	0.815	49.1	32.1	8.0	Not Tested	27	<2	44	1820	24	6
1530M20	C4	Lower Harbour	Top	Low	13-Dec-05	51.50.925	08.16.073	12:57	Total 13.7	Not Tested	Not Tested	Not Tested	0.822	45.8	30.4	8.0	Not Tested	28	<2	65	2825	30	15
1530M21	C3	End Cork Harbour	Bottom	Low	13-Dec-05	51.48.768	08.16.323	13:15	29	Not Tested	Not Tested	Not Tested	0.804	51.9	34.1	8.0	Not Tested	24	<2	<6	500	<16	<1
1530M22	C3	End Cork Harbour	Middle	Low	13-Dec-05	51.48.768	08.16.323	13:17	16	Not Tested	Not Tested	Not Tested	0.804	51.9	34.3	8.0	Not Tested	25	<2	9	487	<16	<1
1530M23	C3	End Cork Harbour	Top	Low	13-Dec-05	51.48.768	08.16.323	13:20	Total 29.5	Not Tested	Not Tested	Not Tested	0.807	51.4	33.8	8.0	Not Tested	22	<2	<6	695	<16	4
1530M24		Field Control B																					
sample 24-3		Field B-A																					
Min									3.5	15.8	11.4	11.4	0.8	6.6	3.6	7.5	0.0	20.0	0.0	9.0	487.0	20.0	3.0
Max									29.0	17.8	11.7	11.7	1.0	226.0	34.3	8.0	0.0	65.0	0.0	268.0	22922.0	72.0	7280.0
Mean									9.8	16.8	11.6	11.6	0.9	56.3	25.6	7.9	#DIV/0!	38.2	#DIV/0!	132.4	6852.5	45.3	713.0

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temp (°C)	DO (mg/lO2)	Conductivity @25°C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	Coliforms (MPN/100)	Chlorophyll a (µg/l)
3421M1	C16	Anglers Rest	Top	Low	2-Feb-06					8.0	10.9	0.2	7.6		70	58	<2	37	18362	43	649	1.0
3421M2	C14	Waterworks	Top	Low	2-Feb-06					8.0	10.8	0.2	7.5		42	27	<2	33	2466	49	687	0.9
3421M3		A										49.7	32.6	8.1	38	25	<2	17	2368	26	*	*
3421M4	C9	Tivoli	Bottom	Low	2-Feb-06	51.54.10	08.26.01	14.00	5	7.8	7.7	23.4	14.6	7.7	103	71	<2	356	11951	66	4040	0.6
3421M5	C9	Tivoli	Top	Low	2-Feb-06	51.54.10	08.26.01	14.03	5.6	8.5	9.7	7.7	4.3	7.5	113	91	<2	270	19513	72	4870	0.9
3421M6	C7	Blackrock Castle	Bottom	Low	2-Feb-06	51.54.07	08.23.90	13.37	7	7.5	8.9	39.1	25.0	7.8	77	52	<2	309	6371	66	228	0.8
3421M7	C7	Blackrock Castle	Middle	Low	2-Feb-06	51.54.07	08.23.90	13.4	3.5	7.6	8.5	34.5	21.8	7.8	75	55	<2	356	8431	66	1986	0.6
3421M8	C7	Blackrock Castle	Top	Low	2-Feb-06	51.54.07	08.23.90	13.45	7.7	8.0	10.4	9.3	5.3	7.5	83	63	<2	418	17231	66	2420	1.2
3421M9	C8	Mid L. Mahon	Bottom	Low	2-Feb-06	51.53.15	08.22.10	13.14	7	7.6	8.9	42.1	27.1	7.9	71	47	<2	257	5066	62	127	0.8
3421M10	C8	Mid L. Mahon	Middle	Low	2-Feb-06	51.53.15	08.22.10	13.18	3.5	7.5	8.9	36.8	23.3	7.8	73	50	<2	285	7491	66	292	0.7
3421M11	C8	Mid L. Mahon	Top	Low	2-Feb-06	51.53.15	08.22.10	13.22	7.9	7.9	9.6	30.3	18.9	7.8	71	53	<2	266	10171	66	2420	1.0
3421M12	C6	End L. Mahon	Bottom	Low	2-Feb-06	51.52.66	08.20.10	12.51	10.5	7.6	8.9	41.1	26.4	7.9	78	48	<2	288	5846	62	317	0.8
3421M13	C6	End L. Mahon	Middle	Low	2-Feb-06	51.52.66	08.20.10	12.55	5.5	7.7	9.2	38.3	24.5	7.8	72	46	<2	251	7116	62	770	0.9
3421M14	C6	End L. Mahon	Top	Low	2-Feb-06	51.52.66	08.20.10	12.58	10.2	7.8	9.6	32.4	20.3	7.8	79	50	<2	265	9781	66	1300	1.2
3421M15	C5	Haubowline	Bottom	Low	2-Feb-06	51.50.39	08.19.03	12.16	12.5	8.1	9.2	46.0	29.9	7.8	61	35	<2	165	3524	49	38	0.8
3421M16	C5	Haubowline	Middle	Low	2-Feb-06	51.50.39	08.19.03	12.14	6.5	8.3	9.0	45.9	29.9	7.8	66	37	<2	170	3672	43	63	0.8
3421M17	C5	Haubowline	Top	Low	2-Feb-06	51.50.39	08.19.03	12.1	13	8.1	6.9	45.4	29.4	7.8	60	38	<2	185	3892	43	53	No Result
3421M18	C4	Lower Harbour	Bottom	Low	2-Feb-06	51.15.91	08.16.07	11.4	12	8.4	9.2	49.9	32.7	7.8	42	40	<2	40	1821	33	7	0.9
3421M19	C4	Lower Harbour	Middle	Low	2-Feb-06	51.15.91	08.16.07	11.34	6.5	8.3	9.4	49.7	32.8	7.8	38	17	<2	39	1843	36	7	0.8
3421M20	C4	Lower Harbour	Top	Low	2-Feb-06	51.15.91	08.16.07	11.3	13.5	8.3	9.1	48.9	32.0	7.8	42	25	<2	67	2166	39	5	0.9
3421M21	C3	End Cork Harbour	Bottom	Low	2-Feb-06	51.48.78	08.16.32	11.04	28	8.9	9.1	51.2	33.7	7.9	31	18	<2	8	1268	30	<1	1.0
3421M22	C3	End Cork Harbour	Middle	Low	2-Feb-06	51.48.78	08.16.32	10.54	14	8.8	9.2	50.8	33.5	7.9	32	19	<2	<6	1424	33	6	1.0
3421M23	C3	End Cork Harbour	Top	Low	2-Feb-06	51.48.78	08.16.32	10.43	28.7	8.3	9.2	50.2	33.1	7.9	40	24	<2	68	1680	36	4	1.1
3421M24		B										49.3	32.3	8.0	229	221	<2	544	3373	20	<1	*
sample 24-3		Control B-A										0	0	0	191	196	0	527	1005	-6	<1	*
Min									3.5	7.5	6.9	7.7	4.3	7.5	31.0	17.0	<2	<6	1268.0	26.0	<1	0.6
Max									28.7	8.9	10.9	51.2	33.7	8.1	113.0	91.0	<2	418.0	19513.0	72.0	4870.0	1.2
Mean									10.4	8.0	9.2	39.6	25.6	7.8	70.2	49.7	<2	188.6	6671.9	51.3	966.1	0.9

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Time (24Hr)	Depth (m)	Temp (°C)	DO (mg/lO2)	Conductivity @25 °C (mS/cm)	Salinity (ppt)	pH	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	BOD (mg/l)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	Coliforms (MPN/100)	Chlorophyll a (µg/l)
3494M1	C16	Anglers Rest	Top	High	3-Feb-06					11.5	10.7	0.2	0.1	7.3	39	27	<2	41	15404	51	387	1.1
3494M2	C14	Waterworks	Top	High	3-Feb-06					10.8	11.0	0.2	0.1	7.5	48	35	<2	30	22809	53	308	1.0
3494M3		Field Control A																				
3494M4	C9	Tivoli	Bottom	High	3-Feb-06	51.54.09	08.26.02	9.35	9.0	7.6	No Result	29.8	18.4	7.5	74	58	<2	366	5817	69	15	<0.1
3494M5	C9	Tivoli	Top	High	3-Feb-06	51.54.09	08.26.02	9.47	9.7	8.0	8.8	30.5	18.9	7.7	60	37	<2	122	16171	66	20	1.3
3494M6	C7	Blackrock Castle	Bottom	High	3-Feb-06	51.54.07	08.23.93	10.02	10.0	7.7	8.8	43.4	28.0	7.8	76	52	<2	332	5020	59	60	0.7
3494M7	C7	Blackrock Castle	Middle	High	3-Feb-06	51.54.07	08.23.93	10.07	5.0	7.7	8.9	42.5	27.3	7.8	80	55	<2	352	6451	66	228	0.8
3494M8	C7	Blackrock Castle	Top	High	3-Feb-06	51.54.07	08.23.93	10.10	11.0	7.7	9.0	38.2	24.3	7.8	77	55	<2	255	9408	76	548	0.9
3494M9	C8	Mid L. Mahon	Bottom	High	3-Feb-06	51.53.10	08.22.01	10.27	9.0	7.8	8.9	46.1	30.0	7.9	61	43	<2	240	4305	56	29	0.7
3494M10	C8	Mid L. Mahon	Middle	High	3-Feb-06	51.53.10	08.22.01	10.31	5.0	7.8	9.0	44.2	28.6	7.9	62	45	<2	270	4826	62	48	0.7
3494M11	C8	Mid L. Mahon	Top	High	3-Feb-06	51.53.10	08.22.01	10.35	10.6	7.7	9.1	41.8	26.9	7.9	71	53	<2	297	7348	76	457	0.9
3494M12	C6	End L. Mahon	Bottom	High	3-Feb-06	51.52.69	08.20.12	11.09	12.0	7.8	8.9	45.3	29.4	7.9	50	37	<2	185	3739	53	11	0.7
3494M13	C6	End L. Mahon	Middle	High	3-Feb-06	51.52.69	08.20.12	11.13	6.0	7.8	9.0	44.8	29.0	7.9	55	39	<2	202	4294	49	35	0.8
3494M14	C6	End L. Mahon	Top	High	3-Feb-06	51.52.69	08.20.12	11.19	13.0	7.7	9.1	43.2	27.8	7.9	61	45	<2	226	5085	56	36	1.0
3494M15	C5	Haubowline	Bottom	High	3-Feb-06	51.50.42	08.19.08	13.02	12.0	7.8	8.9	46.7	30.5	8.0	57	36	<2	180	3404	49	21	0.8
3494M16	C5	Haubowline	Middle	High	3-Feb-06	51.50.42	08.19.08	13.06	6.0	7.8	9.0	45.2	29.3	8.0	56	36	<2	206	3659	53	21	0.9
3494M17	C5	Haubowline	Top	High	3-Feb-06	51.50.42	08.19.08	13.10	13.5	7.8	9.1	44.8	29.0	8.0	57	40	<2	222	4079	53	40	0.9
3494M18	C4	Lower Harbour	Bottom	High	3-Feb-06	51.50.92	08.16.09	12.29	12.0	8.1	9.0	50.6	33.3	8.0	33	22	<2	50	1567	36	2	0.8
3494M19	C4	Lower Harbour	Middle	High	3-Feb-06	51.50.92	08.16.09	12.34	6.0	8.0	9.1	49.7	32.6	8.0	39	24	<2	64	1848	39	4	0.8
3494M20	C4	Lower Harbour	Top	High	3-Feb-06	51.50.92	08.16.09	12.38	13.8	7.9	9.1	48.5	31.7	8.0	50	29	<2	116	2479	53	4	0.8
3494M21	C3	End Cork Harbour	Bottom	High	3-Feb-06	51.48.79	08.16.30	11.53	28.0	8.2	8.8	51.1	33.6	8.0	27	19	<2	33	1194	43	11	0.9
3494M22	C3	End Cork Harbour	Middle	High	3-Feb-06	51.48.79	08.16.30	11.57	15.0	8.2	9.0	51.1	33.6	8.0	31	21	<2	39	1266	35	1	1.1
3494M23	C3	End Cork Harbour	Top	High	3-Feb-06	51.48.79	08.16.30	12.01	30.2	8.1	9.1	49.9	32.8	8.0	32	22	<2	40	1422	39	1	0.9
3494M24		Field Control B																				
sample 24-3		Field B-A																				
Min									5.0	7.6	8.8	29.8	0.1	7.3	27.0	19.0	<2	30.0	1194.0	35.0	1.0	0.7
Max									30.2	11.5	11.0	51.1	33.6	8.0	80.0	58.0	<2	366.0	22809.0	76.0	548.0	1.3
Mean									11.8	8.2	9.2	44.4	26.1	7.9	54.4	37.7	<2	175.8	5981.6	54.2	104.0	0.9

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Sample Registration 1471

Client Reference																						
Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25 °C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
5422M1	C16	Anglers Rest	Top	High	21-Mar-06					12.6	7.7	195.0	0.1	11.5		<2	35	12	17	15755	25	160
5422M2	C14	Waterworks	Top	High	21-Mar-06					12.3	7.8	196.0	0.1	11.1		<2	36	17	18	19884	33	186
5422M3		Field Control A														<2	33.0	25.0	<6	2790.0	<16	*
5422M4	C9	Tivoli	Bottom	High	21-Mar-06	51.54.09	08.25.99	6.5	9:30	7.2	8.0	42.9	27.7	9.4		<2	50	43	269	5133	36	104
5422M5	C9	Tivoli	Top	High	22-Mar-06	51.54.09	08.25.99	Total 7.9	9:34	7.5	7.9	31.2	19.4	9.5		<2	43	14	77	13458	36	1986
5422M6	C7	Blackrock Castle	Bottom	High	21-Mar-06	51.54.09	08.23.93	10.2	9:06	7.3	8.0	44.9	29.1	9.5		<2	51	46	276	4690	36	121
5422M7	C7	Blackrock Castle	Middle	High	22-Mar-06	51.54.09	08.23.93	5.3	9:11	7.2	8.1	44.3	28.7	9.6		<2	60	41	248	6762	43	488
5422M8	C7	Blackrock Castle	Top	High	23-Mar-06	51.54.09	08.23.93	Total 11.5	9:15	7.4	8.0	34.4	21.6	9.9		<2	55	26	136	13095	43	2420
5422M9	C8	Mid L. Mahon	Bottom	High	21-Mar-06	51.53.12	08.21.98	9.4	8:35	7.2	8.0	46.5	30.3	9.3		<2	34*	37	192	3680	30	48
5422M10	C8	Mid L. Mahon	Middle	High	22-Mar-06	51.53.12	08.21.98	4.7	8:41	7.1	8.1	43.9	28.3	9.8		<2	34*	36	180	4384	33	28
5422M11	C8	Mid L. Mahon	Top	High	23-Mar-06	51.53.12	08.21.98	Total 10.7	8:46	7.0	8.1	42.3	27.2	10.1		<2	37	35	176	4433	30	24
5422M12	C6	End L. Mahon	Bottom	High	21-Mar-06	51.52.68	08.20.14	11.5	8:06	7.2	8.1	49.4	32.4	9.6		<2	22*	26	112	2759	23	6
5422M13	C6	End L. Mahon	Middle	High	22-Mar-06	51.52.68	08.20.14	6.4	8:12	7.2	8.1	47.9	31.2	9.7		<2	27*	29	126	2927	30	10
5422M14	C6	End L. Mahon	Top	High	23-Mar-06	51.52.68	08.20.14	Total 12.7	8:16	7.0	8.1	42.7	27.5	10.1		<2	38	35	166	4433	30	38
5422M15	C5	Haubowline	Bottom	High	21-Mar-06	51.50.40	08.19.01	13.1	10:23	7.2	8.1	50.6	33.3	9.5		<2	39	22	63	1639	20	12
5422M16	C5	Haubowline	Middle	High	22-Mar-06	51.50.40	08.19.01	7.2	10:27	7.2	8.1	49.9	32.7	9.6		3	34	25	82	2272	56	11
5422M17	C5	Haubowline	Top	High	23-Mar-06	51.50.40	08.19.01	Total 13.9	10:32	6.9	8.1	45.4	29.4	9.9		<2	27*	30	120	3242	26	11
5422M18	C4	Lower Harbour	Bottom	High	21-Mar-06	51.50.90	08.16.08	11.2	10:58	7.2	8.1	51.9	34.2	9.4		<2	28	19	33	850	33	1
5422M19	C4	Lower Harbour	Middle	High	22-Mar-06	51.50.90	08.16.08	6.1	11:03	7.2	8.1	51.3	33.8	9.5		<2	18*	19	32	1027	<16	2
5422M20	C4	Lower Harbour	Top	High	23-Mar-06	51.50.90	08.16.08	Total 12.1	11:06	7.0	8.1	48.7	31.8	9.8		<2	20*	21	45	1315	<16	4
5422M21	C3	End Cork Harbour	Bottom	High	21-Mar-06	51.48.79	08.16.29	27.9	11:25	7.2	8.1	51.9	34.2	9.3		<2	25	20	35	1143	<16	2
5422M22	C3	End Cork Harbour	Middle	High	22-Mar-06	51.48.79	08.16.29	15.6	11:29	7.2	8.1	51.3	33.8	9.5		<2	31	20	45	1222	<16	1
5422M23	C3	End Cork Harbour	Top	High	23-Mar-06	51.48.79	08.16.29	Total 29.1	11:34	7.1	8.1	50.1	32.9	9.7		<2	32	24	48	1488	20	1
5422M24		Field Control B														<2	143.0	132.0	113.0	2834.0	<16	*
sample 24-3		Field B-A														<2	110.0	107.0	113.0	44.0	<16	*
Min								4.7		6.9	7.7	31.2	19.4	9.3		0.0	25.0	12.0		44.0	20.0	1.0
Max								27.9		12.6	8.1	51.9	34.2	11.5		3.0	60.0	46.0	276.0	19884.0	56.0	2420.0
Mean								10.4		7.7	8.0	46.1	30.0	9.8	#DIV/0!		45.3	31.4		4850.4	32.4	257.5

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Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (µS/cm)	Salinity (ppt)	DO (mg/O2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-phosphate (µg/l P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
5753M1	C16	Anglers Rest	Top	Low	21-Mar-06					14.0	7.6	178.6	0.1	11.2		<-2	41	8	20	12077	26	166
5753M2	C14	Waterworks	Top	Low	21-Mar-06					14.0	7.5	168.2	0.1	10.7		<-2	40	13	22	14087	30	196
5753M3		Field Control A																				
5753M4	C9	Tivoli	Bottom	Low	21-Mar-06	51.54.10	08.26.02	4.3	12.12	7.7	7.8	44.6	28.9	8.6		<-2	78	43	243	6855	99	1300
5753M5	C9	Tivoli	Top	Low	22-Mar-06	51.54.10	08.26.02	Total 5.5	12.16	7.9	7.7	6.3	3.5	11.4		<-2	54	24	63	14123	36	5460
5753M6	C7	Blackrock Castle	Bottom	Low	21-Mar-06	51.54.06	08.23.92	6.5	11.48	7.5	7.8	45.8	29.8	8.3		<-2	79	48	264	5398	36	649
5753M7	C7	Blackrock Castle	Middle	Low	22-Mar-06	51.54.06	08.23.92	3.1	11.51	8.0	7.8	41.4	26.6	9.1		<-2	70	37	183	8981	39	1300
5753M8	C7	Blackrock Castle	Top	Low	23-Mar-06	51.54.06	08.23.92	Total 7.2	11.55	7.9	7.7	11.4	6.5	11.0		<-2	62	33	135	12794	36	2420
5753M9	C8	Mid L. Mahon	Bottom	Low	21-Mar-06	51.53.14	08.22.09	6.6	11.20	7.8	7.8	45.2	29.3	9.0		<-2	81	42	220	6142	43	233
5753M10	C8	Mid L. Mahon	Middle	Low	22-Mar-06	51.53.14	08.22.09	3.0	11.24	8.3	7.8	37.2	23.6	9.4		<-2	22	41	206	7737	43	613
5753M11	C8	Mid L. Mahon	Top	Low	23-Mar-06	51.53.14	08.22.09	Total 7.2	11.28	8.2	7.8	31.9	19.8	9.8		<-2	85	38	165	10350	43	980
5753M12	C6	End L. Mahon	Bottom	Low	21-Mar-06	51.62.54	08.20.09	9.8	11.00	8.2	7.8	44.4	28.7	9.3		<-2	75	44	215	5695	46	231
5753M13	C6	End L. Mahon	Middle	Low	22-Mar-06	51.62.54	08.20.09	5.8	10.56	8.2	7.8	40.7	26.1	9.5		<-2	65	40	197	6931	49	344
5753M14	C6	End L. Mahon	Top	Low	23-Mar-06	51.62.54	08.20.09	Total 11.0	11.04	8.2	7.8	33.2	20.7	9.8		<-2	63	40	208	7772	49	179
5753M15	C5	Haubowline	Bottom	Low	21-Mar-06	51.50.41	08.19.04	9.5	13.06	8.1	7.9	47.7	31.1	9.3		<-2	60	35	149	4956	36	146
5753M16	C5	Haubowline	Middle	Low	22-Mar-06	51.50.41	08.19.04	4.5	13.13	8.2	7.9	38.7	24.6	9.6		<-2	69	38	172	6280	39	517
5753M17	C5	Haubowline	Top	Low	23-Mar-06	51.50.41	08.19.04	Total 11.0	13.17	8.3	7.9	36.4	23.0	9.7		<-2	63	38	175	6576	49	411
5753M18	C4	Lower Harbour	Bottom	Low	21-Mar-06	51.50.93	08.16.10	11.6	13.33	8.0	8.0	51.5	33.9	9.1		<-2	48	26	82	3202	23	44
5753M19	C4	Lower Harbour	Middle	Low	22-Mar-06	51.50.93	08.16.10	6.7	13.37	8.1	7.9	48.4	31.7	9.2		<-2	44	29	98	3817	26	29
5753M20	C4	Lower Harbour	Top	Low	23-Mar-06	51.50.93	08.16.10	Total 13.6	13.42	8.3	7.9	42.3	27.2	9.5		<-2	57	34	145	5093	33	178
5753M21	C3	End Cork Harbour	Bottom	Low	21-Mar-06	51.48.84	08.16.39	23.9	14.03	7.9	8.0	55.2	36.7	9.0		<-2	57	15	20	1103	<16	1
5753M22	C3	End Cork Harbour	Middle	Low	22-Mar-06	51.48.84	08.16.39	13.7	14.07	7.9	8.0	55.1	36.6	9.1		<-2	53	19	35	1521	<16	2
5753M23	C3	End Cork Harbour	Top	Low	23-Mar-06	51.48.84	08.16.39	Total 25.4	14.11	8.2	8.0	49.5	32.4	9.3		<-2	38	26	71	2848	23	15
M24		Field Control B																				
sample 24-3		Field B-A																				
Min										3.0	7.5	7.5	6.3	0.1	8.3	0.0	22.0	8.0		1103.0	23.0	1.0
Max										23.9	14.0	8.0	55.2	36.9	11.4	0.0	85.0	48.0	264.0	14123.0	49.0	5460.0
Mean										8.4	8.6	7.8	40.3	23.7	9.6	#DIV/0!	59.3	32.3		7015.4	37.2	700.6

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Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/O2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
7017M1	C16	Anglers Rest	Top	Low	24-Apr-06					7.5		211.0	0.1	11.8		3	32	11	23	14805	23	179
7017M2	C14	Waterworks	Top	Low	24-Apr-06					7.6		233.0	0.1	10.3		<2	47	25	22	20549	33	548
7017M3		Field Control A														*	*	*	*	*	*	*
7017M4	C9	Tivoli	Bottom	Low	24-Apr-06	51.54.09	08.26.01	5.0	9.50	10.6	7.9	49.2	32.2	8.8		<2	114	55	374	3933	39	166
7017M5	C9	Tivoli	Top	Low	24-Apr-06	51.54.09	08.26.01	Total 6.1	9.55	12.0	7.9	42.9	27.7	8.6		<2	61	32	98	14109	49	3930
7017M6	C7	Blackrock Castle	Bottom	Low	24-Apr-06	51.54.08	08.23.97	5.8	9.27	10.6	8.0	49.4	32.3	9.4		<2	95	28	203	3357	39	31
7017M7	C7	Blackrock Castle	Middle	Low	24-Apr-06	51.54.08	08.23.97	3.2	9.33	10.8	8.0	48.5	31.7	9.7		<2	73	27	185	5611	43	173
7017M8	C7	Blackrock Castle	Top	Low	24-Apr-06	51.54.08	08.23.97	Total 7.0	9.36	11.6	8.0	41.0	26.3	9.8		<2	76	28	126	15256	49	1986
7017M9	C8	Mid L. Mahon	Bottom	Low	24-Apr-06	51.53.18	08.24.14	6.6	8.53	10.7	8.0	50.3	33.1	10.0		<2	72	21	183	2476	36	1733
7017M10	C8	Mid L. Mahon	Middle	Low	24-Apr-06	51.53.18	08.24.14	3.9	8.57	11.1	8.0	48.4	31.6	10.2		<2	77	22	159	3091	39	44
7017M11	C8	Mid L. Mahon	Top	Low	24-Apr-06	51.53.18	08.24.14	Total 7.6	9.02	11.4	8.0	43.0	27.7	10.4		<2	66	26	157	10465	56	36
7017M12	C6	End L. Mahon	Bottom	Low	24-Apr-06	51.52.62	08.20.10	11.0	8.28	10.9	8.0	50.2	33.0	10.4		<2	59	14	120	2564	36	45
7017M13	C6	End L. Mahon	Middle	Low	24-Apr-06	51.52.62	08.20.10	5.6	8.33	11.1	8.0	48.7	31.8	10.4		<2	60	15	126	2914	39	22
7017M14	C6	End L. Mahon	Top	Low	24-Apr-06	51.52.62	08.20.10	Total 12.0	8.37	11.3	8.0	44.2	28.6	10.5		<2	64	16	104	6435	56	12
7017M15	C5	Haubowline	Bottom	Low	24-Apr-06	51.50.40	08.19.03	12.2	10.49	10.4	8.1	54.0	35.8	10.6		<2	41	5	69	1457	23	<1
7017M16	C5	Haubowline	Middle	Low	24-Apr-06	51.50.40	08.19.03	6.5	10.53	10.7	8.1	51.9	34.2	10.7		<2	48	9	89	2352	30	4
7017M17	C5	Haubowline	Top	Low	24-Apr-06	51.50.40	08.19.03	Total 13.1	10.57	11.1	8.1	47.4	30.9	10.7		<2	49	11	96	3096	36	16
7017M18	C4	Lower Harbour	Bottom	Low	24-Apr-06	51.50.88	08.66.11	11.6	11.16	10.6	8.1	52.9	35.0	10.9		<2	29	<5	19	833	16	<1
7017M19	C4	Lower Harbour	Middle	Low	24-Apr-06	51.50.88	08.66.11	6.7	11.20	10.6	8.2	52.6	34.8	11.0		<2	34	<5	27	872	16	<1
7017M20	C4	Lower Harbour	Top	Low	24-Apr-06	51.50.88	08.66.11	Total 13.0	11.24	10.7	8.1	52.0	34.3	11.0		<2	36	<5	41	1054	20	<1
7017M21	C3	End Cork Harbour	Bottom	Low	24-Apr-06	51.48.74	08.16.23	21.7	11.48	10.2	8.1	54.4	36.1	10.5		<2	22	<5	19	345	<16	<1
7017M22	C3	End Cork Harbour	Middle	Low	24-Apr-06	51.48.74	08.16.23	10.7	11.52	10.3	8.1	54.3	36.0	10.7		<2	19	<5	22	332	<16	<1
7017M23	C3	End Cork Harbour	Top	Low	24-Apr-06	51.48.74	08.16.33	Total 22.6	11.56	10.5	8.2	53.6	35.5	11.0		<2	21	<5	22	554	<16	<1
7017M24		Field Control B														*	*	*	*	*	*	*
sample 24-3		Field B-A														n/a	n/a	n/a	n/a	n/a	n/a	n/a
Min								3.2		10.2	7.5	41.0	0.1	8.6		<2	19.0	5.0		332.0	16.0	4.0
Max								21.7		12.0	8.2	54.4	36.1	11.8		3.0	114.0	55.0	374.0	20549.0	56.0	3930.0
Mean								8.5		10.9	8.0	49.4	29.5	10.3			54.3	21.6		5293.6	35.7	595.0

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Sample Registration 1471

Client Reference																						
Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
7085M1	C16	Anglers Rest	Top	High	24-Apr-06						7.7	210.0	0.1	11.9		<2	57	38	11	14761	23	238
7085M2	C14	Waterworks	Top	High	24-Apr-06						7.4	234.0	0.1	11.4		8	37	19	15	20115	26	281
7085M3		Field Control A																				
7085M4	C9	Tivoli	Bottom	High	24-Apr-06	51.54.09	08.25.98	6.3	14.41	10.6	8.0	49.4	32.4	9.3		<2	64	30	225	3535	39	40
7085M5	C9	Tivoli	Top	High	24-Apr-06	51.54.09	08.25.98	Total 7.3	14.45	11.4	8.0	38.8	24.7	9.9		3	83	33	162	11266	53	1300
7085M6	C7	Blackrock Castle	Bottom	High	24-Apr-06	51.54.07	08.23.96	9.0	14.11	10.8	8.1	49.7	32.6	9.8		3	60	23	166	3135	39	41
7085M7	C7	Blackrock Castle	Middle	High	24-Apr-06	51.54.07	08.23.96	5.1	14.15	11.0	8.1	48.9	32.0	10.1		2	57	19	130	4238	43	64
7085M8	C7	Blackrock Castle	Top	High	24-Apr-06	51.54.07	08.23.96	Total 10.0	14.19	11.2	8.1	30.5	18.8	10.2		3	62	24	118	9455	49	461
7085M9	C8	Mid L. Mahon	Bottom	High	24-Apr-06	51.53.15	08.22.12	6.9	13.46	11.0	8.1	49.6	32.5	10.4		3	54	18	149	2524	33	20
7085M10	C8	Mid L. Mahon	Middle	High	24-Apr-06	51.53.15	08.22.12	3.8	13:50	11.1	8.1	48.7	31.8	10.5		3	57	18	143	2963	36	61
7085M11	C8	Mid L. Mahon	Top	High	24-Apr-06	51.53.15	08.22.12	Total 8.1	13:55	11.2	8.1	45.3	29.4	10.7		5	55	16	108	3884	43	20
7085M12	C6	End L. Mahon	Bottom	High	24-Apr-06	51.52.61	08.20.04	10.7	13.24	10.8	8.1	50.9	33.5	10.6		2	46	7	69	1682	26	9
7085M13	C6	End L. Mahon	Middle	High	24-Apr-06	51.52.61	08.20.04	5.7	13.28	10.8	8.1	50.7	33.3	10.6		4	48	7	73	1869	26	5
7085M14	C6	End L. Mahon	Top	High	24-Apr-06	51.52.61	08.20.04	Total 11.7	13.32	11.0	8.1	49.3	32.3	10.8		2	45	8	69	2484	30	21
7085M15	C5	Haubowline	Bottom	High	24-Apr-06	51.50.40	08.19.03	13.5	15.34	10.4	8.1	53.9	35.7	10.7		<2	46	<5	14	651	<16	<1
7085M16	C5	Haubowline	Middle	High	24-Apr-06	51.50.40	08.19.03	8.2	15.38	10.6	8.2	53.3	35.2	11.0		3	33	<5	21	797	16	<1
7085M17	C5	Haubowline	Top	High	24-Apr-06	51.50.40	08.19.03	Total 14.7	15.43	10.7	8.2	52.5	34.7	11.1		<2	35	<5	31	1107	16	3
7085M18	C4	Lower Harbour	Bottom	High	24-Apr-06	51.50.90	08.16.11	13.9	15.59	10.1	8.1	55.3	36.8	10.4		<2	18	<5	21	35	<16	<1
7085M19	C4	Lower Harbour	Middle	High	24-Apr-06	51.50.90	08.16.11	7.0	16.03	10.1	8.1	55.3	36.7	10.5		2	15	<5	13	66	<16	<1
7085M20	C4	Lower Harbour	Top	High	24-Apr-06	51.50.90	08.16.11	Total 15.1	16.07	10.3	8.1	54.8	36.4	10.7		<2	15	<5	14	89	<16	<1
7085M21	C3	End Cork Harbour	Bottom	High	24-Apr-06	51.48.77	08.16.39	20.0	16.29	10.1	8.1	55.3	36.8	10.4		<2	14	<5	15	111	<16	<1
7085M22	C3	End Cork Harbour	Middle	High	24-Apr-06	51.48.77	08.16.39	11.1	16.35	10.3	8.2	55.0	36.5	10.6		<2	16	<5	15	149	<16	<1
7085M23	C3	End Cork Harbour	Top	High	24-Apr-06	51.48.77	08.16.39	Total 21.2	16.39	10.5	8.2	54.4	36.1	10.8		<2	17	<5	15	314	<16	<1
7085M24		Field Control B																				
sample 24-3		Field B-A																				
Min									3.6	10.1	7.4	30.5	29.9	9.3			14.0	7.0		35.0	16.0	3.0
Max									20.0	11.4	8.2	55.3	36.8	11.9	8.0	83.0	38.0	225.0	20115.0	53.0	1300.0	
Mean									9.3	10.7	8.1	49.8	29.9	10.6			42.5	20.0		3874.1	33.2	183.1

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/O2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/ P)	o-phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
M1	C16	Anglers Rest	Top	Low	7-Jun-06					19.0	7.3	0.2	0.1	9.9	4.1	<2	38	<5	42	91		
M2	C14	Waterworks	Top	Low	7-Jun-06					18.2	7.2	0.2	0.1	9.8	3.3	<2	44	8	39	82		
M3		Field Control A														<2	67.0	31.0	100.0	<16		
M4	C9	Tivoli	Bottom	Low	7-Jun-06	51.54.10	08.26.02	5.0	9.39	12.9	7.6	50.7	33.3	7.7	11.5	<2	78	15	195	46		
M5	C9	Tivoli	Top	Low	7-Jun-06	51.54.10	08.26.02	6.2	9.44	14.5	7.9	46.9	30.6	11.6	33.4	<2	74	33	123	69		
M6	C7	Blackrock Castle	Bottom	Low	7-Jun-06	51.54.08	08.23.97	6.7	9.14	13.5	7.9	51.8	34.2	10.6	13.6	<2	78	12	147	43		
M7	C7	Blackrock Castle	Middle	Low	7-Jun-06	51.54.08	08.23.97	3.3	9.18	13.5	7.8	50.7	33.4	10.3	16.7	4	71	<5	28	49		
M8	C7	Blackrock Castle	Top	Low	7-Jun-06	51.54.08	08.23.97	8.1	9.21	15.2	8.1	43.4	28.0	13.5	32.3	<2	64	49	77	59		
M9	C8	Mid L. Mahon	Bottom	Low	7-Jun-06	51.53.14	08.22.05	5.7	8.5	13.6	7.9	51.9	34.2	10.9	18.0	3	68	<5	71	43		
M10	C8	Mid L. Mahon	Middle	Low	7-Jun-06	51.53.14	08.22.05	3.5	8.54	14.0	7.9	50.2	33.0	11.5	33.6	3	90	<5	14	56		
M11	C8	Mid L. Mahon	Top	Low	7-Jun-06	51.53.14	08.22.05	8.3	8.58	14.9	8.1	47.9	31.2	14.2	37.7	2	62	<5	21	92		
M12	C6	End L. Mahon	Bottom	Low	7-Jun-06	51.52.68	08.20.15	9.3	8.21	14.0	7.8	51.4	33.9	11.4	17.5	3	62	<5	12	56		
M13	C6	End L. Mahon	Middle	Low	7-Jun-06	51.52.68	08.20.15	5.1	8.26	15.4	8.0	48.8	31.9	12.9	38.1	3	69	<5	17	56		
M14	C6	End L. Mahon	Top	Low	7-Jun-06	51.52.68	08.20.15	11.3	8.31	16.6	8.2	34.8	21.9	13.5	19.3	3	64	<5	14	72		
M15	C5	Haubowline	Bottom	Low	7-Jun-06	51.50.39	08.18.96	14.5	10.41	13.2	8.0	55.5	36.9	11.0	7.3	2	34	<5	22	20		
M16	C5	Haubowline	Middle	Low	7-Jun-06	51.50.39	08.18.96	7.3	10.45	13.4	8.0	54.0	35.8	11.5	11.2	2	48	<5	17	36		
M17	C5	Haubowline	Top	Low	7-Jun-06	51.50.39	08.18.96	15.6	10.48	16.3	8.2	44.9	29.1	14.2	26.9	3	49	<5	<6	69		
M18	C4	Lower Harbour	Bottom	Low	7-Jun-06	51.50.92	08.15.97	10.4	11.17	13.4	8.0	55.7	37.0	11.1	5.5	<2	27	<5	12	<16		
M19	C4	Lower Harbour	Middle	Low	7-Jun-06	51.50.92	08.15.97	5.9	11.22	13.7	8.0	54.6	36.2	11.9	9.6	<2	30	<5	<6	<16		
M20	C4	Lower Harbour	Top	Low	7-Jun-06	51.50.92	08.15.97	12.7	11.26	14.9	8.2	52.2	34.4	13.3	8.4	3	35	<5	<6	33		
M21	C3	End Cork Harbour	Bottom	Low	7-Jun-06	51.48.76	08.16.30	23.1	11.57	12.3	8.0	56.3	37.4	11.2	8.4	<2	19	<5	<6	<16		
M22	C3	End Cork Harbour	Middle	Low	7-Jun-06	51.48.76	08.16.30	15.8	12.02	12.3	8.0	56.3	37.5	11.3	4.1	<2	21	<5	<6	<16		
M23	C3	End Cork Harbour	Top	Low	7-Jun-06	51.48.76	08.16.30	29.0	12.06	14.1	8.1	54.8	36.4	12.3	3.5	<2	23	33	127	69		
M24		Field Control B														<2	157.0	144.0	278.0	<16		
sample 24-3																						
Min									3.3	12.3	7.2	34.8	0.1	7.7	3.3		19.0	8.0		0.0	20.0	0.0
Max									29.0	19.0	8.2	56.3	37.5	14.2	38.1	4.0	90.0	49.0	195.0	0.0	92.0	0.0
Mean									10.3	14.5	7.9	50.6	30.3	11.6	16.5		57.2	40.6		#DIV/0!	57.8	#DIV/0!

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Sample Registration 1471

Client Reference

Lab #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS(W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
M1	C16	Anglers Rest	Top	High	7-Jun-06					18.6	7.1	0.2	0.1	9.7	3.3	<2	58	26	30		79	
M2	C14	Waterworks	Top	High	7-Jun-06					18.3	7.2	0.2	0.1	9.9	3.6	<2	42	12	31		76	
M3		Field Control A																				
M4	C9	Tivoli	Bottom	High	7-Jun-06	51.54.09	08.26.00	7.8	14.36	13.3	7.8	51.2	33.7	9.5	17.4	3	78	6	103		46	
M5	C9	Tivoli	Top	High	7-Jun-06	51.54.09	08.26.00	8.5	14.4	16.1	8.0	39.4	25.1	11.9	25.5	<2	66	25	104		76	
M6	C7	Blackrock Castle	Bottom	High	7-Jun-06	51.54.07	08.23.94	8.2	14.15	13.6	7.9	51.9	34.2	10.8	19.3	2	71	7	105		39	
M7	C7	Blackrock Castle	Middle	High	7-Jun-06	51.54.07	08.23.94	4.0	14.19	14.1	8.0	50.4	33.1	11.7	34.2	3	76	<5	27		49	
M8	C7	Blackrock Castle	Top	High	7-Jun-06	51.54.07	08.23.94	10.2	14.22	17.4	8.4	36.2	22.9	16.6	22.4	<2	72	26	96		66	
M9	C8	Mid L. Mahon	Bottom	High	7-Jun-06	51.53.14	08.22.03	8.9	13.54	13.8	8.0	52.3	34.5	11.4	12.4	<2	65	6	100		33	
M10	C8	Mid L. Mahon	Middle	High	7-Jun-06	51.53.14	08.22.03	4.0	13.58	14.1	8.0	51.7	34.1	11.8	15.9	2	64	<5	62		39	
M11	C8	Mid L. Mahon	Top	High	7-Jun-06	51.53.14	08.22.03	9.8	14.01	16.6	8.2	46.1	30.0	14.7	26.5	3	72	<5	14		72	
M12	C6	End L. Mahon	Bottom	High	7-Jun-06	51.52.62	08.20.10	12.6	13.33	13.4	8.0	54.0	35.8	11.4	9.7	<2	41	<5	30		20	
M13	C6	End L. Mahon	Middle	High	7-Jun-06	51.52.62	08.20.10	6.1	13.37	13.5	8.0	53.6	35.5	11.5	10.8	<2	55	<5	32		46	
M14	C6	End L. Mahon	Top	High	7-Jun-06	51.52.62	08.20.10	14.3	13.4	14.6	8.1	50.5	33.2	12.7	12.7	4	50	<5	18		49	
M15	C5	Haubowline	Bottom	High	7-Jun-06	51.50.39	08.19.01	13.9	15.3	13.6	8.0	55.4	36.8	11.5	7.2	<2	26	<5	18		<16	
M16	C5	Haubowline	Middle	High	7-Jun-06	51.50.39	08.19.01	7.2	15.34	14.1	8.0	54.8	36.4	12.2	8.4	<2	31	<5	21		<16	
M17	C5	Haubowline	Top	High	7-Jun-06	51.50.39	08.19.01	15.4	15.38	15.4	8.2	51.0	33.6	14.5	15.3	3	45	<5	13		36	
M18	C4	Lower Harbour	Bottom	High	7-Jun-06	51.50.91	08.16.09	13.9	15.56	13.0	8.0	56.1	37.3	11.4	4.3	<2	18	<5	<6		<16	
M19	C4	Lower Harbour	Middle	High	7-Jun-06	51.50.91	08.16.09	7.9	15.59	13.3	8.0	56.0	37.3	11.5	3.8	<2	22	<5	10		<16	
M20	C4	Lower Harbour	Top	High	7-Jun-06	51.50.91	08.16.09	15.8	16.03	14.2	8.1	55.3	36.8	12.2	2.3	<2	19	<5	6		<16	
M21	C3	End Cork Harbour	Bottom	High	7-Jun-06	51.48.77	08.16.33	26.7	16.25	12.1	8.0	56.3	37.5	11.4	6.8	<2	20	<5	8		<16	
M22	C3	End Cork Harbour	Middle	High	7-Jun-06	51.48.77	08.16.33	15.5	16.29	12.9	8.0	56.2	37.4	11.4	5.0	<2	18	<5	11		<16	
M23	C3	End Cork Harbour	Top	High	7-Jun-06	51.48.77	08.16.33	29.5	16.34	15.7	8.1	54.4	36.1	12.7	2.3	<2	12	<5	9		<16	
M24		Field Control B																				
sample 24-3		Field B-A																				
Min								4.0		12.1	7.1	36.2	31.0	9.5	2.3		12.0	6.0		0.0	20.0	0.0
Max								29.5		18.6	8.4	56.3	37.5	16.6	34.2	4.0	78.0	26.0	105.0	0.0	79.0	0.0
Mean								12.0		14.6	8.0	51.6	31.0	11.9	12.2		46.4	15.4		#DIV/0!	51.9	#DIV/0!

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Sample Registration 1471

Client Reference

Lab Test #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/O2)	Chlorophyll α (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-Phosphate (µg P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)	
N1	C16	Anglers Rest	Top	High	28-Jun-06					20.3	7.3	67.8	0.0	9.7	3.7	<2	36	18	26	9123	33	236	
N2	C14	Waterworks	Top	High	28-Jun-06					19.9	7.4	66.0	0.0	9.6	4.1	<2	44	23	36	12117	46	435	
N3		Field Control A														<2	61.0	36.0	13.0	2524.0	66.0	<1	
N4	C9	Tivoli	Bottom	High	28-Jun-06	51.54.09	08.26.00	8.2	8.23	15.3	8.0	48.4	31.7	8.1	15.6	<2	67	19	129	1541	49	25	
N5	C9	Tivoli	Top	High	28-Jun-06	51.54.09	08.26.00	Total 9.1	8.27	16.4	8.1	46.1	29.9	10.1	27.5	<2	71	40	172	12121	76	11190	
N6	C7	Blackrock Castle	Bottom	High	28-Jun-06	51.54.08	08.23.97	9.9	8.02	15.3	8.1	49.3	32.3	8.9	14.8	<2	67	14	63	1231	39	55	
N7	C7	Blackrock Castle	Middle	High	28-Jun-06	51.54.08	08.23.97	5.3	8.05	15.5	8.1	49.1	32.2	9.3	15.7	<2	76	15	86	1537	43	99	
N8	C7	Blackrock Castle	Top	High	28-Jun-06	51.54.08	08.23.97	Total 10.6	8.09	16.1	8.1	45.4	29.5	9.8	16.9	<2	77	23	116	6816	69	1733	
N9	C8	Mid L. Mahon	Bottom	High	28-Jun-06	51.53.14	08.22.26	10.1	7.4	15.0	8.1	50.6	33.2	9.6	12.3	<2	52	7	14	793	30	10	
N10	C8	Mid L. Mahon	Middle	High	28-Jun-06	51.53.14	08.22.26	5.5	7.43	15.0	8.1	50.3	33.1	9.6	12.2	<2	53	8	18	921	33	20	
N11	C8	Mid L. Mahon	Top	High	28-Jun-06	51.53.14	08.22.26	Total 11.0	7.47	15.5	8.1	49.0	32.1	9.8	13.3	<2	58	12	30	1616	43	30	
N12	C6	End L. Mahon	Bottom	High	28-Jun-06	51.52.66	08.20.09	12.1	7.18	14.5	8.0	51.9	34.2	9.6	9.5	<2	42	<5	<6	483	20	10	
N13	C6	End L. Mahon	Middle	High	28-Jun-06	51.52.66	08.20.09	5.8	7.22	14.6	8.1	51.4	33.9	9.5	10.6	<2	46	5	17	518	23	6	
N14	C6	End L. Mahon	Top	High	28-Jun-06	51.52.66	08.20.09	Total 13.9	7.26	15.0	8.1	50.5	33.2	9.6	10.6	<2	39	6	9	912	26	11	
N15	C5	Haubowline	Bottom	High	28-Jun-06	51.58.40	08.19.02	15.1	9.13	14.4	8.1	53.6	35.5	8.9	6.1	<2	27	<5	<6	230	<16	3	
N16	C5	Haubowline	Middle	High	28-Jun-06	51.58.40	08.19.02	7.4	9.17	14.4	8.1	52.7	34.8	9.4	9.1	<2	27	<5	<6	434	<16	2	
N17	C5	Haubowline	Top	High	28-Jun-06	51.58.40	08.19.02	Total 15.8	9.21	14.6	8.1	52.2	34.4	9.7	8.5	<2	38	<5	8	381	20	5	
N18	C4	Lower Harbour	Bottom	High	28-Jun-06	51.50.90	08.16.10	14.0	9.37	14.5	8.1	54.3	36.0	8.6	2.8	<2	14	<5	<6	40	<16	<1	
N19	C4	Lower Harbour	Middle	High	28-Jun-06	51.50.90	08.16.10	7.4	9.41	14.5	8.1	54.3	36.0	8.7	2.5	<2	13	<5	<6	40	<16	2	
N20	C4	Lower Harbour	Top	High	28-Jun-06	51.50.90	08.16.10	Total 15.6	9.44	14.6	8.1	54.2	35.9	8.7	1.4	<2	17	<5	<6	71	<16	4	
N21	C3	End Cork Harbour	Bottom	High	28-Jun-06	51.48.74	08.16.38	22.7	10.04	14.5	8.1	53.9	35.7	8.8	4.2	<2	15	<5	6	53	<16	1	
N22	C3	End Cork Harbour	Middle	High	28-Jun-06	51.48.74	08.16.38	11.0	10.08	14.5	8.1	53.8	35.6	9.0	4.0	<2	15	<5	6	49	<16	<1	
N23	C3	End Cork Harbour	Top	High	28-Jun-06	51.48.74	08.16.38	Total 23.2	10.12	14.6	8.1	53.6	35.5	9.0	2.5	<2	18	<5	<6	66	<16	1	
N24		Field Control B														<2	138.0	139.0	129.0	2883.0	62.0	<1	
Sample 24-3		Field B-A																					
Min									5.3		14.4	7.3	45.4	0.0	8.1	1.4		13.0	5.0		40.0	20.0	11.0
Max									22.7		20.3	8.1	54.3	36.0	10.1	27.5	0.0	77.0	40.0	172.0	12121.0	76.0	3.0
Mean									10.3		15.4	8.0	51.2	30.7	9.3	9.5		46.3	26.1		2354.2	41.1	2.0

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Sample Registration 1471

Client Reference

Lab Test #	Station #	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/O2)	Chlorophyll α (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	o-Phosphate (µg P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E. Coliforms (MPN/100mls)
N1	C16	Anglers Rest	Top	Low	28-Jun-06					21.1	7.6	167.0	0.1	9.8	3.9	<2	45	28	59	9331	43	153
N2	C14	Waterworks	Top	Low	28-Jun-06					20.8	7.4	173.2	0.1	9.2	3.3	<2	43	26	68	12750	36	261
N3		Field Control A																				
N4	C9	Tivoli	Bottom	Low	28-Jun-06	51.54.10	08.26.02	5.4	13.17	15.3	7.9	48.2	31.5	7.6	13.8	<2	83	24	341	1599	49	31
N5	C9	Tivoli	Top	Low	28-Jun-06	51.54.10	08.26.02	Total 6	13.2	16.2	8.1	46.6	30.3	10.4	18.3	<2	82	43	355	10482	76	17820
N6	C7	Blackrock Castle	Bottom	Low	28-Jun-06	51.54.07	08.23.96	6.6	12.53	15.4	8.0	48.9	32.0	8.7	13.4	3	62	11	135	1727	49	10
N7	C7	Blackrock Castle	Middle	Low	28-Jun-06	51.54.07	08.23.96	4.2	12.57	15.5	8.0	48.4	31.6	8.6	16.2	4	68	5	114	2808	53	17
N8	C7	Blackrock Castle	Top	Low	28-Jun-06	51.54.07	08.23.96	Total 7.9	13.01	17.1	8.2	37.4	23.8	11.8	14.4	<2	71	39	307	11368	76	5120
N9	C8	Mid L. Mahon	Bottom	Low	28-Jun-06	51.53.13	08.22.07	8.1	12.31	15.2	8.1	50.0	32.8	9.4	13.0	<2	54	9	87	1174	39	7
N10	C8	Mid L. Mahon	Middle	Low	28-Jun-06	51.53.13	08.22.07	4.1	12.34	15.6	8.1	48.7	31.8	9.4	14.2	3	69	7	100	1351	43	20
N11	C8	Mid L. Mahon	Top	Low	28-Jun-06	51.53.13	08.22.07	Total 8.5	12.38	16.2	8.2	46.3	30.1	10.7	11.9	2	51	<5	89	1426	46	5
N12	C6	End L. Mahon	Bottom	Low	28-Jun-06	51.52.61	08.20.09	11.6	12.09	15.3	8.1	49.7	32.6	9.7	12.9	<2	57	<5	73	1244	43	10
N13	C6	End L. Mahon	Middle	Low	28-Jun-06	51.52.61	08.20.09	6.3	12.13	16.0	8.1	47.7	31.1	10.2	11.7	2	55	<5	72	1320	43	23
N14	C6	End L. Mahon	Top	Low	28-Jun-06	51.52.61	08.20.09	Total 12.1	12.17	16.2	8.1	46.1	29.9	10.6	11.8	2	52	<5	91	1616	46	21
N15	C5	Haubowline	Bottom	Low	28-Jun-06	51.50.39	08.18.98	12.0	14.1	14.7	8.1	52.0	34.3	9.5	10.7	<2	41	<5	78	695	26	7
N16	C5	Haubowline	Middle	Low	28-Jun-06	51.50.39	08.18.98	6.0	14.13	15.0	8.1	50.9	33.4	9.9	12.8	<2	38	6	80	713	26	12
N17	C5	Haubowline	Top	Low	28-Jun-06	51.50.39	08.18.98	Total 13.3	14.17	15.7	8.1	49.7	32.6	10.6	9.8	<2	40	<5	71	872	30	4
N18	C4	Lower Harbour	Bottom	Low	28-Jun-06	51.50.91	08.16.09	12.1	14.33	14.6	8.1	53.2	35.2	9.2	6.9	<2	28	<5	57	283	<16	4
N19	C4	Lower Harbour	Middle	Low	28-Jun-06	51.50.91	08.16.09	5.9	14.36	14.8	8.1	52.3	34.5	9.9	10.7	<2	28	<5	62	385	16	5
N20	C4	Lower Harbour	Top	Low	28-Jun-06	51.50.91	08.16.09	Total 12.7	14.4	15.1	8.1	51.4	33.8	10.2	6.6	<2	29	<5	66	509	23	4
N21	C3	End Cork Harbour	Bottom	Low	28-Jun-06	51.48.73	08.16.35	22.2	15	14.6	8.1	54.0	35.7	8.8	4.6	<2	15	<5	71	71	<16	1
N22	C3	End Cork Harbour	Middle	Low	28-Jun-06	51.48.73	08.16.35	12.4	15.03	14.6	8.1	53.7	35.6	9.1	6.1	<2	14	<5	54	89	<16	1
N23	C3	End Cork Harbour	Top	Low	28-Jun-06	51.48.73	08.16.35	Total 23.5	15.07	14.9	8.1	53.2	35.2	9.8	4.5	<2	18	<5	44	84	<16	4
N24		Field Control B																				
sample 24-3		Field B-A																				
Min								4.1		14.6	7.4	37.4	30.1	7.6	3.3		14.0	5.0		71.0	16.0	1.0
Max								22.2		21.1	8.2	54.0	35.7	11.8	18.3	4.0	83.0	43.0	355.0	12750.0	76.0	17820.0
Mean								9.0		15.9	8.0	49.4	29.5	9.7	10.5		47.4	19.8		2813.5	42.4	1070.0

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Sample Registration 1471
Client Reference

Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/lO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	High	31-Jul-06			2.0		16.0	7.7	158.0	0.1	10.0	3.6	2	28	<5	11	7821	46	272
N2	C14	Waterworks	Top	High	31-Jul-06			2.1		16.4	7.4	167.0	0.1	9.0	3.9	2	32	<5	6	10571	43	649
N3		Field Control A	-	-							8.0					<2	48.0	42.0	<6	1749.0	<16	<1
N4	C9	Tivoli	Bottom	High	31-Jul-06	51.54.090	08.25.943	7.7	11:22	19.0	8.0	48.1	31.4	Note 1	15.4	5	55	17	117	939	39	29
N5	C9	Tivoli	Top	High	31-Jul-06	51.54.090	08.25.943	0.9	11:26	19.7	8.1	45.8	29.8	Note 1	43.2	5	67	21	122	1709	46	71
N6	C7	Blackrock Castle	Bottom	High	31-Jul-06	51.54.077	08.24.106	8.8	10:58	18.6	8.1	48.9	32.1	Note 1	10.2	4	52	19	131	864	39	31
N7	C7	Blackrock Castle	Middle	High	31-Jul-06	51.54.077	08.24.106	5.4	11:02	18.5	8.1	48.1	31.5	Note 1	16.1	4	61	20	138	988	43	47
N8	C7	Blackrock Castle	Top	High	31-Jul-06	51.54.077	08.24.106	1.3	11:05	18.6	8.1	46.5	30.2	Note 1	50.5	2	54	26	202	3645	56	2420
N9	C8	Mid L. Mahon	Bottom	High	31-Jul-06	51.53.167	08.22.120	9.2	10:33	18.0	8.1	49.8	32.7	Note 1	7.9	<2	35	16	89	292	26	26
N10	C8	Mid L. Mahon	Middle	High	31-Jul-06	51.53.167	08.22.120	5.2	10:37	18.0	8.1	49.6	32.5	Note 1	10.4	3	43	23	114	722	33	20
N11	C8	Mid L. Mahon	Top	High	31-Jul-06	51.53.167	08.22.120	0.7	10:41	18.4	8.1	46.6	30.3	Note 1	11.6	3	58	21	127	903	46	12
N12	C6	End L. Mahon	Bottom	High	31-Jul-06	51.52.581	08.22.043	13.9	10:02	17.4	8.1	50.9	33.5	7.8	6.5	<2	36	11	48	164	20	5
N13	C6	End L. Mahon	Middle	High	31-Jul-06	51.52.581	08.22.043	7.8	10:08	17.5	8.1	50.6	33.3	7.2	8.5	<2	35	11	51	221	23	18
N14	C6	End L. Mahon	Top	High	31-Jul-06	51.52.581	08.22.043	1.2	10:11	17.9	8.1	49.9	32.7	8.0	13.6	2	33	13	67	257	30	9
N15	C5	Haubowline	Bottom	High	31-Jul-06	51.50.364	08.18.899	19.2	09:28	16.6	8.1	52.2	34.5	7.9	5.0	<2	20	7	21	<22	<16	4
N16	C5	Haubowline	Middle	High	31-Jul-06	51.50.364	08.18.899	10.3	09:32	16.7	8.1	52.1	34.4	7.9	5.1	<2	178	6	17	<22	<16	7
N17	C5	Haubowline	Top	High	31-Jul-06	51.50.364	08.18.899	1.3	09:36	17.1	8.1	51.7	34.1	7.9	4.8	<2	21	8	19	<22	<16	12
N18	C4	Lower Harbour	Bottom	High	31-Jul-06	51.50.961	08.16.213	15.3	09:01	14.5	8.0	53.2	35.1	8.2	3.1	<2	18	<5	14	<22	<16	6
N19	C4	Lower Harbour	Middle	High	31-Jul-06	51.50.961	08.16.213	8.0	09:05	15.0	8.0	53.0	35.0	8.2	3.4	<2	18	<5	21	<22	<16	10
N20	C4	Lower Harbour	Top	High	31-Jul-06	51.50.961	08.16.213	1.1	09:09	16.5	8.1	52.3	34.5	8.2	3.4	<2	19	<5	12	<22	<16	2
N21	C3	End Cork Harbour	Bottom	High	31-Jul-06	51.52.220	08.19.939	17.6	08:29	13.2	7.8	53.5	35.4	8.2	1.8	<2	19	6	17	<22	<16	<1
N22	C3	End Cork Harbour	Middle	High	31-Jul-06	51.52.220	08.19.939	8.7	08:34	13.6	7.9	53.4	35.3	8.0	2.1	<2	22	<5	13	<22	<16	<1
N23	C3	End Cork Harbour	Top	High	31-Jul-06	51.52.220	08.19.939	1.1	08:38	14.3	8.0	53.2	35.2	8.1	2.4	<2	75	5	19	<22	<16	2

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Sample Registration 1471

Client Reference

Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	Low	31-Jul-06			2.2		16.1	7.9	158.4	0.1	9.7	3.7	2	32	<5	9	6249	46	153
N2	C14	Waterworks	Top	Low	31-Jul-06			1.9		15.9	7.8	172.0	0.1	9.5	4.1	2	49	<5	15	8303	49	649
N3		Field Control A	-	-																		
N4	C9	Tivoli	Bottom	Low	31-Jul-06	51.54.101	08.26.044	5.0	16:28	19.1	8.0	47.8	31.2	5.1	15.0	4	66	34	288	2002	53	22
N5	C9	Tivoli	Top	Low	31-Jul-06	51.54.101	08.26.044	2.5	16:33	19.8	8.0	39.3	25.1	6.6	13.3	3	82	70	743	3755	105	770
N6	C7	Blackrock Castle	Bottom	Low	31-Jul-06	51.54.060	08.24.181	6.8	16:01	18.6	8.0	48.6	31.8	7.3	11.9	4	49	20	141	1001	43	21
N7	C7	Blackrock Castle	Middle	Low	31-Jul-06	51.54.060	08.24.181	4.1	16:06	18.9	8.1	48.0	31.3	7.3	21.3	4	56	15	120	1284	49	22
N8	C7	Blackrock Castle	Top	Low	31-Jul-06	51.54.060	08.24.181	1.3	16:10	19.7	8.1	42.0	27.0	7.7	18.9	4	46	21	154	2347	49	130
N9	C8	Mid L. Mahon	Bottom	Low	31-Jul-06	51.53.192	08.22.154	7.2	15:34	18.1	8.1	49.5	32.4	8.8	7.9	4	57	15	105	864	43	13
N10	C8	Mid L. Mahon	Middle	Low	31-Jul-06	51.53.192	08.22.154	3.9	15:37	18.6	8.1	48.3	31.6	7.4	17.2	6	59	10	63	979	62	6
N11	C8	Mid L. Mahon	Top	Low	31-Jul-06	51.53.192	08.22.154	1.0	15:41	19.3	8.2	45.8	29.8	9.7	28.8	6	57	7	35	1156	56	16
N12	C6	End L. Mahon	Bottom	Low	31-Jul-06	51.52.595	08.20.054	11.0	15:09	18.2	8.1	48.6	31.8	7.6	11.9	3	53	18	118	815	56	24
N13	C6	End L. Mahon	Middle	Low	31-Jul-06	51.52.595	08.20.054	5.6	15:13	18.7	8.2	47.3	30.9	9.1	16.3	4	48	13	57	965	46	20
N14	C6	End L. Mahon	Top	Low	31-Jul-06	51.52.595	08.20.054	1.0	15:16	18.8	8.2	46.8	30.5	8.9	21.0	4	46	12	59	1094	46	10
N15	C5	Haubowline	Bottom	Low	31-Jul-06	51.50.364	08.18.862	13.8	14:35	17.4	8.1	51.0	33.5	8.9	6.6	<2	6	9	44	376	23	17
N16	C5	Haubowline	Middle	Low	31-Jul-06	51.50.364	08.18.862	7.9	14:39	17.9	8.1	49.8	32.7	8.2	10.3	<2	31	9	44	500	30	18
N17	C5	Haubowline	Top	Low	31-Jul-06	51.50.364	08.18.862	1.0	14:42	18.1	8.1	49.5	32.5	8.1	9.3	<2	34	9	42	421	30	7
N18	C4	Lower Harbour	Bottom	Low	31-Jul-06	51.50.914	08.16.222	11.2	14:00	16.2	8.0	52.3	34.5	8.3	5.0	<2	20	6	18	<22	<16	4
N19	C4	Lower Harbour	Middle	Low	31-Jul-06	51.50.914	08.16.222	7.1	14:04	16.6	8.0	52.0	34.3	7.8	5.4	<2	20	6	14	<22	<16	6
N20	C4	Lower Harbour	Top	Low	31-Jul-06	51.50.914	08.16.222	1.3	14:08	16.8	8.1	51.9	34.2	8.8	3.7	<2	20	5	21	<22	<16	6
N21	C3	End Cork Harbour	Bottom	Low	31-Jul-06	51.48.749	08.16.379	18.4	13:24	15.4	8.0	52.8	34.9	8.9	3.8	<2	16	<5	<6	<22	<16	2
N22	C3	End Cork Harbour	Middle	Low	31-Jul-06	51.48.749	08.16.379	8.9	13:28	15.7	8.0	52.3	34.9	8.3	4.2	<2	14	<5	8	<22	<16	1
N23	C3	End Cork Harbour	Top	Low	31-Jul-06	51.48.749	08.16.379	1.3	13:32	16.1	8.0	52.2	34.7	7.9	4.0	<2	16	<5	10	<22	<16	6
N24		Field Control B																				
Sample 24-3		Field B-A																				

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25 °C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colliert
N1	C16	Anglers Rest	Top	High	#REF!			2.0		16.6	7.7	169.5	0.1	11.0	3.9	0	18	<5	17	8138	41	130
N2	C14	Waterworks	Top	High	30-08-06			2.1		16.9	7.8	189.7	0.1	11.6	2.8	<2	31	25	24	9557	39	102
N3		Field Control A	-	-												<2	31.0	37.0	522.0	2613.0	<16	<1
N4	C9	Tivoli	Bottom	High	30-08-06	51.54.10	08.26.00	5.8	11:39	16.9	8.0	49.5	32.5	7.9	7.0	2	46	34	180	1085	53	378
N5	C9	Tivoli	Top	High	30-08-06	51.54.10	08.26.00	1.1	11:44	17.6	8.0	48.1	31.5	8.1	7.3	<2	69	69	219	5536	66	34480
N6	C7	Blackrock Castle	Bottom	High	30-08-06	51.54.08	08.23.94	9.2	11:14	16.6	8.0	50.2	33.0	9.2	8.2	<2	40	30	127	846	53	101
N7	C7	Blackrock Castle	Middle	High	30-08-06	51.54.08	08.23.94	5.6	11:18	16.5	8.0	49.8	32.6	9.1	8.1	<2	44	31	131	930	56	148
N8	C7	Blackrock Castle	Top	High	30-08-06	51.54.08	08.23.94	1.0	11:24	16.8	8.0	47.8	31.2	9.2	10.9	<2	50	41	242	2360	56	1986
N9	C8	Mid L. Mahon	Bottom	High	30-08-06	51.53.13	08.22.01	8.4	10:43	16.2	8.0	51.1	33.6	9.0	6.9	<2	35	24	100	593	43	1
N10	C8	Mid L. Mahon	Middle	High	30-08-06	51.53.13	08.22.01	4.6	10:49	16.3	8.0	50.7	33.3	9.7	7.5	<2	36	24	98	620	43	8
N11	C8	Mid L. Mahon	Top	High	30-08-06	51.53.13	08.22.01	1	16:39	16.4	8.0	49.8	32.7	9.3	9.4	2	36	23	90	704	53	7
N12	C6	End L. Mahon	Bottom	High	30-08-06	51.52.59	08.20.11	12.6	10:17	15.8	8.0	52.3	34.6	8.7	5.0	<2	26	16	58	372	30	4
N13	C6	End L. Mahon	Middle	High	30-08-06	51.52.59	08.20.11	6.8	10:23	16.0	8.0	51.8	34.2	9.6	6.0	<2	33	19	62	416	30	9
N14	C6	End L. Mahon	Top	High	30-08-06	51.52.59	08.20.11	1.0	10:29	16.2	8.0	50.9	33.5	9.6	10.9	<2	35	20	71	527	39	5
N15	C5	Haubowline	Bottom	High	30-08-06	51.50.42	08.19.05	14.1	09:35	15.4	8.0	53.3	35.3	8.5	4.0	<2	19	10	21	190	<16	4
N16	C5	Haubowline	Middle	High	30-08-06	51.50.42	08.19.05	7.1	09:41	15.7	8.0	52.9	34.9	9.1	5.3	<2	19	10	21	190	<16	23
N17	C5	Haubowline	Top	High	30-08-06	51.50.42	08.19.05	1.1	09:47	15.8	8.0	52.6	34.7	9.1	5.1	<2	20	12	23	199	<16	1
N18	C4	Lower Harbour	Bottom	High	30-08-06	51.50.92	08.16.12	14.4	09:05	14.6	8.0	54.0	35.8	8.4	3.8	<2	15	6	<6	84	<16	2
N19	C4	Lower Harbour	Middle	High	30-08-06	51.50.92	08.16.12	7.3	09:11	14.8	8.0	53.9	35.9	7.7	3.9	<2	15	7	<6	89	<16	1
N20	C4	Lower Harbour	Top	High	30-08-06	51.50.92	08.16.12	1.1	09:16	14.9	8.0	53.8	35.7	8.2	4.2	<2	14	9	<6	89	<16	<1
N21	C3	End Cork Harbour	Bottom	High	30-08-06	51.48.79	08.16.32	26.9	08:33	14.4	7.9	54.1	35.9	105.4	3.9	<2	12	6	12	140	<16	<1
N22	C3	End Cork Harbour	Middle	High	30-08-06	51.48.79	08.16.32	14.2	08:40	14.4	7.9	54.1	35.9	8.8	4.2	<2	11	6	13	106	<16	1
N23	C3	End Cork Harbour	Top	High	30-08-06	51.48.79	08.16.32	1.3	08:45	14.4	7.9	54.1	35.9	8.9	3.6	<2	13	6	15	89	<16	1
N24		Field Control B			30-08-06											<2	105.0	151.0	104.0	2480.0	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	Low	#REF!			2.2		15.1	7.7	171.5	0.1	11.6	3.7	<2	37	25	36	7560	43	613
N2	C14	Waterworks	Top	Low	30-08-06			1.9		15.5	7.7	186.9	0.1	10.6	3.1	<2	34	28	33	9167	33	172
N3		Field Control A	-	-																		
N4	C9	Tivoli	Bottom	Low	30-08-06	51.54.10	08.26.03	4.4	16:26	17.0	8.0	49.3	32.3	7.5	6.0	<2	65	63	366	2405	56	27230
N5	C9	Tivoli	Top	Low	30-08-06	51.54.10	08.26.03	1.1	16:31	18.8	7.9	47.5	31.0	6.9	6.2	<2	60	54	411	7236	53	687
N6	C7	Blackrock Castle	Bottom	Low	30-08-06	51.54.09	08.24.00	6.1	16:00	16.8	8.0	49.7	32.6	7.3	7.7	<2	<5	32	166	1076	49	112
N7	C7	Blackrock Castle	Middle	Low	30-08-06	51.54.09	08.24.00	3.3	16:04	17.0	8.0	48.9	32.0	8.4	8.4	<2	47	34	185	1329	53	285
N8	C7	Blackrock Castle	Top	Low	30-08-06	51.54.09	08.24.00	1.1	16:09	18.0	8.0	46.7	30.4	9.5	8.6	<2	55	43	225	2892	56	921
N9	C8	Mid L. Mahon	Bottom	Low	30-08-06	51.53.12	08.22.05	8.2	15:26	16.5	8.0	50.4	33.1	8.2	6.7	<2	45	28	109	850	53	34
N10	C8	Mid L. Mahon	Middle	Low	30-08-06	51.53.12	08.22.05	4.2	15:31	16.6	8.0	49.4	32.4	8.8	7.7	2	45	26	78	996	53	115
N11	C8	Mid L. Mahon	Top	Low	30-08-06	51.53.12	08.22.05	0.8	15:37	16.8	8.0	48.6	31.8	9.5	11.3	3	53	26	86	1081	49	186
N12	C6	End L. Mahon	Bottom	Low	30-08-06	51.52.60	08.20.13	10.9	15:00	16.3	8.0	50.2	33.0	9.5	7.4	<2	45	28	130	744	49	16
N13	C6	End L. Mahon	Middle	Low	30-08-06	51.52.60	08.20.13	5.9	15:04	16.3	8.0	49.9	32.8	8.6	7.0	<2	42	30	131	757	56	11
N14	C6	End L. Mahon	Top	Low	30-08-06	51.52.60	08.20.13	1.1	15:09	16.5	8.1	49.0	32.1	9.6	12.9	<2	46	27	122	957	53	72
N15	C5	Haubowline	Bottom	Low	30-08-06	51.50.41	08.19.04	12.2	14:26	15.7	8.0	52.7	34.8	8.7	4.7	<2	26	16	62	354	26	3
N16	C5	Haubowline	Middle	Low	30-08-06	51.50.41	08.19.04	7.2	14:31	15.9	8.0	52.0	34.3	8.8	5.9	<2	30	17	59	381	26	2
N17	C5	Haubowline	Top	Low	30-08-06	51.50.41	08.19.04	1.0	14:36	16.1	8.0	51.6	34.0	9.3	7.6	<2	31	17	55	456	33	8
N18	C4	Lower Harbour	Bottom	Low	30-08-06	51.50.89	08.16.12	11.0	13:56	14.9	8.0	53.7	35.6	9.0	4.2	<2	18	9	22	164	<16	<1
N19	C4	Lower Harbour	Middle	Low	30-08-06	51.50.89	08.16.12	6.1	14:02	15.4	8.0	53.2	35.2	9.5	4.8	<2	26	9	23	190	<16	1
N20	C4	Lower Harbour	Top	Low	30-08-06	51.50.89	08.16.12	1.0	14:06	15.6	8.0	52.9	35.0	9.2	4.7	<2	23	11	26	230	<16	<1
N21	C3	End Cork Harbour	Bottom	Low	30-08-06	51.48.80	08.16.32	26.2	13:25	14.6	8.0	54.0	35.8	9.1	3.7	<2	12	5	<6	58	<16	<1
N22	C3	End Cork Harbour	Middle	Low	30-08-06	51.48.80	08.16.32	15.2	13:30	14.7	8.0	54.0	35.7	10.0	4.5	<2	9	<5	<6	38	<16	<1
N23	C3	End Cork Harbour	Top	Low	30-08-06	51.48.80	08.16.32	3.0	13:35	14.9	8.0	53.2	35.6	9.1	5.0	<2	15	5	<6	35	<16	3

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/l P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	High	4-Oct-06						7.3	168.7	0.1	16.2	2.4	<2	42	14	46	8129	81	155
N2	C14	Waterworks	Top	High	4-Oct-06						7.2	146.7	0.1	12.3	5.4	<2	41	17	39	9730	76	91
N3		Field Control A	-	-												<2						
N4	C9	Tivoli	Bottom	High	4-Oct-06	51.54.10	08.25.97	6.7	16.19	15.1	7.8	47.4	27.0	7.5	1.5	<2	56	45	176	2843	92	16
N5	C9	Tivoli	Top	High	4-Oct-06	51.54.10	08.25.97	1.4	16.22	15.4	7.8	35.2	7.6	8.6	2.8	<2	64	28	100	10350	76	1120
N6	C7	Blackrock Castle	Bottom	High	4-Oct-06	51.54.10	08.23.95	6.3	15.52	15.0	7.9	47.4	27.3	8.0	1.7	<2	86	48	172	2883	95	16
N7	C7	Blackrock Castle	Middle	High	4-Oct-06	51.54.10	08.23.95	3.6	15.56	14.9	7.9	46.3	19.4	8.1	1.7	<2	64	42	154	6470	95	387
N8	C7	Blackrock Castle	Top	High	4-Oct-06	51.54.10	08.23.95	1.4	15.59	14.7	7.8	34.9	8.9	9.1	3.1	<2	56	35	114	12121	76	2420
N9	C8	Mid L. Mahon	Bottom	High	4-Oct-06	51.53.14	08.22.11	6.4	15.29	14.8	7.9	47.7	27.3	8.3	1.6	<2	52	39	145	2684	79	11
N10	C8	Mid L. Mahon	Middle	High	4-Oct-06	51.53.14	08.22.11	3.4	15.33	14.8	7.9	45.6	25.2	8.6	1.9	<2	60	39	150	3468	89	18
N11	C8	Mid L. Mahon	Top	High	4-Oct-06	51.53.14	08.22.11	1.3	15.36	14.9	7.9	38.2	22.3	9.4	3.0	<2	69	41	163	4522	95	29
N12	C6	End L. Mahon	Bottom	High	4-Oct-06	51.52.60	08.19.07	12.6	15.08	14.7	7.9	50.4	31.1	8.6	1.8	<2	45	25	78	1382	56	12
N13	C6	End L. Mahon	Middle	High	4-Oct-06	51.52.60	08.19.07	7.2	15.11	14.7	7.9	49.8	29.3	8.7	1.9	<2	48	29	102	2090	62	13
N14	C6	End L. Mahon	Top	High	4-Oct-06	51.52.60	08.19.07	1.3	15.14	14.8	7.9	43.2	26.4	9.2	2.9	<2	53	34	134	2945	82	21
N15	C5	Haubowline	Bottom	High	4-Oct-06	51.50.42	08.15.98	12.5	14.42	14.7	7.9	51.3	32.3	8.9	1.9	<2	28	21	57	961	53	10
N16	C5	Haubowline	Middle	High	4-Oct-06	51.50.42	08.15.98	7.3	14.46	14.7	7.9	50.7	30.8	8.8	1.9	<2	37	24	73	1550	56	8
N17	C5	Haubowline	Top	High	4-Oct-06	51.50.42	08.15.98	1.3	14.49	14.8	7.9	47.0	29.0	9.3	3.3	<2	42	29	98	2117	72	4
N18	C4	Lower Harbour	Bottom	High	4-Oct-06	51.50.90	08.16.32	14.3	14.18	14.6	7.9	52.3	33.4	8.9	1.6	<2	30	17	32	478	43	4
N19	C4	Lower Harbour	Middle	High	4-Oct-06	51.50.90	08.16.32	7.4	14.21	14.7	8.0	52.2	32.4	8.9	1.7	<2	31	19	46	930	46	9
N20	C4	Lower Harbour	Top	High	4-Oct-06	51.50.90	08.16.32	1.4	14.25	15.0	7.9	47.9	31.2	9.3	2.8	<2	33	24	69	1426	53	3
N21	C3	End Cork Harbour	Bottom	High	4-Oct-06	51.48.19	08.16.30	25.3	13.52	14.6	8.0	53.1	34.5	8.9	1.6	<2	19	13	6	259	36	1
N22	C3	End Cork Harbour	Middle	High	4-Oct-06	51.48.19	08.16.30	19.5	13.57	14.6	8.0	52.9	34.3	8.9	1.8	<2	28	13	13	164	44	4
N23	C3	End Cork Harbour	Top	High	4-Oct-06	51.48.19	08.16.30	1.4	14.01	14.6	8.0	52.2	34.1	9.1	1.8	<2	21	14	17	341	39	2
N24		Field Control B																				

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	Low	4-Oct-06					13.2	7.3	168.7	0.1	16.2	2.4	<2	70	28	34	13740	58	365
N2	C14	Waterworks	Top	Low	4-Oct-06					13.3	7.3	184.2	0.1	16.3	2.7	<2	54	28	31	16209	66	411
N3		Field Control A	-	-												<2	61.0	48.0	<6	2436.0	<16	<1
N4	C9	Tivoli	Bottom	Low	4-Oct-06	51.54.10	08.25.99	5.6	11.37	15.1	7.8	48.2	28.8	6.9	1.3	<2	72	45	195	2095	85	50
N5	C9	Tivoli	Top	Low	4-Oct-06	51.54.10	08.25.99	1.1	11.40	15.8	7.8	41.4	7.5	8.1	3.6	<2	80	39	154	9898	82	8090
N6	C7	Blackrock Castle	Bottom	Low	4-Oct-06	51.54.09	08.23.95	6.2	11.14	15.0	7.8	48.4	24.1	7.7	1.4	<2	71	41	168	3375	92	101
N7	C7	Blackrock Castle	Middle	Low	4-Oct-06	51.54.09	08.23.95	3.5	11.19	15.1	7.9	47.5	25.2	7.8	1.5	<2	74	42	163	2980	89	35
N8	C7	Blackrock Castle	Top	Low	4-Oct-06	51.54.09	08.23.95	1.4	11.23	15.2	7.8	43.4	5.9	7.9	3.1	<2	68	32	127	8915	89	3230
N9	C8	Mid L. Mahon	Bottom	Low	4-Oct-06	51.53.14	08.22.06	6.5	10.54	15.0	7.9	48.3	27.8	7.9	1.6	<2	95	47	170	2445	92	25
N10	C8	Mid L. Mahon	Middle	Low	4-Oct-06	51.53.14	08.22.06	3.0	10.57	15.1	7.9	45.1	23.8	8.0	2.0	<2	91	47	188	4070	102	45
N11	C8	Mid L. Mahon	Top	Low	4-Oct-06	51.53.14	08.22.06	1.2	11.00	15.0	7.8	41.4	15.2	8.2	2.4	<2	78	43	189	7577	128	579
N12	C6	End L. Mahon	Bottom	Low	4-Oct-06	51.52.61	08.20.15	10.3	10.33	15.0	7.9	47.4	27.6	8.0	1.9	<2	83	44	162	2493	89	20
N13	C6	End L. Mahon	Middle	Low	4-Oct-06	51.52.61	08.20.15	6.3	10.36	14.9	7.8	43.3	23.1	8.3	2.1	<2	74	43	181	4163	99	411
N14	C6	End L. Mahon	Top	Low	4-Oct-06	51.52.61	08.20.15	1.3	10.40	14.1	7.8	32.8	16.6	9.1	3.1	<2	67	38	159	6514	95	1120
N15	C5	Haubowline	Bottom	Low	4-Oct-06	51.50.40	08.18.98	10.5	10.03	14.8	7.9	50.6	29.4	8.6	0.0	<2	50	32	109	2077	66	24
N16	C5	Haubowline	Middle	Low	4-Oct-06	51.50.40	08.18.98	5.6	10.07	14.7	7.9	45.7	27.3	8.6	0.0	<2	54	35	132	2560	72	22
N17	C5	Haubowline	Top	Low	4-Oct-06	51.50.40	08.18.98	1.3	10.10	14.4	7.9	38.9	23.0	9.0	0.0	<2	55	39	153	3955	89	56
N18	C4	Lower Harbour	Bottom	Low	4-Oct-06	51.50.10	08.16.08	10.7	9.04	14.7	7.9	52.0	32.3	0.1	2.3	<2	31	20	59	934	43	10
N19	C4	Lower Harbour	Middle	Low	4-Oct-06	51.50.10	08.16.08	5.4	9.14	14.7	7.9	49.7	31.8	5.4	0.1	<2	30	22	66	1089	49	10
N20	C4	Lower Harbour	Top	Low	4-Oct-06	51.50.10	08.16.08	1.4	9.18	14.2	7.9	46.1	29.4	0.0	3.2	<2	39	28	99	1926	59	6
N21	C3	End Cork Harbour	Bottom	Low	4-Oct-06	51.48.19	08.16.30	26.2	8.26	14.6	7.9	52.8	33.1	0.1	0.5	<2	26	17	39	678	44	13
N22	C3	End Cork Harbour	Middle	Low	4-Oct-06	51.48.19	08.16.30	14.6	8.32	14.6	7.9	51.0	32.4	0.1	2.2	<2	38	20	50	864	43	9
N23	C3	End Cork Harbour	Top	Low	4-Oct-06	51.48.19	08.16.30	1.2	8.38	14.4	7.9	48.8	31.2	0.1	2.2	<2	37	24	76	1430	59	9
N24		Field Control B																38.0	<6	2480.0	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16	E58	E61	E 18	E 19	E 22	E 23	E24	E 25	E 27
													ETE 161			ETE 181	E 221	E 221	E 221	E24	E 221	Colilert
N1	C16	Anglers Rest	Top	High	24-Oct-06					11.4	7.6	0.2	0.1	12.6	2.0	<2	58	44	18	18038	72	517
N2	C14	Waterworks	Top	High	24-Oct-06					11.8	7.7	0.2	0.1	13.6	2.0	<2	43	35	19	24322	59	308
N3		Field Control A	-	-												<2	52	44	<6	2701	<16	<1
N4	C9	Tivoli	Bottom	High	24-Oct-06	51.54.10	08.26.02	7.1	09:37	14.2	7.6	41.8	26.9	6.5	0.9	<2	60	45	285	5319	95	70
N5	C9	Tivoli	Top	High	24-Oct-06	51.54.10	08.26.02	1.3	09:41	13.8	7.8	36.9	23.4	8.8	1.5	<2	58	45	81	17533	102	1553
N6	C7	Blackrock Castle	Bottom	High	24-Oct-06	51.54.08	08.23.95	8.8	09:12	13.8	7.9	42.0	27.0	9.5	1.3	<2	65	44	231	4225	85	85
N7	C7	Blackrock Castle	Middle	High	24-Oct-06	51.54.08	08.23.95	5.2	09:16	13.7	7.9	41.7	26.7	8.7	1.4	<2	65	45	225	6475	92	343
N8	C7	Blackrock Castle	Top	High	24-Oct-06	51.54.08	08.23.95	1.5	09:20	13.6	7.9	36.9	23.4	9.5	1.6	<2	62	39	145	12954	115	722
N9	C8	Mid L. Mahon	Bottom	High	24-Oct-06	51.53.14	08.22.06	9.4	08:48	13.8	7.9	46.7	30.4	10.0	1.1	<2	51	32	143	3716	69	53
N10	C8	Mid L. Mahon	Middle	High	24-Oct-06	51.53.14	08.22.06	5.3	08:52	13.7	7.9	43.1	27.8	9.8	1.3	<2	56	37	174	5026	82	123
N11	C8	Mid L. Mahon	Top	High	24-Oct-06	51.53.14	08.22.06	1.4	08:55	13.2	7.9	36.8	23.3	10.0	1.4	<2	54	39	139	12785	108	1733
N12	C6	End L. Mahon	Bottom	High	24-Oct-06	51.62.67	08.20.15	13.1	08:23	13.8	7.9	47.3	30.8	10.0	1.1	<2	48	30	127	3543	66	13
N13	C6	End L. Mahon	Middle	High	24-Oct-06	51.62.67	08.20.15	7.2	08:27	13.8	7.9	47.0	30.7	10.3	1.2	<2	53	32	134	4110	72	47
N14	C6	End L. Mahon	Top	High	24-Oct-06	51.62.67	08.20.15	1.2	08:31	12.6	7.8	31.8	19.8	10.6	1.4	<2	60	40	163	9836	95	727
N15	C5	Haubowline	Bottom	High	24-Oct-06	51.50.38	08.19.00	13.6	10:26	13.6	8.0	46.3	30.1	9.8	1.2	<2	46	27	100	2622	59	22
N16	C5	Haubowline	Middle	High	24-Oct-06	51.50.38	08.19.00	8.2	10:30	13.7	8.0	46.0	29.9	9.7	1.2	<2	41	27	103	2887	59	42
N17	C5	Haubowline	Top	High	24-Oct-06	51.50.38	08.19.00	1.4	10:34	13.6	8.0	44.5	28.8	10.0	1.2	<2	56	31	122	4163	66	37
N18	C4	Lower Harbour	Bottom	High	24-Oct-06	50.51.92	08.16.11	13.2	10:49	14.1	8.0	52.0	34.3	9.8	0.9	<2	22	18	40	1134	39	12
N19	C4	Lower Harbour	Middle	High	24-Oct-06	50.51.92	08.16.11	9.2	10:53	13.9	8.0	50.3	33.1	10.0	1.0	<2	29	20	58	1581	46	10
N20	C4	Lower Harbour	Top	High	24-Oct-06	50.51.92	08.16.11	1.3	10:57	13.8	8.0	48.5	31.7	10.0	1.1	<2	30	23	72	1940	49	12
N21	C3	End Cork Harbour	Bottom	High	24-Oct-06	51.48.74	08.16.30	22.1	11:17	13.9	8.0	50.6	33.2	9.9	1.0	<2	43	21	55	1601	43	15
N22	C3	End Cork Harbour	Middle	High	24-Oct-06	51.48.74	08.16.30	15.7	11:21	13.9	8.0	50.2	33.0	10.0	1.0	<2	30	20	58	1758	43	13
N23	C3	End Cork Harbour	Top	High	24-Oct-06	51.48.74	08.16.30	1.4	11:25	13.7	8.0	48.0	31.4	10.2	1.0	<2	30	22	67	2241	46	28
N24		Field Control B														<2	210	205	171	2790	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/lO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	Low	24-Oct-06					11.6	7.7	0.2	0.1	13.5	2.3	<2	58	40	18	18414	72	387
N2	C14	Waterworks	Top	Low	24-Oct-06					12.0	7.7	0.2	0.1	13.4	1.9	<2	72	39	19	24149	56	326
N3		Field Control A	-	-																		
N4	C9	Tivoli	Bottom	Low	24-Oct-06	51.54.09	08.25.00	4.8	15:42	14.1	7.7	41.6	26.7	7.0	0.9	<2	65	53	359	4796	89	26
N5	C9	Tivoli	Top	Low	24-Oct-06	51.54.09	08.25.00	1.4	15:46	14.8	7.8	37.6	23.9	8.8	1.3	<2	68	46	140	19477	72	9880
N6	C7	Blackrock Castle	Bottom	Low	24-Oct-06	51.54.09	08.23.95	5.5	15:22	13.9	7.9	41.8	26.8	6.2	0.9	<2	68	48	265	4752	89	60
N7	C7	Blackrock Castle	Middle	Low	24-Oct-06	51.54.09	08.23.95	2.2	15:26	13.8	7.9	37.8	24.0	9.0	1.3	<2	65	46	206	9092	95	659
N8	C7	Blackrock Castle	Top	Low	24-Oct-06	51.54.09	08.23.95	1.6	15:29	13.8	7.9	36.2	22.9	9.3	1.3	<2	74	49	163	16169	82	7540
N9	C8	Mid L. Mahon	Bottom	Low	24-Oct-06	51.53.15	08.22.11	6.3	15:00	13.8	7.9	43.4	28.0	9.5	1.1	<2	65	47	228	4539	89	73
N10	C8	Mid L. Mahon	Middle	Low	24-Oct-06	51.53.15	08.22.11	3.0	15:04	13.8	7.9	40.0	25.6	9.3	1.2	<2	67	44	222	5638	95	51
N11	C8	Mid L. Mahon	Top	Low	24-Oct-06	51.53.15	08.22.11	1.3	15:08	13.7	7.9	34.3	21.5	10.3	1.8	<2	70	44	212	7223	82	85
N12	C6	End L. Mahon	Bottom	Low	24-Oct-06	51.52.59	08.20.08	11.2	14:39	13.8	7.9	43.6	28.2	9.5	1.1	<2	68	50	270	4805	92	251
N13	C6	End L. Mahon	Middle	Low	24-Oct-06	51.52.59	08.20.08	6.6	14:44	13.6	7.9	40.6	26.0	10.0	1.2	<2	64	42	208	5987	89	534
N14	C6	End L. Mahon	Top	Low	24-Oct-06	51.52.59	08.20.08	1.4		13.2	7.9	32.0	20.0	10.7	2.3	<2	59	40	183	9313	66	727
N15	C5	Haubowline	Bottom	Low	24-Oct-06	51.50.40	08.19.10	11.4	14:07	14.0	8.0	49.8	32.8	9.8	0.9	<2	54	34	147	3986	76	31
N16	C5	Haubowline	Middle	Low	24-Oct-06	51.50.40	08.19.10	8.4	14:11	13.8	8.0	46.9	30.5	9.8	1.0	<2	53	36	157	4770	76	71
N17	C5	Haubowline	Top	Low	24-Oct-06	51.50.40	08.19.10	1.5	14:15	13.4	7.9	39.0	24.8	10.0	1.7	<2	58	40	177	6709	82	154
N18	C4	Lower Harbour	Bottom	Low	24-Oct-06	51.50.89	08.16.08	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<2	42	27	99	2631	53	16
N19	C4	Lower Harbour	Middle	Low	24-Oct-06	51.50.89	08.16.08	6.8	13:40	13.8	8.0	46.9	30.5	9.9	1.1	<2	44	30	117	3109	59	35
N20	C4	Lower Harbour	Top	Low	24-Oct-06	51.50.89	08.16.08	1.4	13:43	13.6	8.0	42.2	27.1	10.1	1.2	<2	49	34	148	4690	69	56
N21	C3	End Cork Harbour	Bottom	Low	24-Oct-06	51.48.75	08.16.36	21.5	13:08	14.0	8.0	50.4	33.1	10.2	0.9	<2	30	21	55	1479	39	13
N22	C3	End Cork Harbour	Middle	Low	24-Oct-06	51.48.75	08.16.36	13.6	13:13	14.0	8.0	50.4	32.8	9.9	1.0	<2	33	22	68	1827	39	11
N23	C3	End Cork Harbour	Top	Low	24-Oct-06	51.48.75	08.16.36	1.6	13:17	13.8	8.0	43.2	30.8	9.8	1.1	<2	44	25	96	3344	49	19

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16	E58	E61	E 18	E 19	E 22	E 23	E24	E 25	E 27
													ETE 161			ETE 181	E 221	E 221	E 221	E 221	E 221	Colilert
N1	C16	Anglers Rest	Top	High	15-Nov-06					n/a	7.3	117.0	0.1	8.5	2.0	<2	88	48	32	11853	143	3950
N2	C14	Waterworks	Top	High	15-Nov-06					n/a	7.4	186.2	0.1	9.9	2.1	<2	112	78	40	17723	92	1986
N3		Field Control A	-	-												<2	61.0	46	<6	2524	<16	<1
N4	C9	Tivoli	Bottom	High	15-Nov-06	51.54.10	08.26.04	6.8	15:14	12.6	7.9	47.6	28.8	7.0	0.9	<2	90	51	298	3007	69	302
N5	C9	Tivoli	Top	High	15-Nov-06	51.54.10	08.26.04	1.5	15:18	12.3	7.9	39.7	4.2	7.6	1.5	<2	119	68	163	14977	92	30760
N6	C7	Blackrock Castle	Bottom	High	15-Nov-06	51.54.08	08.23.94	7.0	14:46	12.7	7.9	48.0	29.2	7.4	0.9	<2	66	47	235	2918	69	71
N7	C7	Blackrock Castle	Middle	High	15-Nov-06	51.54.08	08.23.94	4.2	14:50	12.6	7.9	47.5	28.0	7.5	0.9	<2	60	46	235	3755	72	132
N8	C7	Blackrock Castle	Top	High	15-Nov-06	51.54.08	08.23.94	1.4	14:55	12.2	7.9	42.4	5.3	7.6	1.3	<2	116	53	230	12462	53	41060
N9	C8	Mid L. Mahon	Bottom	High	15-Nov-06	51.53.15	08.22.09	7.9	14:19	12.8	7.9	48.8	30.7	7.7	0.9	<2	70	67	233	2400	125	35
N10	C8	Mid L. Mahon	Middle	High	15-Nov-06	51.53.15	08.22.09	5.4	14:22	12.7	7.9	48.0	30.2	7.4	0.9	<2	84	53	225	2759	56	56
N11	C8	Mid L. Mahon	Top	High	15-Nov-06	51.53.15	08.22.09	1.3	14:27	12.0	7.9	41.3	17.1	7.9	1.2	<2	57	37	174	8335	92	980
N12	C6	End L. Mahon	Bottom	High	15-Nov-06	51.52.62	08.70.08	12.2	13:51	12.9	8.0	50.3	31.9	7.4	0.9	<2	38	25	94	1891	43	20
N13	C6	End L. Mahon	Middle	High	15-Nov-06	51.52.62	08.70.08	7.8	13:55	12.9	8.0	49.9	30.4	7.5	0.9	<2	41	28	111	2325	49	17
N14	C6	End L. Mahon	Top	High	15-Nov-06	51.52.62	08.70.08	1.4	13:59	12.1	7.9	44.6	17.3	8.0	1.1	<2	60	37	171	7489	95	1203
N15	C5	Haubowline	Bottom	High	15-Nov-06	51.50.41	08.19.16	12.9	13:15	13.1	8.0	51.6	32.4	8.2	0.8	<2	25	21	64	1749	36	19
N16	C5	Haubowline	Middle	High	15-Nov-06	51.50.41	08.19.16	8.5	13:19	13.0	8.0	51.4	31.3	7.4	0.8	<2	35	24	90	2281	43	23
N17	C5	Haubowline	Top	High	15-Nov-06	51.50.41	08.19.16	1.5	13:23	12.1	7.9	45.0	26.6	8.2	1.2	<2	53	35	171	4291	69	38
N18	C4	Lower Harbour	Bottom	High	15-Nov-06	51.50.89	08.16.12	14.3	12:42	13.1	7.9	52.3	34.2	7.1	0.8	<2	25	16	22	779	23	2
N19	C4	Lower Harbour	Middle	High	15-Nov-06	51.50.89	08.16.12	8.2	12:46	13.1	7.9	52.1	33.8	7.2	0.8	<2	27	18	36	1050	26	7
N20	C4	Lower Harbour	Top	High	15-Nov-06	51.50.89	08.16.12	1.3	12:51	12.6	7.9	49.6	32.5	7.6	1.0	<2	31	20	57	1523	33	7
N21	C3	End Cork Harbour	Bottom	High	15-Nov-06	51.41.86	08.16.38	24.0	12:11	13.0	7.8	52.7	34.6	7.2	0.8	<2	26	14	7	525	<16	3
N22	C3	End Cork Harbour	Middle	High	15-Nov-06	51.41.86	08.16.38	14.6	12:16	13.0	7.9	52.5	34.8	7.3	0.8	<2	28	15	12	554	<16	5
N23	C3	End Cork Harbour	Top	High	15-Nov-06	51.41.86	08.16.38	1.4	12:21	12.9	7.9	51.6	33.3	7.8	0.9	<2	38	17	30	899	23	4
N24		Field Control B														<2	180	167	1090	2657	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	Low	20-Nov-06					9.9	7.3	150.8	0.1	9.4	2.1	<2	44	23	7	12407	143	210
N2	C14	Waterworks	Top	Low	20-Nov-06					9.9	7.5	157.6	0.1	9.6	2.3	<2	57	30	6	14845	125	308
N3		Field Control A	-	-																		
N4	C9	Tivoli	Bottom	Low	20-Nov-06	51.54.08	08.25.98	5.0	12:35	12.0	7.7	43.4	28.0	5.8	0.9	<2	72	47	271	5775	85	1203
N5	C9	Tivoli	Top	Low	20-Nov-06	51.54.08	08.25.98	2.0	12:39	11.4	7.7	22.9	13.8	8.3	1.9	<2	67	37	51	14889	125	2419
N6	C7	Blackrock Castle	Bottom	Low	20-Nov-06	51.54.09	08.23.97	4.5	12:10	11.5	7.8	43.1	27.8	6.5	1.0	<2	81	47	249	5691	82	649
N7	C7	Blackrock Castle	Middle	Low	20-Nov-06	51.54.09	08.23.97	4.2	12:14	11.6	7.8	40.8	26.2	5.6	1.6	<2	75	46	207	7892	92	1414
N8	C7	Blackrock Castle	Top	Low	20-Nov-06	51.54.09	08.23.97	1.9	12:50	10.9	7.8	31.5	19.6	7.6	1.5	<2	78	44	152	11284	105	1986
N9	C8	Mid L. Mahon	Bottom	Low	20-Nov-06	51.53.16	08.22.12	8.3	11:46	11.2	7.9	44.6	28.9	7.3	1.0	<2	62	39	208	3941	66	85
N10	C8	Mid L. Mahon	Middle	Low	20-Nov-06	51.53.16	08.22.12	4.4	11:49	11.0	7.9	42.0	27.0	7.4	1.1	<2	72	41	231	6492	79	629
N11	C8	Mid L. Mahon	Top	Low	20-Nov-06	51.53.16	08.22.12	1.3	11:52	10.0	7.8	31.3	19.5	8.2	1.4	<2	91	45	210	9614	95	1986
N12	C6	End L. Mahon	Bottom	Low	20-Nov-06	51.52.59	08.20.11	11.7	11:18	11.1	7.9	43.5	28.1	7.5	1.1	<2	61	37	207	5088	69	159
N13	C6	End L. Mahon	Middle	Low	20-Nov-06	51.52.59	08.20.11	7.2	11:23	10.6	7.9	40.2	25.7	7.8	1.1	<2	73	38	194	6541	76	403
N14	C6	End L. Mahon	Top	Low	20-Nov-06	51.52.59	08.20.11	1.2	11:27	10.1	7.8	26.9	16.5	8.5	1.7	<2	81	45	159	11027	99	1553
N15	C5	Haubowline	Bottom	Low	20-Nov-06	51.50.41	08.19.09	10.1	10:45	11.0	7.9	44.9	29.1	7.8	1.0	<2	57	31	139	3866	56	89
N16	C5	Haubowline	Middle	Low	20-Nov-06	51.50.41	08.19.09	7.1	10:48	10.8	7.9	42.5	27.3	8.8	1.0	<2	71	34	154	5363	62	105
N17	C5	Haubowline	Top	Low	20-Nov-06	51.50.41	08.19.09	1.2	10:52	10.4	7.9	37.1	23.5	8.2	1.2	<2	62	39	165	8352	79	510
N18	C4	Lower Harbour	Bottom	Low	20-Nov-06	51.50.90	08.16.04	10.2	10:11	11.6	7.9	49.5	32.4	7.7	0.9	<2	173	24	85	2334	43	35
N19	C4	Lower Harbour	Middle	Low	20-Nov-06	51.50.90	08.16.04	7.2	10:15	11.0	7.9	46.7	30.4	7.8	0.9	<2	49	26	85	2511	43	37
N20	C4	Lower Harbour	Top	Low	20-Nov-06	51.50.90	08.16.04	1.1	10:18	10.9	7.9	44.3	28.7	8.0	1.0	<2	49	29	113	3516	53	42
N21	C3	End Cork Harbour	Bottom	Low	20-Nov-06	51.48.83	08.16.34	24.5	09:31	11.9	7.9	50.8	33.4	7.6	0.9	<2	35	19	46	1820	33	21
N22	C3	End Cork Harbour	Middle	Low	20-Nov-06	51.48.83	08.16.34	16.3	09:35	11.7	7.9	50.4	32.9	7.7	0.9	<2	37	20	45	1703	33	29
N23	C3	End Cork Harbour	Top	Low	20-Nov-06	51.48.83	08.16.34	1.5	09:39	11.0	7.9	46.1	30.2	7.9	1.1	<2	56	29	90	5301	43	61

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Lab Test No	Station No	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/lO2)	Chlorophyll a (µg/l)	BOD (mg/l)		Lab Test No	Station No	Total Phosphate (µg/l P)	MRP Phosphate (µg/l P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	Test No & Method		E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181		Test No & Method		E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
N1	C16	Anglers Rest	Top	High						N1	C16									N1	C16						
N2	C14	Waterworks	Top	High						N2	C14									N2	C14						
N3		Field Control A	-	-						N3										N3							
N4	C9	Tivoli	Bottom	High		51.54.10	08.26.03			N4	C9									N4	C9						
N5	C9	Tivoli	Top	High		51.54.10	08.26.03			N5	C9									N5	C9						
N6	C7	Blackrock Castle	Bottom	High		51.54.09	08.24.00			N6	C7									N6	C7						
N7	C7	Blackrock Castle	Middle	High		51.54.09	08.24.00			N7	C7									N7	C7						
N8	C7	Blackrock Castle	Top	High		51.54.09	08.24.00			N8	C7									N8	C7						
N9	C8	Mid L. Mahon	Bottom	High		51.53.12	08.22.05			N9	C8									N9	C8						
N10	C8	Mid L. Mahon	Middle	High		51.53.12	08.22.05			N10	C8									N10	C8						
N11	C8	Mid L. Mahon	Top	High		51.53.12	08.22.05			N11	C8									N11	C8						
N12	C6	End L. Mahon	Bottom	High		51.52.60	08.20.13			N12	C6									N12	C6						
N13	C6	End L. Mahon	Middle	High		51.52.60	08.20.13			N13	C6									N13	C6						
N14	C6	End L. Mahon	Top	High		51.52.60	08.20.13			N14	C6									N14	C6						
N15	C5	Haubowline	Bottom	High		51.50.41	08.19.04			N15	C5									N15	C5						
N16	C5	Haubowline	Middle	High		51.50.41	08.19.04			N16	C5									N16	C5						
N17	C5	Haubowline	Top	High		51.50.41	08.19.04			N17	C5									N17	C5						
N18	C4	Lower Harbour	Bottom	High		51.50.89	08.16.12			N18	C4									N18	C4						
N19	C4	Lower Harbour	Middle	High		51.50.89	08.16.12			N19	C4									N19	C4						
N20	C4	Lower Harbour	Top	High		51.50.89	08.16.12			N20	C4									N20	C4						
N21	C3	End Cork Harbour	Bottom	High		51.48.80	08.16.32			N21	C3									N21	C3						
N22	C3	End Cork Harbour	Middle	High		51.48.80	08.16.32			N22	C3									N22	C3						
N23	C3	End Cork Harbour	Top	High		51.48.80	08.16.32			N23	C3									N23	C3						

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16	E58	E61	E 18	E 19	E 22	E 23	E24	E 25	E 27
													ETE 161			ETE 181	E 221	E 221	E 221	E 221	E 221	Colilert
N1	C16	Anglers Rest	Top	Low	4-Dec-06					8.9	7.4	0.1	0.1	10.1	2.2	<4	67	22	54	12912	32	326
N2	C14	Waterworks	Top	Low	4-Dec-06					8.9	7.1	0.1	0.1	10.0	2.1	<4	96	35	53	16784	33	488
N3		Field Control A	-	-												<4	55	45	<6	2303	<16	<1
N4	C9	Tivoli	Bottom	Low	4-Dec-06	n/a	n/a	5.7	12:37	9.6	7.8	29.9	18.5	8.9	1.5	<4	70	36	82	15451	36	2410
N5	C9	Tivoli	Top	Low	4-Dec-06	n/a	n/a	1.5	12:40	8.8	7.5	1.4	0.8	10.8	2.2	<4	73	39	89	17705	39	3640
N6	C7	Blackrock Castle	Bottom	Low	4-Dec-06	n/a	n/a	7.6	12:06	10.0	7.8	42.8	27.6	8.2	1.7	<4	75	38	109	11156	36	1986
N7	C7	Blackrock Castle	Middle	Low	4-Dec-06	n/a	n/a	4.7	12:13	9.4	7.8	27.3	16.8	9.3	1.7	<4	79	35	108	14384	39	1553
N8	C7	Blackrock Castle	Top	Low	4-Dec-06	n/a	n/a	1.5	12:17	8.8	7.6	3.7	2.0	10.7	2.3	<4	75	35	114	12077	43	1986
N9	C8	Mid L. Mahon	Bottom	Low	4-Dec-06	n/a	n/a	7.4	11:41	9.9	7.8	43.0	27.7	8.2	1.1	<4	91	41	153	11616	56	1300
N10	C8	Mid L. Mahon	Middle	Low	4-Dec-06	n/a	n/a	4.0	11:45	9.0	7.7	17.3	10.2	9.8	2.0	<4	88	40	132	13215	53	1120
N11	C8	Mid L. Mahon	Top	Low	4-Dec-06	n/a	n/a	1.4	11:48	8.9	7.5	11.7	6.7	10.3	2.1	<4	68	37	87	17484	39	1986
N12	C6	End L. Mahon	Bottom	Low	4-Dec-06	n/a	n/a	11.4	11:18	9.8	7.8	39.3	25.1	8.4	1.3	<4	98	49	210	10190	62	1733
N13	C6	End L. Mahon	Middle	Low	4-Dec-06	n/a	n/a	5.8	11:21	8.6	7.8	22.0	13.2	9.4	1.9	<4	90	38	153	12582	62	1203
N14	C6	End L. Mahon	Top	Low	4-Dec-06	n/a	n/a	1.3	11:25	8.8	7.6	13.5	7.8	10.1	2.0	<4	96	40	149	13919	56	1733
N15	C5	Haubowline	Bottom	Low	4-Dec-06	n/a	n/a	10.9	10:45	10.1	7.9	49.9	32.7	8.1	0.9	<4	72	35	95	5496	30	549
N16	C5	Haubowline	Middle	Low	4-Dec-06	n/a	n/a	7.8	10:48	9.8	7.9	43.9	28.4	8.4	1.1	<4	82	38	123	7918	39	980
N17	C5	Haubowline	Top	Low	4-Dec-06	n/a	n/a	1.4	10:51	8.9	7.8	22.7	13.7	9.6	1.8	<4	80	40	138	11187	46	1414
N18	C4	Lower Harbour	Bottom	Low	4-Dec-06	n/a	n/a	8.1	10:09	9.6	7.9	41.6	26.7	8.6	1.1	<4	67	38	94	5983	30	270
N19	C4	Lower Harbour	Middle	Low	4-Dec-06	n/a	n/a	6.3	10:12	9.5	7.9	37.8	24.0	8.8	1.3	<4	69	37	108	7037	36	403
N20	C4	Lower Harbour	Top	Low	4-Dec-06	n/a	n/a	1.6	10:15	9.1	7.8	28.4	17.4	9.4	1.6	<4	76	39	<6	9597	43	1120
N21	C3	End Cork Harbour	Bottom	Low	4-Dec-06	n/a	n/a	21.6	09:37	10.1	7.8	51.3	33.8	8.0	1.1	<4	64	30	57	3269	23	64
N22	C3	End Cork Harbour	Middle	Low	4-Dec-06	n/a	n/a	14.4	09:41	10.0	7.8	48.8	32.0	8.2	1.0	<2	65	31	67	3906	26	120
N23	C3	End Cork Harbour	Top	Low	4-Dec-06	n/a	n/a	1.7	09:46	9.3	7.8	36.6	22.9	8.9	1.3	<4	69	35	102	6997	33	299
N24		Field Control B														<4	148	109	165	2347	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/IO2)	Chlorophyll α ($\mu\text{g/l}$)	BOD (mg/l)	Total Phosphate ($\mu\text{g/l P}$)	MRP Phosphate ($\mu\text{g/ P}$)	Ammonium ($\mu\text{g/l NH}_4$)	Nitrate ($\mu\text{g/l NO}_3$)	Nitrite ($\mu\text{g/l NO}_2$)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---			E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
P1	C16	Anglers Rest	Top	High	10-Jan-07					9.0	6.9	0.145	0.1	11.2	1.9	<2	52	28	69	12648	46	365
P2	C14	Waterworks	Top	High	10-Jan-07					8.7	6.4	0.153	0.1	10.8	1.9	2	71	38	72	14805	56	579
P3		Field Control A	-	-												<2	48	48.0	<6	2613	<16	<1
P4	C9	Tivoli	Bottom	High	10-Jan-07	51.54.08	08.25.99	6.6	11:49	9.5	7.7	43.2	27.8	8.6	0.9	<2	51	41	179	5310	36	89
P5	C9	Tivoli	Top	High	10-Jan-07	51.54.08	08.25.99	0.4	11:53	8.2	7.5	3.9	2.1	11.3	2.1	<2	83	45	117	14357	59	980
P6	C7	Blackrock Castle	Bottom	High	10-Jan-07	51.54.08	08.29.98	7.0	11:22	9.8	7.8	45.0	29.2	8.9	1.0	<2	72	40	168	3676	33	72
P7	C7	Blackrock Castle	Middle	High	10-Jan-07	51.54.08	08.29.98	4.9	11:26	9.8	7.8	43.9	28.4	9.0	1.0	<2	65	42	183	4473	33	96
P8	C7	Blackrock Castle	Top	High	10-Jan-07	51.54.08	08.29.98	0.4	11:29	8.5	7.6	12.1	6.9	10.7	2.0	<2	91	48	134	12896	59	1414
P9	C8	Mid L. Mahon	Bottom	High	10-Jan-07	51.53.14	08.22.12	7.3	10:55	9.8	7.8	47.0	30.6	9.0	0.9	<2	45	34	111	3330	26	52
P10	C8	Mid L. Mahon	Middle	High	10-Jan-07	51.53.14	08.22.12	4.5	10:59	9.8	7.8	45.9	29.8	9.0	2.0	<2	49	39	132	7298	39	94
P11	C8	Mid L. Mahon	Top	High	10-Jan-07	51.53.14	08.22.12	0.3	11:03	8.8	7.7	21.3	12.7	10.2	1.6	<2	72	46	161	11306	56	1300
P12	C6	End L. Mahon	Bottom	High	10-Jan-07	51.52.51	08.20.10	14.2	10:22	9.8	7.7	48.8	31.9	7.6	1.5	<2	38	30	76	3069	23	46
P13	C6	End L. Mahon	Middle	High	10-Jan-07	51.52.51	08.20.10	10.6	10:25	9.8	7.8	48.4	31.6	8.9	0.9	<2	48	31	89	4127	26	42
P14	C6	End L. Mahon	Top	High	10-Jan-07	51.52.51	08.20.10	0.4	10:29	8.6	7.8	26.0	15.8	10.1	1.4	<2	60	42	152	11152	59	1553
P15	C5	Haubowline	Bottom	High	10-Jan-07	51.50.41	08.19.09	9.2	09:46	9.9	7.8	50.6	33.3	8.9	0.9	<2	42	29	37	2148	16	5
P16	C5	Haubowline	Middle	High	10-Jan-07	51.50.41	08.19.09	11.5	09:50	9.9	7.8	50.6	33.3	8.9	0.9	<2	37	27	49	2369	16	13
P17	C5	Haubowline	Top	High	10-Jan-07	51.50.41	08.19.09	0.4	09:54	9.4	7.8	38.4	24.4	9.4	1.1	<2	43	35	122	6904	36	106
P18	C4	Lower Harbour	Bottom	High	10-Jan-07	51.50.90	08.16.11	16.1	09:09	9.9	7.8	52.5	34.7	9.0	1.2	<2	48	23	14	1067	<16	1
P19	C4	Lower Harbour	Middle	High	10-Jan-07	51.50.90	08.16.11	10.8	09:13	9.9	7.8	52.5	34.7	8.9	1.0	<2	38	23	22	1430	<16	4
P20	C4	Lower Harbour	Top	High	10-Jan-07	51.50.90	08.16.11	0.3	09:20	9.5	7.8	46.0	29.9	9.1	0.9	<2	34	29	63	3290	23	11
P21	C3	End Cork Harbour	Bottom	High	10-Jan-07	51.48.82	08.16.39	28.4	08:38	9.9	7.7	52.8	34.9	9.1	1.1	<2	80	21	<6	390	<16	<1
P22	C3	End Cork Harbour	Middle	High	10-Jan-07	51.48.82	08.16.39	17.8	08:43	9.9	7.8	52.8	34.9	8.9	1.0	<2	66	21	<6	354	<16	<1
P23	C3	End Cork Harbour	Top	High	10-Jan-07	51.48.82	08.16.39	0.4	08:48	9.8	7.8	51.8	34.2	8.8	0.9	<2	44	22	10	841	<16	<1
P24		Field Control B															586	589	527	2879	<16	<1

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Lab Test No	Station No	Station	Depth	Tide	Date	GPS (N)	GPS (W)	Depth (m)	Time (24Hr)	Temp (°C)	pH	Conductivity @25°C (mS/cm)	Salinity (ppt)	DO (mg/lO2)	Chlorophyll a (µg/l)	BOD (mg/l)	Total Phosphate (µg/l P)	MRP Phosphate (µg/ P)	Ammonium (µg/l NH4)	Nitrate (µg/l NO3)	Nitrite (µg/l NO2)	E Coliforms (MPN/100mls)
Test No & Method			---	---	---	---	---	E60	---	E59	E56	E57	E16 ETE 161	E58	E61	E 18 ETE 181	E 19 E 221	E 22 E 221	E 23 E 221	E24 E 221	E 25 E 221	E 27 Colilert
P1	C16	Anglers Rest	Top	Low	16-Jan-07					8.4	7.6	0.145	0.1	10.4	1.5	<2	22	23	48	11466	36	166
P2	C14	Waterworks	Top	Low	16-Jan-07					8.4	7.6	0.160	0.1	10.4	1.6	<2	26	28	51	14233	53	210
P3		Field Control A	-	-								0.160										
P4	C9	Tivoli	Bottom	Low	16-Jan-07	51.54.09	08.25.96	6.5	11:37	9.8	7.8	47.4	30.9	8.0	0.8	<2	35	40	211	4203	36	127
P5	C9	Tivoli	Top	Low	16-Jan-07	51.54.09	08.25.96	0	11:40	8.5	7.6	4.6	2.4	10.9	1.6	<2	44	35	85	14938	56	2750
P6	C7	Blackrock Castle	Bottom	Low	16-Jan-07	51.54.09	08.23.95	7.9	11:10	9.7	7.8	47.6	31.1	8.3	2.6	<2	38	40	202	6545	39	488
P7	C7	Blackrock Castle	Middle	Low	16-Jan-07	51.54.09	08.23.95	4.7	11:18	9.5	7.9	43.0	27.8	8.5	0.9	<2	38	40	165	9415	46	1046
P8	C7	Blackrock Castle	Top	Low	16-Jan-07	51.54.09	08.23.95	0.2	11:21	8.5	7.7	5.1	2.8	10.8	1.7	<2	55	40	117	14318	56	1986
P9	C8	Mid L. Mahon	Bottom	Low	16-Jan-07	51.53.16	08.22.12	7.5	10:46	9.7	7.7	39.1	25.1	5.4	2.1	<2	38	41	217	6842	49	416
P10	C8	Mid L. Mahon	Middle	Low	16-Jan-07	51.53.16	08.22.12	4.8	10:50	9.4	7.9	40.1	25.6	8.4	0.9	<2	37	39	175	10150	59	1046
P11	C8	Mid L. Mahon	Top	Low	16-Jan-07	51.53.16	08.22.12	0.1	10:53	8.4	7.7	15.0	8.7	10.2	1.4	<2	37	38	145	12803	62	2420
P12	C6	End L. Mahon	Bottom	Low	16-Jan-07	51.52.63	08.20.12	12.7	10:24	9.6	7.9	48.3	31.6	8.5	1.5	<2	50	51	275	4247	36	326
P13	C6	End L. Mahon	Middle	Low	16-Jan-07	51.52.63	08.20.12	7.5	10:28	9.6	7.9	45.3	29.4	8.6	0.9	<2	41	45	225	8255	53	921
P14	C6	End L. Mahon	Top	Low	16-Jan-07	51.52.63	08.20.12	0.0	10:31	8.2	7.8	16.6	9.7	10.2	1.4	<2	38	40	135	12856	56	1414
P15	C5	Haubowline	Bottom	Low	16-Jan-07	51.50.42	08.19.14	12.5	09:49	9.7	7.9	51.3	33.8	8.7	0.8	<2	27	33	96	2715	23	23
P16	C5	Haubowline	Middle	Low	16-Jan-07	51.50.42	08.19.14	7.0	09:53	9.6	7.9	47.3	30.8	8.8	0.8	<2	32	36	135	3946	30	28
P17	C5	Haubowline	Top	Low	16-Jan-07	51.50.42	08.19.14	0.1	09:57	8.7	7.9	27.0	16.6	9.8	1.2	<2	35	39	148	10208	49	1414
P18	C4	Lower Harbour	Bottom	Low	16-Jan-07	51.50.87	08.15.94	12.6	09:18	9.7	7.9	52.3	34.5	8.7	2.7	<2	23	27	58	2980	23	7
P19	C4	Lower Harbour	Middle	Low	16-Jan-07	51.50.87	08.15.94	7.2	09:22	9.5	7.9	47.8	31.2	8.8	0.9	<2	23	28	67	3463	26	3
P20	C4	Lower Harbour	Top	Low	16-Jan-07	51.50.87	08.15.94	0.1	09:26	8.7	7.9	36.5	23.1	9.6	1.0	<2	31	33	122	6638	36	488
P21	C3	End Cork Harbour	Bottom	Low	16-Jan-07	51.48.83	08.16.36	26.6	08:43	9.7	7.8	52.3	34.9	8.6	1.8	<2	26	24	18	1971	<16	1
P22	C3	End Cork Harbour	Middle	Low	16-Jan-07	51.48.83	08.16.36	16.8	08:49	9.7	7.8	42.9	34.8	8.6	0.8	<2	32	25	36	2237	<16	1
P23	C3	End Cork Harbour	Top	Low	16-Jan-07	51.48.83	08.16.36	0.1	08:54	9.0	7.8	42.9	27.6	9.2	0.9	<2	38	28	81	4566	30	1

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Sample Registration 1471

Sample Registration 1471

High Tide

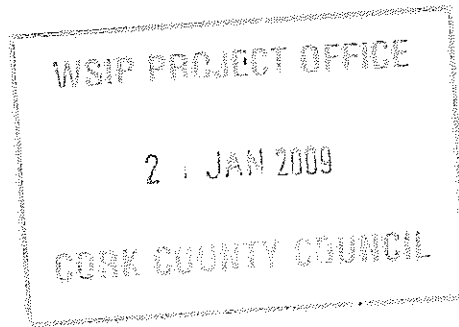
Station #	Station	Station #	Depth	Station	GPS (W)	GPS(N)	May-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Feb-06	Mar-06	Apr-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Jan-07
							E. Coliforms (MPN/100mls)																
C16	Anglers Rest	C16	Top	Anglers Rest			770	150	131	488	61	96	128	387	160	238	236	272	130	155	517	3950	365
C14	Waterworks	C14	Top	Waterworks			387	162	178	238	93	152	148	308	186	281	435	649	102	91	308	1986	579
C9	Tivoli	C9	Bottom	Tivoli	70174	72203	20	8	16	15	23	980	34	15	104	40	25	29	378	16	70	302	89
C9	Tivoli	C9	Top	Tivoli	70174	72203	6440	25	1300	15290	4500	687	5370	20	1986	1300	11190	71	34480	1120	1553	30760	980
C7	Blackrock Castle	C7	Bottom	Blackrock Castle	72655	72101	47	10	12	21	24	76	40	60	121	41	55	31	101	16	85	71	72
C7	Blackrock Castle	C7	Middle	Blackrock Castle	72655	72101	75	11	22	22	28	816	84	228	488	64	99	47	148	387	343	132	96
C7	Blackrock Castle	C7	Top	Blackrock Castle	72655	72101	3300	18	687	1120	2310	1300	1553	548	2420	461	1733	2420	1986	2420	722	41060	1414
C8	Mid L. Mahon	C8	Bottom	Mid L. Mahon	74336	70846	45	1	20	27	27	46	55	29	48	20	10	26	1	11	53	35	52
C8	Mid L. Mahon	C8	Middle	Mid L. Mahon	74336	70846	221	4	46	45	26	517	52	48	28	61	20	20	8	18	123	56	94
C8	Mid L. Mahon	C8	Top	Mid L. Mahon	74336	70846	250	7	11	12	122	921	530	457	24	20	30	12	7	29	1733	980	1300
C6	End L. Mahon	C6	Bottom	End L. Mahon	76742	67407	14	4	5	12	16	59	17	11	6	9	10	5	4	12	13	20	46
C6	End L. Mahon	C6	Middle	End L. Mahon	76742	67407	31	5	9	8	25	178	13	35	10	5	6	18	9	13	47	17	42
C6	End L. Mahon	C6	Top	End L. Mahon	76742	67407	41	10	6	9	230	1733	165	36	38	21	11	9	5	21	727	1203	1553
C5	Haubowline	C5	Bottom	Haubowline	78050	65301	14	<1	<1	6	8	14	6	21	12	1	3	4	4	10	22	19	5
C5	Haubowline	C5	Middle	Haubowline	78050	65301	38	3	2	3	7	17	20	21	11	1	2	7	23	8	42	23	13
C5	Haubowline	C5	Top	Haubowline	78050	65301	146	3	1	6	15	55	195	40	11	3	5	12	1	4	37	38	106
C4	Lower Harbour	C4	Bottom	Lower Harbour	81736	66052	2	<1	6	<1	1	5	3	2	1	1	1	6	2	4	12	2	1
C4	Lower Harbour	C4	Middle	Lower Harbour	81736	66052	4	2	7	1	2	33	5	4	2	1	2	10	1	9	10	7	4
C4	Lower Harbour	C4	Top	Lower Harbour	81736	66052	6	1	2	1	3	44	7	4	4	1	4	2	1	3	12	7	11
C3	End Cork Harbour	C3	Bottom	End Cork Harbour	81242	62182	<1	1	7	13	3	17	2	11	2	1	1	1	1	1	15	3	1
C3	End Cork Harbour	C3	Middle	End Cork Harbour	81242	62182	1	<1	1	23	2	36	1	1	1	1	1	1	1	4	13	5	1
C3	End Cork Harbour	C3	Top	End Cork Harbour	81242	62182	4	1	3	5	33	3	1	1	1	1	1	2	1	2	28	4	1

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Sample Registration 1471

						Low Tide																		
Client Reference						May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Feb-06	Mar-06	Apr-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07
Station #	Station	Depth	Station	GPS (W)	GPS(N)	<i>E. coli</i> forms (MPN/100mls)																		
C16	Anglers Rest	Top	Anglers Rest			770	179	172	109	249	378	397	308	649	166	179	153	153	613	365	387	210	326	166
C14	Waterworks	Top	Waterworks			1733	517	160	214	299	173	308	276	687	196	548	261	649	172	411	326	308	488	210
C9	Tivoli	Bottom	Tivoli	70174	72203	488	30	11	10	5	156	575	154	4040	1300	166	31	22	27230	50	26	1203	2410	127
C9	Tivoli	Top	Tivoli	70174	72203	12740	1733	28	14210	12010	3790	2420	7280	4870	5460	3930	17820	770	687	8090	9880	2419	3640	2750
C7	Blackrock Castle	Bottom	Blackrock Castle	72655	72101	107	39	13	7	4	19	42	218	228	649	31	10	21	112	101	60	649	1986	488
C7	Blackrock Castle	Middle	Blackrock Castle	72655	72101	436	94	16	22	2	41	52	361	1986	1300	173	17	22	285	35	659	1414	1553	1046
C7	Blackrock Castle	Top	Blackrock Castle	72655	72101	3840	756	35	9580	1733	3450	1733	1414	2420	2420	1986	5120	130	921	3230	7540	1986	1986	1986
C8	Mid L. Mahon	Bottom	Mid L. Mahon	74336	70846	67	37	10	7	7	122	58	178	127	233	1733	7	13	34	25	73	85	1300	416
C8	Mid L. Mahon	Middle	Mid L. Mahon	74336	70846	73	40	19	19	6	160	208	268	292	613	44	20	6	115	45	51	629	1120	1046
C8	Mid L. Mahon	Top	Mid L. Mahon	74336	70846	167	61	23	29	32	1414	1733	1986	2420	980	36	5	16	186	579	85	1986	1986	2420
C6	End L. Mahon	Bottom	End L. Mahon	76742	67407	167	24	9	56	12	23	44	173	317	231	45	10	24	16	20	251	159	1733	326
C6	End L. Mahon	Middle	End L. Mahon	76742	67407	344	16	5	53	23	42	177	189	770	344	22	23	20	11	411	534	403	1203	921
C6	End L. Mahon	Top	End L. Mahon	76742	67407	344	27	14	345	21	770	1120	1203	1300	179	12	21	10	72	1120	727	1553	1733	1414
C5	Haubowline	Bottom	Haubowline	78050	65301	7	21	7	10	<1	11	4	10	38	146	1	7	17	3	24	31	89	549	23
C5	Haubowline	Middle	Haubowline	78050	65301	7	11	6	12	3	28	3	26	63	517	4	12	18	2	22	71	105	980	28
C5	Haubowline	Top	Haubowline	78050	65301	7	15	20	10	19	403	39	188	53	411	16	4	7	8	56	154	510	1414	1414
C4	Lower Harbour	Bottom	Lower Harbour	81736	66052	1	1	3	2	5	6	3	3	7	44	1	4	4	1	10	16	35	270	7
C4	Lower Harbour	Middle	Lower Harbour	81736	66052	<1	2	1	2	5	6	4	6	7	29	1	5	6	1	10	35	37	403	3
C4	Lower Harbour	Top	Lower Harbour	81736	66052	2	3	4	1	4	13	23	15	5	178	1	4	6	1	6	56	42	1120	488
C3	End Cork Harbour	Bottom	End Cork Harbour	81242	62182	<1	6	3	2	2	1	3	<1	1	1	1	1	2	1	13	13	21	64	1
C3	End Cork Harbour	Middle	End Cork Harbour	81242	62182	3	1	5	<1	2	5	1	<1	6	2	1	1	1	1	9	11	29	120	1
C3	End Cork Harbour	Top	End Cork Harbour	81242	62182	<1	<1	28	1	1	12	4	4	15	1	4	6	3	9	19	61	299	1	1

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Tim O'Herlihy
Cork County Council
W.S.I.P. Project Office
Model Business Park
Model Farm Road
Cork

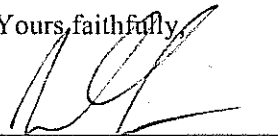
19th January 2009

Re: Proposed Wastewater Treatment Plant at Shanbally, County Cork.

Dear Madam,

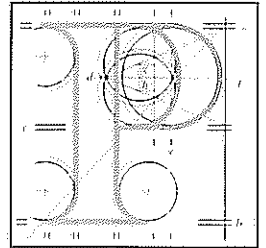
Further to our email in relation to the preliminary report associated with the above mentioned case, the Board hereby requests that the suggested volumes be forwarded to it within 2 weeks from the date of this letter, i.e. by **2nd February, 2009**.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully

Luke Ryan
Executive Officer.

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An Bord Pleanála



64 Sráid Maoilbhríde,
Baile Átha Cliath 1.

Tel: (01) 858 8100
Lo-Call: 1890 275 175
Fax: (01) 872 2684
Web: <http://www.pleanala.ie>
email: bord@pleanala.ie

64 Marlborough Street,
Dublin 1.



Mr Luke Ryan,
Executive Officer,
An Bord Pleanála,
64 Marlborough Street,
Dublin 1.

22nd January 2009

**Re: Proposed Wastewater Treatment Plant at Shanbally, County Cork.
ABP Ref. 04.YA0005**

Further to your letter of 19th January and our previous discussions, enclosed please find copies of the following documents from the Preliminary Report for the above project.

- VOLUME 1
 - Section 1 – Introduction
 - Section 2 – Existing Infrastructure
 - Section 3 – Future Infrastructure
- VOLUME 2
 - Section 4 – Waste Water Conveyance Treatment and Disposal Schemes
 - Section 5 – Waste Water and Sludge Treatment
- VOLUME 5
 - Appendix G – Appendices to Section 4 & 5
- VOLUME 6 (PDF copies on CD)
 - Drawings

Yours sincerely,

Tim O'Herlihy
Executive Engineer
WSIP Project Office

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From: Ann Marie Donlon [a.donlon@epa.ie]

Sent: 09 October 2008 09:49

To: Valerie Hannon

Cc: Marie O'Connor

Subject: D0057-01 Ringaskiddy

Valerie

In relation to the Ringaskiddy application please be advised that the following information is outstanding following our discussions:

- Further information submitted to ABP (in relation to the EIS only).
- The EIS approval notice (permission etc).
- Completed tables for the proposed discharges (post installation of WWTP) for the agglomeration.
- The impact assessment for the proposed discharges having regard to the trophic status of the receiving water and current uses (shellfish, bathing).
- The Appropriate Assessment requested by NPWS.
- Describe the proposed works with regard to the handling of the treated trade effluent and untreated waste water.

If you have any questions please contact either myself or Marie O'Connor.

Regards

Ann Marie Donlon

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