

This Report has been cleared for

submission to the Board by

Programme Manager: Frank Clinton

Signed *Yvonne O'Leary* Date *26/11/09*



OFFICE OF CLIMATE,  
LICENSING & RESOURCE USE.

## INSPECTORS REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To: DIRECTORS

From: Ann Marie Donlon **Environmental Licensing  
Programme**

Date: 25<sup>TH</sup> NOVEMBER 2009

RE: Application for a Waste Water Discharge Licence from Cork  
County Council for the Crosshaven-Carrigaline-Ringaskiddy  
agglomeration, Reg. No. D0057-01.

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent of more than 10,000.
Licence application received:	14/12/2007.
Notices under Regulation 18(3)(b) issued:	04/04/2008.
Information under Regulation 18(3)(b) received:	30/06/2008.
Site notice check:	03/01/2008
Submission Received	09/04/2008.

### 1. Agglomeration

This application relates to the Crosshaven-Carrigaline-Ringaskiddy agglomeration. The agglomeration comprises of a number of distinct areas: Crosshaven village, Carrigaline town, Shanbally village and includes treated trade effluent from five IPPC industries in the Ringaskiddy area. Waste water in the agglomeration is collected in a partially combined foul and separated foul sewage drainage network.

There is currently no waste water treatment plant and except for treated trade effluent, the waste water discharges untreated. The population equivalent load is stated as 97,556 of which 14,864 population equivalent (p.e.) is domestic and the remainder is non-domestic (82,692 p.e.).

The works currently comprises of six pumping stations. The Coolmore pumping station in Carrigaline is important as it forwards all waste water from Carrigaline and Crosshaven to the Ringaskiddy gravity sewer. This pumping station includes a comminutor chamber. The Shanbally village is served by a single pumping station. The treated trade effluent from the Ringaskiddy industries combines with untreated waste water from the other areas and flows

by gravity through the screening plant and discharges *via* a long sea outfall to Cork Harbour. A flushing pump keeps the deep-water outfall clear.

**Table 1: Network details**

Area	Pumping Station	Storm water holding tanks	Storm Overflows
Crosshaven	2	100m <sup>3</sup> , 155m <sup>3</sup>	2; Owenboy River
Carrigaline	3	70m <sup>3</sup>	3; Owenboy River
Shanbally	1		1; Monkstown Creek
Ringaskiddy	Flushing pump		

Secondary treatment was required under the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) (UWW Regulations) by 31/12/05.

### The Proposed Scheme

The Cork Harbour Main Drainage Scheme (also referred to as the Cork Lower Harbour Sewerage Scheme) is for the provision of collection systems and waste water treatment facilities in the Cork Lower Harbour area serving the agglomerations of Crosshaven /Carrigaline /Ringaskiddy (D0057-01), Cobh (D0043-01), Passage West /Monkstown (D0129-01) and Ringaskiddy village (D0436-01) (see figure 3). It is proposed to construct a new WWTP at Shanbally providing new sewers and secondary treatment with a design capacity of 80,000PE. The treated trade effluent from five IPPC licenced installations will by-pass the proposed WWTP and discharge via the outfall but without further treatment. It is proposed to discharge the treated effluent from the new wastewater treatment plant to Cork Harbour via the existing outfall known as Dognose bank. It is expected that the scheme will be completed by mid to late 2014.

An Environmental Impact Statement (EIS) for the proposed WWTP and associated works was submitted with the application. An Bord Pleanála granted planning permission in June 2009. Separate planning approval will be required for the construction of pumping stations, holding tanks or outfalls for waste water or storm water associated with the conveyance system and that form part of the Cork Harbour Main Drainage Scheme.

The EIS describes indicative designs of the proposed WWTP that aim to meet the quality standards specified in the UWW Regulations but does include provision for nutrient removal or disinfection.

In summary, the existing uncontrolled discharges from the Crosshaven-Carrigaline-Ringaskiddy agglomeration will continue until 2015. Thereafter three other agglomerations will be integrated into this existing agglomeration and will be served by a WWTP at Shanbally. The existing primary discharge will remain operational under the proposal and treated trade effluent will bypass the WWTP and discharge directly to the outfall.

## 2. Discharges to Waters

The primary discharge (SW01RING) is to Lower Cork Harbour, 2.6km from shore near Dognose Bank and at a depth of 30m. It is estimated that there are 1300 dilutions available immediately in the proximity of the discharge point.

As stated previously domestic wastewater from the agglomeration currently discharges untreated with the treated trade effluent from the five IPPC industries (P0006-03, P0010-04, P0013-04, P0476-02, P0778-01) at SW01RING. Each industry provides secondary treatment of their effluent but licence limits are currently in excess of the UWW Regulations standards. These effluents contain certain micropollutants such as detergents and metals.

Based on monitoring data from 2006 to 2008 the average BOD load on the environment from SW01RING is 738kg/day BOD. This is equivalent to 12,300 p.e., thus indicating that the industrial load is significantly overestimated.

Monitoring data indicates that of the dangerous substances monitored, copper and mercury were found in significant amounts in the existing primary discharge. Copper is limited in two IPPC licences.

There are six emergency/ storm water overflows associated with the existing pumping stations. Three stormwater overflows have holding tanks. No information was provided on the conformance of the existing storm water overflows with the DoEHLG 'Procedures and Criteria in Relation to Storm Water Overflows, 1995'.

### Future Discharges

The effluent from the proposed WWTP is expected to meet the quality standards for general components (cBOD, COD, SS) specified in the UWW Regulations. It is anticipated that secondary treatment will achieve a 90% reduction in organic matter, faecal coliforms, *E.coli* and *Norovirus*.

The treated trade effluent from the five IPPC installations will bypass the WWTP. No other industrial wastewater is proposed to bypass the plant.

**Table 2: Loading on the proposed WWTP by 2030**

Agglomeration	Estimated PE in 2030	BOD load in 2030 (kg/d)
Passage West /Monkstown (D0129-01)	11,478	689
Cobh (D0043-01)	27,020	1621
Crosshaven-Carrigaline-Ringaskiddy (D0057-01) Ringaskiddy Village (D0436-01)	41,484	2489
<b>TOTAL Input</b>	<b>79,982</b>	<b>4,799</b>
<b>WWTP treated discharge @ 25mg/l</b>		<b>371</b>
<b>Current IPPC industrial discharges</b>		<b>3,903</b>

Following the amalgamation of the four agglomerations and the provision of secondary treatment in accordance with the UWW Regulations, the BOD load on the environment will significantly reduce (see table 2).

### 3. Receiving waters and Impact

The following table summarises the main considerations in relation to the Cork Harbour (receiving water).

**Table 3. Receiving waters**

Characteristic	Classification	Comment
Receiving water name and type	Cork Harbour	Coastal waters (SW_06_0000). Protected areas within the harbour.
Resource use	Port activities. Shellfish production	Designated shellfish areas: Rostellan North, Rostellan South and Cork Great Island North Channel.

**Table 3. Receiving waters (cont/d)**

Characteristic	Classification	Comment
Amenity value	Fishing, water sports, bathing	No designated bathing area but traditional bathing areas within the Harbour (Gobbin Head, Cuskinny, Aghada Pier). Fountainstown beach is 5.25km from outfall
Applicable Regulations	Shellfish waters <sup>1</sup>	Rostellan North, Rostellan South and Cork Great Island North Channel are designated <sup>2</sup> . No monitoring has been undertaken as these were designated in 2009.
	EU Regulation 854/2004	Class B 2009 (purification required before sale) for Oysters <sup>3</sup> . Based on bacteriological quality.
	EU Regulation 853/2004	Cork harbour mussel production area is currently closed due to biotoxins. <sup>4</sup>
	Bathing Waters <sup>5</sup>	Fountainstown beach in the outer harbour is classed as sufficient <sup>6</sup> .
	EO Regulations <sup>7</sup>	See details under WFD for details. DIN and dangerous substances are exerting pressure.
Trophic classification <sup>8</sup>	Unpolluted 1995 –1999 Intermediate 1999-2005	Dis-improvement from '95-99.
WFD <sup>9</sup> (Cork harbour)	Status: Moderate	Inclusive of DIN and conservation status.
	Risk: 1a (at risk)	WWTPs and dangerous substances identified as pressures.
	Objective: Restore	Restore by 2015 to achieve Protected Area objective and Reduce Chemical Pollution objective.
WFD others <sup>9</sup>	1a (at risk) '05 1b (possibly at risk) 2b (strongly expected to achieve good status)	Cork Outer Harbour (Coastal) Lough Mahon (Transitional) North Channel (Transitional) Owenboy estuary (Transitional) Western Celtic Sea (Coastal)
WFD Protected areas <sup>9</sup>	SPA (4030) Great Island SAC Lee estuary Lough Mahon & Owenacurra estuary North Channel Rostellan North, Rostellan South and Cork Great Island North Channel	Water dependant habitat & species  Nutrient sensitive areas  Shellfish waters
Other designations	Owenboy River pNHA Monkstown Creek NHA Fountainstown beach	5.25Km from the outfall.

**Note 1:** European Communities (Quality of Shellfish Waters) Regulations, 2006 (S.I. 268 of 2006)

**Note 2:** European Communities (Quality of Shellfish Waters)(Amendment) Regulations 2009

**Note 3:** Source: Sea Fisheries Protection Authority website

**Note 4:** Source: Food Safety Authority of Ireland website

**Note 5:** Quality of Bathing Water Regulations, 1992 (S.I. 155 of 1992) and amendments.

**Note 6:** EPA (2009) Quality of bathing water in Ireland Report 2008

**Note 7:** European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 277 of 2009)

**Note 8:** EPA (2008) Water Quality in Ireland 2004 – 2006

**Note 9:** Draft River Basin Management Plan for the South Western River Basin District and interactive maps, December 2008.

## Nutrients

The harbour has a trophic classification of 'intermediate' having been an unpolluted area up to 1999. For this purpose, Cork harbour is the area south of Great Island and north of the Camden Fort/Carlisle Fort line. The primary discharge is located in the main channel just inside Cork Harbour. Underlying this classification the parameter of concern is dissolved inorganic nitrogen (DIN). It was reported in the Cork Harbour Main Drainage Scheme EIS, based on Cork City Council monitoring data 2005-2007 that winter DIN in the area exceeded the critical value. EPA data (2004-2007) submitted as part of the application indicates that the DIN and dissolved oxygen was exceeded. The exceedance for winter DIN singularly, was confirmed by personal communication with the Office of Environmental Assessment, EPA.

The Lee estuary/ Lough Mahon and the Owenacurra estuary / North Channel are designated sensitive areas under the UWW Regulations (see Figure 1). The Lee estuary, Lough Mahon and the North Channel are now classified 'intermediate' due to breaches in the winter DIN criterion. The Owenacurra estuary remains eutrophic due to the high nitrogen levels in the Owenacurra River.

Two indicative designs for the treatment plant are described in the EIS. The secondary treatment component of the design will be either an activated sludge system or Sequencing Batch Reactor (SBR) system. The former will only achieve carbonaceous BOD removal and the latter can achieve nitrification of the waste water prior to discharge. Denitrification of the waste water is not proposed. A linear cascade model of three nitrogen species (organic nitrogen, ammonia and nitrate) was undertaken to predict the effect of treatment and consolidation of numerous discharges from the four agglomerations into one point.

The model considered a scenario of 28.5mg/l total N (15mg/l organic N, 12.5mg/l ammonia N and 1mg/l Nitrate N) post treatment and without nitrification, which was above the average total nitrogen levels reported in the application but below the maximum value. It is predicted (EIS) that nitrogen levels will increase slightly in the outer harbour (Fountainstown, Myrtleville and Roches Point area) and upstream of the outfall but there will be a reduction in Cork Harbour. The increase is 0.05% when the maximum concentrations experienced at Fountainstown from the untreated to the treated scenario, are expressed as a percentage of the European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 277 of 2009) (EO Regulations) of the DIN standard for high status waters. The maximum concentrations at Fountainstown following treatment represent 0.85% of the DIN high status standard.

The model results indicate that Cobh experiences the highest results for all three parameters after 'upstream of outfall' point.

**Table 4: Nitrogen levels at Cobh (max concentrations (µg/l))**

Scenario	Untreated - 10 outfalls (425kg/d)	Treated - single outfall (296kg/d)	Treated - single outfall (424kg/d)
<b>Parameter</b>	<b>41mg/l total N</b>		
Organic nitrogen µg/l	2.97	1.83	2.6
Ammonia µg/l	5.5	1.86	2.6
Nitrate µg/l	4.1	0.815	1.1

Table 4 illustrates the relative improvement in water quality in the harbour as a result of consolidating the discharge points from four agglomerations and providing secondary treatment. The impacts of treated effluent with different total nitrogen loadings (296kg/d and 424kg/d) are shown on Table 4. However, it is important to state that neither background levels nor trade effluent were considered in the table above. The model indicates that due to

treatment and the consolidation of discharges the nitrogen levels in the receiving water could be reduced by 50% from current levels associated with these discharges. The maximum concentrations experienced at Cobh represent 2% of the EO Regulations of the DIN standard for high status waters.

The EIS states that 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 and would lead to a decrease in algal mats and *Enteromorpha* plants. However, the EIS failed to quantify the effects on the trophic classification of the harbour in particular the DIN parameter.

The model results are limited in that they only considered the discharges from the proposed WWTP, some 424kg/day total nitrogen under the worst-case scenario. Co-incidentally the current discharge of total nitrogen from all the agglomerations concerned (Cobh, Passage West, Monkstown, Glenbrook, Ringaskiddy, Crosshaven and Carrigaline) including the trade effluent is very similar at approximately 434kg/day. The contribution of the Crosshaven-Carrigaline-Ringaskiddy agglomeration is currently estimated at 151kg/day, which is significantly lower than the reported IPPC loading at licence limits of 1,587kg/day total nitrogen. As stated previously monitoring data indicates that the IPPC loading is significantly less than that provided for by licence limits.

The primary discharge is located in the deepest water of the harbour with shortest flushing times. The model results indicate that water quality will improve. The Recommended Licence (RL) sets a concentration limit of 28.5mg/l for total nitrogen in line with the EIS model assessment. The RL sets a mass emission limit of 424kg/day for total nitrogen for the following reasons:

- DIN is exerting pressure in the receiving water giving an intermediate trophic classification.
- The EIS only considered a loading of 424kg/day total nitrogen and regard must be had for the EIS in the consenting process.
- The mass emission limit is approximately that discharged currently to the harbour. In order to prevent deterioration of the receiving water in line with Article 5 of the EO Regulations, a mass load is specified at near current loading levels.

*Article 5: A public authority shall not, in the performance of its functions, undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status (or ecological potential as the case may be) of a body of surface water.*

- Article 7 (a) of the EO Regulations requires the setting of mass emission limits.

*Article 7(a): the emission limits shall establish the maximum concentration and the maximum quantity of a substance permissible in a discharge and shall aim to achieve the environmental objectives established in Part III of these Regulations including the environmental quality standards set out in Schedules 5 and 6 and any standards or objectives laid down for protected areas.*

The RL does not require nutrient removal but these limits may require it to allow for further development or reassess the impact. This limit may require the applicant to re-consider/ review IPPC discharges in order to meet the limit at the primary discharge. Total nitrogen is limited in the RL in preference to individual limits on ammonia and total oxidised nitrogen (components of DIN) as it takes account of the total nitrogen component of the discharge, was considered in the impact assessment (EIS), and provides adequately for DIN in the receiving water. As previously stated the model considered ammonia levels of 12.5mg/l and nitrate levels of 1mg/l.

## **Bacteriological Quality and Shellfish Waters**



Figure 1 illustrates the extent of the designated shellfish waters in Cork Harbour. The area is Class B for oysters requiring purification before sale, which indicates the poor bacteriological quality of the waters in the vicinity of the farms. The primary discharge is located approximately 6.8km from the outer harbour oyster fishery and shellfish waters.

With secondary treatment it is predicted that faecal coliforms in the effluent will be reduced by 80-95% from current levels and the concentrations of Norovirus in the harbour would be reduced by 90-95% from existing levels. Modelling of the release, transport and decay of micro-organisms in Cork Harbour due to the discharges of treated and untreated waste water discharges from the agglomerations concerned (Cobh, Passage West, Monkstown, Glenbrook, Ringaskiddy, Crosshaven and Carrigaline) was undertaken. It should be noted that other discharges including storm water overflows or trade effluent were not considered. Consequently the results are indicative of relative improvement and **not** absolute water quality.

The maximum concentrations of faecal coliforms across the harbour following provision of treatment for wastewater from the agglomeration were predicted as 2 to 400 faecal coliforms/100ml (reduced from 2-1500FC/100ml untreated discharges). The contribution of faecal coliforms from the treated discharges is well within the quality standard for bathing waters ( $\leq 2000$ cfu/100ml).

The shellfish waters regulations only specifies a flesh standard of  $\leq 300$  faecal coliforms /100ml. There is no water quality standard for micro-organisms and this scientific area is particularly complex with bioaccumulation and species dependant factors to be considered. In the USA, Canada and Australia shellfish growing waters are classified as 'approved' when the median or geometric mean faecal coliform Most Probable Number (MPN) of the water does not exceed 14/100 ml. Regard is had for this standard for the purposes of scale and context.

The **relative improvement** in bacteriological water quality at the oyster farms in Rostellan and the North Channel are summarised in table 5 below. The EIS does not state that the area could be reclassified but the reduction of faecal coliform concentrations will have a positive effect on shellfish bacteriological quality.

**Table 5: Faecal Coliform /E.coli (max concentrations per 100ml - T90 12hr<sup>1</sup>)**

Location	Untreated ( $1.0 \times 10^7$ FC/100ml) - 10 outfalls (Spring Tide)	Treated ( $1.0 \times 10^6$ FC/100ml) - single outfall (Spring Tide)	US/ Canada /Australia Approved water standard (geo- mean MPN)
Oyster F – North channel	7.8 FC/100ml	0.2 FC/100ml	14FC/100ml
Oyster F – Outer (Rostellan)	3.7 FC/100ml	0.9 FC/100ml	14FC/100ml

Although the model did not address treated trade effluent or more specifically the domestic portion of such discharges to the network, it did consider a worst case scenario of 14,873m<sup>3</sup>/day which adequately caters for any potential bacterial contribution from trade effluent.

The model also predicted that there would be a relative reduction of at least 80% in the number of *Norovirus* as a result of treatment. The occurrence of *Norovirus* in sewage is as a result of an outbreak of 'winter vomiting bug', which can then cause gastroenteritis following consumption of raw oysters. Oysters are harvested during the winter months. There is no quality standard for *Norovirus* and unlike faecal coliforms, the virus has a relatively slow die

<sup>1</sup> The time required for 90% decay rate of coliform bacteria is 12 hours.

off rate of approximately 30 days. The Cork CC and UCC "*Modelling the Norovirus contamination of an oyster farm in Cork Harbour*", 2007 report submitted with the Midleton agglomeration (D0056-01) application, describes the relative contribution of all significant discharges to the contamination of the oyster farm. Appendix C to the study outlines that the untreated discharges from Cobh, Passage West, Monkstown are significant at 28% (maximum concentrations of *Norovirus*) at Rostellan. This inspector estimates that secondary treatment of this waste water alone will reduce that relative contribution to approximately 6%. Other contributors include, storm water overflows, Cork City (Carrigrennan), Midleton, Cloyne, Whitegate, Aghada, etc., waste water discharges and individual houses.

The EIS describes that the WWTP will result in an improvement in water quality which will have a long-term positive impact on beaches utilised by locals and tourists and on public health and safety. The EIS predicts a reduction in biotoxins associated with phytoplankton blooms.

The Agency is obliged under the European Communities (Quality of Shellfish Water) Regulations, 2006 (S.I. 268 of 2006) (Shellfish Waters Regulations) to comply with the quality standards specified in Schedule 2. There is no quality standard for faecal coliforms in this Schedule. Under the Shellfish Waters Regulations the Minister of Environment, Heritage and Local Government is to try to ensure that shellfish waters comply the quality standards specified in Schedule 4 which sets the shellfish flesh standard of  $\leq 300$  faecal coliforms /100ml as a guide value.

Shellfish Waters Regulations:

*6. (1) The Minister shall, in consultation with the prescribed public authorities, establish a programme of action in respect of each area of shellfish waters with a view to providing that, as far as reasonably practicable, those waters comply with the Shellfish Waters Directive and these Regulations. In particular, the objective of such a programme must be to take reasonably practicable steps to reduce pollution in those waters with a view to meeting the standards specified in Schedule 4.*

Under EU Regulation 854/2004, Cork harbour shellfish production areas are classified B, which indicates that these shellfish waters do not comply with the shellfish flesh standard. Monitoring of shellfish water in accordance with the Shellfish Waters Regulations has not been undertaken in the harbour as the shellfish areas within the harbour were designated only in 2009 but the Marine Institute will undertake this monitoring in the future. A programme of action has yet to be published for this shellfish water as required by the Regulations. These programmes have been published for other designated shellfish waters.

Secondary treatment and the consolidation of discharges will significantly reduce the relative contribution of these four agglomerations to the contamination in the region of the oyster farms located at Rostellan and the North Channel. Although the model assessment indicates that the discharge would not be a significant contributor, in the absence of water quality standards, a definitive assessment cannot be made. In order to close this knowledge gap, the RI requires the licensee to review their assessment in consultation with DoEH/G, Sea Fisheries Protection Authority, the Marine Institute and An Bord Iascaigh Mhara and implement the recommendations arising, which may include UV disinfection where the discharge is indicated to be having a deleterious effect on the quality of shellfish.

The RI does not specify emission limit values for the parameters (metals, organics, colour etc) specified in the Shellfish Waters Regulations due to the available dilutions and the distance to the shellfish waters (~6.8km). Requirements are specified in the RI with regard to such substances and these are discussed below. If water quality data indicates any failure of compliance with the mandatory values (Schedule 2 of the Shellfish waters regulations) and its attributed to the primary discharge, Condition 3.6 requires that the Water Services Authority take 'such measures as are necessary'.



## Dangerous substances and the Birds Directive

The National Parks and Wildlife Service (NPWS) advised Cork Co. Co. that the discharge requires an appropriate assessment with regard to the SPA (4030) (see figure 2) having particular reference to projected PE loads, effects in combination with other WWTP discharges and the bioaccumulate and ecotoxicologically effects of heavy metals and persistent organic pollutants (POPs) from industrial and other discharges.

The appropriate assessment undertaken by Cork Co. Co. concluded that the provision of the proposed WWTP will not have a significant adverse effect on the SPA but will have a positive effect through the reduction in heavy metal and POPs released to the harbour. The main points of the assessment are summarised as follows:

- Monitoring by the Marine Institute of oyster flesh in Cork harbour (1997 to 2005) did not show elevated levels of either heavy metals or POPs. Thus indicating the low level of contamination with respect to these parameters in the ambient water quality currently.
- In 2004 UCC measured contaminants in sediments at Aghada and Whitegate and the results indicated that levels of PAH, PCB's OCPs, BFRs, organotin and metals (copper, lead, cadmium, zinc) were relatively low.
- Secondary treatment will decrease levels of heavy metals.

This inspector notes that the levels of heavy metals in oysters were assessed against levels permitted for human consumption. When the levels are compared against the EC standard<sup>2</sup> mercury levels in oysters exceed the EC standard (20µg/kg (ww)).

The assessment did not address the treated trade effluent from the IPPC installations but none of the individual metals and substances limited in the IPPC licences are priority substances. However copper and zinc are 'specific pollutants'. It is noted that a limit is set in two licences for 'heavy metals' which by definition includes priority substances. As discussed earlier copper and mercury were detected at significant levels in the existing discharge but only 20 dilutions are needed to meet the standards specified in the EIO Regulations.

In the context of the impact of dangerous substances on protected areas, other data sources provide information on Cork harbour and these are discussed as follows:

In the EPA Dangerous Substances Regulations - National Implementation Report 2005, Cork harbour was reported as non-compliant with regard to Cu, Cr, Pb and Zn. It is important to note that the monitoring was undertaken in the 1980's. It was further reported in the EPA Report that

- pollution levels for Tributyl tin (TBT) in Cork Harbour were high due to antifouling paint used on boats.
- lead levels in mussels were elevated in 1999 but lead levels in shellfish were compliant in 2001 and 2002.
- Cork County Council has expressed concerns relating to the levels of dangerous substances in waters surrounding the Irish Ispat plant in Cork Harbour. Historical monitoring indicated elevated levels of metals at Blackpoint. Analysis of sediments and dredge material in Cork Harbour and near to the Naval Base also indicates the presence of dangerous substances.

The Marine Institute in 1999 reported elevated concentrations of mercury, Cadmium, tributyltin, zinc, copper and PCB's in sediments and elevated concentrations of dissolved metals in the harbour (mercury, organotins)<sup>3</sup>.

---

<sup>2</sup> Council Directive 2008/105/EC on environmental water quality standards in the field of water policy.

<sup>3</sup> Ireland's Marine and Coastal Areas and Adjacent Seas: An Environmental Assessment, 1999.

More recently data was collected under the Water Framework Directive and the Dangerous Substances Screening Monitoring Programme TNO reports, 2008 (see [www.wfd.ie](http://www.wfd.ie)) indicated significant levels of mercury and di-n-butylphthalate in the water of Cork Harbour. The mercury levels in the receiving water exceed the standards specified in the EO Regulations and the Shellfish Waters Regulations. The same survey observed elevated PCB levels in sediments and mussels within the harbour having regard to the OSPAR environmental assessment criteria.

In summary, certain metals and PCB co-geners have been detected in the Cork harbour. There is a lack of monitoring data but the recent designation of certain parts of Cork harbour as shellfish waters may meet this shortcoming. The Marine Institute monitors seawater samples from designated shellfish waters twice annually for trace metals and organochlorines. There is no evidence of an on-going impact on the SPA and the site synopsis to the SPA states *'polluted conditions may not be having significant impacts on the bird populations'*.

The EIS addressed the ecological impact of reduced nutrient inputs as a result of the proposed scheme, highlighting an expected increase in invertebrate diversity, reduction in phytoplankton blooms and algal mats, increase in the value of the harbour as a fish nursery and a reduction in the forcing of primary production in Lough Mahon and in the North Channel.

The provision of a WWTP will improve the quality of discharges to the harbour. In order to reduce chemical pollution (dangerous substances), the RL specifies a number of requirements:

- further screening of the primary discharge for specific pollutants and priority pollutants as specified in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009) (EO Regulations);
- on-going monitoring of the discharge for those priority pollutants highlighted during the Screening Programme discussed above and detected in the discharge;
- toxicity testing of the primary discharge and specifies a toxic unit limit of 10 in line with the IPPC licences.
- a PRTR;
- an investigation of sources and taking of measures, and
- a Programme of Improvements that includes a requirement to reduce priority substances in the discharge and cease discharges and losses of priority hazardous substances.

These requirements will quantify any losses of priority pollutants and reduce chemical pollution.

### **Other components and the RL**

The RL specifies ELV's for BOD, COD and SS in line with the UWW regulations for the primary discharge and specifies that the monitoring point is at the final landfall point on the network to ensure monitoring captures all discharges to the network. These ELV's for the combined discharges of treated trade effluent and the effluent from the proposed WWTP.

In accordance with Agency policy and the combined approach, these emission limit values are effective immediately. The applicant cannot meet these limits before the completion of the proposed WWTP and associated works. As IPPC industrial discharges to the sewer will by-pass the proposed treatment plant, the RL requires an assessment of industrial discharge licences and a plan of improvement as part of the Programme of Improvements. The RL further requires flow proportional composite sampling given that trade effluent by-passes the plant. It is anticipated that the BOD load will be in the order of 514kg/day, which represents a significant reduction of organic load from the combined agglomerations.

The RL requires an annual report on water quality to demonstrate that there has been no deterioration in the status of the receiving water as a result of discharges from the agglomeration prior to the provision of secondary treatment. The RL recognises that monitoring of coastal waters is undertaken by a number of agencies including the EPA and consequently Cork County Council is only required to carry out such monitoring deemed necessary. If a deterioration in the status of the receiving waters is noted, and is attributed to the discharges from this waste water works, Condition 2.2 requires that the Water Services Authority take 'such measures as are necessary' to prevent such deterioration.

In relation to the existing storm water overflows, the RL requires an assessment to be undertaken and reported by the second AER and improvements to be completed by 1<sup>st</sup> January 2015.

#### **4. Water Framework Directive**

The following summary information has been abstracted from the draft River Basin Management Plan, December 2008<sup>4</sup>. Cork harbour has a 'moderate' status. The elements that contribute to this description and in so far as they may relate to the UWW discharges are DIN and conservation status. The 1a risk is attributed to the UWWTPs and dangerous substances. The overall objective is to restore protected areas and reduce chemical pollution by 2015. Measures identified in the Action Plan include: appropriate assessment (Birds Directive) is carried out, licence UWW discharges, ensure shellfish waters meet the quality standard, reduce priority pollutants and increase WWTP capacity. The measures/actions do not include nutrient removal.

The RL requires secondary treatment and sets ELV's for general components eBOD, COD, SS and total nitrogen, which aim to restore water quality. The RL specifies requirements to reduce chemical pollution from the primary discharge. At this time, there are no specific environmental quality standards or objectives laid down for the protected area (water dependant habitat and species - SPA) under the EO regulations.

#### **5. Programme of Improvements**

As stated above, Crosshaven-Carrigaline-Ringaskiddy agglomeration is part of the Cork Harbour Main Drainage Scheme. It is proposed to connect a number of agglomerations and provide secondary treatment. It is proposed to pump Cobh waste water across the Passage West Channel and the combined flow of Cobh, PassageWest/Monkstown is pumped forward to the proposed WWTP at Shanbally. The wastewater from Crosshaven-Carrigaline-Ringaskiddy will also be treated at the proposed WWTP at Shanbally. It is proposed that pumping stations and associated overflows will be designed in accordance with the DoEHLG 'Procedures and Criteria in relation to Storm water Overflows', 1995. These works are due for completion by mid to late 2014.

#### **6. Compliance with EU Directives**

In considering the application, regard was had for the requirements of Regulation 6(2) of the Waste Water (Discharge) Authorisation, Regulations, 2007 (S.I. No. 684 of 2007) notably:

- Water Framework Directive [2000/60/EC]

This is discussed above.

- Urban Waste Water Treatment Directive [91/271/EEC]

---

<sup>4</sup> Draft South Western River Basin Management Plan, December 2008 and interactive maps ([www.WFD.ie](http://www.WFD.ie)).

The receiving water is not designated sensitive and the requirements of the Directive have been transposed as discussed above.

- Shellfish Waters Directive [2006/113/EC]

Secondary treatment and the amalgamation of discharges will significantly reduce the bacteriological contribution from these discharges to designated shellfish waters.

- Dangerous Substances Directive [2006/11/EC]

The RL specifies requirements to reduce Chemical Pollution.

- Birds Directive [79/409/EEC] & Habitats Directive [92/43/EEC]

The EIS and further assessment was undertaken to address the impact of discharges on the Cork Harbour SPA. The amalgamation of discharges and the provision of secondary treatment mean that the primary discharge is not likely to have a significant effect.

The RI requires secondary treatment and the provision of adequate infrastructure for storm water overflows by the 1<sup>st</sup> January 2015.

## 7. Submissions

One submission was received in relation to this application.

1. Mr. Hugh Jones, Atlantic Shellfish Limited

Mr. Hugh-Jones objects to the licensing of discharges of raw sewage from Ringaskiddy as they are in contravention of the UWW Directive and Regulations and, in danger of infraction proceedings. The huge BOD load to be discharged without treatment to Cork Harbour cannot be licensed until it complies with the UWW Directive and Regulations.

The company is the holder of the Oyster Fishery (Cork Harbour) Order, 1963, which covers waters to the east of Cuskinny Bay and Long Point and they have oyster trestles on the foreshore of Rostellan and also extensive subtidal layings. They believe the area is to be shortly designated under the Shellfish Waters Directive following European Court of Justice proceedings and trust that the requirements of this Directive will be observed in setting consent for the future treated discharge.

He highlights that in the hydrodynamic survey, *“Modelling the norovirus contamination of an oyster farm in Cork Harbour”*, submitted as supporting information for the County Council’s Application for a WWDI, for the Middleton WWTP discharges (D0056-OI), Prof. O’Kane devotes Chapter 6 to looking at the effect of the Carrigaline and Crosshaven sewage discharges on the oyster beds covered by this Oyster Fishery Order in the Lower Harbour and concludes that, at present, the discharge of sewage contributes approximately a third of the contribution of Cobh and Ringaskiddy village, under summer conditions, to these beds and about half in the winter. Mr. Hugh –Jones states that ‘until the sewage from the towns of Carrigaline, Crosshaven and Ringaskiddy and, indeed, all these Lower Harbour and Passage West towns, is fully treated, we trust that you will not see fit to license their numerous discharges of untreated sewage into Cork Harbour’.

### *Comment:*

The RI requires the provision of secondary treatment by 2015. The secondary treatment of waste water reduces significantly (up to 90%) pathogenic micro-organisms levels. Rostellan North and Rostellan South have been designated under Shellfish Waters Directive and Regulations in 2009. The impact of discharges on the shellfish waters is discussed extensively above. The RI requires the licensee to review their bacteriological impact assessment in consultation with DoEHLG, Sea Fisheries Protection Authority, the Marine Institute and An Bord Iascaigh Mhara and implement the recommendations arising, which may include UV disinfection where the discharge is indicated to be having a deleterious effect on the quality of shellfish. The RI requires the Water Services Authority to, at all times prior

to the provision of treatment, take such measures as are necessary to ensure that significant environmental pollution is not caused as a result of the discharge.

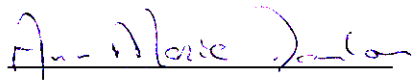
## **8. Charges**

The RL sets an annual charge for the installation at €4,304 and is reflective of the monitoring and enforcement regime being proposed for the agglomeration. Sampling and analysis will not be undertaken until post 2015.

## **Recommendation**

I recommend that a Final Decision be issued subject to the conditions and for the reasons as set out in the attached Recommended Decision.

Signed

A handwritten signature in blue ink that reads "Ann Marie Donlon". The signature is written in a cursive style and is positioned above a horizontal line.

Ann Marie Donlon

Office of Climate, Licensing and Resource Use

Figure 1: Nutrient Sensitive Areas (red stripe) and Shellfish Waters (green stripe)

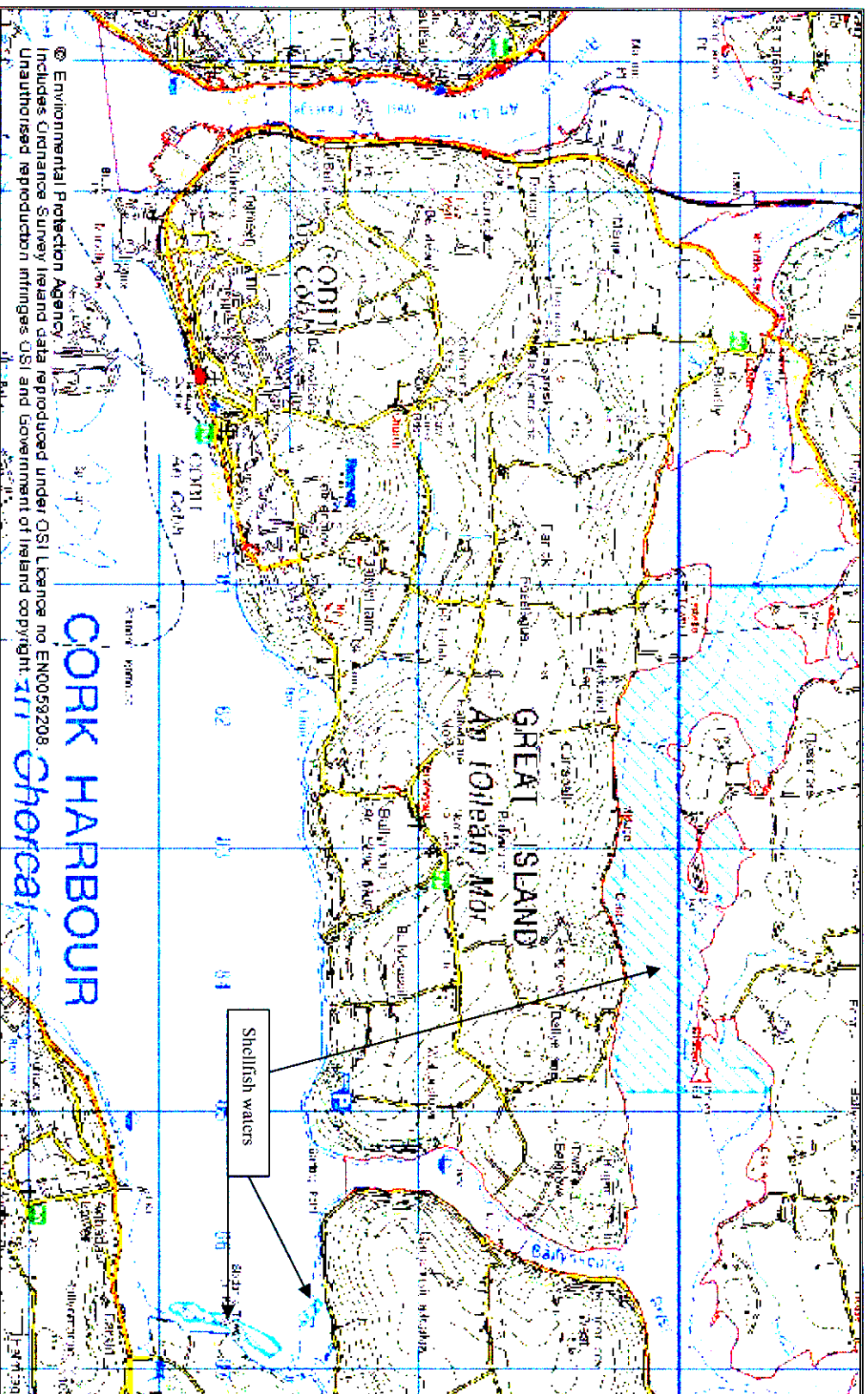
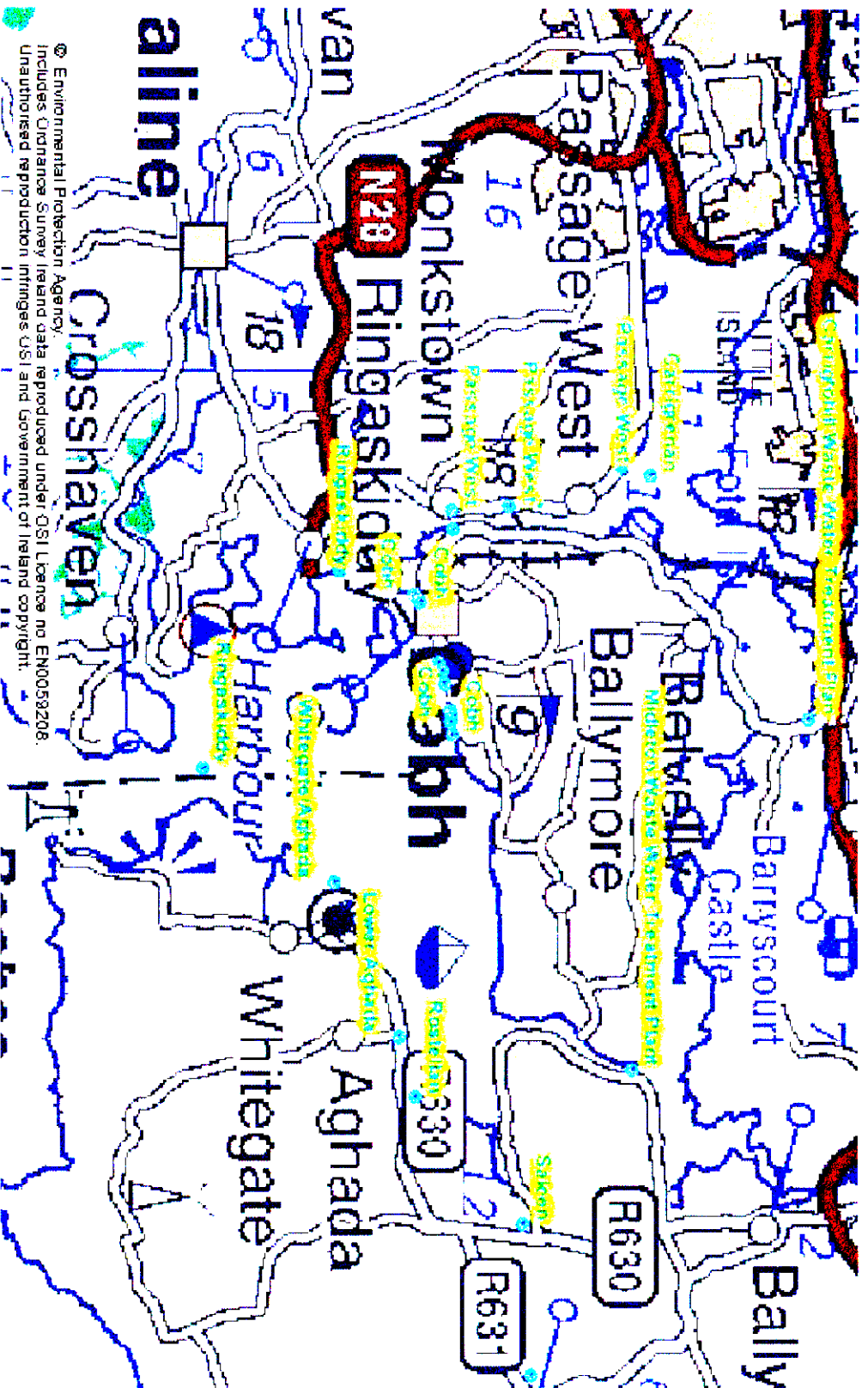






Figure 3: UWW Discharge Points to Cork Harbour



© Environmental Protection Agency.  
 Includes Ordnance Survey Ireland data reproduced under OSI Licence no. EN00592208.  
 Unauthorised reproduction infringes OSI and Government of Ireland copyright.