This report has been cleared for submission to the Board by the Programme Manager Frank Clinton.
Signed [signature] Date 3/6/10

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:	11th June 2010	
RE:	Application for a Waste Water Discharge Licence from Cork County Council Southern Division, for the agglomeration named Cloyne, Reg. No. D0298-01	

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent between 1,000 and 2,000
Licence application received:	27/02/2009
Notices under Regulation 18(3)(b) issued:	None
Notices under Regulation 20(1) issued:	15/12/2009
Site notice check:	25/03/2009
Site visit:	05/11/2009
Submission(s) Received:	04/06/2010

1. Agglomeration

This application relates to Cloyne agglomeration. Waste water in the village of Cloyne is collected by a partially combined foul sewerage network. There are five pumping stations within the agglomeration and all are without emergency overflows. Only one pumping station (PS) has been taken in charge by Cork County Council (River Street PS).

Cloyne waste water treatment plant (WWTP) provides tertiary treatment by activated sludge initially and then by reed bed (constructed wetland). The treatment plant has a design capacity of 1,400 population equivalent (PE). The WWTP is currently operated by a private operator under a 10 year Operation and Maintenance contract. The waste water is predominantly domestic in nature. The stated existing load is estimated at 1,800PE which is treated adequately by the WWTP as indicated by discharge quality. It is stated in the application that the WWTP is deemed adequate to treat up to 2,000PE. The load from developments granted planning permission but not commenced is calculated as 1,120PE. The WWTP cannot cater for this additional load and this is discussed further below.

The applicant proposes to upgrade the treatment plant capacity to 3,000PE and relocate the outfall to the sea at Ballycotton. This proposal does not have planning permission and is proposed under the Serviced Land Initiative Funding Programme. No further details were provided and therefore this proposal is not considered as part of the application.

It was noted during the site visit to the WWTP that the reed bed is not currently actively managed but the operator is looking to improve this aspect of site management. The WWTP is hydraulically designed to take 3 times the DWF (~ $45m^3/h$).

2. Discharges to waters

The primary discharge from the WWTP is to the Spital Stream, which flows into Cork Harbour 3 km down stream. The discharge can easily achieve the quality standards specified in the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) (UWWT Regulations). The average BOD is < 5mg/l and average SS is < 10mg/l. The reed beds do not appear to have an effect on the phosphorus levels with average levels of 2.6mg/l Total P upon discharge. The reed bed is lined with a plastic liner and therefore the risk of loss of treated effluent to ground is low.

The primary discharge is also a storm water overflow with excess flows by-passing the treatment plant and joining the final effluent after the effluent monitoring point. There is no information as to whether this SWO complies with the DoEHLG 'Procedures and Criteria in Relation to Storm Water Overflows, 1995'. The Recommended Licence (RL) requires the SWO to be assessed and remedial action taken if necessary by 2013.

3. Receiving waters and impact

The primary discharge is to the Spital stream. The present dilution factor is 1:1 and therefore there is no assimilative capacity. One round of ambient monitoring data (one sample taken upstream and another downstream) indicates that downstream is being impacted with regard to orthophosphate (<0.05mg/l upstream rising to 0.12mg/lP downstream) in particular. As this stream is less than $10km^2$ in catchment size, the receiving water is regarded as Cork Harbour under the Water Framework Directive. Therefore the following assessment relates to the Harbour. The following table summarises the main considerations in relation to Cork Harbour downstream of the primary discharge (around the Spital estuary) (see Figure 1).

Table 1.0 Receiving waters

Characteristic	Classification	Comment
Receiving water name and type	Cork Harbour	Coastal water body
Resource use	Shell fish production	
Amenity value	Water sports, bathing	No designated bathing area but traditional bathing areas within the Harbour (Gobbin Head, Cuskinny, Aghada Pier).
Applicable Regulations	Shellfish waters [1]	Rostellan North, Rostellan South, Rostellan West and Cork Great Island North Channel are designated[2]. No monitoring has been undertaken as these areas were designated in 2009.
	EU Regulation 854/2004	Class B 2009 (purification required before sale) for Oysters[3]. Based on bacteriological quality.
	EU Regulation 853/2004	Cork harbour mussel production area is currently closed due to biotoxins.[4]
	EO Regulations [5]	See WFD below for details.
Trophic Status	Unpolluted 1995 –1999 Intermediate 1999-2005 Intermediate 2006-2008	Dis-improvement from '95-99. DIN level elevated. [6]
WFD[7]	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 protected areas[7]	SPA (4030)	Water dependant habitat & species. The Spital stream discharges into the SPA
	Owenacurra Estuary/ North Channel	Nutrient sensitive area
	Rostellan North, Rostellan South, Rostellan West and Cork Great Island North Channel	Shellfish waters

Note 1: Quality of Shellfish Water, 2006 (S.I. 268 of 2006).
Note 2: European Communities (Quality of Shellfish Waters)(Amendment) Regulations 2009 and European Communities (Quality of Shellfish Waters)(Amendment) (No.2) Regulations 2009
Note 3: Source: Sea Fisheries Protection Authority website
Note 4: Source: Food Safety Authority of Ireland website
Note 5: European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 277 of 2009)
Note 6: EPA (2008) Water Quality in Ireland 2004 – 2006 and EPA (2009) Water Quality in Ireland 2007 – 2008: Key Indicators of the Aquatic Environment
Note 7: River Basin Management Plan for the South Western River Basin District, April 2010 and interactive map.

As described in Table 1 above, the main considerations in relation to Cork Harbour in the vicinity of the discharge is its intermediate nutrient status, the recent designation of shellfish waters, the occurrence of dangerous substances and the SPA.

Nutrients and the Water Framework Directive (WFD)

The intermediate status of Cork Harbour under the Trophic Status Assessment Scheme relates to an exceedance of the Dissolved Inorganic Nitrogen (DIN) criteria. The moderate status of Cork Harbour under the WFD is inclusive of DIN. Cork Harbour is not designated nutrient sensitive under the UWWT Regulations.

The average total nitrogen levels in the discharge are less than 10mg/l or 9kg/day. This latter value reported in the application is based on maximum flows and the mass emission is more likely to be approximately 3kg/day (based on average flow and average concentration). Reed bed treatment removes nitrogen through nitrification, denitrification, plant uptake and adsorption. From one round of influent sampling, it would appear that the treatment plant is removing approximately 80% total nitrogen. The application contains only one result for nitrate (1.36mg/l) in the primary discharge and ammonia values range from <0.1mg/l to 16.2mg/l.

The European Communities Environmental Objectives (Surface waters) Regulations, 2009 (EO SW Regulations) specifies a standard for DIN, which is currently exceeded in the ambient water of the harbour. The relative contribution of the primary discharge to DIN levels in the harbour is considered low at an average daily load of 3kg total nitrogen. The RL specifies an annual average concentration limit of 15mg/l for total nitrogen in order to protect the receiving water. This limit is in accordance with the UWWT Regulations for nutrient sensitive areas and ensures that denitrification continues to occur across the plant. The RL does not specify limits for ammonia and total oxidised nitrogen due to the variable and limited data available as discussed above. A limit for total nitrogen provides adequately for the DIN quality standard and takes account of all nitrogen in the discharge. The RL further requires, as part of the Programmes of Improvements, the reduction of nitrogen loadings.

The EO SW Regulations do not specify a standard for molybdate reactive phosphorus in coastal waters such as Cork Harbour. There is no clear evidence of phosphorus removal at the waste water treatment plant particularly in regard to the reed bed. Consequently the RL does not specify limits regarding phosphorus but does require the reduction of phosphorus loadings under the Programme of Improvements.

Shellfish waters

The primary discharge discharges 3km upstream of the nearest shellfish waters (see figure 1). The shellfish production area: Rostellan North, is located at the mouth of Spital stream and Rostellan South is located near Siddons Tower (see Figure 1). Rostellan West is located west of Rostellan South. These shellfish production areas were designated as 'shellfish water' in 2009. The Pollution Reduction Programme for each shellfish water has been published and faecal contamination within / in the vicinity of these shellfish areas was identified as a problem. Cloyne discharges were not identified as a key pressure in the pollution reduction programme.

The WWTP provides tertiary treatment by reed bed. Activated sludge plants can reduce up to 90% of faecal coliforms in the waste water. Reed beds are known to remove pathogens through sedimentation, filtration, natural die-off etc. The EPA STRIVE report 'On-site Wastewater Treatment: Investigation of rapid percolating subsoils, reed beds and effluent distribution' reported mean concentrations of 120 to 240 MPN/100ml of *E.coli* in reed beds for tertiary treatment indicating good removal rates.

No monitoring of the discharge for micro-organisms has been undertaken. The relative contribution of this agglomeration to the contamination in the harbour is difficult to assess, as there are other untreated discharges in the vicinity of the shellfish water. The Marine Institute was notified of the application but has not made a submission. The RL requires an assessment of the microbiological impact of the discharges (including the storm water

overflow) on the shellfish water and requires remedial measures to be implemented, which are likely to relate to the storm water overflow.

Where water quality data indicates any failure of compliance with the mandatory values (Schedule 2 of the Shellfish waters regulations) and it is attributed to the primary discharge, Condition 3.2 requires that the Water Services Authority take 'such measures as are necessary' to ensure that no deterioration in the quality of the receiving waters shall occur as a result of the discharge.

Dangerous substances

The primary discharge was monitored for a range of dangerous substances and no significant levels were detected in the discharge. It is noted that the influent sample detected significant levels of phenols and zinc but these were not detected in the discharge. Reed beds are known to remove metals and immobilize them in the anaerobic mud layer. The RL requires an investigation of sources of phenol and zinc and the taking of appropriate measures to reduce these substances in the discharges.

Birds Directive

The designated special protection area (SPA) under the Birds Directive, site code 4030, includes the area occupied by the Spital estuary and extends as far north as the Ballynacorra passage and South to Aghada Pier. The shellfish production areas, Rostellan North, Rostellan South and Rostellan west, are within the SPA. The site synopsis for the SPA states that '*the polluted conditions may not be having significant impacts on the bird pollutions*'. In accordance with the EU Birds Directive (79/409/EEC), Cork County Council undertook stage one (screening) assessment which concluded that no significant impacts are evident or predicted on species for which the SPA is designated because the treated effluent complies with standards laid down in the UWWT regulations and is discharging to a large well-exchanged body of water where dilution and dispersion potential is high.

Tertiary treatment provides excellent removal of BOD, COD and SS as highlighted by monitoring results discussed above. Reduced organic loading from the agglomeration helps prevent deoxygenating conditions occurring in the harbour. The harbour currently does not exceed the oxygen criteria for trophic classification. As discussed above the reed bed is lined and to ensure that losses of wastewater is limited to evaporation and transpiration, the RL requires a hydraulic balance to be undertaken of the plant on an biannual basis.

As the receiving water is technically Cork Harbour, the RL does not require ambient monitoring to be undertaken but does require a report on the quality of shellfish waters to be submitted annually.

4. Combined Approach

The Waste Water Discharge Authorisation Regulations, 2007 (S.I. No. 684 of 2007) specify that a 'combined approach' in relation to licensing of waste water works must be taken, whereby the emission limits for the discharge are established on the basis of the stricter of either or both, the limits and controls required under the Urban Waste Water Treatment Regulations (S.I. No. 254 of 2001) and the limits determined under statute or Directive for the purpose of achieving the environmental objectives established for surface waters, groundwater or protected areas for the water body into which the discharge is made. The RL as drafted gives effect to the principle of the Combined Approach as defined in S.I. No. 684 of 2007 **by basing limits on the performance of the tertiary treatment plant, 10/10 (cBOD/SS) standard and a concentration limit for total nitrogen.**

5. Programme of Improvements

Although the applicant proposes to upgrade the treatment plant capacity to 3,000PE and relocate the outfall to the sea at Ballycotton, this proposal is at an early stage and is not considered here. Schedule C of the RL does not require any specified improvement programme for the primary discharge. It is noted that the applicant has already approved developments that will result in an over loading of the existing plant. The RL specifies ELV's that represent an efficient plant and these ELV's will be exceeded if the plant is overloaded and may result in enforcement action. The RL further requires the monitoring of treatment capacities and requires the applicant to seek a review where treatment capacity will be exceeded (see Condition 1.7).

6. Compliance with EU Directives

In considering the application, regard was had to 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]

As discussed above the RL requires that there will be no further deterioration of the receiving water quality as a result of these discharges.

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

The receiving water is not designated sensitive. The level of treatment provided is tertiary.

- Shellfish Waters Directive [2006/113/EC]

The identified pressure on shellfish waters as discussed above is bacteriological. The RL requires an assessment of the microbial impact of the discharges on the shellfish waters and remedial measures as necessary.

- Dangerous Substances Directive [2006/11/EC]

No significant levels of dangerous substances were detected in the primary discharge.

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

So long as there is no further deterioration in water quality the primary discharge is not considered to have a likely significant effect on the current conservation status of the SPA.

7. Cross Office Liaison

Advice and guidance issued by the Technical Working Group (TWG) was followed in my assessment of this application. Advice and guidance issued by the TWG is prepared through a detailed cross-office co-operative process, with the concerns of all sides taken into account. The Board of the Agency has endorsed the advice and guidance issued by the TWG for use by licensing Inspectors in the assessment of wastewater discharge licence applications.

8. Submissions

One submission was received in relation to this application. The submission was read and is summarised below.

Mr. Hugh–Jones, Atlantic Shellfish Limited

Mr. Hugh-Jones points out that there are now three designated shellfish waters in the Lower Harbour. He points out that siting of the outfall is of paramount importance to shellfish production particularly in relation to Norovirus contamination. He says that discharge to the open sea in Ballycotton Bay might prevent another costly Midleton debacle, be a less onerous option and safer for human health.

Mr. Hugh-Jones enclosed a copy of a report commissioned by Cork Co. Co. from Dixon-Brosnan on the impact that the proposed development (Saleen WWTP) may have on the oyster trestles at the mouth of Saleen Creek.

Comment

The recent designation of shellfish waters in Cork Harbour has been taken into account in the assessment of this application for the Cloyne agglomeration. The proposed outfall at Ballycotton Bay was not considered, as insufficient information was provided in the application. The report submitted by Mr. Hugh-Jones primarily related to the Saleen agglomeration, located downstream of Cloyne near Spital estuary. In relation to Cloyne, the following statements are noted from the report:

'Dilution and the effects of natural biotic and abiotic factors in surface waters will reduce the density of pathogens and in the absence of specific studies it is not possible to predict the percentage of discharged microbes, if any, which will reach the trestles'.

'It is recommended that monitoring at Cloyne WWTP is carried out to determine the microbial concentration of the final effluent'.

The RL requires an assessment of the microbiological impact of the discharges (including the storm water overflow) on the shellfish water which may result in further works.

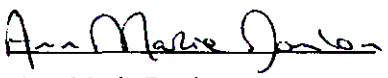
9. Charges

The RL sets an annual charge for the agglomeration at € 2,316 and is reflective of the monitoring and enforcement regime being proposed for the agglomeration.

Recommendation

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

Signed



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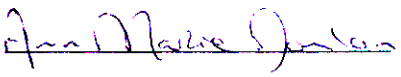

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Figure 1: Shellfish Waters in relation to Cloyne primary discharge