This memo has been cleared for submission to the Board by the Senior Inspector K. Creed.
Signed: _____ Date: 2/3/11
Máire Buckley

OFFICE OF CLIMATE, LICENSING & RESOURCE USE.

INSPECTORS REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To:	DIRECTORS	
From:	Úna O'Callaghan	**Environmental Licensing Programme**
Date:		
RE:	Application for a Waste Water Discharge Licence from Cork County Council Northern Division, for the agglomeration named Charleville and Environs, Reg. No. D0204-01	

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent (p.e.) of between 2,001 p.e. and 10,000 p.e.
Licence application received:	06/10/2008
Notices under Regulation 18(3)(b) issued:	14/01/2009, 30/04/2010, 15/7/2010
Information under Regulation 18(3)(b) received:	13/03/2009, 01/06/2010, 01/09/2010
Site notice check:	16/10/2008
Site visit:	19/01/2011
Submission(s) Received:	None

1. Agglomeration

The application relates to Charleville and Environs agglomeration. The town of Charleville is located in North County Cork, close to the County Limerick border. The Charleville waste water treatment plant (WWTP) was constructed on a green field site in the townsland of Ballincolly, to the north east of Charleville, in the early 1980s.

The primary discharge is to the Charleville stream. The Charleville stream starts out as a small stream (also known as the Glen River), which rises west of Charleville and flows in an easterly direction through the town. Within the town is a surface water body called the Mill Race which converges with the Glen River to form the Charleville stream. The Charleville stream converges with the Maigue River ~8km downstream. The Maigue River discharges into the Lower River Shannon.

The wastewater from Charleville and environs agglomeration is collected through a pipe network and flows by gravity to the WWTP. The waste water network is primarily a separate (foul only) system. However, there are three unscreened storm water overflows (SWO) in the network which overflow to the Charleville stream. There are no secondary discharges within the agglomeration. The surface water in Charleville town generally drains directly to the Charleville stream (see figure 1).

The WWTP is designed to cater for a population equivalent (p.e.) of 15,000. However, the estimated p.e. arriving at the WWTP is 3,696, which consists of domestic (2,984 p.e.) and commercial (712 p.e.) waste waters (based on the Central Statistics Office census figures for 2006). The WWTP plant accepts leachate from the closed Ballguyroe Landfill (W0002-02) at an estimated rate of $40m^3$/day with a p.e equivalent of 15-80p.e., which is less than 1% of the influent arriving at the WWTP. The application for a waste water discharge licence was made for a 2,000 to 10,000 p.e agglomeration. The WWTP is operating at under its design capacity. Charleville was not included in the Water Services Investment Programme 2010-2012.

The Charleville WWTP provides secondary treatment. Influent arriving at the WWTP is directed to an inlet flume (which contains a storm water overflow). This is followed by screening. The flow is then directed via a splitter chamber into one of two oxidation ditches (the idle oxidation ditch is used as a lagoon for the leachate which is gradually fed back into the treatment system). Following extended aeration with nitrification, the treated effluent undergoes settlement and clarification prior to discharge to the Charleville stream.

There are two IPPC licensed activities (P0283-02 BCD Ltd and P0386-02 Kerry Ingredients) within the Charleville and Environs agglomeration. Only one of these, P0283-02, is permitted to discharge neutralised process water to the sewer network and this is limited to $75m^3$ per annum. However, to date the facility has not discharged to the sewer network; instead the process waste water is tankered off site to a licensed facility for further treatment.
Kerry Ingredients (P0386-02) discharges surface water to the Charleville stream, however, treated effluent from the facility is discharged outside the agglomeration, ~1.5km downstream of the primary discharge point.

Site visit

A site visit to the agglomeration was conducted on the 19th January 2011.
The visit focussed on the primary discharge point, the receiving waters at the point of discharge and the treatment plant in general.

2. Discharges to waters

The primary discharge SW01 is located 2.0km north east of the town and discharges to the Charleville stream. There are no secondary discharges within the agglomeration.

There are three storm water overflows within the waste water network. Two are located within the town at Glen Bridge and at the intersection of Clancy Terrace and Chapel Street. Both SWOs discharge to the old Mill Race which in turn flows into the Charleville stream. A third SWO is located at the inlet flume of the WWTP and discharges directly to the Charleville stream adjacent to the primary outfall. All SWOs are unscreened.

It is not known whether the storm water overflows currently meet the Department of Environment, Heritage and Local Government (DoEH&LG) criteria, outlined in the DoEH&LG publication *"Procedures and Criteria in relation to storm water overflows"*, 1995. Condition 4 of the RL requires an assessment of the SWOs to determine compliance with these criteria, and Condition 5 requires the licensee to agree and implement where necessary a programme for upgrades of the SWOs.

The projected future p.e. for the agglomeration has been calculated based the number of planning permissions granted in 2008. This is estimated at 6,480 and consists of an estimated 5,134 p.e domestic and 1,346 p.e. commercial/industrial waste waters.
It is estimated that on average 4500m^3/day of treated effluent is discharged through SW01. This figure is greater than the projected dry weather flow of 1,170m^3/day at 6,500 p.e. and the applicant has indicated this is due to infiltration of water into the waste water network. Condition 5 requires the licensee to assess the integrity of the waste water works having regard to the infiltration of both surface and ground water.

Monitoring data collected in 2007/2008 under the monitoring regime imposed by the Urban Wastewater Treatment Regulations 2001, (S.I. No. 254 of 2001 as amended), and submitted to the Agency as part of the application process, indicate the municipal WWTP discharge is compliant with the requirements of these regulations in terms of effluent quality. However, the WWTP is non-compliant with the regulations due to insufficient sampling being carried out according to the Agency report "*Urban Waste Water Discharges in Ireland for Population Equivalents Greater than 500 Persons - A Report for the Years 2006-2007*".
The average discharge concentrations from 2007-2008 are shown in Table 1.

Table 1: Primary discharge average monitoring results 2007-2008 (from eight samples)

Parameter	BOD mg/l	Suspended Solids mg/l	Total Phosphorus mg/l	COD mg/l
Mean Concentration	5	9	1.3	18

3. Receiving waters and impact

Under the Shannon International River Basin District Management Plan (IRBD), the Charleville stream is divided into river segments and as it progresses towards the River Maigue, the lower reaches of the stream come under the remit of the Water Framework Directive (~1.7km d/s of discharge) prior to its confluence with the Maigue River. The following table summarises the main considerations in relation to this lower section of the Charleville stream downstream of the primary discharge.

Table 2: Receiving waters

Characteristic	**Classification**	**Comment**
Receiving water name and type	Charleville stream	WFD River Segment Code SH_24_119
Resource use	None.	No drinking water abstraction immediately downstream. Nearest drinking water abstraction point at Adare ~27km d/s
Amenity value	General.	
Applicable Regulations	Environmental Objectives Regs [Note 1]	Non compliant (refer to Table 3)
Designations	None.	
EPA monitoring stations	24C020200 Q3 (2008, 2006) 24C020500 Q2-3 (2008,2006) 24C020800 Q3 (2008,2006)	Bridge S. of Charleville, ~2.3km upstream of WWTP. Bridge N. of Ballincolly, ~ 0.7 km downstream of WWTP ~3km downstream of WWTP, upstream of confluence with Maigue River.
WFD status	Poor	As per Maigue Water Management Unit (WMU) Action Plan
WFD Objective	Restore by 2021.	As per Maigue WMU Action Plan
WFD protected area	SAC	The Lower River Shannon SAC (Site Code 0002165), ~27km d/s from SW01

Note 1: European Communities Environmental Objectives (Surface Waters) Regulations 2009. S.I. No. 272 of 2009.

The Charleville stream is rated Q3 (moderately polluted) upstream of the WWTP. The monitoring station located 700m downstream of the WWTP is rated Q2-3 (moderately polluted). The stream reverts to Q3 at the monitoring station located ~3km downstream of the plant.

The chemical river monitoring data for the Charleville stream indicate that the water quality is compromised both upstream and downstream of the WWTP, having regard to the standards in the Environmental Objectives Regulations 2009. The upstream monitoring is conducted 50m upstream of the WWTP primary discharge point. The downstream monitoring is conducted 200m from the WWTP primary discharge point.

The chemical river monitoring data for the Charleville stream (based on 7 months data) supplied by the applicant is summarised in Table 3.

Table 3: Charleville Stream Average Monitoring Data, 2007/2008 (7 months data)

Parameter	Upstream mg/l	Downstream mg/l	Water Quality Standards (Mean Values) mg/l
BOD	1.03	4.49	2.6
Ortho-P	0.16	0.59	0.075
Total Ammonia - N	0.1	1	0.14

Given that the river is moderately polluted before reaching the WWTP, it is clear that other upstream sources of pollution are negatively impacting on the streams water quality.

The Maigue Water Management Unit Action Plan, published under the Shannon IRBD management plan, indicates that the status of the lower reaches of Charleville stream is poor due to its poor macro invertebrate status and poor ecological status. The plan looks to restore water quality in the Charleville Stream to good status by 2021, through a series of measures which include:

- Implementation of an appropriate performance management system
- Providing nutrient removal or relocation of the WWTP outfall
- Providing tertiary treatment or relocation of the WWTP outfall
- Investigation of combined storm water overflows

The Charleville agglomeration and WWTP is not currently included in the Water Services Investment Programme (WSIP) 2010-2012.

Neither the Charleville Stream nor the Maigue River into which it flows has been classified as nutrient sensitive water under the Urban Waste Water Treatment Regulations. There are no designated sites (SPA or SAC) in the general vicinity of the discharge. However, the lower reaches of the Maigue River (at Adare) is included in the Lower River Shannon SAC (Site Code: 002156) which is ~27 km downstream of the primary discharge. The applicant conducted a stage one (screening) assessment of the impact of the discharge on the Lower River Shannon SAC. The conclusion of the assessment is that the WWTP is not having an impact on the SAC.

Impact of Discharge

The assessment of the impact of the wastewater discharge, as described below, considered the design specification of the WWTP, wastewater composition and quality, receiving water monitoring results, and assimilative capacity calculations. The dilution factor at the point of discharge is approximately 1.8 on the basis of the WWTP Dry Weather Flow (DWF) discharge volume of 0.0135m^3/s (estimated at 6,500 p.e.) and the estimated 95%ile flow of

the Charleville stream, which is 0.011m^3/s at the discharge point. As the stream progresses towards the Maigue River and comes under the remit of the Water Framework Directive (~1.7km d/s of discharge), the dilution factor increases to 2.7, as the 95%ile flow at this point is estimated to bc 0.023m^3/s. This assessment addresses the impact of the discharge on the latter stretch of the stream, which is under the remit of the WFD.

Table 4 summarises the assimilative capacity calculations using the projected dry weather flow of the primary discharge, 95%ile river flow and the water quality standards in the Environmental Objectives (Surface Waters) Regulations 2009. Details of the assimilative capacity calculations using actual background concentrations have not been included as there is not enough assimilative capacity in the stream to allow for the discharge. The background levels for orthophosphate and ammonia already exceed the standards set in the Surface Water Regulations. Therefore, for the purpose of this assessment, the 'notional clean river' approach (formulated by the Office of Environmental Assessment) has been taken, and excludes all other sources of pollution impacting the river, which are outside the control of this licence.

Table 4: Assimilative Capacity at projected 6,500 P.E

Parameter	Notional Clean River Background Concentration (mg/l)	Proposed ELVs for primary discharge (mg/l)	Contribution from primary discharge (mg/l)	Predicted downstream water quality (mg/l) Note 2	EQOs Note 1 (mg/l)
BOD	0.26	6.5	2.308	2.57	2.6
Ortho-P (interim ELV) Note 3	0.005	1	0.368	**0.373**	0.075
Ortho-P (ELV from 31/12/19) Note 4	0.005	0.19	0.068	0.073	0.075
Total Ammonia – N (interim ELV) Note 3	0.008	2	0.737	**0.745**	0.14
Total Ammonia – N (ELV from 31/12/19) Note 4	0.008	0.35	0.126	0.134	0.14

Note 1: European Communities Environmental Objectives (Surface Waters) Regulations 2009.
Note 2: Predicted downstream concentration ~1.7km from the primary discharge point at WFD code SH 24_119.
Note 3: Emission limit values shall apply until 31 December 2019
Note 4: Emission limit Values shall apply from 1 January 2020

The proposed ELVs in the table are based on what the WWTP can currently achieve. Though these limits are stringent, the assimilative calculations suggest that the receiving water body is not capable of accommodating the proposed discharge without causing a breach in the standards for orthophosphate and ammonia as outlined in National and European legislation. This is primarily due to the small number of dilutions in the stream and the level of treatment achieved by the WWTP.

The WWTP would be required to achieve a discharge limit of 0.19mg/l for orthophosphate and 0.35mg/l ammonia in order to ensure the "good status" limits of the Surface Water Regulations are met. At present the WWTP is not capable of achieving such stringent limits.

As discussed previously, the Maigue WMU Action Plan requires measures to be taken to restore the water quality to good status by 2021. These measures include providing tertiary treatment/nutrient removal at the WWTP or relocation of the outfall.

It is acknowledged that the upgrade of the wastewater treatment plant and, in particular, the relocation of the outfall would be a significant and costly undertaking. However, the Maigue WMU Action Plan requires measures to be taken to restore the water quality to good status by 2021. Accordingly, the RL includes Condition 5.2(d) that requires the licensee to identify and implement the most appropriate measure(s) with reference to the Maigue WMU Action Plan by 2019, to assist the receiving water body in achieving good status for the Charleville Stream by the end of 2021.

Therefore, in the interim, the ELVs as presented in Table 4 have been set for ammonia and orthophosphate. These ELVs should ensure no further deterioration in the quality of the receiving water will take place. In addition *Condition 3.2* requires the Water Services Authority to 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.

If the licensee chooses to relocate the outfall, the emission limit values and other aspects of the licence (e.g. the discharge and monitoring locations) will not be relevant. Accordingly, a review of the licence would be required. If the licensee chooses not to relocate the outfall, then the tighter emission limit values, in Table 4 above, must be achieved from 31st December 2019. This provides sufficient time for the licensee to identify and implement the necessary measures required to assist the receiving water in achieving good status by 2021.

In regard to optimising plant performance, Condition 5.1 of the RL requires a programme of infrastructural improvements for the operation of the WWTP and the sewer network. It also requires that the phosphorus and ammonia discharges be reduced to the maximum practicable extent.

Measures to address other pollutant sources, which are outside the control of this licence are incorporated into other mechanisms. In particular, Shannon IRBD Management Plan (2009 - 2015) provides details of recommendations and planned measures to reduce pollution in watercourses. It is considered that the above plan, if fully implemented, in addition to the upgrade of the WWTP, will assist in ensuring compliance with the Water Framework Directive requirements for the Charleville Stream.

Schedule A: Discharges of the RL sets ELVs for the primary discharge. Monitoring of the discharges will take place as per *Schedule B: Monitoring.*

4. Ambient Monitoring

The RL requires monitoring of the receiving water for a range of parameters in the vicinity of the primary discharge. This is to verify that no deterioration of the receiving water quality is occurring within the vicinity of the primary discharge. The applicant currently proposes to undertake ambient monitoring of the Charleville stream 50 metres upstream and 200 metres downstream of the primary discharge. I consider that the proposed downstream location may be within the mixing zone of the primary discharge. The RL requires an assessment of the suitability of this location, and if necessary, a new downstream monitoring location to be agreed with the Agency.

5. 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.

6. Programme of Improvements

As discussed above the RL requires the licensee to identify the measure(s) necessary to assist the receiving water body in achieving good status by 2021. *Schedule C: Specified Improvement Programme* requires the licensee to implement the appropriate measure or combination of measures as identified in Condition 5 by 2019. The WWTP is not currently included in the Water Services Investment Programme (WSIP) 2010-2012.

7. 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:

Drinking Water Abstraction Regulations

There is no drinking water abstraction immediately downstream of the primary discharge from the Charleville and Environs agglomeration. The nearest drinking water abstraction point is located at Adare approximately 27km downstream.

Sensitive Waters

The Charleville Stream is not designated sensitive under the UWWT Regulations (S.I No. 254 of 2001 as amended).

Water Framework Directive [2000/60/EC]

The RL, as drafted, transposes the requirements of the Water Framework Directive. In particular *Condition 3: Discharges* provides conditions regulating discharges to waters. *Schedule A; Discharges* specifies limit values for those substances contained within the waste water discharge. Those limits specified in the RL are determined with the aim of achieving good water quality status by 2021 in combination with the measures discussed above.

European Communities Environmental Objectives (Surface Water) Regulations 2009, S.I. No. 272 of 2009

Based on the ambient monitoring data provided as part of the application the Charleville Stream does not comply with the Surface Water Regulations 2009 for a number of parameters downstream of the discharge notably, BOD, orthophosphate, ammonia, lead and mercury (based on once off sampling, there are no permitted discharges of these parameters to the stream). The Maigue WMU Action Plan provides for a derogation of these standards to 2021.

The RL requires the licensee to determine the measure(s) necessary (with reference to the Maigue WMUAP) to assist the receiving water body achieving good status and implement the identified appropriate measure by 2019. The RL will act to improve the quality of the receiving water environment and assist the water body to achieve good status by 2021.

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

The Charleville WWTP has good effluent quality but is not in compliance with the requirements of the Urban Waste Water Treatment Directive according to the Agency report "*Urban Waste Water Discharges in Ireland for Population Equivalents Greater than 500 Persons - A Report for the Years 2006-2007*". The non-compliance is a result of insufficient sampling being carried out in 2006 and 2007. The RL, as drafted, has regard to the requirements of the Urban Waste Water Treatment Directive. *Schedule A: Discharges* and *Condition 3: Discharges* provide details of limits and criteria for those substances contained within the wastewater discharge. In addition, *Schedule B: Monitoring* requires monitoring of the discharge in accordance with the Directive.

Bathing Water Directive [2006/7/EC]

There are no designated bathing waters on any of the receiving waters downstream of the WWTP.

EC Freshwater Fish Directive [2006/44/EC]

Neither the Charleville Stream nor the Maigue River are designated salmonid waterways.

Shellfish Waters Directive [2006/113/EC]

There are no designated shellfish waters located in the vicinity of the discharge(s).

Dangerous Substances Directive [2006/11/EC]

The applicant provided sampling results for 19 dangerous substances in the primary discharge for the purposes of the licence application. Of the parameters tested, 17 of the 19 measured concentrations were not considered significant. However, the result for lead (priority substance) exceeded the standard set in the Environmental Objectives (Surface Water) Regulations. The average lead in the discharge was 36µg /l. If the dilution factor under dry weather flow conditions is taken into consideration, the resultant concentration in the receiving water would be 32 µg/l (the standard is 7.2µg /l). Monitoring was also carried out on the receiving water both upstream and downstream of the primary discharge. The monitoring results for lead in the receiving water also indicated a breach of the Surface Water Regulations both upstream and downstream of the discharge with an observed value of 38 µg/l and 46µg/l respectively. In addition, mercury (priority hazardous substance) was detected in both the discharge and the receiving water from a one sample at 0.8µg/l and 0.2µg/l respectively (the standard is 0.05µg /l).

To ensure compliance with the Directive the RL requires a number of measures to be undertaken. Condition 4 of the RL requires further testing of the primary discharge for the presence of organic compounds and metals within six months of the date of grant of licence. It also requires the licensee to investigate the sources of dangerous substances and take the necessary measures to ensure the receiving water complies with the European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No 272 of 2009). In addition, the RL limits the amount of leachate accepted for treatment at the WWTP, to less than 4% leachate by volume in accordance with section *8.3.5 Landfill Manuals, Landfill Site Design (EPA, 2000).*

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

The primary discharge from the agglomeration occurs into the Charleville stream, a tributary of the Maigue River. The lower reaches of the Maigue River (at Adare) is included in the Lower River Shannon cSAC, (Site Code 0002165) which is ~27 km downstream of the primary discharge.

The applicant conducted a stage one (screening) assessment of the impact of the discharge on key species and habitats in the designated sites and concluded that no significant impacts are evident or predicted on species for which the area is designated. I am satisfied on the basis of the assessment that the licensed discharge will not have an adverse impact in this regard.

Environmental Liabilities Directive

Condition 7 of the RL satisfies the requirements of the Environmental Liabilities Directive in particular those requirements outlined in Article 3(1) and Annex 11 of 2004/35/EC.

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.

Data relating to flows in the Charleville stream was provided by Rebecca Quinn of the Hydrometric Team in the Office of Environmental Assessment (OEA). Information regarding the IPPC facilities within the agglomeration was provided by the Office of Environmental Enforcement.

Submissions

No submissions were received in relation to this application.

Charges

The RL sets an annual charge for the agglomeration at €4,276 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

Úna O'Callaghan

Office of Climate, Licensing and Resource Use

Figure 1: Charleville and Environs agglomeration