



This memo has been cleared for submission to the Board by Senior Inspector, Dr Karen Creed

Signed: Sonja Smith Date: 06/01/11

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RESOURCE USE

INSPECTORS REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To: DIRECTOR

From: STUART HUSKISSON

- ENVIRONMENTAL LICENSING PROGRAMME

Date: 20TH DECEMBER 2010

RE: APPLICATION FOR AN URBAN WASTE WATER DISCHARGE LICENCE FROM CORK COUNTY COUNCIL (SOUTHERN DIVISION) IN RESPECT OF THE KILLEENS AGGLOMERATION
LICENCE REGISTER NO. D0329-01.

Application Details

Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent of 1,001 to 2,000.
Agglomeration name:	Killeens
Licence application received:	27 th February 2009
Notices under Regulation 18(3)(b) issued:	14 th December 2009 & 21 st May 2010
Information under Regulation 18(3)(b) received:	26 th February 2010 & 27 th September 2010
Site notice check:	27 th March 2009
Site visit:	17 th November 2010
Submission(s) Received:	None

1. Agglomeration

This application relates to the Killeens agglomeration. The agglomeration's current 860 population equivalent (p.e) is serviced by a predominantly separate sewer network with a single waste water treatment plant (WWTP) located in the north west of the agglomeration. The application from Cork County Council (Southern Division) relates to the maximum design capacity of the recently upgraded WWTP, i.e. 1,200 p.e.. The WWTP receives both domestic and commercial effluent, and the discharge from the WWTP is the primary discharge from the waste water works.

The WWTP at Killeens was upgraded and commissioned in 2009 and provides tertiary treatment. Waste water arriving at the treatment plant passes through a fine screen, followed by grit removal and then flows into the primary settlement tank. The effluent from the primary settlement tank is split (50/50) between two separate Rotating Biological Contactors (RBCs). Phosphorus is reduced by dosing with ferric sulphate. From the RBCs the waste water is transferred to a final clarifier and then to a sand filter prior to discharge. The plant also includes a sludge removal and thickening plant.

There are three discharges from the waste water works, i.e. the primary discharge, one storm water overflow (SWO) and one emergency overflow. There are no secondary discharges in the agglomeration.

The WWTP discharge is pumped 300 metres north-west of the plant to the primary discharge point (SW01), which is located in the River Blarney. The SWO (SW03) and emergency overflow (SW02) discharge to a minor unnamed stream that flows into the River Blarney.

SW02 (emergency overflow) is associated with a post treatment pump which is used to pump the final treated discharge from the WWTP via a pipe approximately 300 metres north-west to the final discharge point in the Blarney River. In the event that this pump fails, treated effluent will discharge via SW02 to a minor tributary of the Blarney River, adjacent to the WWTP. This emergency overflow would only come into operation in rare circumstances such as power failure or multiple pump failure (1 duty and 1 standby) and is not considered further here or in the Recommended Licence (RL).

SW03 is the SWO associated with the storm water holding tank located at the inlet works of the WWTP. The WWTP is designed to treat a flow of 27m³/hour (3 x Dry Weather Flow (DWF)). Flows in excess of 3DWF are diverted to the storm water holding tank, which has a volume of 36m³, providing 1.3 hours storage at 3DWF. SW03 will therefore operate if the flow to the WWTP exceeds approximately 63m³ in one hour. The SWO discharges to a minor tributary of the Blarney River, adjacent to the WWTP.

The applicant does not state whether the SWO performs in compliance with the requirements of the Department of the Environment, Heritage & Local Government (DoEHLG) guidance on SWOs. The Recommended Licence (RL) requires the discharge from the SWO to be assessed and, where required, a programme of improvements implemented to bring this into compliance with the DoEHLG criteria for operation of storm water overflows.

2. Contributions to WWTP

Wastewater from the agglomeration arises from domestic and non-domestic sources, including a hotel. There is no significant industrial source in the agglomeration.

3. Discharges to waters

The primary discharge from the Killeens WWTP (SW01) is to the Blarney River. The predicted DWF from the WWTP (operating at 1,200 p.e.) is approximately 216 m³/day. The Blarney River is a tributary of the River Martin, which enters the River Shournagh and then the River Lee. The Blarney River is the receiving water for the primary discharge. The single SWO (SW03) discharges to a minor tributary of the Blarney River.

Most of the waste water generated in the agglomeration flows by gravity to the WWTP. In addition there are two small pumping stations each fitted with a duty and a standby pump, which pump waste water to the gravity sewer.

The monitoring undertaken for the purposes of the waste water discharge licence application did not indicate that elevated levels of any dangerous substances, as defined in the Dangerous Substances Directive (2006/11/EC), were being discharged.

The RL as drafted provides regulation and control of discharges from the Killeens agglomeration, it does not deal with the issues of odour, noise or management of the waste water works infrastructure as these matters are regulated under other legislative mechanisms.

4. Receiving waters and impact

The following table (Table 1) summarises the main considerations in relation to the Blarney River downstream of the primary discharge.

Table 1. Receiving waters

Characteristic	Classification	Comment
Receiving water name and type	Blarney River	Tributary of the River Martin - flows via River Shournagh to the River Lee which is a designated salmonid river (11km downstream).
Resource use	Drinking water	Lee Road Water Works - drinking water abstraction 15 km downstream
Amenity value	Fishing and general amenity	-
Applicable Regulations	Environmental Objectives Regs. ^{Note 1} Abstraction regulations ^{Note 2}	Details included in Section 4 of this report. Compliant at intake (15 km downstream)
Designations	None	
EPA monitoring stations	19B020500 (upstream) 19M010600 (downstream)	Adjacent to discharge (Br. NW of Killeens Cross) 4.3 km downstream (Bawnafinny Br.)
Biological quality rating (Q value)	Q4 upstream Q4 downstream	2008, 2005 2008, 2005
WFD Risk Category	1a	At risk of not achieving good status
River status at discharge location	'Moderate'	Due to general physiochemical and ecological status
WFD Objective	Restore to 'Good Status' by 2021	As per Lower Lee Owenboy Water Management Unit Action Plan (WMUAP)
WFD protected areas	pSPA (4030) Cork Harbour River Lee Lee Road Water Works Lee Estuary/ Lough Mahon	Site 24 km downstream. Salmonid water 11km downstream Drinking water 15km downstream Sensitive water 15km downstream
Conservation areas	pNHA 001857	Blarney Bog

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

Note 2: European Communities (Quality of Surface Water intended for the Abstraction of Drinking Water) Regulations, 1989, S.I. No. 294/1989.

The Blarney River is located within the South Western River Basin District (SWRBD) and the Lower Lee-Owenboy Water Management Unit. The Lower Lee Owenboy WMUAP identifies Killeens WWTP as causing risk to the water management unit. The objective for the receiving waterbody is to restore to 'good status' by 2021.

The water quality upstream and downstream of the WWDA discharge has been consistently Q4 since 2005. The River Lee approximately 11 km downstream of the discharge point is compliant with the Salmonid Regulations. Therefore the waste water works does not appear to adversely affect the River Lee.

The 2009 ambient monitoring data supplied as part of the application indicates that the water quality of the Blarney River upstream of the discharge complies with the 'good status' (95%ile) standards of the Surface Water Regulations, 2009. The downstream ambient monitoring results show that the Blarney River does not comply with the upper 'good status' (95%ile) limit for Molybdate-Reactive Phosphorus (MRP)¹, with a receiving water concentration of 0.0963mg/l, compared with a standard of 0.075mg/l.

Impact of Discharge

The assessment of the impact of the discharge considered the waste water composition and quality, the treatment capabilities of the plant and assimilative capacity calculations. A dilution factor of 24 is available based on the DWF discharge volume at 1,200 p.e. (216m³/day) and the 95%ile flow in the river. Table 2 below presents the results of the assimilative capacity/receiving

¹ Molybdate-Reactive Phosphorus [MRP] is broadly equivalent to "orthophosphate" as determined using the ascorbic acid/molybdate colorimetric procedure. (Ref: *Parameters of Water Quality – Interpretation and Standards*, EPA, 2001).

water concentration calculations for the primary discharge, with reference to relevant water quality standards.

The background concentrations are based on the results of the ambient upstream river monitoring location (19B020500). The 95%ile flow used for the Blarney River at the discharge location is 0.06m³/second. Background concentration values shown in the table are taken from the monitoring conducted for the application, however because the predicted downstream concentration for total ammonia is above the upper 'good status' limit of the Surface Water Regulations 2009, it is the "Notional Clean River Values" in the table, and not the measured background concentrations which have been used to calculate the predicted downstream concentrations for all parameters in the table. This is because the purpose of the table is to show the impact of the discharge with respect to water quality standards, and the sources which give rise to the background concentrations are outside the control of the licence.

Table 2. Mass Balance Calculations

Parameter	Background (mg/l)	Notional Clean River Values (mg/l) <small>Note 1</small>	Proposed ELV from SW01 (mg/l)	Contribution from WWTP (mg/l) <small>Note 1</small>	Predicted Downstream Quality (mg/l)	Water Quality Standard (mg/l)
BOD (95%ile)	0.5	0.260	25	1.00	1.25	≤2.6 <small>Note 2</small>
Ortho-P (95%ile)	0.0475	0.005	1	0.04	0.045	≤0.075 <small>Note 2</small>
Total Ammonia (95%ile)	0.05	0.008	30.7 <small>Note 3</small>	1.226 <small>Note 3</small>	1.234 <small>Note 3</small>	≤0.14 <small>Note 2</small>
			3.0 <small>Note 4</small>	0.12 <small>Note 4</small>	0.127 <small>Note 4</small>	

Note 1: Based on the dry weather flow of WWTP operating at 1,200 p.e. (0.0025 m³/second) and the proposed ELVs for upgraded WWTP.

Note 2: 'Good Status' - European Communities Environmental Objectives (Surface Waters) Regulations, 2009. S.I. No. 272/2009. These regulations revoke the Phosphorus Regulations (S.I. 258 of 1998).

Note 3: Based on the current Total Ammonia discharge from the WWTP.

Note 4: Based on the proposed Total Ammonia ELV of 3.0 mg/l to be achieved by 31st January 2020.

The assimilative capacity calculations are based on the predicted volumetric discharge (at 1,200 p.e) and ELVs as set in the RL. The calculations suggest that the receiving water, based on notional clean river background values, is capable of accommodating the proposed discharge of BOD, suspended solids, and orthophosphate without exceeding the standards outlined in National and European legislation. Phosphorus and ammonia are considered further below.

Phosphorus

The Killeens WWTP is achieving an orthophosphate emission concentration of <1mg/l, which is considered to represent a high standard of treatment, however, due to the existing background concentration in the Blarney River additional measures will be required to reduce the phosphorus levels in the receiving water to ensure compliance with the Surface Water Regulations, 2009.

The Phosphorus Regulations National Implementation Report, 2005, published by the Office of Environmental Enforcement (OEE) highlighted the actions and initiatives being carried out by Cork County Council in relation to point and diffuse sources of nutrients in County Cork. In addition the measures as detailed in the Water Management Action Plan for the region will assist in reducing the background phosphorus concentration by reducing the inputs from point and diffuse sources within the catchment which will assist the receiving water to achieve and maintain 'good status'.

The orthophosphate concentration in this stretch of the receiving water is elevated, however, this has not affected the biological water quality status of the downstream monitoring location, which has been rated Q4 consistently since 2005, as outlined above. This Q4 rating is consistent with

'good status', which is required to be achieved and maintained under the Water Framework Directive.

Ammonia

In the case of ammonia, a discharge which complies with an ELV of 3.0 mg/l total ammonia can be accommodated by the receiving water without causing a breach in the relevant standards as outlined in National and European legislation. The Killeens WWTP does not currently provide nitrification and so is not able to achieve compliance with this proposed ammonia discharge concentration. The total ammonia discharge from the WWTP is currently 30.7mg/l (annual average), which will result in a receiving water concentration of 1.23mg/l. The Surface Water Regulations 2009 specify a receiving water ammonia standard of <0.140mg/l (95%ile) for 'good status' rivers. The WWTP is newly upgraded and there are no plans to make significant changes to the plant, nor has further funding been provided for the plant under the 2010-2012 Water Services Investment Programme (WSIP).

In order to achieve compliance with this receiving water objective and to achieve 'good status' by 2021, (as specified in the Lower Lee Owenboy WMUAP), the RL requires Cork County Council to investigate and implement ammonia reduction measures to achieve compliance with a total ammonia ELV of 3.0mg/l by 1st July 2019 (as included in Table 2 above). This provides sufficient time for the applicant to make adjustments at the WWTP, as required, to achieve this ELV.

Any infrastructural improvements required will be addressed under **Condition 5**. In addition, **Condition 3.2** requires that no deterioration in the quality of the receiving waters shall occur as a result of the discharge. These measures will assist in ensuring that the requirements of the Water Framework Directive are met and that for the Blarney River achieves 'good status' by 2021.

It is noted that the 2009 ambient monitoring of total ammonia, carried out at the downstream monitoring location, complied with the upper 'good status' 95%ile limit.

Schedule A: Discharges of the RL specifies ELVs for the primary discharge (SW01). The ELVs are aimed at providing a high degree of protection to the receiving water and are based on data supplied in the application concerning the WWTP performance. Monitoring of the discharges will take place as specified in *Schedule B: Monitoring* of the RL.

5. Ambient Monitoring

The RL requires ambient monitoring to be carried out upstream and downstream of the primary discharge. This is to verify that there is no deterioration in the status of the receiving water quality due to the discharge (*Schedule B.4*).

6. Combined Approach

The Waste Water Discharge Authorisation Regulations, 2007 (S.I. No. 684 of 2007) as amended 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) as amended 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 as amended.

7. Programme of Improvements

The Killeens WWTP upgrade works were completed in 2009. The RL specifies the discharge limits required to be achieved by the WWTP. There is no further programme of improvements planned for the plant, or for the infrastructure in the agglomeration. The RL requires the applicant to implement measures as necessary in order to comply with the ELV for total ammonia by 01st July 2019.

The conditions and emission limit values specified in the RL should therefore ensure no deterioration in the quality of the receiving waters as a result of the discharge and assist in the achievement of 'good status' by 2021.

8. 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:

8.1 Drinking Water Abstraction Regulations

There is a drinking water abstraction from the River Lee (0400PUB1001), approximately 15 km downstream of the primary discharge point. Having regard to limits of quantification and the extent of the monitoring suite, results for the downstream drinking water works intake indicates that the quality standard for A1 surface water is met the majority of the time.

The Killeens waste water works does not appear to adversely affect drinking water abstraction at the intake to Cork City Council water works (approximately 15km downstream of the discharge).

It should be noted that the discharges from the Blarney agglomeration (Licence Reg. No. D0043-01) enter the River Shournagh approximately 5km downstream of the Killeens discharge and the discharges from the Ballincollig agglomeration (Licence Reg. No. D0049-01) enter directly into the River Lee approximately 10km upstream of the drinking water abstraction point. The discharges from both the Blarney agglomeration (11,400 p.e.) and the Ballincollig agglomeration (24,600 p.e.) contribute a significantly greater volume of treated effluent to the receiving water than from the Killeens agglomeration.

8.2 Sensitive Waters

The Blarney River is not designated as sensitive under the Urban Waste Water Treatment Regulations (S.I. No. 254 of 2001) as amended. The Salmonid Regulations are met downstream of the discharge. Therefore this discharge does not appear to contribute to the pollution at the Lee Estuary/Lough Mahon sensitive area approximately 15km downstream of the discharge.

8.3 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 while *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.

8.4 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 Blarney River, downstream of the primary discharge, does not currently comply with the environmental quality standard set in the Surface Water Regulations, 2009, for orthophosphate.

The Lower Lee Owenboy WMUAP provides for a derogation of these standards and the Blarney River must achieve 'good status' by 2021. The limits specified in the RL are determined with the aim of achieving compliance with the requirements of the Surface Water Regulations, 2009, and restoring the receiving water to 'good status' by 2021.

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

It should be noted that the p.e. of the Killeens agglomeration is below the 2,000 p.e. threshold at which the ELVs specified in Part I of the second schedule of the Urban Waste Water Treatment Regulations (S.I. 254 of 2001) apply. For agglomerations under this threshold, "appropriate treatment" is required as specified in Article 7 of the Regulations. The term appropriate treatment is defined in the Regulations in terms of the level of treatment necessary to protect water quality.

The ELVs specified in the RL are based on the performance of the WWTP, and can be considered to be "appropriate treatment" in terms of impact on water quality, as discussed in Section 3 above. The effluent monitoring requirements specified in the RL are based on the requirements for a 2,000 p.e. agglomeration, and therefore comply fully with the requirements of the Urban Waste Water Treatment Directive (91/271/EEC).

8.6 Bathing Water Directive [2006/7/EC]

There are no designated bathing waters on the Blarney River, River Martin or River Shournagh.

8.7 EC Freshwater Fish Directive [2006/44/EC]

The Blarney River, River Martin and River Shournagh are not designated as salmonid waters. The River Lee, 11km downstream of the discharge, is a designated salmonid river and is compliant with the Salmonid Regulations and Dangerous Substances Directive requirements. Therefore the discharges from the waste water works do not appear to adversely affect the River Lee.

8.8 Shellfish Waters Directive [2006/113/EC]

There are no designated shellfish waters located in the vicinity of the discharges from the Killeens agglomeration.

8.9 Dangerous Substances Directive [2006/11/EC]

The applicant has provided sampling results for all of the 19 dangerous substances in the primary discharge for the purposes of the licence application. The measured concentrations are not considered significant. The agglomeration is effectively domestic in nature with a limited contribution from commercial activities. The initial screen for the application is therefore considered sufficient and the agglomeration is compliant with the Dangerous Substances Directive.

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

The primary discharge from the Killeens agglomeration is to the Blarney River and the nearest downstream site designated under the E.U. Habitats and Birds Directive is the Cork Harbour SPA, approximately 24km downstream of the discharge point.

The applicant conducted a Stage 1 screening for an "appropriate assessment" in accordance with Circular Letter L8/08 from the Department of the Environment, Heritage and Local Government. The conclusion of the assessment is that the discharges from the agglomeration should not impact on a Natura 2000 site, the nearest being the Cork Harbour SPA (24km downstream of the discharge). This site is selected as an SPA for being of international importance both for total numbers of wintering birds (i.e. >20,000) and also for its population of Redshank. Several of the species which regularly occur are listed on Annex I of the E.U. Birds Directive. The site synopsis for the SPA states that *'the polluted conditions may not be having significant impacts on the bird pollutions'*.

The effects of the discharge from the Killeens WWTP on the Cork Harbour SPA are not considered significant due to the distance between the discharge and the designated site, the dilution and dispersion in the receiving water body upstream of the designated site and as no significant impacts are evident or predicted on species for which the SPA is designated. Therefore it was considered by the applicant that a Stage 2 appropriate assessment was not required. I am satisfied that the discharges from the waste water works, as specified in the RL, will not have an adverse impact in this regard.

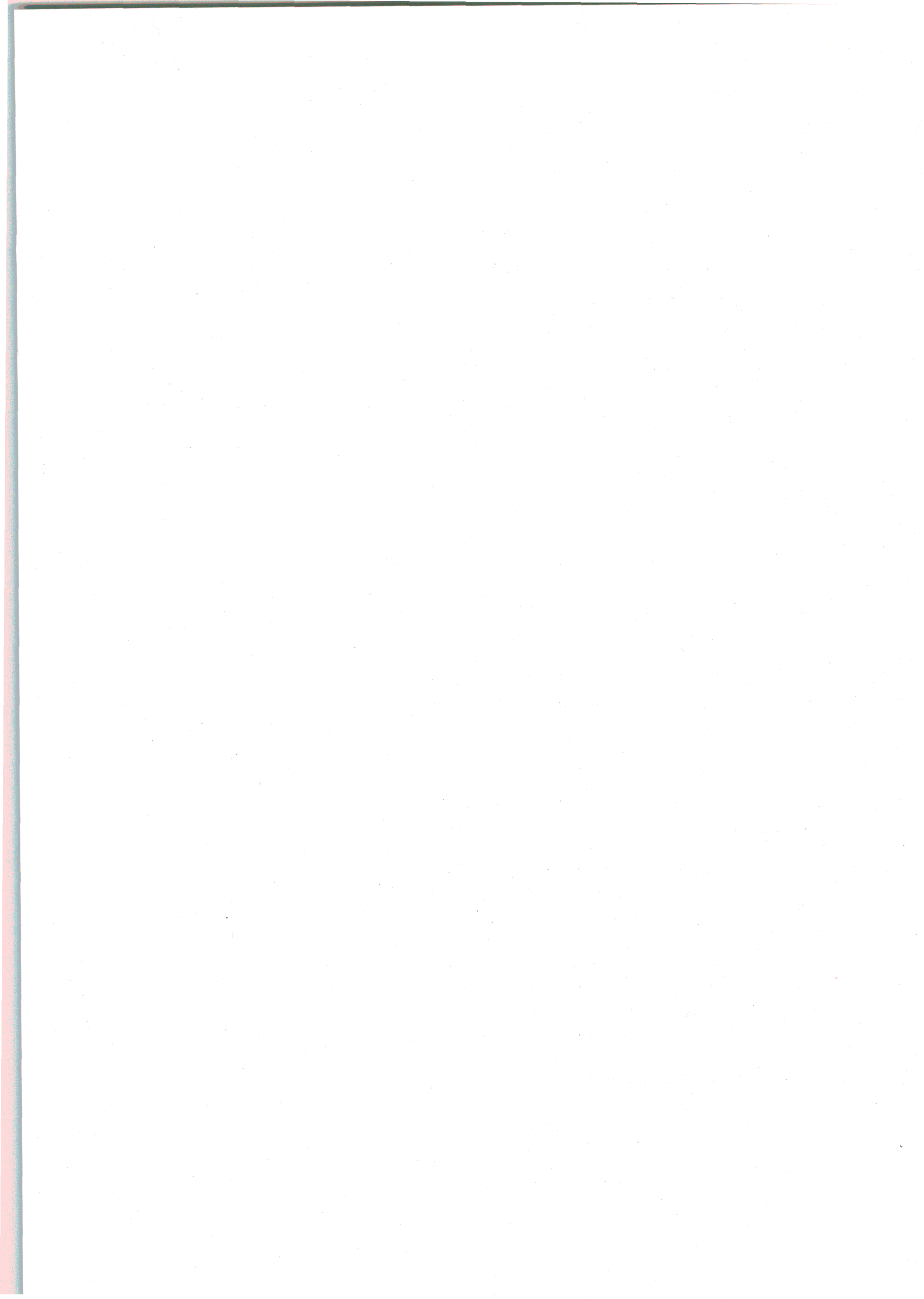
Additional Designated Site

The Blarney River, 200 metres downstream of the primary discharge from the Killeens WWTP, is designated as a Natural Heritage Area (NHA). The Blarney Bog NHA (Site Code 001857) is a small area of reed grass fen, situated in the flat valley floor of the River Blarney. It is located approximately 500 metres west of Blarney Town. The main habitats are lowland wet grassland and ungrazed and freshwater marsh/fen. The area is used by a variety of bird species, including the Sedge and Grasshopper Warblers, Reed Bunting, Stonechat, Meadow Pipet, Snipe and Mallard. Hen Harriers, a species listed in Annex 1 of the Birds Directive, are regularly seen hunting and sometimes nesting in the reeds.

It is considered that the RL as drafted will provide a high level of protection to the Blarney River, as it will ensure that all discharges from the Killeens agglomeration are provided with an appropriate level of treatment, as per **Condition 3: Discharges**. By ensuring that all waste water is treated to a high standard the RL will act to ensure no deterioration of the receiving water quality and contribute to the objective of safeguarding protected areas.

9. Environmental Liabilities Directive [2004/35/EC]

Condition 7.2 of the RL satisfies the requirements of the Environmental Liabilities Directive in particular those requirements outlined in Article 3(1) and Annex III of 2004/35/EC.



10. 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.

11. Submissions

No submissions were received in relation to this application.

12. Site Visit

A site visit of the WWTP was undertaken on 17th November 2010. The visit included a tour of the WWTP, from the inlet works through to the waste water discharge point and the storm water overflow discharge point associated with the WWTP.

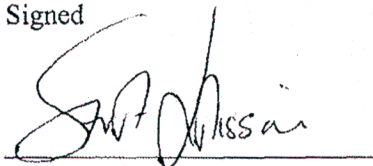
13. Charges

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.

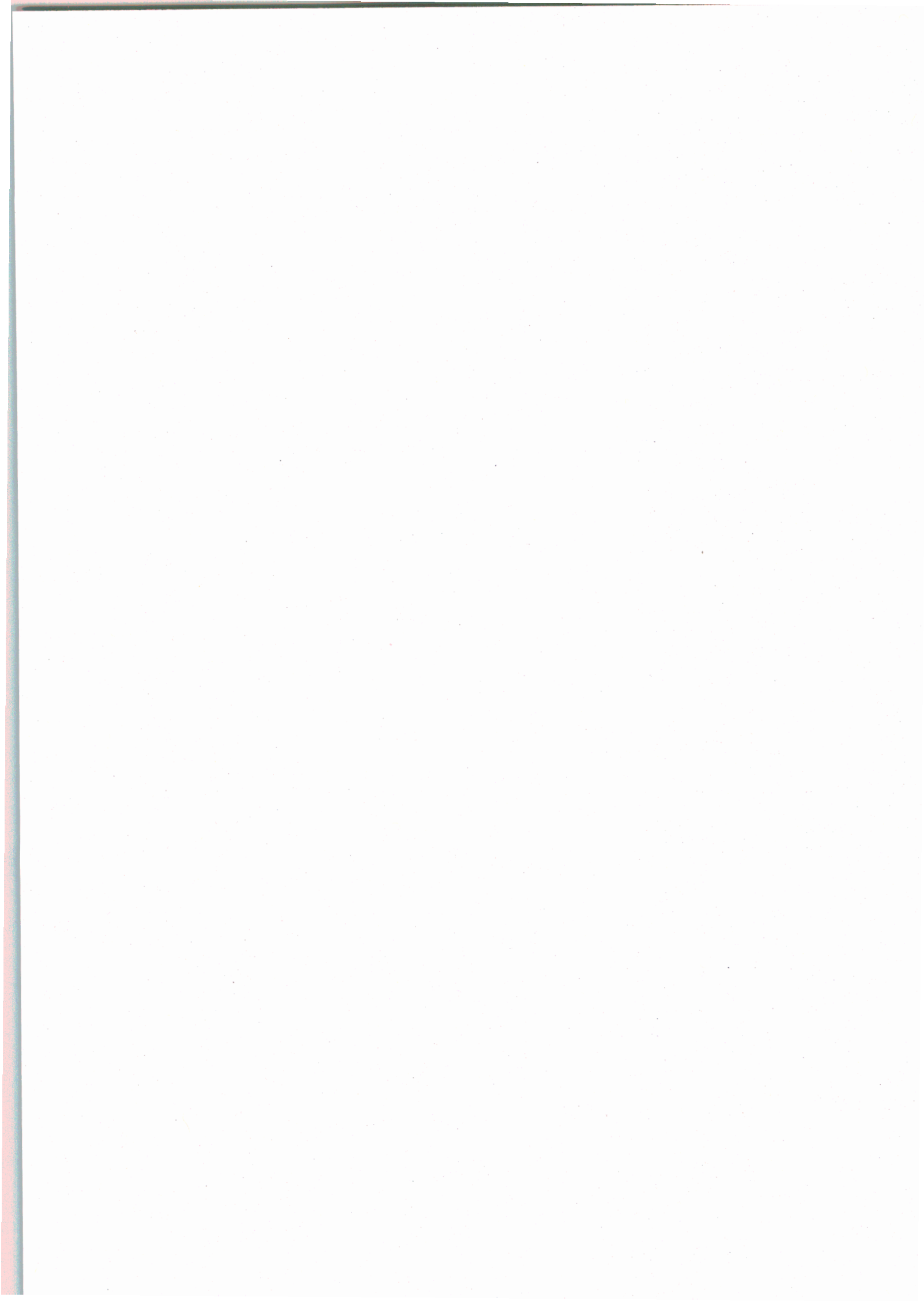
14. Recommendation

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



Stuart Huskisson
Inspector
Office of Climate, Licensing and Resource Use



Killeens Agglomeration D0329-01

