DONEGAL COUNTY COUNCIL
ENVIRONMENT SECTION

ADVICE NOTE No. 2:

Guidelines for the Discharge of Effluent to Waters from Industrial, Commercial Developments, and Communal Housing (> 2 House) Developments.

This document is issued for guidance only. It does not purport to be a legal interpretation of legislation.

1 INFORMATION TO BE SUBMITTED WITH A PLANNING APPLICATION

Information to be submitted with Planning application	Industrial or Commercial Development discharging to surface waters	Industrial or Commercial Development discharging to ground, (percolation)	8 houses or more discharging to ground, (percolation area)
Receiving Waters Chemical & Microbial analysis (See Appendix 1)	Yes 4 Samples	Yes 4 samples	Yes 4 samples
Receiving Waters 95%ile flow measurement (See Appendix 2)	Yes	No	No
Receiving Waters Biological Rating (See Appendix 1 & 5)	Yes	No	No
Surface water assimilative capacity assessment (See Appendix 1)	Yes	No	No
Groundwater Assessment (See Appendix 4)	No	Yes	Yes
Effluent Characteristics	Yes	Yes	Yes
Detailed Proposal for dealing with sewage sludge	Yes	Yes	Yes
(Discharge Licence Required ?)	Yes	Yes	Yes

2 *WHEN IS A DISCHARGE LICENCE REQUIRED UNDER THE WATER POLLUTION ACTS?

- All discharges of effluent to surface waters, whether commercial or industrial, need a licence under the Water Pollution Acts.
- All commercial or industrial discharges to ground (percolation area), need a licence under the Water Pollution Acts.
- A single house, or up to 7 houses in a cluster development discharging domestic effluent to ground/percolation area are exempt, and do not need a licence under the Water Pollution Acts.
- Houses discharging to sewers do not need a licence under the Water Pollution Acts.
- Discharges of non-domestic effluent to sewers require a licence under the Water Pollution Acts.

3 OBJECTIVES & LEGISLATION

Water in County Donegal

Donegal County Council seek to improve the percentage of river channels which are unpolluted and reduce the percentage of river channels that are seriously, moderately and slightly polluted. We are committed to sustainable development that will not result in deterioration of Donegal's water quality.

It is also of vital importance to protect our Groundwater to maintain water supplies (individual wells, group schemes and public supplies). Groundwater also feeds our surface waters through springs and base flow all year round. In some rivers, more than 50% of the annual flow is derived from groundwater and in low flow periods it can account for 90%. If groundwater becomes contaminated, surface water quality will also be affected; therefore its protection is an important aspect of sustaining water quality. Groundwater resources are limited and must be managed and protected on a sustainable basis, since some are key sources of drinking water.

Legislation

The EU Water Framework Directive 2000/60/EC was adopted in December 2003 and places an obligation on the Council to achieve "good water quality status" for all waters within our jurisdiction by 2015.

Similarly, the Phosphorus Regulations S.I. 258/1998 require an incremental improvement in water quality by 2007.

The Irish Water Pollution Acts (1977 & 1990) and Regulations govern the regulation of discharges to watercourses, ground-waters and sewers.

4 GENERAL DEVELOPMENT GUIDELINES

1. Where development is within an area that is already served by a public wastewater treatment system or where a public system is proposed the development shall be conditioned to connect to that system.

2. Where existing facilities do not have sufficient capacity, the Developer may contact the Sanitary Services Section to determine whether the development can be facilitated by an extended public system. This extension to the public system to be carried out in consultation with the Developer.

3. Where the proposed development is in an area with no public wastewater facilities and none are proposed, it may be possible that the proposed wastewater be treated and discharged subject to a discharge licence, to a suitable receiving waters or a percolation area. Donegal County Council Sanitary Services Section should also

be consulted in relation to system design and early consideration of taking in charge.

4. All proposals for discharges to waters should be developed in accordance with these guidelines.
5. Any discharge that would result in the receiving water not complying with relevant standards shall not be permitted, in accordance with Section 4 subsection (4) of the Water Pollution Act(s) 1977 & 1990.
6. All site investigation and development should be carried out in accordance with the EPA Wastewater Treatment Manuals and British Standards for site investigations:

- Code of Practice Wastewater Treatment systems for Single Houses, (P.E <10)
- Treatment systems for Small Communities, Business, Leisure Centres and Hotels
- BS5930 Code of Practice for Site Investigations.

5 DISCHARGES TO SURFACE WATERS

INFORMATION TO BE SUBMITTED WITH A WATER POLLUTION LICENCE APPLICATION*

The applicant is responsible for submitting all data in relation to quality and quantity of effluent and receiving waters.

To evaluate the impact of wastewater on receiving water, the following will be required:

1. An Application for Licence to Discharge Trade or Sewage Effluent to Waters Form, completed in accordance with the Licence Application Explanatory Notes. Both are available on the Donegal County Council website.
2. A description of the chemical and microbiological composition of the effluent at the proposed development.
3. A description of the chemical, biological and microbiological condition of the receiving water at the proposed development. (See Appendix 1)
4. Flow data of receiving waters, indicating 95 %ile flow and Dry Weather Flow (See Appendix 2)
5. An assessment of the associated impacts of the proposed discharge on the chemical, biological and microbial quality of the receiving waters having consideration for the relevant legislation (See appendix 3).
6. Details of proposals for dealing with sludge. This must include sludge collection contractor's details and letter of acceptance from permitted disposal site.
7. In certain sensitive circumstances a biological monitoring (fish data) and habitat assessment of the receiving water body may also be required.

In general, discharge to the following are regarded as unsuitable for the disposal of effluent;

- The extreme head waters of a catchment
- Waters with inadequate assimilative capacity
- or where the waters are moderately or seriously polluted

See Appendix 5 for guidance on typically "good" surface water standards, and on flows to be used for calculation of assimilative capacity.

Donegal County Council river monitoring data is available from Donegal County Council. Where a Donegal County Council water quality station exists within a reasonable distance of proposed discharge, this monitoring data should be used in assimilative capacity assessments.

*The information detailed in items 2 – 6 above must also be submitted with the Planning Application.

6 DISCHARGES TO GROUNDWATERS

Discharges directly to groundwater will not be considered, although the discharge of treated effluent to ground via a percolation area should be treated according to the protocol given below.

To evaluate the impact of wastewater on receiving waters the following is required, which may require the applicant to engage the services of a qualified hydrogeologist:

1. A Water Pollution Licence Application Form (Industrial, Commercial & Communal housing) completed in accordance with the Licence Application Explanatory Notes.
2. A description of the chemical and microbiological composition of the effluent at the proposed development.
3. A description of the chemical and microbiological condition of the groundwater at the proposed discharge location, (to establish baseline conditions, See Appendix 1). ***Permanent groundwater sampling points will need to be installed at locations suitable for the long term monitoring of groundwater quality, relative to this baseline condition.***
4. Aquifer characterisation and vulnerability rating of the site (See appendix 4)
5. An aquifer map for Co. Donegal is available from the Geological Survey of Ireland website www.gsi.ie
6. Details of the source of the water supply for the proposed development and details of any wells & wastewater treatment systems within 100 meters of treatment plant or percolation area. (Maps indicating the locations of these features to be included)
7. An assessment of the associated impacts of the discharge on the chemical and microbial quality of the groundwater having consideration for the relevant legislation. (See Appendix 3 & 4)
8. Details of proposals for dealing with sludge. This must include sludge collection contractor's details, letter of acceptance from permitted disposal site and Nutrient Management Plan.
9. Discharges to ground with inadequate percolation will not be considered.
10. Discharges in the vicinity of Regionally Important Aquifers will not be considered without reference to relevant groundwater protection plans. In general, discharges determined to place Regionally Important Aquifers at risk will not be permitted.

*The information detailed in items 2 – 8 above must also be submitted with the Planning Application.

Note: Site Specific Evaluation with reference to nitrates

Where nitrogen levels are known to be high or where nitrogen loading analysis indicates a potential problem with reference to nitrogen levels in the groundwater, then discharge to groundwaters via percolation may not be an option.

7 EFFLUENT TREATMENT STANDARDS

DISCHARGE OF EFFLUENT TO WATERS

In order that development should not adversely impact on waters, the following effluent emission limit values are given as **guidance** and should be taken into consideration when designing a treatment system prior to discharge of effluent to waters:

Parameter	Emission Limit Value
BOD	10 mg/l
Suspended Solids	10 mg/l
Total Phosphorus	2 mg/l P
Ortho Phosphate	1.5 mg/l P (4.5 mg/l PO_4)
Total Nitrogen	≈15 - 20 mg/l N
Nitrate	≈ 9 mg/l N (40 mg/l NO_3)
Nitrite	≈1 mg/l N (3.3mg/l NO_2)
Ammonia (pre-polishing filter)	≈ 4 mg/l NH_3N, @ pH <7.5 and Temp <15 °C. (5mg/l NH_4 or 5 mg/l NH_3) More stringent values to be applied at greater pH & Temp
Temperature	10 °C Nov – April, 20 °C Maximum No increase in ambient temperature by more than 1.5 °C
pH	6.5 - 9
Oils, Fats and grease	10 mg/l
Detergents	1mg/l

Note: *No discharge will be permitted which causes the receiving waters to deviate from the baseline ecological status, as determined by the quality elements described in the EPA's "Water Framework Directive - Proposed Quality Standards for Surface Water Classification" July 2007. In addition under the WFD, all waters must achieve good status by 2015 and no deterioration in status will be permitted.*

DISCHARGES TO GROUND VIA A PERCOLATION AREA

The following table sets out performance requirements which are considered to be the minimum acceptable levels that should be achieved by treatment systems, such as packaged and/or site assembled or prefabricated treatment units, prior to the discharge of effluent to ground via a percolation area, (given as **guidance only)**,*

Parameter	**Minimum % Removal of raw effluent for secondary treatment systems**	**Standard #**	**Comments**
BOD	85%	20 mg/l	
COD	70%	-	
Suspended Solids	60%	30 mg/l	
NH3 -N	-	10 mg/l	Unless otherwise specified
Total Nitrogen	20%	5 mg/l ***$***	Only for nutrient sensitive sites
Total Phosphorus	-	2 mg/l	Only for nutrient sensitive sites
Total Coliform	99.9%		

95%ile compliance is required
$ 24-hour composite samples

* **-** Extracted from the EPA's ***Code of Practice: Treatment Systems for Single Houses (P.E. <10)***

APPENDIX 1

RECEIVING WATERS ANALYSIS PARAMETERS

The receiving waters shall be sampled and analysed for the following parameters:

a) Chemical analysis for surface waters

- BOD_5 mg/l
- Suspended Solids mg/l
- Conductivity µS/cm
- pH
- Temperature ^{o}C
- Ammonium as mg/l NH_4
- Ammonia as mg/l NH_3
- Ortho phosphate as mg/l P
- Total phosphorus as mg/l P
- Nitrite as mg/l NO_2
- Nitrate as mg/l NO_3
- Total Nitrogen mg/l N
- Chlorides mg/l, Sulphate mg/l

b) Chemical analysis for groundwaters

Add to the above list:

- Sodium mg/l Na & Potassium mg/l K

c) Microbial analysis for surface waters and groundwaters

- Total Coliforms per 100mls
- Faecal Coliforms per 100mls
- A biological Q rating of the proposed receiving waters is required.

d) Biological/Ecological analysis for surface waters

e) Toxicity testing of Industrial Discharges

Toxicity Testing/Bioaccumulation Testing/Biodegradation testing of industrial effluent impacts on the receiving water will be required only for industrial type effluents.

f) General

Where the discharge is to surface waters in certain sensitive circumstances, a biological monitoring (fish data) and habitat assessment of the receiving water body may also be required. Other parameters may be required depending on specific proposed discharge and individual site circumstances. Where a Donegal County Council or EPA water quality station exists within a reasonable distance of proposed discharge, this monitoring data should be used in assimilative capacity assessments

All sampling and analysis shall be carried out by an independent person from an ILAB accredited laboratory or a laboratory approved by an external calibration programme.

APPENDIX 2

FLOW MEASUREMENT OF RECEIVING WATERS

The 95%ile flow in the receiving waters at the point of the proposed discharge must be measured or calculated.

(A)

Where historical data on the receiving waters indicating 95 %ile and Dry Weather Flow (DWF) exists, this data may be used. This data is available from the Hydrometric Section, EPA or on their website:

http://www.epa.ie/PublicAuthorityServices/HydrometricProgrammeandSurfaceWaters/

(B)

Where no historical data exists for the proposed receiving waters the following guidelines are recommended:

. Set up a temporary hydrometric station to ISO 1070/BS 3680 standards.
. measure flow in the catchment at the point of interest.
. This flow should then be correlated to a nearby rated station whose catchment area is similar in size, geology, unaffected by large abstractions/springs and with estimates of the DWF/ 95%ile flow.

Measurements should preferably be undertaken towards the end of a dry Summer (Aug, Sept, Oct) so that any groundwater in storage is allowed to discharge.

Note:

1. The Catchment area of the stream/receiving waters must be calculated and outlined on an appropriate map including contours.
2. Long term annual rainfall and evapotranspiration must be included. This information is available from the meteorological office

References:

BS 3680 Measurement of liquid flow in Open Channels. Part 2 Dilution Methods

Part 3A Velocity Area Methods

ISO 1070 Liquid flow in open channels - Velocity area method

APPENDIX 3

LEGISLATION

- Water Pollution Act(s) 1977 & 1990
- Water Framework Directive SI 772 of 2003
- Nitrates Directive
- Freshwater Fish Statutory Instrument 293 of 1988
- Shellfish Statutory Instrument 200 of 1994 where discharge is either directly or indirectly to a shellfish area.
- Quality of Salmonid Waters SI 293 of 1988
- Bathing Water Statutory Instrument 155 of 1992 and 230 of 1996 where discharge is either directly or indirectly to a bathing area.
- Surface Water Abstraction Regulation SI 294 of 1989
- Quality of Surface water intended for abstraction of drinking waters SI 294 of 1989
- Any relevant Water quality management plan
- Phosphorus Regulations Statutory Instrument 258 of 1998. Donegal County Council Phosphorus measures report.
- Memorandum No 1 Technical Committee on Effluent and Water Quality Standards
- EPA 1998 Environmental Quality objectives and Environmental Quality Standards
- Groundwater Directive as implemented by Statutory Instrument SI 271 of 1992, Statutory Instrument SI 41 of 1999.
- Any other relevant national Environmental Quality standards and objectives

APPENDIX 4

GROUNDWATER INVESTIGATIONS

A prior investigation will be required where the proposed discharge contains harmful substances listed in the First and Second Schedule of the Protection of Groundwater Regulations SI 41 of 1999 (List I & II Substances), Appendix 6. This investigation should include:

- The hydrogeological conditions of the area in which the percolation area and any aquifer is located.
- Nature, slope, thickness, particle size distribution, vulnerability, variations with depth and permeability of any overlying soil and subsoil and its effectiveness in preventing or reducing the entry of the harmful substance to water in an aquifer
- Permeability of bedrock
- Depth to Groundwater, recharge estimates and hydraulic gradient
- Existing Water Quality, see Appendix 1
- The risk of deterioration in the quality of the water therein due to the entry of harmful substance
- The risk to human health or water supplies, risk of harm to living resources and the aquatic ecosystem or the interference with the use of the water for agriculture, commercial, domestic, fisheries, industrial or recreational purposes.

Geotechnical Investigation, to determine the hydraulic suitability of the site for the disposal and attenuation of contaminants, should ***be carried out by a suitably qualified hydrogeologist.***

Investigations should be carried out in accordance with ***BS5930 Code of Practice for Site Investigations.***

APPENDIX 5

a) GUIDELINE RIVER WATER QUALITY VALUES

Parameter	Value	Units	RiverQuality
BOD	<3	mg/l O_2	Clean
	3 to 5	mg/l O_2	Doubtful
	>5	mg/l O_2	Poor
Orthophosphate (Mean annual level)	See table overleaf, which comprises the Third Schedule, Part 1 ("Quality Standards for Rivers") of the Phosphorus Regulations, S.I. 258 of 1998.		
Total Ammonia	<0.2	mg/l N	Clean
	>0.2	mg/l N	Doubtful
Unionised Ammonia	<0.02	mg/l NH_3	Clean
	>0.02	mg/l NH_3	Doubtful
Nitrate	<5.65	mg/l N	Clean
	>5.65	mg/l N	Doubtful
Nitrite	<0.05	mg/l N	Clean
	>0.05	mg/l N	Doubtful
Chloride	<40	mg/l Cl	Clean
	>40	mg/l Cl	Doubtful
Temperature	<21.5	^oC	Clean
	>21.5	^oC	Doubtful

b) RIVER FLOWS TO BE USED WHEN CALCULATING ASSIMILATIVE CAPACITY OF RIVERS:

Characteristics	Catchment area ≤ 5 sq km	Catchment Area > 5 sq km
Phosphate, Phosphorus	95%ile flow	Mean flow
Ammonia	DWF	DWF
All other characteristics	DWF	95%ile

c) ABSTRACT FROM PHOSPHORUS REGULATIONS SI 258 OF 1998

QUALITY STANDARDS FOR RIVERS		
Column 1	Column 2	Column 3
Existing Biological Quality (Q) Rating/Q Index	Minimum Target Biological Quality (Q) Rating/Q Index	Molybdate-Reactive Phosphate Concentration* (μgP/L)
Unpolluted		
5	5	15
4 - 5	4 -5	20
4	4	30
Slightly Polluted		
3 - 4	3 - 4	30
Moderately Polluted		
3	3 - 4	50
2 - 3	3	70
Seriously Polluted		
≤ 2	3	70
* Median concentration to be determined using as a minimum 10 samples taken at intervals of 4 weeks or longer in any 12 consecutive month period. Where the requisite number of samples has not been taken within such period the median concentration shall be determined from sampling conducted over such period being a period not exceeding 24 months as required to obtain a minimum of 15 samples taken at intervals of 4 weeks or longer.		

The table above is reproduced from the Phosphorus Regulations S.I. 258 of 1998. A complete copy of this Statutory Instrument is available on the **www.irishstatutebook.ie** website.

Note:

. The Phosphorus Regulations require that rivers with an existing quality rating in column 1 be maintained at or improved to the rating in column 2. For example a river with an existing column 1 rating of Q 3 should be improved to Q3 – 4.

. The phosphate concentration shown in Column 3 is the concentration which is applicable to the existing quality rating in column 1. For example, a phosphate concentration of 50 would indicate an existing water quality rating of Q3; moderately polluted water.

APPENDIX 6

First and Second Schedule of the Protection of Groundwater Regulations SI 41 of 1999 (List I & II Substances).

Harmful Substances (List I)	
Individual substances belonging to the following families and groups of substances:—	
1.	Organohalogen compounds and substances which may form such compounds in the aquatic environment.
2.	Organophosphorus compounds.
3.	Organotin compounds.
4.	Substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment, including substances in the Second Schedule which possess such properties in or via the aquatic environment.
5.	Mercury and its compounds.
6.	Cadmium and its compounds.
7.	Mineral oils and hydrocarbons.
8.	Cyanides.

Harmful Substances (List II)

Individual substances and categories of substances belonging to the following families and groups of substances:—

1. The following metalloids and metals and their compounds:

1.	Zinc	6.	Selenium	11.	Tin	16.	Vanadium
2.	Copper	7.	Arsenic	12.	Barium	17.	Cobalt
3.	Nickel	8.	Antimony	13.	Beryllium	18.	Thallium
4.	Chrome	9.	Molybdenum	14.	Boron	19.	Tellurium
5.	Lead	10.	Titanium	15.	Uranium	20.	Silver

2. Biocides and their derivatives other than those in the First Schedule.
3. Substances which have a deleterious effect on the taste and/or odour of water and compounds liable to cause the formation of such substances in such water and to render it unfit for human consumption.
4. Toxic or persistent organic compounds of silicon and substances which may cause the formation of such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into harmless substances.
5. Inorganic compounds of phosphorus and elemental phosphorus.
6. Fluorides.
7. Ammonia and nitrites.

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