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02 Dec 2019

IW-ER-LT0470

Dear Ms. English,

RE: Ballymote Waste Water Discharge Licence Application D0094-02

Further to Irish Water's licence review application for the Ballymote Agglomeration, submitted on 24 May 2018, and the Agency's determination on 11 July 2019 that an Appropriate Assessment was required, please find information provided.

Irish Water has prepared a Natura Impact Statement (NIS) which concludes that Ballymote WWTP discharges, alone or in-combination with other plans and projects will not give rise to significant effects on the integrity of the Templehouse and Cloonacleigha Loughs SAC as long as the mitigation measures are implemented, which include the upgrade of the WWTP and compliance with the appropriate ELVs.

It should be noted that the current and projected population equivalent in the 2018 licence review application has been revised in the intervening period. Section B.5(i) actual population equivalent (P.E.) is now 2,594 (in line with AERs 2017 and 2018) and Section B.5(ii) projected loadings P.E. for 2024 is now 2,629.

At the time of submission of the licence review application, the Waste Assimilation Capacity (WAC) calculations were carried out using water quality data available (2016 – 2017), which identified proposed ELVs, of BOD 25 mg/l, Ammonia 5 mg/l N and Ortho- Phosphate 2 mg/l P. These proposed ELVs would protect the receiving waterbody WFD objectives and therefore the qualifying interests under the Habitats Directive. The NIS attached to this letter includes an updated WAC which uses more recent water quality data (2018 – 2019). The more recent chemistry data indicates there has been some deterioration in water quality in the Owenmore River, upstream of Ballymote WWTP, which affects the outcome of the WAC. As detailed in the attached NIS, the updated WAC using the background levels of 0.066 mg/l Ammonia and 2.22 mg/l BOD, with the proposed ELVs, predicts downstream quality of 0.158 mg/l Ammonia and 2.646 mg/l BOD.

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The updated WAC predicts the proposed ELVs, in combination, would breach good status EQS downstream for Ammonia and BOD at low flows, due to current existing high background concentrations for these parameters in the upstream receiving waterbody.

Catchment characterisation by the EPA identifies the significant pressures for the Owenmore catchment are agriculture (nutrient pollution) and forestry (altered habitat due to morphological changes). Ballymote WWTP is not listed as a pressure. Nutrient loading to the Owenmore River is predominantly from catchment sources upstream of the Ballymote WWTP. With improved catchment management under the River Basin Management Plan, diffuse pollution is expected to reduce nutrient loadings from land management.

The EPA monitoring for biological quality in 2018 also indicates catchment influences on the Owenmore River upstream of the Ballymote WWTP discharge point. In 2018, Owenmore River upstream of the WWTP was assigned a Q3-4 rating indicating moderate ecological status, while the downstream site was assigned a Q4 rating, indicating Good water quality status.

Ambient monitoring results from January 2018 to June 2019, included in the NIS, demonstrate that water quality in the Owenmore River is influenced by catchment sources upstream of the Ballymote WWTP. The number of exceedances of the EQS for BOD and Ammonia is more frequent upstream than downstream of the WWTP. Ortho-phosphorus results show water quality is within the EQS for Good status, both upstream and downstream of the WWTP.

Irish Water recommends that based on a notionally clean approach, the proposed ELVs for the final effluent from Ballymote WWTP (BOD 25 mg/l, Ammonia 5 mg/l N and Ortho-Phosphate 2 mg/l P) would not prevent the Owenmore river from meeting environmental objectives under the Surface Water Regulations 2009, as amended nor compromise achievement of WFD Good status in the receiving watercourse.

Please find enclosed:

1. Natura Impact Statement Ballymote WWTP discharge licence review

Kind regards,



Joanne McGuinness

Environmental Regulation

1. Natura Impact Statement – Ballymote WWDL Review

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Irish Water Report

Natura Impact Statement
Ballymote WwTP Discharge Licence Review
September 2019

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Introduction

This report provides an Appropriate Assessment (AA) of the existing Waste Water Treatment Plant (WwTP) in Ballymote, County Sligo for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007), as amended. It assesses whether the on-going operation of the plant, alone or in combination with other plans and projects, could adversely affect the integrity of European Site(s) in view of best scientific knowledge and the conservation objectives of the site(s). European Sites are those identified as sites of European Community importance designated as Special Areas of Conservation under the Habitats Directive or as Special Protection Areas under the Birds Directive.

This report takes account of the guidance for AA published by the Environmental Protection Agency's (EPA) 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)' (EPA, 2009); the Department of the Environment, Heritage and Local Government's guidelines 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (DoEHLG, 2009) and Circular L8/08 'Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments' (DoEHLG, 2008).

This Appropriate Assessment has been carried out by a qualified ecologist working for Irish Water.

Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6(4) states:

If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

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Methodology

Guidance Followed

Both EU and national guidance exists in relation to Member States fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA Screening has had regard to the following guidance:

- Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Environmental Protection Agency, (EPA, 2009).
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, (DoEHLG, 2010).
- Circular L8/08 – Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Department of Environment, Heritage and Local Government, (DoEHLG, 2008).
- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg, (EC, 2000a).
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg, (EC, 2018).
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001).
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg, (EC, 2007).
- Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg (EC, 2006).
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012).

- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).

Stages Involved in the Appropriate Assessment Process

Stage 1: Screening / Test of Significance

This process identifies whether the WwTP discharge is directly connected to or necessary for the management of a European Site(s); and identifies whether the discharge is likely to have significant impacts upon a European Site(s) either alone or in combination with other projects or plans.

The output from this stage is a determination for each European Site(s) of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause that site to be brought forward to Stage 2.

Stage 2: Appropriate Assessment

This stage considers the impact of the WwTP discharge on the integrity of a European Site(s), either alone or in combination with other projects or plans, with respect to (1) the site's conservation objectives; and (2) the site's structure and function and its overall integrity. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts

The output from this stage is a Natura Impact Statement (NIS). This document must include sufficient information for the EPA to carry out the appropriate assessment. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

Stage 3: Assessment of Alternatives

This process examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European Site. This assessment may be carried out concurrently with Stage 2 in order to find the most appropriate solution. If no alternatives exist or all alternatives would result in negative impacts to the integrity of the European sites then the process either moves to Stage 4 or the project is abandoned.

Stage 4: Assessment Where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

Field Walkover Surveys

Field walkover surveys were undertaken on 25th of July 2019 to identify the potential for qualifying species and habitats in the surrounding environments of the current WwTP discharge at Ballymote. The field surveys and reporting were completed by a qualified ecologist.

Consultation

The EPA, as the competent authority, will seek NPWS advice as may be required in reaching their decision on a WwTP discharge. The NPWS can only communicate with the applicant (i.e. Irish Water) on request from the competent authority, when the formal application process to the competent authority has already commenced.

Screening for AA

Screening for Appropriate Assessment was undertaken by the Environmental Protection Agency who determined on 11/7/2019 that an Appropriate Assessment for the Waste Water Discharge Licence was required as they could not exclude, on the basis of objective information, that the activity, individually or in combination with other plans or projects, would have a significant effect on the qualifying interests of Templehouse and Cloonacleigha Loughs SAC which is located downstream of the discharge.

Description of the Project

Ballymote town is situated in the heart of County Sligo, 24 kilometres south of Sligo town. The current Population Equivalent (P.E.) for the Ballymote Agglomeration is 2,594 P.E. with a projected 2024 population equivalent of 2,629 P.E. Waste water generated within the catchment is conveyed predominantly by gravity with one pumping station located within the town at Ballybrennan (PS1). The sewer network conveys flows to the Ballymote WwTP, located to the south of Ballymote Town (IGR 166154E, 314573N). The primary discharge point (SW001) of the plant discharges into the Owenmore River along with a Storm Water Overflow (SW002). There is a network overflow (SW003) to the Ballymote stream, and an emergency overflow (SW004) from Ballybrennan Pumping Station to the Carmross Stream.

The Ballymote WwTP /discharges are not directly connected with or necessary to the management of any European Site for nature conservation.

Existing Ballymote WWTP

The existing Ballymote WWTP was designed to provide treatment for a design load of 2,000 P.E. The plant comprises fine screening, forward feed pumping, 2 no. aeration tanks with mechanical

aerators, and 1 no. final settlement tank. Sludge treatment is provided by thickening the sludge in a picket fence thickener. The existing imported sludge acceptance facility is not currently used. The existing plant was designed for secondary treatment with a final effluent of 25mg/l BOD.

Proposed Upgrade to Ballymote WWTP

Planning permission was granted in May 2017 for an upgrade to the existing Ballymote WWTP. The upgrade works are currently scheduled to commence in October 2019. The upgraded works will increase the design capacity of the secondary treatment plant from 2,000 P.E. to 3,500 P.E. In order to facilitate the upgrade the following works are proposed:

- Construction of new inlet works
- Construction of new pumping chamber
- Construction of new storm water holding tank, complete with storm water overflow mechanism
- Modification to the existing secondary clarifier
- Construction of a new secondary clarifier
- Replacement of the existing return activated sludge (RAS) pumps and waste activated sludge (WAS) pumps and pipework
- Installation of electromagnetic flow measurement on the RAS and WAS rising main
- Construction of a new administration/control building
- Installation of a new main control panel SCADA system
- Installation of automatic inlet and outlet samplers
- All associated site access, infrastructure and security measures

The location of the primary discharge to the Owenmore River is E165726, N313177. Based on a current loading of 225l/pp/day the dry weather flow for the current discharge is calculated at 0.00676m³/sec, with the 2024 dry weather flow calculated at 0.00685m³/sec. The long-term 95-percentile flow for the Owenmore River, as obtained from the EPA Hydrotool website¹, is 0.359m³/sec.

Effluent data from 2018-2019 is presented in Table 1.0 together with UWWT limit values. Any exceedances of standards are highlighted in bold. The current ELV's listed on the licence are based on a discharge to the Ballymote stream which is not the correct existing discharge point. The existing discharge point is to the Owenmore River, a significantly larger watercourse. An amendment to the licence has been requested to correct the existing discharge location to the Owenmore River and propose appropriate ELV's.

¹ <http://watermaps.wfdireland.ie/HydroTool/Authentication/Login.aspx?ReturnUrl=%2fHydroTool%2fDefault.aspx>
Accessed 10/09/2019

Table 1.0: Effluent Monitoring Data at Primary Discharge 2018 - 2019

Sample Date	BOD mg/l	COD mg/l	SS mg/l	Total Nitrogen mg/l	Total Phosphorous mg/l	Ammonia mg/l	Ortho-Phosphate mg/l
UWWT Reg Limits*	25	125	35				
16/01/18	4.9	32.1	21.6	4.47	0.484	1.05	0.0751
19/02/18	20.3	89.4	72.3	5.91	2.13	4.74	0.256
26/03/18	18.4	80.1	21.0	18.8	1.4	16.3	0.493
09/04/18	12	46	28.0	9.4	0.3	7.4	0.14
01/05/18	12.3	75	9.0	9.9	0.3	11	0.045
07/06/18	4.1	45	15.0	19.5	1.7	0.66	1.3
03/07/18	4.7	92	54	23	0.5	0.25	0.27
01/08/18	2	53	22.0	23.7	1.7	0.43	1.4
12/09/18	2	30	5	19.2	0.8	15	0.77
12/10/18	9.7	117	10.0	15.3		0.056	0.38
16/11/18	7.2	70	35.00	11.4	1.5	2.3	1.1
14/12/18	7.6	37	9.00	7.5	0.04	5.2	0.18
07/01/19	7.1	67	28.0	16.5	1.2	12	0.92
07/02/19	15.8	44	30.0	6.8	0.7	3	0.27
06/03/19	13.4	19	24.0	6.8	0.6	2.6	0.22
18/04/19	36.7	75	38.0	17	0.9	0.94	0.045
03/05/19	2	71	5.0	13.9	1.1	7.9	0.41
18/06/19	17.2	222	54.0	8.9	0.6	0.076	0.047

* Limits set for plants >2000p.e. for BOD, COD and SS in Schedule 2, Part 1 of the UWWT Regulations 2001 (S.I. 254 of 2001); Limits set for plants >10,000p.e. for Total Nitrogen and Total Phosphorus in Schedule 2, Part 1 of the UWWT Regulations 2001 (S.I. 254 of 2001) for discharges to sensitive waters listed in Schedule 1 of the UWWT (Amendment) Regulations 2010 (S.I. 48 of 2010) subject to EPA determination following amended regulation 4(3) of S.I. No 254/2001.

The primary discharge effluent occasionally exceeds the UWWT Regulation limits (Table 1.0). The agglomeration does not discharge to any waterbody listed as a Sensitive Area on Schedule 1 of the Urban Waste Water Treatment (Amendment) Regulations 2010 (S.I. No. 48/2010).

Description of the Receiving Environment and Monitoring Results

The primary discharge from the plant enters the Owenmore River. There are monitoring locations upstream and downstream of the discharge point. The upstream monitoring location is 'Br SSW of Emlaghfad' RS35O060200, located ca. 1.5km upstream of the discharge location on the Owenmore River. The downstream monitoring location is '1km ds of Ballymote stream' RS35O060250 located ca 400m downstream of the discharge point on the Owenmore River.

Monitoring data from 2018 and 2019 for these locations is given in Table 2.0 with exceedances of the SW Regulation limits highlighted in bold.

Table 2.0: Ambient monitoring data

Date	Ammonia N mg/l	BOD mg/l	DO mg/l	Ortho-Phosphate PO4-P mg/l	Total Nitrogen N mg/l	Total Phosphorus P mg/l
SW Regs EQS	≤0.14 (good) ≤0.090 (high)	≤2.6 (good) ≤2.2 (high)		≤0.075 (good) ≤0.045 (high)		
Upstream						
16/01/2018	< 0.2	< 1	10.7	< 0.02	1.25	0.0505
26/03/2018	< 0.2	< 1		< 0.02	1.05	0.0503
09/04/2018	0.013	2.2	11	< 0.005	< 1	0.01
01/05/2018	0.066	2.1	11	0.013	< 1	0.04
07/06/2018	0.088	1.6	10	0.024	< 1	0.07
03/07/2018	0.019	2.1	10	< 0.005	18.8	0.01
12/09/2018	0.165	4.5	10	0.011	< 1	0.03
12/10/2018	< 0.01	1.3	11	0.013	2.8	0.05
16/11/2018	0.081	2.2	9	0.014	2.9	0.06
14/12/2018		1.03			25.5	2.5
07/01/2019	0.113	4.2	10	0.024	2.6	0.03
06/03/2019	0.018	3.4	12	0.034	1.8	0.08
18/04/2019	0.039	2.6	10	0.026	1.5	0.03
18/06/2019	0.051	2.8	9	0.013	<2.5	0.04
Downstream						
16/01/2018	< 0.2	2.88	10.3	< 0.02	1.22	0.0638
26/03/2018	< 0.02	2.06	7.7	< 0.02	1.14	
09/04/2018	0.065	2.5	11	0.02	< 1	0.04
01/05/2018	0.091	1.5	11	0.007	< 1	0.04
07/06/2018	0.065	1.7	10	0.02	< 1	0.05
03/07/2018	0.044	1.4	12	0.007	11.1	0.03
12/09/2018	0.025	3.4	8	0.025	< 1	0.05
12/10/2018	0.014	1.9	11	0.013	2.7	0.06
16/11/2018	0.097	3.5	11	0.02	3	0.06
14/12/2018	< 0.01	1	0	0.005	1	0.01
07/01/2019	0.215	8.8	10	0.052	2.6	0.07
06/03/2019	0.106	4.4	12	0.054	2.5	0.1
18/04/2019	0.096	2.4	9	0.02	1.6	0.04
18/06/2019	0.047	2.5	9	0.014	<2.5	0.04

Comparing the monitoring results above with the standards in Schedule 5 of the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009),

indicates that there are occasional exceedances of the standards for BOD and Ammonia both upstream and downstream of the discharge point.

The EPA monitor biological water quality upstream and downstream of the discharge point (at the same upstream/downstream locations identified above). In the latest round of monitoring in 2018, the Owenmore River upstream site was assigned a Q3-4 rating indicating moderate water quality status, while the downstream site was assigned a Q4 rating indicating Good water quality status.

The Owenmore River both upstream and downstream of Ballymote WwTP has also been assigned Good WFD status (2010-2015), dropping to Moderate status ca. 1km upstream of entering Templehouse Lake. The Owenmore River flows into Templehouse Lake ca. 7.2km downstream of the discharge point. The lake water quality is classed as mesotrophic by the EPA (2009). The WFD status (2010-2015) for the lake is Bad.

The EPA's catchment data highlights that the significant pressures for the Owenmore catchment are agriculture (nutrient pollution) and forestry (altered habitat due to morphological changes). Ballymote WwTP is not listed as a pressure. The WFD App highlights that fish and macrophytes are driving the bad ecological status in the lake.

The Owenmore River upstream and downstream of the discharge location was visited 25th July 2019. Sedimentation of substrates and dark water colour were notable at all locations visited (see Photos 1-4). Bankside habitats were dominated by intensive agricultural pasture land. There were no obvious visual signs of pollution or odours that would typically be attributed to urban wastewater. Kick samples were undertaken at the EPA biological monitoring locations. The upstream location warranted a Q3-4 rating, with moderately pollution tolerant taxa most abundant, but sensitive stonefly nymphs also present. The downstream sample contained no sensitive taxa, was dominated by moderately pollution tolerant taxa, and included the presence of *Chironomus* larvae - a highly pollution tolerant species. The downstream sample thus warranted a Q3 rating. Two further downstream sites were sampled (RS35O060400, Carrowroagh Br (u/s Templehouse L), and RS35O060300 (Ford at Ballynaglogh), and though individual 'Group A' Mayflies were found, the community was similar to that found at the other downstream sites (including *Chironomus* larvae) and thus both these sites also warranted Q3 ratings.



Photo 1 Upstream - Br SSW of Emlaghfad RS35O060200



Photo 2 Downstream location - 1km ds of Ballymote stream RS35O060250



Photo 3 Downstream - (Ford at Ballynaglogh) RS35O060300



Waste Assimilative Capacity

Table 3.0 summaries the assimilative capacity calculations which are based on the 2024 estimated loading of 2,629p.e., 95%ile river flow and water quality standards in the European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 272 of 2009). The licence application used an overestimated figure for population equivalent of 2,768 as the projected 2024 p.e., however this was based on an overestimated current loading. The generated load in 2017 and 2018 (and reported in AERs for those years) was 2,594. With a growth rate of 0.225% that projects 2024 population equivalent of 2,629. Assimilative capacity calculations use both actual background concentrations and the 'notionally clean river' approach. The average values for effluent quality (Table 1.0) were used together with the average values of the most recent upstream monitoring data for actual background concentrations (Table 2.0).

Table 3.0 Assimilative capacity calculations at estimated 2024 loadings of 2,629p.e. for actual background concentrations and for a notionally clean river (based on current effluent data).

Parameter		Background (mg/l)	Predicted downstream quality (mg/l)	EQS* (mg/l)
BOD	Actual Background	2.220	2.384	≤2.6
	Notionally Clean	0.260	0.460	
Ammonia	Actual Background	0.066	0.159	≤0.14
	Notionally Clean	0.008	0.102	
Orthophosphate	Actual Background	0.015	0.024	≤0.075
	Notionally Clean	0.005	0.014	

*European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009 (95%ile standards presented).

Considering the actual background concentrations, the Owenmore River does not have available assimilative capacity for the current discharge of Ammonia, however there is capacity for BOD and Orthophosphate. Considering notionally clean water quality there is assimilative capacity for all parameters.

Table 4.0 summaries the assimilative capacity calculations using proposed ELV's which are the UWWT Reg Limits for BOD, COD and SS, 5mg/l N for Ammonia and 2mg/l P for Orthophosphate.

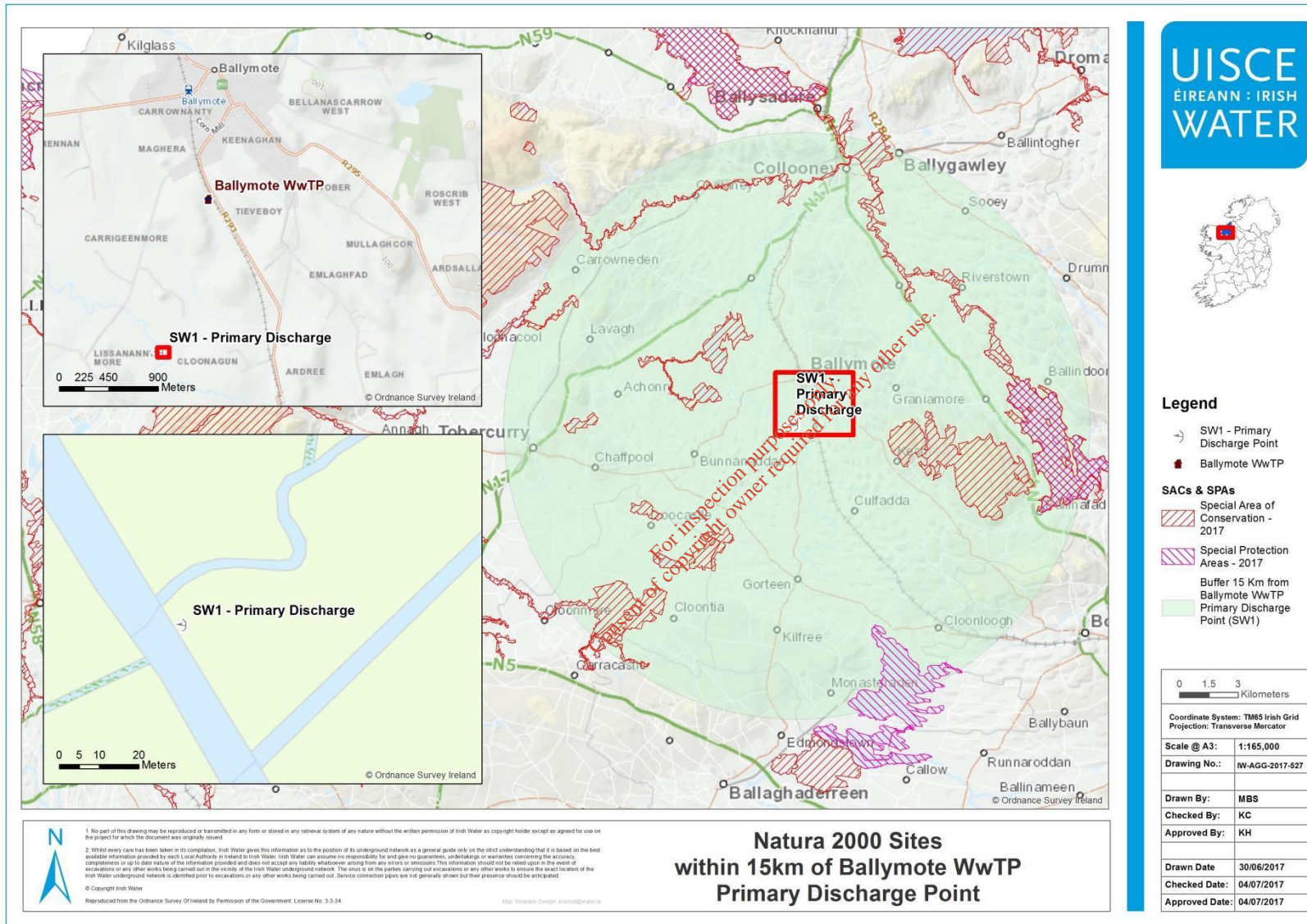
Table 4.0 Assimilative capacity calculations at estimated 2024 loadings of 2,629p.e. for actual background concentrations and for a notionally clean river (based on the proposed ELV's)

Parameter		Background (mg/l)	Predicted downstream quality (mg/l)	EQS* (mg/l)
BOD	Actual Background	2.220	2.646	≤2.6
	Notionally Clean	0.260	0.723	
Ammonia	Actual Background	0.066	0.158	≤0.14
	Notionally Clean	0.008	0.101	
Orthophosphate	Actual Background	0.015	0.052	≤0.075
	Notionally Clean	0.005	0.042	

*European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009 (95%ile standards presented).

Considering the actual background concentrations, the Owenmore River does not have available assimilative capacity for the proposed ELV's for BOD or Ammonia, however there is capacity for Orthophosphate. Considering notionally clean water quality there is assimilative capacity for all parameters.

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Appropriate Assessment

Templehouse and Cloonacleigha Loughs SAC, which has been determined as requiring AA, is described and all the potential impacts resulting from the Ballymote WwTP discharge are discussed in relation to the conservation objectives of this designated site.

Description of the European Site Affected

Table 5.0 European Sites

Site Code	Site Name	Qualifying Habitats	Qualify Species
000636	Templehouse and Cloonacleigha Loughs SAC	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]	n/a

Templehouse and Cloonacleigha Loughs SAC²

This site is located approximately 5 km north-west of Ballymote, Co. Sligo. It comprises three shallow, hard water lakes - Templehouse Lough, Cloonacleigha Lough and Killawee Lough - which are inter-connected by the Owenmore River. The lakes are situated on Carboniferous limestone, but are surrounded by low, peat-covered hills.

Templehouse and Cloonacleigha Loughs support a wide diversity of wetland communities including floating and submerged aquatic habitats, tall fen vegetation, carr and wet woodland. Other habitats within the site are mixed woodland, lowland wet grassland, raised bog and cut-away bog.

The emergent vegetation of the lakes includes Common Reed (*Phragmites australis*), Common Club-rush (*Scirpus lacustris*), Slender Tufted-sedge (*Carex acuta*), Marsh-marigold (*Caltha palustris*), Marsh Willowherb (*Epilobium palustre*) and River Water-dropwort (*Oenanthe fluviatilis*). Yellow and White Water-lilies (*Nuphar lutea* and *Nymphaea alba*) and Ivy-leaved Duckweed (*Lemna trisulca*) dominate the floating vegetation. Five species of stonewort have been recorded from Cloonacleigha Lough: *Chara aspera*, *C. contraria*, *C. rudis*, *C. virgata* and *C. vulgaris* var. *longibracteata*, with the last-named also occurring in Templehouse Lough. Other submerged species present include Perfoliate Pondweed (*Potamogeton perfoliatus*), Spiked

² Extracted from NPWS Site Synopsis (NPWS, 2013a)

Water-milfoil (*Myriophyllum spicatum*) and Canadian Waterweed (*Elodea canadensis*). Also present along the shore of Cloonacleigha Lough are areas of fen and scraw (floating vegetation) which are rich in sedges (e.g. *Carex lasiocarpa*, *C. aquatilis*, *C. acuta*), along with fen pastureland with Tufted Hair-grass (*Deschampsia cespitosa*) and Tall Fescue (*Festuca arundinacea*).

Mixed woodland occurs on the northern shores of Templehouse Lough. The dominant tree species are Pendunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*), and Beech (*Fagus sylvatica*); small amounts of Grand Fir (*Abies grandis*) are also present. A dense understorey of Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*) occurs in some parts. Both the Beech and Ash are extensively regenerating. Areas of more natural woodland with birch (*Betula pubescens* and *B. pendula*), Rusty Willow (*Salix cinerea* subsp. *oleifolia*), Eared Willow (*S. aurita*), Bay Willow (*S. pentandra*), Ash and Alder (*Alnus glutinosa*) also occur. The Red Data Book species Bird Cherry (*Prunus padus*) is known from the Templehouse area and may occur within the site. Epiphytic lichens such as Cup-moss (*Cladonia pyxidata*) and beard-mosses (*Usnea* spp.) are abundant here. Ground flora species recorded include Bluebell (*Hyacinthoides non-scripta*), Woodruff (*Galium odoratum*), Dog's Mercury (*Mercurialis perennis*), Lords-and-Ladies (*Arum maculatum*), Meadowsweet (*Filipendula ulmaria*), Water Mint (*Mentha aquatica*) and Yellow Loosestrife (*Lysimachia vulgaris*).

The stretch of Owenmore River included in the site is meandering and slow-moving and hosts a diverse flora which achieves up to 80% coverage in places. Species present include Branched Bur-reed (*Sparganium erectum*), Yellow Water-lily, Broad-leaved Pondweed (*Potamogeton natans*), starworts (*Callitriche* spp.), River Water-dropwort and the non-native Monkeyflower (*Mimulus guttatus*). Tall fen vegetation, with stands of Common Reed, an abundance of sedges and a herb layer which includes the Red Data Book species Marsh Pea (*Lathyrus palustris*) occurs along the river.

The complex of loughs, woodland and river channels makes this an important site for birds, especially wintering waterfowl e.g. Teal, Wigeon, Mallard, Tufted Duck and Goldeneye. There is also a relatively large wader population, including Lapwing, Curlew and small numbers of Greenland White-fronted Goose, a species listed on Annex I of the E.U. Birds Directive. Many bird species breed in the area, including Mute Swan and Great Crested Grebe, and the largest heronry in Co. Sligo, supporting approximately 16 breeding pairs, is found on the shore of Templehouse Lough. Furthermore, a population of Woodcock is managed for shooting on the Templehouse estate.

Besides shooting, the area is used for coarse fishing and boating. Some agricultural land is included in the site and this is extensively grazed by sheep, and less so by cattle, and some hay is also cropped.

Potential threats to the site include: water pollution from domestic and agricultural sources; over-grazing of lough fringe vegetation and woodland ground flora; field drainage; peat cutting; and afforestation. A section of wetland has already been damaged by the construction of several large drains and some of its margins have been cut for turbary. Some conifer afforestation has also taken place.

Description of the Conservation Interests of the SAC

Annex I Habitats³

The Templehouse and Cloonacleigha Loughs SAC supports 2 Annex I habitats:

- Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] (*Hard water lakes*)
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260] (*Floating river vegetation*)

Hard water lakes (habitat 3140) habitat is strongly associated with lowland lakes over limestone bedrock with groundwater contribution being typical. They are characterised by a diverse charophyte community exhibiting a depth-related zonation. Eutrophication is a significant pressure for this habitat via both surface and groundwater pathways, the primary sources of pollutants being agriculture and municipal and industrial wastewaters. The overall assessment of conservation status for this habitat nationally is 'Bad', primarily due to the inadequate action to reduce pollution losses from agriculture, which is the largest source of phosphorus to water, and to address the impact of peatland drainage and degradation (NPWS, 2013b). The Owenmore river enters Templehouse lake, an example of this habitat.

Floating river vegetation (habitat 3260), taking a broad interpretation of the habitat based on the plants listed in the EU Interpretation Manual, is potentially found in most watercourses in Ireland. Sub-types have not been defined to date and would have varying levels of sensitivity to pressures, with slow flowing streams dominated by Ranunculus and Callitriche less sensitive to diffuse pollution than acid, oligotrophic flashy upland streams dominated by bryophytes. The declines in the latter oligotrophic sub-types are the basis of assessing the overall conservation status of this habitat as inadequate nationally (NPWS, 2013b). Nutrient and organic losses from agriculture and municipal and industrial discharges are the most significant pressures and threats. While no examples of this habitat were found in the vicinity of the discharge point or downstream, a section of the Owenmore River is included in the designation and has the potential to support this habitat.

Table 6.0: Qualifying Habitats along Surveyed Stretch

Site	Qualifying Habitats	Present within potential zone of influence of the discharge
Templehouse and Cloonacleigha Loughs SAC	Hard water lakes	Yes
	Floating river vegetation	Yes

³ In subsequent text and tables in this report the full Annex I habitat names are shortened as per NPWS (2013b)

Conservation Objectives of the Templehouse and Cloonacleigha Loughs SAC⁴

Article 6 of the Habitats Directive states that:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications of the site in view of the site's conservation objectives.

The importance of a site designated under the Habitats Directive is defined by its qualifying features or interests. Qualifying interests for any European site are listed on a *pro forma*, called the Natura 2000 standard data form, which forms the basis of the rationale behind designation, and informs the Conservation Management Plan for targeted management and monitoring of key species and habitats.

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

There are no detailed conservation objectives for the qualifying interests of this SAC, however reference was made to conservation objectives for the Annex I habitats from another SAC where they have been published (Lough Corrib SAC 000297):

Typical detailed conservation objectives for hard water lakes:

- Attribute: Hydrological regime – water level fluctuations;
Target: Maintain appropriate natural hydrological regime necessary to support the habitat.
- Attribute: Lake substratum quality;
Target: Restore appropriate substratum type, extent and chemistry to support the vegetation.

⁴ NPWS (2018) Conservation objectives for Templehouse and Cloonacleigha Loughs SAC [000636]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.

- Attribute: Water quality: transparency;
Target: Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
- Attribute: Water quality: nutrients;
Target: Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
- Attribute: Water quality – phytoplankton biomass;
Target: Maintain appropriate water quality to support the habitat, including high chlorophyll a status.
- Attribute: Water quality – phytoplankton composition;
Target: Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
- Attribute: Water quality – attached algal biomass;
Target: Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
- Attribute: Water quality – macrophyte status;
Target: Restore high macrophyte status.
- Attribute: Acidification status;
Target: Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat subject to natural processes.
- Attribute: Water colour;
Target: Restore/maintain appropriate water colour to support the habitat.
- Attribute: Dissolved organic mg/l carbon (DOC);
Target: Restore/maintain appropriate organic carbon levels to support the habitat.
- Attribute: Turbidity;
Target: Restore/maintain appropriate turbidity to support the habitat.
- Attribute: Fringing habitat – area and condition;
Target: Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140.

Typical detailed conservation objectives for floating river vegetation:

- Attribute: Habitat distribution;
Target: No decline, subject to natural processes.
- Attribute: Habitat Area;
Target: Area stable or increasing, subject to natural processes.
- Attribute: Hydrological regime - river flow,
Target: Maintain appropriate hydrological regimes.
- Attribute: Hydrological regime – groundwater discharge;
Target: Maintain appropriate hydrological regimes.
- Attribute: Substratum composition - particle size range;
Target: Maintain appropriate substratum particle size range, quantity and quality, subject to natural process.
- Attribute: Water quality;
Target: Maintain appropriate water quality to support the natural structure and functioning of the habitat.

- Attribute: Vegetation composition – typical species;
Target: Typical species of the relevant habitat sub-type should be present and in good condition.
- Attribute: Floodplain connectivity - area;
Target: The area of active floodplain at and upstream of the habitat should be maintained.
- Attribute: Riparian habitat - area;
Target: Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types.

Impact Prediction

Impacts on Water Quality

The aquatic conservation interests of Templehouse and Cloonacleigha Loughs SAC are directly dependant on the aquatic environment and as the Ballymote WwTP discharges directly to the Owenmore River there is a direct connection between this facility and the ecological receptors of the SAC lake/river downstream.

Templehouse lake, forming part of Templehouse and Cloonacleigha Loughs SAC, is located ca. 7Km downstream of the discharge point along the Owenmore River. Recent water quality and effluent data reviewed as part of this NIS occasionally exceeds the relevant standards. Water quality upstream of the discharge is clearly being impacted by forestry and agriculture (as identified by the CSMU of the EPA⁵), and the site visit indicated that agriculture continues to be a pressure upstream and downstream of the WwTP discharge location. There is no assimilative capacity for the existing discharge levels of Ammonia, or the proposed ELVs for BOD or Ammonia. ELV's of 15mg/l BOD and 3mg/l Ammonia would be required to ensure there is no deterioration in the EQS's for these parameters downstream Biological water quality sampling undertaken as part of this study suggests that water quality deteriorates downstream of the discharge point, though the persistence of negative indicator species 6km downstream of the discharge is considered more likely to be due to local agricultural impacts than the WwTP discharge. It is noted that EPA monitoring found that biological water quality improved downstream in 2018 however, despite the ongoing discharge from the overloaded plant.

Other water quality impacts which have the potential to act cumulatively and impact on the SAC result from the following:

- Chemical fertiliser application to agricultural lands (the main fertilisers in use supply nitrogen, phosphorus, potassium and sulphur);
- Agricultural practices such as ploughing leads to greater mineralisation and nitrification, and in the case of old grassland, it can result in an increase in the release of nitrogen over a number of years (OECD, 1986);
- Artificial drainage increases nitrate leaching and reduce the morphological qualities of watercourses, thereby reducing the quality of habitat for flora and fauna;

⁵ <https://www.catchments.ie/>

- Endocrine disruptors in domestic sewage, including the main active component in the oral contraceptive pill, can interfere with the endocrine system of plants and animals which controls a wide range of processes including metabolism, growth and reproduction. Effects include a high degree of intersexuality downstream of sewage works (Routledge *et al.* 1998);
- Forestry may alter water quality indirectly through increased evaporation losses and hence an increase in solute concentrations; and
- On-site wastewater treatment systems, poorly performing septic tank units and other small effluent systems can be significant sources of nutrients to rivers.

Impacts on Annex I Habitats

Water quality (particularly phosphorus and nitrates) strongly influences the species composition, extent and condition of riverine plant communities. The key parameters include alkalinity, pH, nitrate, phosphate, potassium and suspended solids. Eutrophication is regarded as the major water quality issue currently affecting plant communities in Irish rivers (NPWS. 2013b). The process of eutrophication and its impact on macrophyte communities varies, depending upon river type and catchment. The effects of eutrophication on aquatic macrophytes are documented (Haslam 1978; Spink *et al.* 1993; Mainstone *et al.* 2000) as usually causing a shift in community composition and increased biomass. Increasing nutrient supply will lead to an overall reduction in the number of species, with a loss of *Ranunculus spp.* and an increase in pollution-tolerant species such as *Potamogeton pectinatus*, *Myriophyllum spicatum*, *Sparganium emersum*, *Schoenoplectus lacustris* and filamentous algae. More extreme nutrient increases lead to an overall impoverishment of the plant community, with algae dominating.

The Owenmore River flows directly into Templehouse lake, currently classed as Bad WFD status, with one of the driving factors being macrophytes. The Annex I habitats for which this site is designated are sensitive to eutrophication, with increased nutrient inputs having the potential to interfere with the conservation objectives for this site, aimed at restoring the site to favourable conservation status. Reviewing the 'typical' detailed targets for the relevant habitats, those related to vegetation composition and water quality have the potential to be impacted by continued nutrient inputs.

While EPA monitoring data would not suggest that the existing discharge is impacting 'alone' on water quality of the Owenmore River, given the overloading of the current plant and the poor quality of the current effluent, in-combination impacts with other catchment pressures cannot be excluded. Assimilative capacity calculations demonstrate that the river does not have capacity for the proposed ELV's for BOD or Ammonia due to the significant pressures upstream. Cumulative impacts have the potential to continue to affect the conservation objectives for hard water lakes and Floating river vegetation. Mitigation is required in order to address the contribution of the WwTP discharge to water quality issues in the River.

Table 7.0: Qualifying SAC Habitats Potentially Impacted by WwTP Discharge

SAC	Qualifying Habitats	Potential Impacts	Brief Explanation	Mitigation required
Templehouse and Cloonacleigha Loughs SAC	Hard water lakes	Eutrophication	Existing poor quality effluent may be contributing to eutrophication pressures at a catchment scale	Yes
	Floating river vegetation	Eutrophication	Existing poor quality effluent may be contributing to eutrophication pressures at a catchment scale	Yes

Mitigation Measures

The primary mitigation measure proposed is the upgrade of Ballymote WwTP to a standard to ensure that it is not overloaded and that appropriate effluent quality standards for a discharge to the Owenmore River (rather than the Ballymote stream) can be met. The Ballymote WwTP upgrade project has received planning permission, and a contractor has been appointed to undertake the work which is expected to commence in October 2019. While it is noted that due to the current deterioration in upstream water quality there is currently no assimilative capacity for the proposed ELV's for BOD and Ammonia, it is understood that the EPA will define appropriate ELV's for the WwTP discharge taking account of the significant pressures on the waterbody identified upstream.

Furthermore, to ensure satisfactory operation of the plant:

- Ensure ELV's set by the EPA are not breached; and
- Continuation of monitoring of the discharge, including at the outfall, and the ambient background concentrations, on a consistent and regular basis.

Stage 2 Appropriate Assessment Conclusion Statement

The current Appropriate Assessment has been prepared following the EPA (2012) 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007), Version 2.2'. The Department of the Environment, Heritage and Local Government guidance 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (2010) has also been taken into account. Therefore the current assessment for the Waste Water Discharge Licence investigates the potential adverse effects on the aquatic qualifying interests of the Natura 2000 network arising from the plant discharges, in combination with other plans / projects affecting the aquatic environment.

The assessment considers whether the discharges, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects.

When the above mitigation measures are implemented in full, it is envisaged that there will be no significant adverse effects on the integrity of Templehouse and Cloonacleigha Loughs SAC in view of this site's conservation objectives and that the conservation status of the Annex I habitats will not be compromised by the WwTP discharges either directly, indirectly or cumulatively.

It is therefore concluded that Ballymore WwTP discharges, alone or in-combination with other plans and / or projects will not give rise to significant effects on the integrity of Templehouse and Cloonacleigha Loughs SAC as long as the mitigation measures as listed above are implemented in full. Stage 2 concludes the Appropriate Assessment process of the Ballymote Waste Water Discharge Licence Review.

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