



ATTACHMENT D.2.2:
AA SCREENING & NIS REPORT
NOVEMBER 2022

Irish Water Report

AA Screening & Natura Impact Statement Report as part of the
Mallow Waste Water Discharge Licence Review D0052-02
November 2022



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Introduction

This report provides information to enable the EPA as competent authority to conduct an Appropriate Assessment (AA) Screening Determination and Stage 2 AA in respect of the Mallow agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020. It considers whether the operational discharges from the agglomeration, 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 (SACs) under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") or as Special Protection Areas (SPAs) under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC (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 OPR guidance on Appropriate Assessment Screening for Development Management, OPR Practice Note PN01 (OPR, 2021) and 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), together with subsequent case law.

This assessment was completed by Kate Harrington MSc MCIEEM, an Ecologist who has 18 years' experience in undertaking ecological surveys and assessments in Ireland and abroad. Ms Harrington's experience includes the preparation of AA Screening, NIS, Ecological Impact Assessments, biodiversity studies and water quality studies for a range of infrastructure projects. She has extensive experience of reviewing and undertaking ecological assessments for Irish Water projects and activities as well as developing guidance documents and advising consultant engineers and ecologists regarding best practice. She currently works as a freelance ecologist and is pursuing a PhD in woodland ecology.

Legislative Context

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 SACs designated under the Habitats Directive and SPAs designated under the Birds Directive.

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.

Article 7 of the Habitats Directive provides that the provisions of Article 6(3) and 6(4) (among other provisions) are to apply to SPAs designated under the Birds Directive.

Article 6(3) provides for a two-stage process. The first stage involves a screening for AA and the second stage arises where, having screened the application for the development, the competent authority determines that AA is required, in which case it must then carry out that AA. A competent authority does not have jurisdiction to grant development consent unless the AA provisions are correctly applied.

The Habitats and Birds Directives are transposed in Ireland under the European Communities (Birds and Natural Habitats) Regulations 2011, as amended (2011 Regulations). In relation to the assessments to be carried out under the Habitats Directive, the provisions of Regulation 42 of the 2011 Regulations require “a screening for AA of a... project for which an application for consent is received”. Following that screening, if the relevant public authority determines that an AA is required, then a Natura Impact Statement [NIS] must be submitted and “a public authority shall give consent for a... project, only after having determined that the... project shall not adversely affect the integrity of a European site”.

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 NIS has had regard to the following guidance:

- Office of the Planning Regulator (OPR). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. (OPR, 2021)
- 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, 2000).
- 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).
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission, Brussels (EC, 2021).
- 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).

- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012).
- EPA Guidance for Irish Water on Requests for Alterations to a Wastewater Discharge Licence or Certificate of Authorisation” (Revised March 2019).

Stages Involved in the Appropriate Assessment Process

Stage 1: Screening / Test of Significance

This process identifies whether the Mallow agglomeration operational discharges are directly connected to or necessary for the management of a European Site(s); and identifies whether they are likely to have significant impacts upon a European Site(s), either alone or in combination with other projects or plans.

In essence, upon conducting a Stage 1 Screening, the competent authority is required to determine whether or not it can be excluded, on the basis of objective scientific information, that the project, in this case the operational discharges from the Mallow agglomeration, individually or in combination with other plans or projects, will have a significant effect on a European site.

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 operational discharges 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. The potential impacts of the Mallow operational discharges are examined with respect to the attributes and targets which define the favourable conservation condition of each qualifying interest in the Blackwater River (Cork/Waterford) SAC, and the extent, if any, to which meeting those targets could be affected. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts may be carried out at Stage 2.

To assist the competent authority to carry out the Stage 2 AA, the developer must prepare 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 European 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.

Consultation

Irish Water issued a request to the EPA on the 30th August 2022, for a Scoping Opinion on the scope and level of detail to be included in an EIAR for the Mallow Waste Water Discharge Licence (D0052-01) review. In accordance with the requirements of Regulation 17C & 17D of the European Union (Waste Water Discharge) Regulations 2007 to 2020 (WWD Regulations), the EPA consulted with the relevant prescribed bodies under Regulation 21(1) of the above referenced WWD Regulations. One scoping response was received from Cork County Council. The other prescribed bodies did not provide a response within the timeframe set out.

In relation to EIA and AA, Cork County Council's submission stated the following:

The proposed operational discharges will discharge in the BLACKWATER (MUNSTER)_130 and BLACKWATER (MUNSTER)_140, both of which have a WFD 2013-2018 designation of "GOOD" status. The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (Margaritifera Margaritifera) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) and is also a Special Area of Conservation designated for the protection of a range of freshwater species and habitats. The EPA as competent authority to confirm through the EIA and AA processes that licence emission limit values are established at limits which can ensure that Ecological Quality Objectives as set out in the fourth schedule of the FWPM Regulations can be maintained, and that the Conservation Objectives for all qualifying interests of the Special Area of Conservation are also met.

The assessment contained herein has taken full regard of the above submission.

Desk Study

The sources of available desktop information used to inform the assessment included:

- The National Parks and Wildlife Service (NPWS) natural heritage database (www.npws.ie) was consulted for designated sites of nature conservation interest in the study area;
- The National Biodiversity Data Centre (NBDC) species database (<http://www.biodiversityireland.ie/>) and BSBI database (<https://database.bsbi.org/>) were consulted to obtain species records in the study area.
- The Environmental Protection Agency mapping system (<https://gis.epa.ie/EPAMaps/>), and www.catchments.ie website for data related to water quality;

- The Inland Fisheries Ireland (IFI) website and www.wfdfish.ie website for fisheries data;
- Ordnance Survey Ireland mapping and aerial photography from <http://map.geohive.ie/>;
- Geological Survey Ireland (GSI) data and maps <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx> ;
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland <https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/>;
- DixonBrosnan (2019a) Natura Impact Statement – Mallow Sewerage Scheme. Report for TJ O’Connor & Associates. Dated April 2019. Available on Cork Co. Co. Planning System Reference 195078;
- DixonBrosnan (2019b) Ecological Impact Assessment – Mallow Sewerage Scheme. Report for TJ O’Connor & Associates. Dated April 2019. Available on Cork Co. Co. Planning System Reference 195078;
- DixonBrosnan (2019c) Appendix G (Ecological FI Queries) Appendix 3 - Lamprey breeding survey and assessment of potential salmon spawning habitat for the pipeline crossing area for the Mallow Sewerage Scheme, Co. Cork. Available on Cork Co. Co. Planning System Reference 195078; and
- TJ O’Connor & Associates (2019) Mallow Sewerage Scheme – Planning Further Information Response. October 2019. Available on Cork Co. Co. Planning System Reference 195078.

Field Study

A walkover survey was carried out by the author on September 12th 2022. The relevant discharge locations were visited with the aim of identifying the aquatic habitats in the receiving waters, and determining what qualifying interests occur, or have the potential to occur, within the zone of influence of the discharges. Habitats were classified with reference to The Heritage Council’s ‘*A Guide to Habitats in Ireland*’ (Fossitt, 2000)¹ and the Annex I interpretation manual.² Searches for protected species followed NRA (2009)³ guidance. Salmonid habitat was assessed for adult, juvenile and nursery habitat potential following DANI guidelines⁴, while lamprey habitat potential was assessed following Harvey & Cowx (2003)⁵.

¹ <https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf>

² Interpretation Manual of European Union Habitats – EUR28

https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf

³ NRA (2009) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes <https://www.tii.ie/technical-services/environment/planning/Ecological-Surveying-Techniques-for-Protected-Flora-and-Fauna-during-the-Planning-of-National-Road-Schemes.pdf>

⁴ <https://www.daera-ni.gov.uk/sites/default/files/publications/dcal/provision-of-salmon-and-trout-habitat-leaflet.pdf>

⁵ Harvey J & Cowx I (2003). Monitoring the River, Brook and Sea Lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough

Description of the Project

Background

Mallow town lies within an agricultural landscape on the N20 ca. 30km north of Cork City. The WwTP is located on the east side of the town on the banks of the Blackwater River. The new Mallow Bridge Pumping Station is located at Bearforest Lower, west of the WwTP, and also on the banks of the River Blackwater.

In April 2019, Irish Water applied to Cork County Council Planning Authority under Section 34 of the Planning and Development Act, 2000 (as amended) for the Mallow Sewerage Scheme Upgrade Project (Ref. Planning Register Number: 195078). A final grant of planning was obtained on the 13th January 2020, subject to 41 no. conditions. As part of their planning determination, Cork County Council, as the Competent Authority, carried out an AA Screening, and subsequent AA, on the above Upgrade Project.

The main objectives of the Mallow Sewerage Scheme Upgrade Project are to ensure compliance with the WWDL - Licence Register Number: D0052-01; issued by the EPA in accordance with the Waste Water Discharge (Authorisation) Regulations (S.I. No. 684 of 2007) on the 18th December 2012 (now S.I. No. 214 of 2020), and subsequent Technical Amendments A and B, and to ensure compliance with Irish Water's Water Services Strategic Plan (WSSP) which includes an objective to target capital investment to progressively achieve compliance with the UWWTD and the Water Framework Directive (WFD).

The Upgrade Project consists of 2 no. contracts, namely the Networks Upgrade Contract which commenced on site in April 2021, and which has an estimated completion date of January 2023 and the Mallow WwTP Upgrade and new Bridge Street Pumping Station Contract, which commenced in May 2021, and which has an estimated completion date of December 2023.

The Upgrade Works includes for the removal of 9 no. Storm Water Overflows (SWO), laying of new sewers, provision of a new pumping station to replace the existing Mallow Bridge Pumping Station at Bearforest Lower and the upgrading of the existing WwTP.

Planning was obtained on the basis of WwTP meeting the ELV's as per Schedule A.1. of the WWDL DL0052-01: BOD 25mg/l, COD 125mg/l, SS 25mg/l, pH 6-9 pH units, Total Phosphorous 2mg/l, Ammonia 3mg/l and Orthophosphate 1.5mg/l.

Since planning was obtained, a Waste Assimilative Capacity calculation was completed in 2022 to inform this WWDA review application in order to ensure that the above ELVs were fit for purpose based on the latest data available (see **Appendix A**). It was concluded that a more onerous Orthophosphate ELV of 1mg/l was required in order to meet the High-status 95thile EQS downstream of the primary discharge.

Considering relevant flow data, upstream water quality and treatment capabilities the ELV's now proposed ensure that High status water chemistry requirements are met by the primary discharge (SW001).

On completion of the Networks Upgrade Contract, which will remove 9 no. SWO's from the agglomeration, there will be a single remaining Dual Function Overflow (SW010) in the agglomeration from Mallow Bridge Pumping station which will operate as a SWO or an Emergency Overflow (EO). The SWO has been designed to operate to meet the definition of 'Storm Water Overflow' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG 'Procedures and Criteria in Relation to Storm Water Overflows', 1995. The following design measures will also be in place:

- A 2,400m³ Stormwater Holding Tank will be provided at the new Pumping Station, flows in excess of the Stormwater Tanks capacity will overflow to the Blackwater River.
- Overflows from the Storm Water Holding Tank will be screened by a self-cleaning mechanical screens with a maximum passage of 6mm
- The works will include the installation of a new SCADA and telemetry system, this system will ensure compliance and compatibility with Irish Water's Design Specifications.
- Provision for a standby power supply will be made at Mallow Bridge Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply.
- Provision for a standby power supply will be made at the Mallow WwTP to provide for continued operation of the wastewater treatment equipment in the event of an interruption in the power supply.
- All flows will be monitored continuously and recorded by flowmeters at the WwTP and Mallow Bridge Pumping Station.

Further information was submitted with the Mallow Sewerage Scheme Upgrade Project planning application in response to a query regarding the impact of an overflow during low river flow conditions (TJ O'Connor & Associates, 2019⁶). This theoretical exercise considered a 'worst case scenario' 1 year storm event Using the network model a storm event that resulted in the highest flow through the overflow stormwater tank was selected. On the basis of future loads, a series of mass balance calculations was carried out. The predicted resultant concentrations in the river meet the Urban Pollution Manual⁷ 99 %ile standards as applicable to Water Framework Directive (WFD) High status waters. In reality, the scenario modelled was highly conservative and unlikely to arise as it did not consider any additional flows to the river from the catchment which would occur in a storm event (thus providing greater dilution).

Effluent data from 2021-2022 is presented in **Table 1.0** together with the current ELVs as per D0051-01. The 2021 AER was also reviewed. The WwTP is non-compliant with the Ammonia ELV as the current WwTP it is not designed for N removal, however the upgrade underway will address this. Otherwise, the primary discharge meets the relevant standards in the Urban Wastewater Treatment Regulations 2001 (S.I. No. 254/2001) as amended, and the current and proposed ELVs, for all parameters with the exception of one exceedance for Suspended Solids.

⁶TJ O'Connor & Associates (2019) Mallow Sewerage Scheme – Planning Further Information Response. October 2019. Available on Cork Co. Co. Planning System Reference 195078.

⁷ <http://www.fwr.org/UPM3/>

Table 1.0: Effluent Monitoring Data at Primary Discharge 2021-2022

Date	BOD mg/l	COD mg/l	SS mg/l	Ammonia mg/l	Ortho-phosphate mg/l	Total Phosphorus
Current ELVs as per D0052-01	25	125	25	3	1.5	2
ELVs as per WWDA Review	25	125	25	3	1	2
27/01/2021	2.10	28.00	11.00	2.50	0.04	0.07
11/02/2021	3.40	35.00	7.00	3.40	0.23	0.39
11/03/2021	2.40	14.85	10.00	2.20	0.04	0.1
08/04/2021	2.70	14.85	4.00	4.50	0.04	0.16
20/05/2021	2.90	14.85	5.00	0.50	0.04	0.09
03/06/2021	6.20	36.00	17.00	0.90	0.08	0.21
01/07/2021	4.30	33.00	9.00	3.80	0.04	0.09
05/08/2021	3.00	14.85	4.00	1.40	0.26	0.48
09/09/2021	3.70	29.00	36.00	1.70	0.11	0.25
14/10/2021	2.70	14.85	6.00	0.90	0.14	0.23
11/11/2021	2.90	14.85	6.00	0.50	0.20	0.34
09/12/2021	6.70	35.00	22.00	0.20	0.04	0.11
13/01/2022	5.50	30.00	14.00	0.40	0.26	0.37
10/02/2022	1.90	24.00	3.00	1.60	0.27	0.51
24/03/2022	0.71	31.00	5.00	0.70	0.04	0.14
21/04/2022	4.00	26.00	6.00	1.30	0.04	0.07
05/05/2022	2.10	14.85	4.00	0.90	0.04	0.09
15/06/2022	7.10	31.00	11.00	0.40	0.10	0.22
Mean	3.57	24.55	10.00	1.54	0.11	0.22

Mallow Agglomeration Operational Discharges

The 2 no. operational discharges (*i.e.*, SW001 & SW010) under consideration herein discharge directly into the Blackwater River, see **Figure 1.0** and **Table 2.0**.

Table 2.0: Operational Discharges relating to the Mallow WWDL review

Discharge Name	Type	Asset	Discharge Location (NGR)
SW001	Primary Discharge	WwTP	157530E 098140N
SW010	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Mallow Bridge Pumping Station	156636E 097862N

Primary Discharge (SW001) at Mallow WWTP:

The primary discharge from the WwTP will remain at the existing primary discharge location at NGR 157530E, 098140N, into the River Blackwater (Blackwater (Munster)_140)) and will comply with the proposed ELVs below.

Table 3.0: Proposed ELVs/Standards for Primary Discharge

Parameter	Proposed ELVs/ Standards
cBOD	25mg/l
COD	125mg/l
Suspended Solids	25mg/l
Total Ammonia (as N)	3mg/l
Ortho-P (as P)	1mg/l
Total P (as P)	2 mg/l
pH	6.0 - 9.0

Dual Function Overflow (SW010) at Bridge Street Pumping Station:

There will be one Dual Function Overflow (SW010) at the Bridge Street Pumping Station *i.e.*, an overflow which can act as a SWO or as an EO depending on the event.

In the event that the storm water tank is at capacity (>2,400m³) an overflow from the storm tank will be discharged to the River Blackwater *via* the new SWO (SW010 – NGR 156636E, 097862N). Level probes will control the flow in and out of the storm tank. This high-level overflow will be capable of conveying the full storm flow of 3,500 l/s and shall not permit backflow from the storm tank to the storm sump. Overflows to the storm water storage tank will be screened *via* a self-cleaning mechanical screen with a maximum passage of 6mm. As mentioned above this SWO has been designed to meet the definition of ‘Storm Water Overflow’ as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended, and the criteria as set out in the DoEHLG ‘Procedures and Criteria in Relation to Storm Water Overflows’, 1995.

Provision for a standby power supply will be made at Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* an Emergency Overflow (SW010) at NGR 156636E, 097862N.

All flows at the WwTP and Pumping Station will be monitored continuously and recorded with flowmeters.

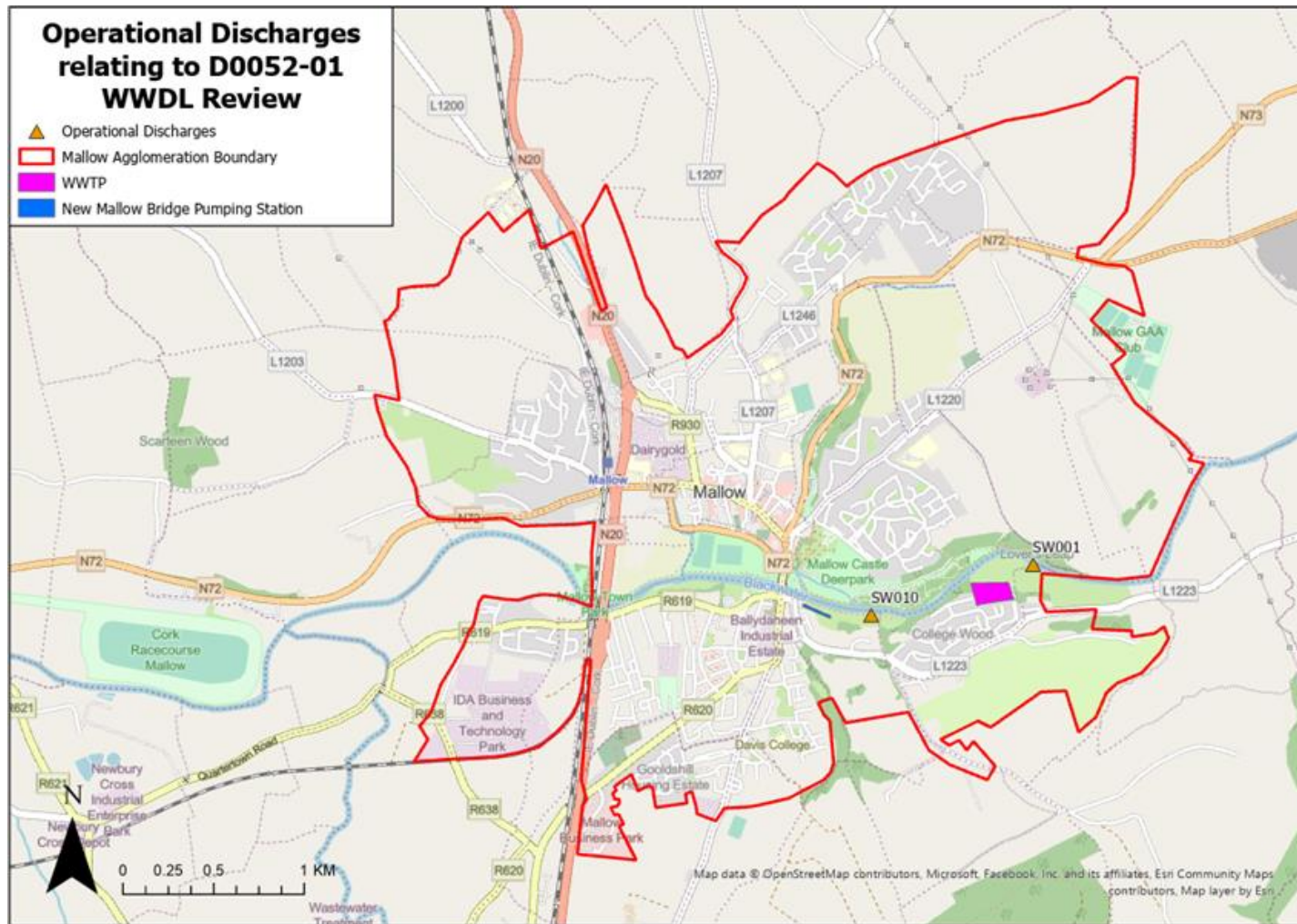


Figure 1.0: Operational Discharges relating to D0052-01 WWDL Review

Description of the Receiving Environment and Monitoring Results

Water Quality

The agglomeration discharges to the River Blackwater are presented below (**Table 2.0** above). These include the primary discharge from the upgraded WwTP (SW001) and 1 no. Dual Function Overflow which can function as a SWO or EO, depending on the event. They both enter the Blackwater (Munster)_140 waterbody which is assigned Good WFD status (2013-2018 & 2016-2021). For 2013-2018, both Ammonium and Orthophosphate are noted as High under WFD status. There are no significant pressures identified for this waterbody.

The EPA monitor biological water quality at Station RS18B021500 (Rly Br Mallow LHS) which is ca. 1.5km upstream of SW010. This station was assigned a Q4 score in 2021 indicating Good water quality conditions. The station RS18B021510 (Rly Bridge, Mallow) just downstream of RS18B021500 was assigned Q3-4 – Moderate Status at the last measurement (2021). The next Q value monitoring point downstream is RS18B021800 (NE of Ballymagooly) ca. 2.5km downstream of SW001, which was monitored in 2020 and also assigned a Q4 score.

Water chemistry is monitored by Cork Co. Co./EPA at:

- RS18B021600 (Mallow Br) - ca. 500m upstream of SW010
- RS18B021690 (1.2km d/s Mallow Br (u/s STW)) - ca. 50m upstream of SW001
- RS18B021720 (Downstream of TPEFF0500D0052SW001) - ca. 560m downstream of SW001

The most recent 18 months of data for key parameters are shown below in **Table 4.0**. Monitoring locations are shown on **Figure 2.0**.

Results were compared with the Environmental Quality Standards specified in the Surface Waters Regulations 2009 (as amended). Generally, at least Good status conditions are met upstream and downstream of the discharge with occasional exceedances. On most sampling occasions the results meet the High status limit. The current WFD target objective for the waterbody is to maintain Good status. The River Blackwater is a salmonid river for which the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293 of 1988) apply and based on the parameters presented below the requirements of these regulations are also met (suspended solids were not monitored).

Table 4.0 River Blackwater Water Quality Monitoring

Sample Date	Ammonia mg/l	BOD mg/l	DO % Sat	Ortho-P mg/l	pH
	95%ile EQS: ≤0.14 (good) ≤0.090 (high) Mean EQS : ≤0.065 (good) ≤0.040 (high)	95%ile EQS : ≤2.6 (good) ≤2.2 (high)	95%ile EQS : 80-120%	95%ile EQS: ≤0.075 (good) ≤0.045 (high) Mean: ≤0.035 (good) ≤0.025 (high)	EQS 4.5< pH < 9.0 (Soft water)
RS18B021600					
13/01/2021	0.035	0.8	100	0.024	7.6
25/02/2021	0.038	0.7	96	0.031	7.5
03/03/2021	0.021	0.3	98	0.023	8
06/05/2021	0.01	0.9	86	0.003	8
19/05/2021	0.025	1.8	85	0.01	7.8
03/06/2021	0.022	1.7	97	0.008	7.8
14/07/2021	0.025	1	98.7	0.017	7.9
05/08/2021	0.009	2.3	103.2	0.005	8.2
30/09/2021	0.017	1.8	101.7	0.031	7.9
04/11/2021	0.01	0.1	97	0.032	7.7
02/12/2021	0.025	2.5	97	0.031	7.6
06/12/2021	0.163	-	99	0.048	7.6
09/12/2021	0.047	1.6	100.7	0.022	7.6
09/12/2021	0.051	0.7	99	0.054	7.2
15/12/2021	0.17	1.3	100	0.044	7.6
10/03/2022	0.063	0.4	95	0.058	6.9
13/04/2022	0.01	1.3	95	0.009	7.2
18/05/2022	0.032	1.6	96	0.011	7.8
01/06/2022	0.023	0.7	102	0.021	7.4
14/07/2022	0.094	3.7	107	0.106	7.8
04/08/2022	0.032	2.7	94	0.115	7.5
RS18B021690					
13/04/2022	0.01	1.4	96	0.021	7.3
14/07/2022	0.088	3.6	107	0.096	7.6
RS18B021720					
13/01/2021	0.043	0.7	102	0.035	7.6
03/03/2021	0.027	1	100	0.022	8
06/05/2021	0.01	1.1	99	0.007	8
19/05/2021	0.027	8.5	99	0.013	7.7
03/06/2021	0.027	1.7	98	0.008	7.8
08/07/2021	0.043	1.1	95	0.028	7.8
05/08/2021	0.028	1.8	101	0.014	8
13/10/2021	0.032	2.9	94	0.073	8.1
04/11/2021	0.023	0.2	97	0.071	7.6
02/12/2021	0.025	2.5	97	0.031	7.6
10/03/2022	0.05	0.8	92	0.038	6.9
18/05/2022	0.055	1.7	96	0.005	7.7
01/06/2022	0.01	1.1	102	0.045	7.4
04/08/2022	0.028	0.8	94	0.032	7.5



Figure 2.0: Monitoring Stations and Discharge Points (Source EPA Maps accessed 19/09/2022)

Waste Assimilative Calculations

A Waste Assimilative Capacity (WAC) analysis has been carried out on the receiving waterbody, the Blackwater_140 on the basis of the proposed ELVs, design p.e of 22,000 and the most recent available u/s ambient monitoring data for RS18B021600. The calculations were based on the EPA adopted approach utilising dry weather flows from the treatment plant mass-balanced against 95%ile flows in the river. The calculations were performed using 2020 to 2022 mean background river water quality data from Station RS18B021600 and the “*notionally clean river*”⁸ concentrations. The long-term 95-%ile flow for the relevant reach of the Blackwater River as obtained from the EPA Hydrometrics and Groundwater Section is 4.870m³/sec.

The stated water body objective for the River Blackwater is to meet Good status, as defined by the standards specified in the Surface Waters Regulations⁹ and detailed in **Table 5.0**. BOD, Ammonia and Orthophosphate meet the specified standards for both the background water quality and notionally-clean scenarios. The 95th%ile High status limits are also met. For 2013-2018, both the Ammonium and Ortho-P status elements are noted as High under WFD status in the Blackwater (Munster)_140.

Table 5.0: Assimilative Capacity Calculations

Parameter	Background		Proposed ELVs	Predicted D/S Concentration	Relevant Standards
BOD	Actual	1.207	25	1.510	95%ile: ≤2.6 (good) ≤2.2 (high)
	Notionally Clean	0.26		0.575	
Ortho-phosphate	Actual	0.031	1	0.044	95%ile: ≤0.075 (good) ≤0.045 (high)
	Notionally Clean	0.005		0.018	
Ammonia	Actual	0.047	3	0.085	95%ile: ≤0.14 (good) ≤0.090 (high)
	Notionally Clean	0.008		0.046	

⁸ The “*notionally clean*” river approach considers a hypothetically clean stretch of river (*i.e.* river of pristine water quality where the EPA’s Office of Environmental Assessment uses background concentrations of 0.26mg/l BOD, 0.005mg/l Ortho-phosphate, 0.008mg/l Ammonia) to determine if a discharge on its own is likely to cause a significant deterioration in the status of the water body into which it enters.

⁹ S.I No. 272 of 2009 as amended by S.I No. 77 of 2019 (European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019)

Ecological Desktop & Field Survey

The ecological receptors and surrounding area of the operational discharges are described below, informed by the desk study and site visit. In the context of this assessment, the survey focuses on aquatic habitats and species, or those terrestrial species which may interact with the aquatic environment. Particular attention is paid to identifying habitats or species listed in the Habitats or Birds directives.

Habitats & Flora

The River Blackwater in Mallow is ca. 30m wide and is characterised by moderately fast flowing glide habitat. The river substrate comprises predominately gravel-size material. A narrow woodland strip runs along both banksides, with adjacent lands comprising built infrastructure, agricultural lands, residences/gardens and parklands. The banks are steep-cut and ca. 2-4m high. On the left hand bank, the land rises steeply into a cliff area of woodland /cliffs known as Lovers Leap. Trees on both banks include poplar *Populus* sp, ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus*, beech *Fagus sylvatica*, oak *Quercus robur* and willows *Salix* spp. A fringe of wetland herbs arise where the banks are less steep with species including reed canary grass *Phalaris arundinacea*, bur-reed *Sparganium erectum*, water speedwell *Veronica anagallis-aquatica*, water plantain *Alisma plantago-aquatica*, purple loosestrife *Lythrum salicaria* and water mint *Mentha aquatica*. The invasive species Himalayan balsam *Impatiens glandulifera* is common.



Photo 1 River Blackwater upstream of SW010



Photo 2 River Blackwater downstream of SW010



Photo 3 River Blackwater - gravel substrate visible in foreground



Photo 4 River Blackwater in the vicinity of SW001

The new overflow, SW010, has been installed on an area of the right hand bank of the river together with rock armour. It flows into a deep/eroding section of the river. The primary discharge SW001 enters the river further downstream in an area where the channel is constrained by deposited gravels on the right hand bank, with a deeper channel on the left hand bank at the base of cliffs.

No instream vegetation could be seen in the River Blackwater at the time of visiting. The River Blackwater is designated for the Annex I habitat Vegetation of flowing waters as described in the EU Interpretation manual. NPWS (2019a)¹⁰ highlight that the common and widespread form of this habitat dominated by water crowfoot is considered to have low conservation value and indicate damage, with SAC's designated for rarer sub-types of this habitat. This habitat was not recorded during previous aquatic surveys (DixonBrosnan, 2019a). None of the habitats recorded during the current survey within the river or riparian margins align with the criteria for Annex I habitats. Alluvial woodland is likely to be presented upstream/downstream of Mallow, however the banks in the study area were too steep, and adjacent lands too modified, to support this habitat. The nearest area of alluvial woodland indicated on SAC mapping is at Killavullen ca. 12km downstream (NPWS, 2012a¹¹).

The discharges are directly to the River Blackwater. The river habitat, in terms of its physical attributes and vegetation is of high quality in the reach within the ZoI of the discharges. While Annex I habitats were not observed in the survey area, they are likely to be present downstream.

Fauna

Breeding Kingfisher has been recorded in Mallow area (NBDC); however no Kingfisher nesting sites were recorded by DixonBrosnan (2019b) within the study area during surveys for the Mallow Sewerage Scheme. The NBDC holds records of Kingfisher, Little Egret and Golden Plover listed on Annex I of the Birds Directive, and several waterbirds (including Lapwing, Pochard, Gadwall, Teal, Wigeon, Shoveler, Golden Plover) listed on Annex II of the Directive, from 2011.

There are records of Otter, an Annex II species, throughout the Blackwater River and tributaries, the latest NBDC record in the vicinity of Mallow being from 2013, with other studies identifying their widespread presence throughout the catchment (NPWS, 2019a¹²; Reid et al, 2019¹³). While no signs of otter were found during the current survey, lack of access to private lands precluded a detailed survey. DixonBrosnan (2019b) recorded otter spraint and tar marks throughout the Blackwater river in Mallow during surveys for the sewerage scheme. An otter holt, considered to be a short-term resting area and unsuitable as a breeding holt, was identified in proximity to the works at SW010 requiring construction stage mitigation. Otter using the river are versatile feeders but could be affected by severe eutrophication impacts damaging fish stocks.

¹⁰ NPWS (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol2_Habitats_Article17.pdf

¹¹ NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

¹² NPWS (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill

¹³ Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

White-clawed Crayfish, an Annex II species, were recorded ca. 3km upstream of Mallow in 2015, though none were recorded in the vicinity of Mallow during aquatic surveys for the sewerage scheme (DixonBrosnan, 2019b). Otherwise, the species is largely confined to the Awbeg subcatchment within the Blackwater system (NBDC; NPWS, 2012a). While less sensitive to eutrophication than salmonid species, requiring Moderate water quality conditions, they would be sensitive to more severe eutrophication impacts.

The River Blackwater in the vicinity of Mallow contains excellent habitat for all life stages of brown trout and excellent spawning and nursery habitat for salmon, sea trout and lamprey species. Surveillance monitoring for the CFB (now IFI) in 2009 (CFB, 2009)¹⁴ at Killavullen Bridge (ca. 12km downstream of Mallow) recorded a total of 8 fish species. Dace was the most abundant species, followed by salmon, brown trout, gudgeon, minnow, stone loach, roach and European eel. IFI have also undertaken timed electro-fishing surveys of the River Blackwater as part of Catchment-Wide- Electro-Fishing Surveys (IFI, 2022¹⁵) to assess the distribution and abundance of salmon fry in selected catchments nationally. Based on the most recent 3 complete surveys (2007, 2008, 2016), the River Blackwater's index is 15.64 which does not meet the threshold index (17 salmon fry/5min) above-which it is considered that the rivers could open for angling on a catch and release basis. Salmon and the three lamprey species are listed under Annex II of the Habitats Directive.

Detailed aquatic surveys were carried out as part of the Mallow Sewerage Scheme Upgrade Project planning application due to the requirement for instream works. These surveys, carried out by Ecofact in 2018 (Ecofact report in Appendix 9 of the NIS for the Scheme (DixonBrosnan, 2019a)), and by DixonBrosnan in 2019 as part of a further information request (DixonBrosnan, 2019c (Appendix 3 of Appendix G)). The surveys concluded that there are extensive areas of suitable spawning and nursery micro-habitats for salmon, sea lamprey, river lamprey and brook lamprey. Habitat features present in the study area include spawning gravels, riparian tree and shrubs providing cover and enhancing food supply, silt beds along shaded banks for juvenile lamprey, and sufficient depth and continuous flow of water.

On the basis of past surveys, a scattered population of Freshwater Pearl Mussel, listed under Annex II of the Habitats Directive, is known to exist in the Blackwater between Mallow and Fermoy (Dixon Brosnan, 2019b and references therein; NPWS, 2019b¹⁶). An updated survey was carried out in the area of interest for the Mallow Sewage Scheme in 2018 (Ecofact report in Appendix 9 of the NIS for the Scheme (DixonBrosnan, 2019a)). The report concluded the following:

Generally, the habitat in the study area and within the survey sections was considered to be unsuitable both for adult FPM and juvenile FPM recruitment. This is mainly due to heavy siltation, unsuitable and unstable substrate and eutrophication. Despite this, some small areas did contain some suitable freshwater pearl mussel habitat although it was not common. Occasional dead

¹⁴ CFB (2009) Sampling Fish for the Water Framework Directive - Rivers 2009. South Western River Basin District Rivers.

¹⁵ IFI (2022) Report on Salmon Monitoring Programmes 2021. Funded under the Salmon Conservation Fund. IFI/2022/1-4590) <https://www.fisheriesireland.ie/sites/default/files/2022-03/report-of-salmon-monitoring-programmes-2021-funded-under-the-salmon-conservation-fund.pdf>

¹⁶ NPWS (2019b) Article 17 Species Conservation Assessments 2019 Volume 3 <https://www.npws.ie/publications/article-17-reports/article-17-reports-2019>

FPM shells were found throughout the survey area. However, only one live freshwater pearl mussel was found at the most downstream point of the study area, downstream of the existing outfall for the Mallow WwTP. It is possible that there are a small number of adult freshwater pearl mussels in this area that went undetected, however there is no significant population present here and there are no individuals present in the direct vicinity of the location where the works will be carried out. These results are similar to previous and most recent knowledge of the study area at Mallow, as demonstrated by studies completed by Ross (2014a; 2014b).

Freshwater Pearl Mussel are highly sensitive to eutrophication and siltation impacts, requiring clean gravel beds with minimal silts and macrophytes. Freshwater Pearl Mussel is a qualifying interest of the Blackwater River (Cork/Waterford) SAC and while the core populations are present in the Allow and Licky sub-catchments, following legal challenge it has been clarified that the main channel is also designated for this species.

Screening for AA

European Sites within the potential zone of influence of Primary discharge and SWO

The primary discharge (SW001) and Dual Function Overflow (SW010) are to the River Blackwater which flows eastwards to enter coastal waters in Youghal harbour. All European Sites which could potentially interact with this waterbody, are considered for source-pathway-receptor connectivity in order to establish the potential zone of influence of the discharges. This zone of influence encompasses European Sites within any potential dilution/dispersion zone or those with mobile species for which any potential *ex-situ* effects must be considered. Refer to **Table 6.0** below for European Sites considered in defining the potential zone of influence.

Terrestrial sites which do not interact with the receiving waterbody have no potential to support connectivity. Short-form habitat names follow NPWS (2019a).

Table 6.0: European Sites considered in defining the potential zone of influence

Site Code	Site Name	Qualifying Interests	Pathway and Distance
002170	Blackwater River (Cork/Waterford) SAC	<p>Estuaries [1130]</p> <p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Perennial vegetation of stony banks [1220]</p> <p>Salicornia and other annuals colonising mud and sand [1310]</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]</p> <p>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p>	Discharges are directly to this SAC

Site Code	Site Name	Qualifying Interests	Pathway and Distance
		<i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Alosa fallax fallax</i> (Twaiite Shad) [1103] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Trichomanes speciosum</i> (Killarney Fern) [1421]	
004095	Kilcoman Bog SPA	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Teal (<i>Anas crecca</i>) [A052] Shoveler (<i>Anas clypeata</i>) [A056] Wetland and Waterbirds [A999]	ca. 11km north of Mallow, potential pathway for <i>ex-situ</i> bird species
004094	Blackwater Callows SPA	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Wetland and Waterbirds [A999]	ca. 27km east/downstream of Mallow along the River Blackwater
004028	Blackwater Estuary SPA	Wigeon (<i>Anas penelope</i>) [A050] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Wetland and Waterbirds [A999]	ca. 70km southeast/downstream of Mallow <i>via</i> River Blackwater

The Blackwater River (Cork/Waterford) SAC, Blackwater Callows SPA, and Blackwater Estuary SPA are considered to be within the potential zone of influence of the discharges due to hydrological connectivity. In addition, due to their mobile nature and potential to use the Blackwater River on an *ex-situ* basis, qualifying waterbird species of the Kilcoman Bog SPA are potentially within the zone of influence of the Mallow discharges. The potential impacts that could arise for the qualifying interests, and likely significant effects that could result, are considered further in the sub sections below.

Identification & Description of Potential Impacts

Elevated nutrient input from wastewater effluent into aquatic environments can lead to an altered nutrient balance (eutrophication), increased primary productivity, and the potential for algal blooms. Such impacts have the potential to affect the qualifying interests of European sites directly, indirectly or cumulatively with other activities, projects or plans.

According to the 2021 AER, and as demonstrated in **Table 1.0**, the primary discharge from the WwTP is compliant with its ELV's with the exception of Ammonia. The WwTP upgrade has been designed to meet the current D0052-01 ELV for Ammonia (*i.e.*, 3mg/l). The assimilative capacity calculations demonstrate that based on background water quality, future loads and 95%ile flows that the proposed ELV's as per **Table 3.0** are sufficient to ensure the 95%ile EQS's for High status can be met for BOD, Orthophosphate and Ammonia. The single new SWO in the upgraded sewerage network will meet the required design criteria, and provision has been made for storage and screening. Calculations based on network modelling indicates that this SWO would meet the UPM high-status discharge criteria for intermittent discharges. The adequacy of the upgrades to the agglomeration requires further consideration in the context of the qualifying interests, their sensitivities and conservation objectives.

The likely significant effects (including *ex-situ*) to the qualifying interests of the Blackwater River (Cork/Waterford) SAC, Blackwater Callows SPA, Blackwater Estuary SPA and Kilcoman Bog SPA, that may directly or indirectly arise from the operational discharges are considered below.

Likely Significant Effects

The purpose of this section of the Screening is to examine the possibility whether the agglomeration operational discharges (SW001 and SW010), either individually or in combination other plans and projects, are likely to result in significant effects to any European Site. It further considers the water dependent qualifying interests which may be sensitive to the potential impacts of the discharges, in the context of the nature and scale of these discharges.

The Conservation Objectives and associated Supporting Documents of the relevant European Sites were reviewed as part of this Screening Assessment:

- NPWS (2012a) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2022a) Conservation objectives for Blackwater Callows SPA [004094]. Site Specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.
- NPWS (2012b) Conservation Objectives: Blackwater Estuary SPA 004028. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2022b) Conservation objectives for Kilcoman Bog SPA [004095]. Site Specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.

The discharges are not directly connected with or necessary to the management of any site for nature conservation.

With regard to mobile bird species associated with Kilcoman Bog SPA, while the site is not hydrologically connected to the Blackwater River, their qualifying bird species, being highly-mobile, may occasionally forage within the Blackwater River system. Optimal habitat however is available within their designated area at Kilcoman Bog. Occasional use of more distant habitats in the Blackwater River is not considered likely to significantly affect the populations of these species associated with the SPA. Nutrient input *via* treated effluent from the upgraded WwTP, or diluted intermittent discharges, into the Blackwater river system would not impact water quality at a scale that would significantly affect the health, habitat or food sources of these species. There is no potential for their conservation objectives in the SPA sites to be affected and for significant effects to occur, consequently this site is excluded from further consideration in the AA.

The Blackwater Callows SPA and Blackwater Estuary SPA are located a significant distance downstream of the Mallow discharges. The river maintains Good status downstream of Mallow indicating that ongoing discharges are not causing a deterioration in water quality conditions. The conservation objectives of the wetland bird species for which the SPA's are designated would be supported by Good status water quality conditions, and so significant effects *via* this hydrological pathway can be excluded. As for Kilcoman Bog SPA and the Blackwater Estuary SPA, occasional *ex-situ* bird species associated with these SPA's could occur in the vicinity of Mallow, but would not be impacted by a treated effluent discharge, and their populations in their respective SPA's would not be significantly affected.

The Blackwater (Cork/Waterford) SAC is designated for a range of aquatic-dependant habitats and species which could be sensitive to the impacts of the agglomeration discharges. Freshwater Pearl Mussel is particularly sensitive as it requires High status water quality conditions. Terrestrial habitats or species have no potential to be impacted by the discharges. The estuarine habitats in the Blackwater estuary are over 70km downstream, and as the river maintains Good status downstream of Mallow, this indicates that ongoing discharges are not causing a deterioration in water quality conditions downstream. The conservation objectives of the estuarine habitats are supported by Good status water quality conditions, and so significant effects *via* this hydrological pathway can be excluded. While the Mallow operational discharges will comply with the relevant standards, on a precautionary basis the likelihood of significant effects to aquatic-dependant habitats and species within the SAC cannot be excluded at this stage. Potential adverse effects need to be considered for this SAC in the context of the conservation objectives and targets of the following qualifying interests: Vegetation of flowing waters habitat, alluvial woodland habitat, Freshwater Pearl Mussel, Atlantic salmon, lamprey species, otter, twaite shad and white-clawed crayfish.

With the exception of the River Blackwater (Cork/Waterford) SAC, there is no potential for direct or indirect significant effects to the qualifying interests of the SAC's and SPA's listed in **Table 6.0**.

Potential Cumulative or In-combination Effects

As part of AA Screening, in addition to the agglomeration discharges, other relevant projects and plans in the region must also be considered. This report aims to identify at this early stage any possible likely significant effects on the European Sites from the existing discharges in-combination or cumulatively with other plans and projects.

Plans

Plans of relevance include Irish Waters WSSP, the Cork County Development Plan, and the National River Basin Management Plan.

In 2015, Irish Water published the **Water Services Strategic Plan**, a 25-year Plan which as well as detailing current and future challenges affecting water services, identifies priorities to be addressed in the medium term. Solutions in these priority areas are delivered through capital and other projects outlined in Irish Waters Investment Plan, a multi annual plan covering a five-year horizon, currently 2020-2024. The Mallow Sewerage Scheme Upgrade Project is included on Irish Water's current Capital Investment Plan with works currently underway.

The **Cork County Development Plan 2022-2027** has been recently published. This new plan amalgamates the former municipal area regional plans into the main county plan. The plan has several relevant objectives and statements relating to wastewater:

- WM 11-1: EU Water Framework Directive and the River Basin Management Plan
 - *f) Support the prioritisation of the provision of water services infrastructure in: 1. Metropolitan Cork, the Key Towns and Main Towns to complement the overall strategy for economic and population growth while ensuring appropriate protection of the environment. 2. All settlements where services are not meeting current needs, are failing to meet the requirements of the Urban Wastewater Treatment Directive, and where these deficiencies are – interfering with Councils ability to meet the requirements of the Water Framework Directive; or – having negative impacts on Natura 2000 sites; and*
 - *g) Development may only proceed where appropriate wastewater treatment is available which meets the requirements of environmental legislation, the Water Framework Directive and the requirements of the Habitats Directive*
- Emission Limit Values (ELVs)
 - *11.5.12 In many instances, the Emission Limit Value standards set by the EPA when licensing treatment plants are significantly higher than the requirements of the Urban Wastewater Directive (UWWD). Some of these ELV standards cannot consistently be achieved even by relatively modern plants without significant upgrades. This is a national issue not unique to Cork but it occurs in several locations across the County.*
 - *11.5.13 In assessing the capacity of a WWTP to cater for future development where an ELV issue pertains, the assessment has been based on the hydraulic and organic loadings of the treatment plant relative to its design capacity on the assumption that the ELV issue will be resolved in an approach that will be determined/ agreed at a national level between Irish Water and the EPA.*
- *Section 11.5.3 – 11.5.6 Highlight the issues regarding development planning and the High status objective for Freshwater Pearl Mussel in the River Blackwater.*

- *Section 11.9.5 The assimilative capacity of the County's waterbodies is not infinite, and it is considered important, when assessing individual development proposals involving abstraction or dilution of discharges, that sufficient assimilative capacity is retained so as to allow for the continued growth of the overall settlement and avoiding the unsustainable exploitation of the watercourse.*
- *With specific regard to the Mallow agglomeration the following objectives/statements are noted:*
 - *Table 11.3: Future capacity subject to implementation of projects on the Irish Water Investment Plan (Revenue Control Period 3) or aligned programmes. Any development which would have an adverse impact will be put on hold until resolution of issues relating to impact on water quality in sensitive water catchments.*
 - *CS 2-7 (Mallow): Future growth of the town should be planned for on a phased basis in consultation with the Local Authority and Irish Water to ensure that sufficient wastewater capacity is accounted for and that further growth avoids negative impacts on the nutrient sensitive River Blackwater.*
 - *General Objective for Mallow MW-GO-02: In order to secure the sustainable population growth and supporting development proposed in MW-GO-01, appropriate and sustainable water and waste water infrastructure that will secure the objectives of the relevant River Basin Management Plan and the River Blackwater Special Area of Conservation, must be provided and be operational in advance of the commencement of any discharges from development. Waste-water infrastructure must be capable of treating discharges to ensure that water quality in the receiving water does not fall below legally required levels.*

Information on the **River Basin Management Plan** (2018-2021), Draft River Basin Management Plan (2022-2027), and associated information on the catchments available on www.catchments.ie was reviewed:

- The RBMP sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that Ireland's natural waters are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The Draft 3rd cycle plan, identifies that based on 2013-2018 data, 53% of surface waters are in good or high ecological status while the remaining 47% are in unsatisfactory ecological status.
- Continued investment in wastewater infrastructure is highlighted as one of the key actions in the plans. The 3rd cycle plan and catchment report¹⁷ does not identify any specific actions with respect to the Blackwater in the vicinity of Mallow.

The above plans have themselves been assessed in accordance with Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act, 2000 and the implementation of those plans will not result in adverse effects to the integrity of any European site(s). The plans support the operation of compliant discharges from the Mallow agglomeration, which the upgrade underway is designed to address. While the Mallow agglomeration is not identified as a

¹⁷ [https://catchments.ie/wp-content/files/catchmentassessments/18%20Blackwater%20\(Munster\)%20Catchment%20Summary%20WFD%20Cycle%20203.pdf](https://catchments.ie/wp-content/files/catchmentassessments/18%20Blackwater%20(Munster)%20Catchment%20Summary%20WFD%20Cycle%20203.pdf)

significant pressure on the receiving waterbody, the removal of 9 no. SWOs is likely to be beneficial in terms of reducing nutrient input to the system. The plans identified above also support the prioritisation of actions to deal with significant pressures affecting the catchment, which upstream of Mallow include agriculture, forestry and other urban waste water agglomerations. Hence considered cumulatively with the Project, there is no potential for negative cumulative effects on any qualifying interest.

Projects

Cork Co.Co. planning system was reviewed for any recent proposed or permitted projects that could lead to in-combination impacts with the agglomeration discharges. Several residential developments are at various stages in the planning system including those proposed by Hallmark Building Services Ltd (206116, duration extended); Walsh Engineering Supplies (214648, granted), Oakfield Resources Ltd (224497, New application), Kildana Ltd (224501, FI stage), Brookhill Investments Mallow Ltd (224676, FI stage) and Hallmark Building Ltd (224819, New application). There are also two notable solar farm developments by Amarenco Solar Mallow Ltd (214498, duration extended) and Solar Farm Soleire Renewable SPV Ltd. (225681, FI Stage).

Dairygold Co-Operative Society Limited (P0403-03) is a milk processing facility which discharges treated process water from an on-site WwTP directly to the River Blackwater at NGR 155580E, 098056N, ca. 2km upstream of the Mallow WwTP primary discharge point. As part of their licence review in 2015, the EPA as the competent authority conducted an AA Screening and subsequent AA. The EPA determined based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 and 2013, pursuant to Article 6(3) of the Habitats Directive, that the activity pertaining to the P0403 review, individually or in combination with other plans or projects (this would have included WWDL D0052-01), would not adversely affect the integrity of a European Sites in particular Blackwater River (Cork/Waterford) SAC having regard to its conservation objectives and will not affect the preservation of any European sites at favourable conservation status if carried out in accordance with the conditions set in the IE licence. This determination was based on the stringent ELVs on the discharges to air in compliance with the Air Quality Standards Regulations 2011, the stringent ELVs on the discharge to water to contribute towards high status water quality standards required by the Environmental Objectives Regulations, the requirement for a surface water run-off divert system, and also the significant dilution available in the receiving water, the River Blackwater.

A range of other small development residential, business and agricultural developments within the Mallow agglomeration, which may seek connection to the sewerage network, have been recently granted or are seeking planning consent. Irish Water reviews available capacity for treatment prior to any connection to the IW network and therefore any local development connecting to the WwTP will be within the treatment capacity which meets WFD requirements. Hence considered cumulatively with the agglomeration discharges, there is no potential for negative cumulative effects on any qualifying interest.

Screening Conclusions

The likely impacts that will arise from the Mallow operational discharges have been examined in the context of a number of factors that could potentially affect the integrity of the Natura 2000 network.

On the basis of the information set out, and documentation referenced, in this AA Screening, the likelihood of significant effects to the Blackwater River (Cork/Waterford) SAC cannot be excluded and a Stage Two Appropriate Assessment is therefore provided.

Assessment of impacts on European sites

The European Site which has been determined as requiring AA, is described and all the potential impacts resulting from the Mallow discharges are discussed in relation to the conservation objectives of the Blackwater River (Cork/Waterford) SAC. This European Site and its qualifying interests are described below.

Description of the European Sites

Blackwater River (Cork/Waterford) SAC ¹⁸

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. A small stand of Yew (*Taxus baccata*) woodland occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. At

¹⁸ Extracted from NPWS Site Synopsis Version Date 09.02.2016

Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and several different communities have developed on the acidic or neutral sediments. Floating river vegetation is found along much of the freshwater stretches within the site. The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore, Ash and Horse-chestnut (*Aesculus hippocastanum*). willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora. The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*).

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore, it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

Description of the Conservation Interests of the SAC

Annex I Habitats:

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Perennial vegetation of stony banks [1220]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]

Annex II Species:

- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Alosa fallax* (Twaité Shad) [1103]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Trichomanes speciosum* (Killarney Fern) [1421]

As described at AA Screening Stage, estuarine habitats and terrestrial habitats/species are outside of the zone of influence of the discharge. The habitats and species with aquatic-dependencies that may occur in the vicinity of Mallow or downstream are examined below with regard to potential connectivity to the Mallow agglomeration operational discharges.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]: Alluvial woodland is likely to be present upstream/downstream of Mallow, however the banks in the study area (*i.e.*, operational discharges) were too steep, and adjacent lands too modified, to support this habitat. The nearest area of alluvial woodland indicated on SAC mapping is at Killavullen *ca.* 12km downstream (NPWS, 2012a). The main pressures/threats noted for this habitat relate to invasive species, clear-cutting and problematic native species. The overall national assessment of conservation status for this habitat is Bad (*Deteriorating*). As the presence of this habitat within the zone of influence of the discharges cannot be ruled out, the conservation objectives for this habitat, together with data on water quality, need to be reviewed further in this NIS.

Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]: With regard to 'Vegetation of flowing waters' no high conservation value sub-types are known to occur in the SAC and NPWS (2012a) note further survey is required to determine whether any such habitats are present. NPWS (2019a) highlight that the common and widespread form of this habitat dominated by water crowfoot is considered to have low conservation value and indicate damage, with SAC's designated for rarer sub-types of this habitat. This habitat was not recorded in the vicinity of Mallow during previous aquatic surveys (DixonBrosnan, 2019a). None of the habitats recorded during the current survey within the river or riparian margins align with the criteria for Annex I habitats. Pressures/threats

identified nationally for this habitat (NPWS, 2019a) include urban waste water discharges (excluding SWO's) as well as other pollution pressures (run-off, agriculture, forestry, industry). The overall national assessment of conservation status for this habitat is Inadequate (*Deteriorating*). As the presence of this habitat within the zone of influence of the discharges cannot be ruled out, the conservation objectives for this habitat, together with data on water quality, need to be reviewed further in this NIS.

Freshwater Pearl Mussel

The Freshwater Pearl Mussel is known from the main Blackwater River, two tributaries (Owentraglin and Allow) and the Licky River, which discharges to the Upper Blackwater Estuary. The distribution of, and suitable habitat for, Freshwater Pearl Mussel within the SAC is identified in the conservation objectives mapping (NPWS, 2012a). Their distribution is noted to extend upstream of Lismore in the main channel, and upstream of tidal influences in the Licky. As described earlier, on the basis of past surveys, a scattered population of Freshwater Pearl Mussel is considered to exist in the Blackwater between Mallow and Fermoy (Dixon Brosnan, 2019b and references therein; NPWS, 2019b). Their mapped habitat detailed in the conservation objectives document is a combination of 1) the area of habitat adult and juvenile mussels can occupy and 2) the area of spawning and nursery habitats the host fish can occupy. The River Blackwater in the vicinity of Mallow is mapped as suitable habitat, although the mapped distribution of the species does not include this section of the river (NPWS, 2012a). Freshwater Pearl Mussel are highly sensitive to eutrophication and siltation impacts, requiring clean gravel beds with minimal silts and macrophytes. Requirements for supporting conditions are set out in the Freshwater Pearl Mussel Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. High ranking threats and pressures identified in NPWS (2019b) include physical modification of watercourse, agricultural activities and forestry activities. Urban waste water is noted as a medium-risk pressure/threat. The overall national assessment of the conservation status of Freshwater Pearl Mussel is Bad (*Deteriorating*) (NPWS, 2019b). As well as the scattered downstream population, the upstream populations are considered to lie within the zone of influence of the Mallow operational discharges due to potential indirect effects on host salmonid species, and therefore the conservation objectives for this species, together with data on water quality, need to be reviewed further in this NIS.

White-clawed Crayfish

White-clawed Crayfish were recorded ca. 3km upstream of Mallow in 2015, though none were recorded in the vicinity of Mallow during aquatic surveys for the Mallow Sewerage Scheme (DixonBrosnan, 2019a). Otherwise, the species is largely confined to the Awbeg subcatchment within the Blackwater system (NBDC; NPWS, 2012a). The overall national assessment of the conservation status of White-clawed crayfish is Bad (*Deteriorating*) (NPWS, 2019b). On a precautionary basis the conservation objectives for this species, together with data on water quality need to be reviewed further in this NIS.

Lamprey Species

All three lamprey species could potentially occur in the River Blackwater within the zone of influence of the Mallow operational discharges, with suitable habitat existing for all life stages. A

study by King & Linnane (2004)¹⁹ found the three species of lamprey throughout the catchment. Sea lamprey *Petromyzon marinus* and River lamprey *Lampetra fluviatilis* are anadromous species, spending part of their life cycle in the marine environment and returning to natal watercourses to spawn. Adult fish can migrate long distances into freshwater but artificial barriers to passage can result in spawning being confined to downstream of these barriers (NPWS, 2019b). Spawning of river lampreys starts when the water temperature reaches 10–11°C, usually in March and April, while the sea lamprey usually spawns in late May or June, when the water temperature reaches at least 15°C (Maitland, 2003²⁰). The brook lamprey *Lampetra planeri* is the smallest of the three lamprey species native to Ireland and it is the only one of the three species to spend all its life in freshwater (Maitland, 2003). Migration barriers, climate change-related rainfall increases, agricultural fertilizer use, land drainage and fish harvesting are recognised as pressures/threats for these species (NPWS, 2019b). The NPWS (2019b) overall assessment of the conservation status of sea lamprey is Bad (*Stable*) and that of brook lamprey is Favourable (*stable*). River lamprey is evaluated as being of 'Unknown' conservation status nationally due to limited data (NPWS, 2019b). The conservation objectives for these species, together with data on water quality need to be reviewed further in this NIS.

Twaite Shad

Twaite shad have an anadromous life cycle, spending most of their life in estuaries and coastal waters but returning upriver to spawn. They have been recorded in the lower reaches of the River Blackwater near Clashmore (King & Linnane, 2004). The shad captured in the Blackwater were young and considered indicative of spawning within the estuary (King & Linnane, 2004), and in general spawning is understood to occur around the upper tidal limits of rivers (NPWS, 2019b). Key pressures to this species identified (NPWS, 2019b) include agricultural fertilizer use, hydropower, shipping infrastructure, fishing/harvesting and invasive alien species. Overall, the conservation status of Twaite shad is considered Bad (*Stable*) (NPWS, 2019b). As this species is found in the lower part of the River Blackwater, and not within the zone of influence of the Mallow discharges, adverse effects can be excluded.

Atlantic Salmon

The Atlantic salmon *Salmo salar* is an anadromous species using rivers to reproduce and as nursery areas during their juvenile phase (NPWS, 2019b). Salmon are present throughout the Blackwater catchment (NPWS, 2019b). The species is dependent on good water quality requiring clean (Q4) water for spawning and early life stages. Aside from water pollution, other pressures/threats noted relate to physical alteration of waterbodies, marine aquaculture, hydropower and abstractions (NPWS 2019b). Atlantic salmon are evaluated as being of overall Inadequate (*Stable*) conservation status nationally. This species has been recorded in the vicinity of the Mallow agglomeration discharges and suitable habitats for all life stages is present, therefore the conservation objectives for this species, together with data on water quality, need to be reviewed further in this NIS.

¹⁹ King J. J. and Linnane S. M. (2004) The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs. Irish Wildlife Manuals, No. 14. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

²⁰ Maitland, P. S. (2003) Ecology of the river, brook and sea lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.

Otter

Otter is widespread in the SAC (NPWS, 2012a; NPWS, 2019b; Reid et al, 2019). Otter rely on aquatic prey which are ultimately dependent on water quality. No pressures/threats for this species are identified nationally and the overall national assessment of the conservation status of otter is Favourable (*Improving*) (NPWS, 2019b). This species has been recorded in the vicinity of the Mallow agglomeration discharges, and therefore the conservation objectives for this species, together with data on water quality, need to be reviewed further in this NIS.

Conservation Objectives of the SAC

The conservation objectives for the relevant qualifying interests of the SAC that could potentially be impacted by the discharge are detailed below. In summary these are as follows:

Blackwater River (Cork/Waterford) SAC:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

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 Natura 2000 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.

River Blackwater (Cork/Waterford) SAC

Site specific conservation objectives are available for this SAC (NPWS, 2012a) and are described below.

Vegetation of Flowing Waters

*To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:*

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 – tidal influence;

Target: Maintain natural tidal regime

Attribute: Substratum composition - particle size range;

Target: The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (typically sands, gravels and cobbles).

Attribute: Water quality - nutrients;

Target: The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition.

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.

Alluvial forests

*To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:*

Attribute: Habitat Area;

Target: Area stable or increasing subject to natural processes, at least 19.2ha for sites surveyed.

Attribute: Habitat Distribution;

Target: No decline.

Attribute: Woodland size;

Target: Area stable or increasing. Where topographically possible, “*large*”, woods at least 25ha in size and “*small*” woods at least 3ha in size.

Attribute: Woodland structure – cover and height;

Target: Diverse structure with a relatively closed canopy containing mature trees, subcanopy later with semi-mature trees and shrubs, and well-developed herb layer.

Attribute: Woodland structure – community diversity and extent;

Target: Maintain diversity and extent of community types.

Attribute: Woodland structure –natural regeneration;

Target: Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.

Attribute: Hydrological regime – flooding depth/height of water table;

Target: Appropriate hydrological regime necessary for maintenance of alluvial vegetation.

Attribute: Woodland structure – dead wood

Target: At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).

Attribute: Woodland structure – veteran trees;

Target: No decline.

Attribute: Woodland structure – indicators of local distinctiveness;

Target: No decline.

Attribute: Vegetation composition – native tree cover;

Target: No decline. Native tree cover not less than 95%

Attribute: Vegetation composition - typical species;

Target: A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp.), oak (*Quercus robur*) and ash (*Fraxinus excelsior*).

Attribute: Vegetation composition – negative indicator species;

Target: Negative indicator species, particularly non-native invasive species, absent of under control.

Sea Lamprey

To restore the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: Greater than 75% of main stem length of rivers accessible from estuary.

Attribute: Population structure of juveniles;

Target: At least three age/size groups present.

Attribute: Juvenile density in fine sediment;

Target: Mean catchment juvenile density of brook/river lamprey at least 1/m².

Attribute: Extent and distribution of spawning habitat;

Target: No decline in extent and distribution of spawning beds.

Attribute: Availability of juvenile habitat;

Target: More than 50% of sample sites positive.

River Lamprey

To maintain the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: Access to all water courses down to first order streams.

Attribute: Population structure of juveniles;

Target: At least three age/size groups of brook/river lamprey present.

Attribute: Juvenile density in fine sediment;

Target: Mean catchment juvenile density of brook/river lamprey at least 2/m².

Attribute: Extent and distribution of spawning habitat;

Target: No decline in extent and distribution of spawning beds.

Attribute: Availability of juvenile habitat;

Target: More than 50% of sample sites positive.

Brook Lamprey

To maintain the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: Access to all water courses down to first order streams.

Attribute: Population structure of juveniles;

Target: At least three age/size groups of brook/river lamprey present.

Attribute: Juvenile density in fine sediment;

Target: Mean catchment juvenile density of brook/river lamprey at least 2/m².

Attribute: Extent and distribution of spawning habitat;

Target: No decline in extent and distribution of spawning beds.

Attribute: Availability of juvenile habitat;

Target: More than 50% of sample sites positive.

White-clawed Crayfish

To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: No reduction from baseline.

Attribute: Population structure -recruitment;

Target: Juveniles and/or females with eggs in at least 50% of positive samples.

Attribute: Negative indicator species;

Target: No alien crayfish species.

Attribute: Disease;

Target: No instances of disease.

Attribute: Water quality;

Target: At least Q3-4in all sites sampled by EPA.

Attribute: Habitat quality - heterogeneity;

Target: No decline in heterogeneity of habitat quality.

Atlantic Salmon

To maintain the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: 100% of river channels down to second order accessible from estuary.

Attribute: Adult spawning fish;

Target: Conservation limit (CL) for each system consistently exceeded.

Attribute: Salmon fry abundance;

Target: Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5min sampling.

Attribute: Out-migrating smolt abundance;

Target: No significant decline.

Attribute: Number and distribution of redds;

Target: No decline in number and distribution of spawning redds due to anthropogenic causes.

Attribute: Water quality;

Target: At least Q4 at all sites sampled by EPA.

Freshwater Pearl Mussel

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: Maintain at 161km.

Attribute: Population size;

Target: Restore to 35,000 adult mussels.

Attribute: Population structure - recruitment;

Target: Restore to at least 20% of the population no more than 65mm in length, and at least 5% of population no more than 30mm in length.

Attribute: Population structure – adult mortality;

Target: No more than 5% decline from previous number of live adults counted, dead shells less than 1% of the adult population and scattered in distribution.

Attribute: Habitat extent;

Target: Restore suitable habitat in more than 35km and any additional stretches necessary for salmonid spawning.

Attribute: Water quality – macroinvertebrate and phytobenthos (diatoms);

Target: Restore water quality-macroinvertebrate EQR greater than 0.90 phytobenthos EQR greater than 0.93.

Attribute: Substratum quality – filamentous algae (macroalgae), macrophytes (rooted higher plants);

Target: Restore substratum quality – filamentous algae absent or trace (<5%) macrophytes absent or trace (<5%).

Attribute: Substratum quality - sediment;

Target: Restore substratum quality - stable cobble and gravel substrate with very little fine material, no artificially elevated levels of fine sediment.

Attribute: Substratum quality – oxygen availability;

Target: Restore no more than 20% decline from water column to 5cm depth in substrate.

Attribute: Hydrological regime -flow variability;

Target: Restore appropriate hydrological regimes.

Attribute: Host fish;

Target: Maintain sufficient juvenile salmonids to host glochidial larvae.

Otter

To restore the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute: Distribution;

Target: No significant decline.

Attribute: Extent of terrestrial habitat;

Target: No significant decline. Area mapped and calculated as 1103ha above high water mark, 1165.7ha along river banks/around ponds.

Attribute: Extent of marine habitat;

Target: No significant decline. Area mapped and calculated as 647.2ha.

Attribute: Extent of freshwater (river) habitat;

Target: No significant decline. Length mapped and calculated as 599.54ha.

Attribute: Extent of freshwater (lake) habitat;

Target: No significant decline. Area mapped and calculated as 25.06ha.

Attribute: Couching sites and holts;

Target: No significant decline.

Attribute: Fish biomass available;

Target: No significant decline.

Attribute: Barriers to connectivity;

Target: No significant increase.

Impact Prediction

The potential impacts on water quality from the agglomeration discharges, alone and cumulatively with other catchment pressures is discussed below. The potential for water quality impacts to give rise to significant effects on the relevant qualifying interests of the Blackwater River (Cork/Waterford) SAC is then considered.

Impacts on water quality

Biological water quality monitoring indicates that water quality achieves a Q4 score upstream and downstream of the agglomeration operational discharges, indicating no long-term effect on the benthos occurs downstream of the current ongoing Mallow discharges. Water chemistry data (**Table 3.0**) indicates predominately High status conditions are currently met. The upgrades within the treatment plant will provide additional treatment of Ammonia and address the non-compliances for this parameter. The WFD objective of Good status does not align with the restoration of High water quality conditions required for Freshwater Pearl Mussel. As described earlier however, on the basis of design loads and licence ELV's, there is assimilative capacity in the River Blackwater under measured upstream and notionally-clean background scenarios for BOD, Ammonia and Orthophosphate that meet the 95%ile EQS limits for High status.

The single SWO remaining in the upgraded sewerage network meets the required design criteria, and calculations based on network modelling indicates that this SWO would meet the UPM high-status discharge criteria for intermittent discharges. Provision has been made for storage and screening of the SWO. SWO's are a necessary part of sewerage networks and serve to prevent uncontrolled spillages arising within the agglomeration and to prevent the biological processes necessary to treat effluent being compromised by inundation with excess water. The principal consideration to take account of in the assessment of the impact of overflows for water quality is that overflows will only occur in the event of sustained rainfall. The initial flushing flow arising from the first 5 mm of rain in a rainfall event is contained in the foul sump initially and will not be passed through to the storm tanks unless the capacity of the foul pumps is exceeded. This initial surface runoff flow will have the highest level of pollutants as it will wash in debris from impermeable surfaces and may dislodge settled solids in the sewer network. Flows entering a storm tank will then pass through a 6 mm upward flow screen between the foul sump and storm sump. This will further retain a significant proportion of the organic matter, solids and rags in the foul sump. Flows entering a stormwater holding tank will then be retained in the storm tank providing an opportunity for suspended solids to settle out. As flow recedes, the storm tank contents are passed forward to the WwTP for treatment. If the storm tank reaches capacity a highly diluted screened effluent is discharged. It is not possible to fully retain all stormwater due

to septicity that arises with storage and the inability of treatment plant biological processes to cater for large volumes of dilute wastewater. Diluted, settled and screened effluent which could be discharged during storm conditions, will enter a river will have increased flows driven by sustained rainfall. In this context, the discharges to the large Blackwater River channel will be diluted and dispersed effectively.

The risks of sewer or outfall failure associated with extreme events resulting in the activation of EO's, while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent emergency overflows that can be applied has been incorporated in the design and operation of the agglomeration.

While Good status is being maintained, and no significant pressure has been identified related to the agglomeration, the removal/improvement of overflow discharges is expected to be locally beneficial for the river.

Adverse effects on Qualifying Interests

With regard to Annex I habitats, only Vegetation of flowing waters has a specific conservation objective for water quality parameters targeting Good status conditions which are met by the discharges. Other conservation objective targets of Vegetation of flowing waters and Alluvial woodland that could be indirectly linked to water quality deterioration include negative indicators species, community/habitat distribution, vegetation communities and vegetation structure, however maintaining Good status conditions will support the maintenance/restoration of these targets.

The maintenance of Good status conditions is sufficient to ensure that the specific water quality conservation objective targets for white-clawed crayfish and salmon are met. The other conservation objective targets for these species, as well as those for lamprey and otter which do not specific a water quality target, are supported by Good status water quality conditions. The conservation objective target for Freshwater Pearl Mussel, relating to host fish (*'maintain sufficient juvenile salmonids to host glochidial larvae'*) will also be met, as Good water quality conditions support the upstream migration of salmonid fish crucial to the Freshwater Pearl Mussel life cycle. The ongoing discharges will not affect the movement of salmonid species through Mallow and will not prevent them reaching spawning grounds or affect recruitment of juvenile fish.

The conservation objective targets for Freshwater Pearl Mussel align with the standards specified in the fourth schedule of the Freshwater Pearl Mussel (FPM) Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. The EQR conservation objective target for Freshwater Pearl Mussel for macroinvertebrates of 0.90 relates to a Q Score of Q4-5, indicating High status water quality conditions. As noted earlier, the Q score upstream and downstream of Mallow is currently Q4 and the receiving water is assigned Good status. The assimilative capacity calculations however indicate that, under low flow conditions (worst case scenario), that High status water chemistry conditions can be

achieved by the discharge in the receiving waterbody even in the context of background/upstream pressures. Given the proposed stringent ELV's and the network upgrades, the operational discharges will support the appropriate water chemistry conditions and will therefore not hinder the restoration of the conservation objectives (and FPM Regulation standards) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation.

On the basis of the data considered above, adverse effects of the agglomeration discharges alone on the qualifying interests conservation objectives can be excluded.

Potential Cumulative or In-combination Effects

The assimilative capacity calculations indicate that, under low flow conditions, that High status 95%ile EQS for BOD, Ammonia and Orthophosphate can be achieved by the primary discharge in the receiving waterbody even in the context of the catchment background/upstream pressures, with remaining assimilative capacity available downstream.

It is noted that the Mallow agglomeration, prior to upgrade being completed, was not listed as pressure on its receiving waterbody, and the removal of 9 no. SWO's and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Orthophosphate, and the proposed design and operation of the Dual Function Overflow, SW010, that there will be a reduction in overall nutrient input into the river system. By meeting the ELVs, along with the more onerous Orthophosphate ELV, the agglomeration will not cumulatively affect the restoration conservation objective for Freshwater Pearl Mussel, or the conservation objectives of any other qualifying interests.

Mitigation Measures

The assessment has concluded that the operational discharges from the Mallow agglomeration do not have the potential to adversely affect the qualifying interests of the Blackwater River (Cork/Waterford) SAC or any other European Site. Consequently, there is no requirement for mitigation measures.

To ensure continued satisfactory operation of the Mallow agglomeration in line with the discharge licence the authors recommend the following:

- Ensure that the capacity of the WwTP is not exceeded.
- Ensure all discharges continue to operate in compliance with the ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis.

NIS Conclusion Statement

This NIS has been prepared following the EPA (2009) '*Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)*'. The Department of the Environment, Heritage and Local Government guidance '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*' (DoEHLG, 2009) has also been taken into account. This NIS for the Waste Water Discharge Licence Review investigates the potential adverse effects on the aquatic qualifying interests of the Natura 2000 network arising from the Mallow agglomeration operational 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 consideration of any mitigation measures that may be necessary to avoid, reduce or offset negative effects. Its purpose is to assist the competent authority in carrying out its AA of the proposed licence review.

The operational discharges (*i.e.*, SW001 and SW010) from the Mallow agglomeration will not prevent the achievement of the conservation objectives of the qualifying interests of the Blackwater River (Cork/Waterford) SAC. Based on the assessment herein it has been concluded that there will be no adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC or any other European Site, in view of this sites conservation objectives and that the conservation status of the Annex I habitats, Annex II species or Annex I bird species, will not be compromised by the agglomeration discharges either directly, indirectly or cumulatively.

It is therefore concluded that the Mallow agglomeration operational discharges, alone or in-combination with other plans and / or projects will not give rise to adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC or any other European Site.

APPENDIX A

WASTE ASSIMILATIVE CAPACITY CALCULATIONS

Project Number: 20893 Project Name: Mallow Sheet: 1 of 1	Rev	Date	By
	1.0	07-Aug-22	CAS
	2.0	19-Oct-22	CAS

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140		WFD 2013-2018 Status & 2016-2021 Status	Good
River Flow	m ³ /s	Data Source	m ³ /d	PE
95%ile Flow	4.870	EPA - Estimated 95%ile flow (up to 2018 data)	420,768	Treatment Plant Capacity (Design) 22,000

Background Concentration		Current Effluent Standards as per D0052-01 (Tech A) ^{Note 2}	Max Allowable D/S (mg/l)		EQS ^{Note 1}
	mg/l	Data Source	(mg/l)	Good Status ^{Note 1}	High Status ^{Note 1}
Carbonaceous BOD	1.207	Data Source: Catchments.ie (Station RS18B021600 - Mean Data from Jan 2020 - July 2022)	25.00	2.60	2.20
Total Ammonia (NH ₃)	0.047		3.00	0.14	0.09
Ortho-Phosphate (OP)	0.031		1.00	0.075	0.045

Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m ³ /d	95%ile m ³ /d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	110.47	600.40	1.510	22,000 p.e	Yes
m ³ /d	95%ile m ³ /d	NH ₃ mg/l	NH ₃ kg/d	NH ₃ mg/l		
5435	420,768	7.31	39.73	0.085	22,000 p.e	Yes
m ³ /d	95%ile m ³ /d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	3.44	18.72	0.044	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.

Project Number: 20893 Project Name: Mallow Sheet: 1 of 1	Rev	Date	By
	1.0	07-Aug-22	CAS
	2.0	19-Oct-22	CAS

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140		WFD 2013-2018 Status & 2016-2021 Status	Good
River Flow	m ³ /s	Data Source	m ³ /d	PE
95%ile Flow	4.870	EPA - Estimated 95%ile flow (up to 2018 data)	420,768	Treatment Plant Capacity (Design) 22,000

Background Concentration		Data Source	Current Effluent Standards as per D0052-01 (Tech A) ^{Note 2}	Max Allowable D/S (mg/l)		EQS ^{Note 1}
	mg/l		(mg/l)	Good Status ^{Note 1}	High Status ^{Note 1}	
Carbonaceous BOD	0.260	Background Concentration mg/l (Notionally Clean)	25.00	2.60	2.20	95%ile EQS Status
Total Ammonia (NH ₃)	0.008		3.00	0.14	0.09	95%ile EQS Status
Ortho-Phosphate (OP)	0.005		1.00	0.075	0.045	95%ile EQS Status

Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m ³ /d	95%ile m ³ /d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	183.76	998.73	0.575	22,000 p.e	Yes
m ³ /d	95%ile m ³ /d	NH ₃ mg/l	NH ₃ kg/d	NH ₃ mg/l		
5435	420,768	10.36	56.30	0.046	22,000 p.e	Yes
m ³ /d	95%ile m ³ /d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	5.49	29.86	0.018	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.