



ENVIRONMENT
ISO 14001:2004
NSAI Certified



HEALTH
& SAFETY
OHSAS 18001:2007
NSAI Certified



QUALITY
ISO 9001:2008
NSAI Certified



Energy, Environment & Safety

31st January 2019

t: 1890 130 007

e: info@oes.ie

w: oes.ie

**Environmental Licensing Programme
Office of Environmental Sustainability
Environmental Protection Agency
Johnstown Castle
Co Wexford**

Our Ref: **1160_69**

Re: **Newmarket Co-operative Creameries Ltd – IE Licence Reg. No. P0793-03
Request for Technical Amendment**

Dear Sir/Madam,

Newmarket Co-operative Creameries (NCC) request a Technical Amendment (TA) to Industrial Emissions Licence Reg. No. P0793-03 for their site in Newmarket, Co. Cork under Section 96(1) of the Environmental Protection Agency Acts, 1992 (as amended).

The request for a Technical Amendment arises after extensive review and effort by NCC to identify, agree and establish a suitable ambient surface water monitoring location downstream of the relatively new final effluent discharge/outfall location on the River Dalua at Allen's Bridge.

Under Schedule C.6 of the current IEL (Licence No. P0793-03), NCC are required to conduct ambient monitoring on the River Dalua both upstream and downstream of the discharge/outfall location at Allen's bridge. See licence extract below.

Receiving Water Monitoring

Location:

Mill Stream: MS1 (E131853, N107497),
MS2 (E132040, N107504) ^{Note 1}

Rampart Stream: ASW1 Upstream of Mill Stream (E132157, N107348)
ASW2 Downstream of Mill Stream (E132151, N107325)

River Dalua: ASW3 Upstream of Allen's Bridge (134007E, 104425N) ^{Note 2}
Downstream of Allen's Bridge ^{Note 2, Note 3}

Parameter	Monitoring Frequency	Analysis Method/Techniques
pH	Monthly	pH electrode/meter
Chemical Oxygen Demand	Monthly	Standard Method
Biochemical Oxygen Demand	Monthly	Standard Method
Ammonia (as N)	Monthly	Standard Method
Molybdate Reactive Phosphorus (as P)	Monthly	Standard Method
Visual inspection	Daily	Sample and examine for colour and odour To be agreed by the Agency
Biological Quality (Q) Rating/ Q Link	Annually ^{Note 4}	

Note 1: Upstream and downstream of Storm water emission points SW3-SW12

Note 2: Monitoring shall be carried out on commencement of the discharge to River Dalua.

Note 3: The downstream monitoring location shall be submitted to the Agency for agreement within three months of the date of grant of this licence. In the interim, monitoring shall be carried out at EPA Station 18D010500.

Note 4: Monitoring period – June to September.

Anfield House
Innell Bus. Park
Dublin 22
D22 N2N4

Promenade
Warrenpoint
Newry
Co. Down,
BT34 3NQ

A map showing the outfall location, surrounding hydrology and upstream monitoring location is included in **Attachment 1**. The pipeline outfall is located on the eastern side of Allen's bridge on the River Dalua, as such any ambient monitoring locations needs to be located downstream of this point.

Due to a number of issues and constraints NCC have been unable to establish a suitable and safe monitoring location as requested under Schedule C.6 of the IEL P0793-03. As such it is being requested that the requirement to conduct downstream ambient monitoring as currently outlined be removed from the licence. These issues and constraints are outlined below:

1) Hydrological Constraints

As shown in Map 1 included in Attachment 1 the Rampart stream converges with the River Dalua approximately 260 m downstream of Allen's bridge. In order to avoid monitoring results being influenced by any potential inputs to the Rampart stream and subsequently to the River Dalua via the Rampart Stream it is necessary that any ambient monitoring location be upstream of the Rampart Stream-River Dalua confluence. This leaves a relatively short section of the River Dalua suitable for monitoring.

Condition 6.5 of the IE Licence states the following:

"6.5 Monitoring and analysis equipment shall be operated and maintained as necessary so that monitoring accurately reflects the emission/discharge (or ambient conditions where that is the monitoring objective)"

It is argued that should monitoring take place at any point downstream of the Dalua-Rampart confluence that the results would not accurately reflect that emission/discharge i.e. SW1A or the ambient conditions of the River Dalua influenced solely by that discharge.

2) Access and Land Ownership

It is noted that lands on both banks along the section of the River Dalua between Allen's bridge and Rampart Stream-River Dalua confluence location are private lands and are not under the ownership of NCC or Kerry Group as such agreement to routinely enter these lands for the purpose would be required. In order to enter river or to sample water from the river bank, a suitable distance downstream of the outfall, where any effluent could be regarded as being suitably mixed these private lands would need to be accessed. To date no agreement between NCC/Kerry EMEA has been reached with these land owners. NCC cannot condone the trespass of any of their personnel or those employed on our behalf to enter lands and conduct any activity without the prior consent and agreement of the owners of those lands.

In process of determining a possible suitable downstream monitoring location the feasibility of sampling from the bridge itself was also examined. It was concluded however that this would not be suitable for a number of reasons

1) Health and Safety

At present there is no pedestrian footpath or walkway along Allen's bridge or any suitable space from which to conduct sampling from the bridge. Carrying out any sampling or monitoring from the parapet of the bridge would present a significant risk to those personnel assigned to conduct the work, particularly with respect to traffic along the bridge. Allen's

bridge is approximately 5 m in width and would not provide a suitable space for any personnel to safely conduct any sampling/monitoring.

2) *Sample Suitability*

A sample should be taken at distance downstream of the discharge location such that the treated effluent would be regarded as being thoroughly mixed. Monitoring and sampling in close proximity to the outfall location would not be representative of the conditions of the river itself, with respect to those monitoring parameters outlined downstream of the discharge. It would therefore not be suitable to sample directly from the bridge close to the outfall itself.

Again as stated above conducting any sampling or monitoring directly from the bridge, in close proximity to Allen's Bridge would contravene Condition 6.5 of the licence, and would not be suitable.

3) **Existing Controls**

It is noted that with the issuing of the updated licence new emission limits have been developed relating to the primary treated effluent discharge from the site. Proposed and agreed emission limits were derived through extensive impact assessment with respect to the potential impact on river water quality of the River Dalua. The relevant planning application submitted to Cork County Council (Planning Ref: 16/04895) was accompanied by an EIS. This was also submitted to the Agency as part of the IE Licence Review application. Subsequently the upgraded WWTP was designed and constructed to ensure emission limit values will be maintained.

It is the opinion of the licensee that there are sufficient controls and technologies in place to ensure that the treated effluent generated at the site and discharged at Allen's Bridge will not have a negative impact on the river quality of the River Dalua. The WWTP is equipped with sufficient instream monitoring to ensure that final effluent is within specifications and is meeting licence emission limit criteria. Routine monitoring of SW1A discharge as outlined in the current IE licence provides sufficient control.

Additionally, in order to demonstrate the WWTP's capability to treat wastewater which arises at the facility, all of the monitoring results recorded over a 4-month period (June 2018 – September 2018) were evaluated and the maximum and average result recorded for each parameter was compared to the IE Licence (Reg. No. P0793-03) ELV. The evaluation is present in Table 3 below.

Table 3 Evaluation of Actual Treatment Plant Performance against ELV's

Schedule C.2.2. Monitoring of Emissions to Water (SW1A)					
Control Parameter	IE Licence ELV		Average Recorded Value	Max. Recorded Value	
Flow (Daily) (m ³ /d)	2700	-	1077	1974	-
Flow (Hourly) (m ³ /hr)	120	-	44.5	82	-
pH	6-9	-	7.9	8.19	-
	Concentration	Kg/day		Concentration	Kg/day
COD (mg/l)	75	135	13.22	17	29.6
BOD (mg/l)	10	20	2.24	3	3.24
Suspended Solids (mg/l)	15	40	4.41	7	9.87
Total Nitrogen (mg/l)	20	40	3.8	7.2	7.94
Nitrates (mg/l)	15	30	2.99	7.2	6.84
Ammonia (N) (mg/l)	0.75	1.22	0.13	0.3	0.4
Molybdate Reactive Phosphorous	0.5	0.86	0.02	0.35	0.33
Oils, Fats & Greases (mg/l)	10	20	5.67	7	7.71

*Note: Results are based on monitoring period beginning 14/6/2018 (beginning of discharge to R. Dalua) to 30/9/2018.

Proposed Amendment to IE Licence**Amend Schedule C.6 Ambient Monitoring**

Considering what has been outlined above the following proposed change to the current licence is presented below.

Location:	Mill Stream	MS1 (E131853, N107497) MS2 (E132040, N107504) ^{Note 1}
	Rampart Stream	ASW1 Upstream of Mill Stream (E132157, N107325) ASW2 Downstream of Mill Stream (E132152, N107325)

Parameter	Monitoring Frequency	Analysis Method/Techniques
pH	Monthly	pH electrode/meter
Chemical Oxygen Demand	Monthly	Standard Method
Biochemical Oxygen Demand	Monthly	Standard Method
Ammonia (as N)	Monthly	Standard Method
Molybdate Reactive Phosphorous (as P)	Monthly	Standard Method
Visual Inspection	Daily	Sample and examine for colour and odour
Biological Quality (Q) Rating/Q Link	Annually ^{Note 2}	To be agreed by the Agency

Note 1: Upstream and downstream of storm water emission points SW3-SW12

Note 2: Monitoring Period – June to September

Conclusion

The requested amendments to IE Licence P0793-03 relate solely to a change in ambient monitoring conducted offsite and does not relate any change in the direct operation or activities at the dairy processing site. Due to unavoidable constraints it is not possible for the licensee to conduct ambient monitoring on the River Dalua as outlined in the current IE Licence. It has therefore been requested to amend the licence through the Technical Amendment process as it is understood that the proposed change cannot be accommodated through a change request via the Office of Environmental Enforcement (OEE).

It is concluded that the proposed change will not negatively impact or increase the risk of any adverse impact on the receiving water arising from the current SW1A discharge.

I trust that the above and enclosures provide sufficient information to enable a full evaluation of the proposed amendment to the licence.

Yours sincerely,



Peadar O'Loughlin

Enclosures:

Attachment 1

Outfall and Monitoring Locations

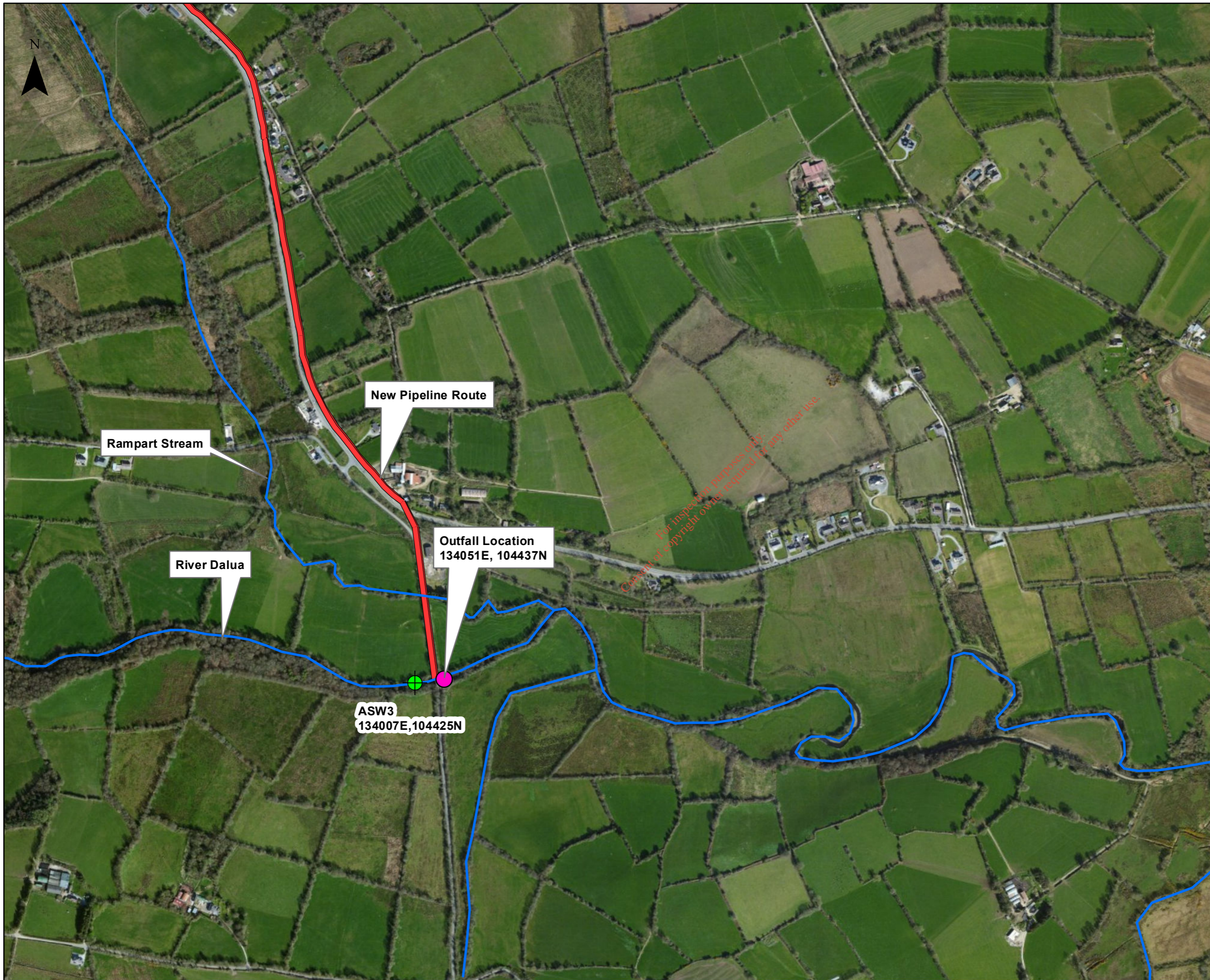
Attachment 2

Appropriate Assessment - Natura Impact Statement (NIS)

For inspection purposes only.
Consent of copyright owner required for any other use.

Attachment 1

Outfall and Monitoring Locations



Legend

- Rivers and Streams
- Monitoring Locations



OES Consulting 2nd Floor, FBD House, Fels Point, Trillick, Co Kerry
 T: (066) 7128321 F: (066) 7180061 E: info@oes.ie

Client:	Newmarket Cooperative Creamery	
Project:	IE Licence Compliance 2018	
Title:	Proposed Ambient Monitoring River Dalua	
Scale:	1:7,000 @ A3 Paper Size	
Ref:	Map 1	
OES Ref:	F-1 16069	
Revision:	01	
Document Control:	Date:	20/06/2018
	Drawn By:	EOC
	Checked By:	DH
	Approved By:	DH

Ordnance Survey Ireland. All Rights Reserved. Licence number EN0059514

0 60 120 240 360 480 Metres

For inspection purposes only.
Consent of copyright owner required for any other use.

Attachment 2

Appropriate Assessment - Natura Impact Statement (NIS)

Cover Note on accompanying Appropriate Assessment Natura Impact Statement (NIS)

As part of the Technical Amendment process it is a requirement to submit an Appropriate Assessment report to examine the potential impacts of the proposed activity on protected and conservation areas, species etc.

It is noted that the proposed change to the licence does not relate to any material change in the operations or licensed activities of the site or change any change to the associated and licensed emissions generated. The proposed technical amendment relates to a change in ambient monitoring requirements on the River Dalua, the receiving water to which the sites primary process related effluent discharges, via SW1A surface water emission point.

As part of the planning application process an extensive and comprehensive Appropriate Assessment report was prepared and submitted to the Local Authority as part of the EIS. The AA report specifically examined the potential impacts on designated as a result of the then proposed new discharge to location on the River Dalua at Allen's Bridge.

This EIS was also submitted to the Agency for consideration as part of the IE licence review application process. The new licence was issued on the basis of this information provided and that all and any of the conclusion drawn from that assessment are acceptable to the Agency.

As there is no proposed change to on-site activities or emission characteristics this AA report is contained overleaf and is being submitted in support of this TA request.

The conclusion of the AA report *'The proposed ELV's for volume and associated mass emission of BOD, Ammonia and Orthophosphate 'have been shown, using approved methodology, to be compliant with S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009 for attaining Good status in the River Dalua'*.

The requested TA to the current IE Licence will not alter this conclusion.

**NATURA IMPACT STATEMENT (NIS)
FOR THE FOLLOWING PROPOSED DEVELOPMENTS AT
NEWMARKET CO-OPERATIVE CREAMERIES LTD.,
NEWMARKET, COUNTY CORK**

- (1) Waste Water Treatment Plant Upgrade**
- (2) Increase in Milk Processing**
- (3) Installation of Underground Pipeline**
- (4) Discharge of Treated Wastewater**

9 February 2016



REPORT PREPARED FOR OES Ltd

by

Bill Quirke BSc, MSc, MCIEEM

Helena Twomey BA(Mod), PhD



Conservation Services, Tullaha, Glenflesk, Killarney, Co. Kerry
Tel/Fax 064 6630130 e-mail cs@conservation-services.ie

Client:	OES Consulting
Project	Natura Impact Statement (NIS) for waste water treatment plant upgrade, installation of underground pipeline & discharge of treated wastewater to Dalua River from Newmarket Co-Operative Creameries, Newmarket, County Cork.
Report No:	15110/NIS/F2
Date	9/02/2016
Status	Final
Prepared by	Bill Quirke BSc, MSc, MCIEEM
Reviewed by	Helena Twomey BA(Mod), PhD

*For inspection purposes only.
Consent of copyright owner required for any other use.*

CONTENTS

1. INTRODUCTION.....	5
2. APPROPRIATE ASSESSMENT SCREENING	6
2.1. DESCRIPTION OF THE PROJECT	6
2.1.1. Waste water treatment plant upgrade	8
2.1.2. Underground wastewater pipeline.....	9
2.1.3. Increase in the milk processing at the facility	10
2.1.4. Emissions to air.....	10
2.2. IDENTIFICATION OF RELEVANT NATURA 2000 SITES, AND COMPILATION OF INFORMATION ON THEIR QUALIFYING INTERESTS AND CONSERVATION OBJECTIVES	12
2.2.1. Qualifying Interests	13
2.2.2. Conservation Objectives	15
2.3. ASSESSMENT OF LIKELY EFFECTS – DIRECT, INDIRECT AND CUMULATIVE	16
2.3.1. Potential impacts on Blackwater (Cork/Waterford) River SAC	18
2.3.2. Potential impacts on Lower River Shannon SAC	24
2.3.3. Potential impacts on Stack's to Mullaghareirk Mountains, West Limerick Hill and Mount Eagle SPA.....	27
2.4. SCREENING STATEMENT WITH CONCLUSIONS	28
3. NATURA IMPACT STATEMENT FOR THE PURPOSES OF APPROPRIATE ASSESSMENT	30
3.1. CHARACTERISTICS OF THE NATURA 2000 SITE	31
3.1.1. General description of Blackwater (Cork/Waterford) River SAC	31
3.1.2. SAC qualifying interests	33
3.1.3. Baseline conditions	33
3.2. POTENTIAL IMPACTS.....	34
3.2.1. An assessment of the potential aquatic environmental impact of the proposed development during the period of construction.....	34
3.2.2. Impact of discharge.....	38
3.2.3. Potential pre-mitigation impacts on Qualifying Interests of Natura 2000 Site	40
3.3. MITIGATION MEASURES.....	60
3.3.1. Mitigation of the potential aquatic impact of the proposed WWTP upgrade during the period of construction	60
3.3.2. Mitigation of potential long-term aquatic impact of the existence of the proposed development.....	70
3.4. MONITORING	73
3.5. RESIDUAL IMPACT	77
4. REFERENCES.....	78

- APPENDIX 1 BASELINE ASSESSMENT OF STREAMS & RIVERS
POTENTIALLY AFFECTED BY THE PROPOSED WWTP
UPGRADE, PIPELINE INSTALLATION AND WASTEWATER
DISCHARGES FROM NEWMARKET CO-OPERATIVE
CREAMERIES, COUNTY CORK
- APPENDIX 2 IMPACT ASSESSMENT OF UPGRADE WORKS TO WWTP
AND INCREASED DISCHARGE TO THE RIVER DALUA
- APPENDIX 3 NPWS SUBMISSION OF 4th DECEMBER 2015
- APPENDIX 4 NPWS SUBMISSION OF 8th FEBRUARY 2016

*For inspection purposes only.
Consent of copyright owner required for any other use.*

1. INTRODUCTION

OES Consulting has commissioned Conservation Services – Ecological & Environmental Consultants to prepare a Natura Impact Statement (NIS) as part of the 'Appropriate Assessment' process for the proposed waste water treatment plant upgrade, increase in milk processing, installation of underground pipeline & discharge of treated wastewater to the Dalua River.

To inform the NIS process a detailed baseline assessment was carried out of habitat, fish populations and biological water quality of the streams & rivers potentially affected by the proposed development. The baseline assessment is presented in Appendix 1 of this report.

An Appropriate Assessment (AA) is an evaluation of the potential impacts of a plan or project on the conservation objectives of Natura 2000 sites, and the development, where necessary/possible, of mitigation or avoidance measures to preclude negative effects. The requirement for AA is laid down in Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna – the 'Habitats Directive' which was transposed into Irish law by the European Communities (Natural Habitats) Regulations, SI 94/1997.

There are four distinct stages to undertaking an AA as outlined in current EU and National Parks and Wildlife Service (NPWS) guidance:

1. Appropriate Assessment Screening
2. Appropriate Assessment
3. Assessment of Alternatives in cases where significant impact cannot be prevented
4. Where no alternatives exist, an assessment of compensatory issues in the case of projects or plans which can be considered to be necessary for imperative reasons of overriding public interest (IROPI)

2. APPROPRIATE ASSESSMENT SCREENING

Screening determines whether appropriate assessment is necessary by examining:

1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a Natura 2000 site.
2. Whether the project will have a potentially significant effect on Natura 2000 sites, either alone or in combination with other projects or plans, in view of the sites' conservation objectives.

Screening involves the following:

- i. Description of plan or project
- ii. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives
- iii. Assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary
- iv. Screening Statement with conclusions

2.1. DESCRIPTION OF THE PROJECT

The primary activity at the Newmarket Co-Operative Creameries Ltd. (Newmarket Co-Op) facility is the production of cheddar cheese from raw fresh milk. The facility received an IPPC Licence from the Environmental Protection Agency (EPA) in 2009 for the processes undertaken at the site. The licensed

activity at the site is described as 'The treatment and processing of milk, the quantity of milk received being greater than 200 tonnes per day (average value on a yearly basis)'.

The facility primarily consists of the following infrastructure components:

- Milk delivery & milk truck wash down area
- Whey production building
- Cheese Production building, including cheddaring area and laboratory
- Boiler house
- Air Compressor & Refrigeration buildings
- Cheese Stores
- A Dispatch Area.

All milk delivered to the site is stored in stainless steel silos, which are remotely banded to the on site waste water treatment system. All processing of product is carried out indoors. Steam required for processing is raised onsite in residual oil fired boilers; boiler air emissions are emitted through 24m high stacks. Raw water for use in processing operations is supplied from onsite wells, and the facility also has a connection to the local water main. A class 1 by-pass separator is installed on the line conveying surface water from the car park area of the site to the Rampart Stream via the Mill Stream.

The Waste Water treatment Plant (WWTP) is located in the east of the facility which treats all wastewaters arising from processing operations. The WWTP has an odour control system which collects and treats any malodours present across the system. The receiving water for the discharge of final treated effluent from the site is at present the Rampart Stream which flows to the Dalua River.

Newmarket Co-Op proposes the following development at its Newmarket facility:

1. An upgrade to the existing operational WWTP onsite and an increase in the total discharge of waste water from the facility from 2,000 metres cubed (m³) to 2,700m³ per day;

2. The installation of an underground pipeline to convey treated water from the facility to a discharge point on the River Dalua, approximately 4 kilometres (km) to the south east of the facility. It is noted that the River Dalua is considered to be the receiving water in the facility's current industrial emissions license;
3. An increase in the duration of milk processing at the creamery (80 million gallons of milk equivalent per year) including an extension of the peak processing period from 6 to 7 days per week.

As part of the planning application, an EIS impact assessment has also been undertaken on the overall facility as this has not been completed to date on the site.

2.1.1. WASTE WATER TREATMENT PLANT UPGRADE

The proposed WWTP development includes an Extended Aeration Activated Sludge Plant complete with anaerobic zone and anoxic zones for biological phosphorous and nitrogen removal and aeration zone for Biochemical Oxygen Demand (BOD) removal. The footprint of the proposed WWTP upgrade incorporating all elements and upgrades will be approximately 2,838m² (0.28 ha). This will add to the footprint of the existing WWTP which is approximately 7,100 m² (0.710 ha). The scale of proposed development is small in comparison with the footprint for the overall Newmarket Co-Op facility site which is approximately 10 ha.

The proposed development aims to improve the efficiency of the treatment of waste water before it leaves the site via the proposed underground pipeline. Newmarket Co-Op propose to upgrade the existing operational WWTP at the Newmarket facility to further improve the treatment abilities of the waste water treatment plant technologies, process controls and existing technologies and enable the facility to operate within the proposed additional milk processing parameters.

2.1.2. UNDERGROUND WASTEWATER PIPELINE

Newmarket Co-Op propose to install an underground pipeline to convey treated water from the WWTP at the creamery facility to a discharge point on the River Dalua, approximately 4km to the south east of the facility. The pipeline will run along the route of the R576 to minimise development impacts on the local area and private property and will avoid any sites designated for ecological, cultural heritage or other conservation purposes. The pipeline will cross the Rampart Stream at Stoneville Bridge in Newmarket and at Bridge A a short distance upstream of the confluence with the Dalua River. The pipeline will also cross a small tributary of the Rampart Stream at Park Bridge which is located on the R576 approximately 3km from Stoneville Bridge.

The Malachy Walsh & Partners Newmarket Co-Op Creameries Ltd. Effluent Rising Main Design Report (November 2015) states that at Stoneville Bridge *“the pipe will be laid in the newer section of road carriageway. There is ample cover available over the upstream side of Stoneville Bridge to allow the effluent line pass over it so that the proposed route should have no impact on the bridge.”* The report indicates that at Park Bridge the embankment and roadway were widened in the past and a new section of culvert installed. The pipeline will be constructed in the new section of bridge and will not affect the existing bridge or watercourse. At Bridge A *“the pipe will be diverted from the roadway and carried across the bridge by tying it to the parapet of the downstream side. It will follow the line of the arch to ensure it does not affect the existing flows through the stream. It will then be re-diverted back to the roadway...”*

The proposed discharge outfall is at Allen’s Bridge. Malachy Walsh & Partners Newmarket Co-Op Creameries Ltd. Effluent Rising Main Design Report (November 2015) states: *“The ductile iron pipe will be turned through the bridge wall and then vertically downwards to discharge into the Dalua at the eastern arch. The pipe will be anchored to the side of the bridge allowing the effluent to discharge directly into the river.”*

2.1.3. INCREASE IN THE MILK PROCESSING AT THE FACILITY

Newmarket Co-Op intends to apply for planning permission to increase its annual production up to its maximum installed processing of 35,000 tonnes of cheese per annum, which is a milk equivalent of approximately 75-80 million gallons. The existing processing period on site is a 6 month period April through to September and sometimes into October. Milk processing occurs throughout this 6/7 month duration. It is proposed to increase processing on site from 6 to 7 days per week.

2.1.4. EMISSIONS TO AIR

Liquid milk is processed at Newmarket Co-operative Creameries Ltd. to produce cheese through a series of manufacturing steps, which involve the application of heat as steam.

Chapter 5. Section 5 of the EIS for the proposed development states: *"The planned intensification programme at the Newmarket Co-Op facility will increase production throughout the year and will increase the number of days with the facility running at maximum output when peak cheese production takes place. This will result in an increase in steam demand from the boilers and also the daily volume of process water treated at the on-site WWTP during peak production."*

An air quality impact study of the emissions from the 2 boilers was undertaken to predict ground level concentrations in the locality and assess percentage compliance with National Air Quality Standards values. Emission rates for SO₂, NO_x and PM from the boilers were for a 'worst-case' emission scenario based on providing the hourly maximum steam demand for the production process during peak production. This steam requirement can be achieved with one boiler operating at 100% load and the other firing at only 60% boiler load. Daily steam demand was estimated at 80% of the hourly demand for each boiler. Continuous daily operation at these boiler load conditions was assumed in the modelling study, with no monthly or seasonal variation in output and so this over-estimates the existing emissions from the facility.

The results of the modelling study demonstrate that the predicted ambient concentrations within the locality comply with the Air Quality Standards for both short-term and annual average limit values specified in the 2011 Regulations. Since the air quality model was based on stack emissions during full hourly plant production, the planned intensification programme will not result in a change in these short-term emission rates. Furthermore, the model excluded monthly or seasonal variations in steam demand and so the predicted long-term concentrations are also applicable to the future intensification programme. Any change in future seasonal emission rates compared to current emissions will be minor or insignificant and less than the modelled values."

*For inspection purposes only.
Consent of copyright owner required for any other use.*

2.2. IDENTIFICATION OF RELEVANT NATURA 2000 SITES, AND COMPILATION OF INFORMATION ON THEIR QUALIFYING INTERESTS AND CONSERVATION OBJECTIVES

Three Natura 2000 sites are situated within a 15km radius of the proposed development; these are:

1. The Blackwater (Cork/Waterford) River Special Area of Conservation (SAC) (Site Code 002170)
2. The Stack's to Mullaghareirk Mountains, West Limerick Hill and Mount Eagle Special Protection Area (SPA) (Site Code 004161)
3. The Lower River Shannon SAC (Site Code 002165).

It is therefore concluded that the only Natura 2000 Sites which could be potentially affected by the proposed development are those listed above.

NPWS site synopses and conservation objectives for each of these Natura sites can be viewed using the following links.

Blackwater (Cork/Waterford) River SAC	
Site Synopsis	Conservation Objectives
www.npws.ie/sites/default/files/protected-sites/synopsis/SY002170.pdf	www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002170.pdf

Note: The Conservation Objectives regarding Freshwater Pearl Mussel no longer apply to the main channel of the Blackwater River (see Department of Arts, Heritage and the Gaeltacht letter of 8 February 2016 in Appendix 4).

Site Synopsis Lower River Shannon SAC	
Site Synopsis	Conservation Objectives
www.npws.ie/sites/default/files/protected-sites/synopsis/SY002165.pdf	www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf

Stack's to Mullaghareirk Mountains, West Limerick Hill and Mount Eagle SPA	
Site Synopsis	Conservation Objectives
http://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004161.pdf	www.npws.ie/sites/default/files/protected-sites/natura2000/NF004161.pdf

2.2.1. QUALIFYING INTERESTS

BLACKWATER (CORK/WATERFORD) RIVER SAC

- Freshwater Pearl Mussel *Margaritifera margaritifera*
- White-clawed Crayfish *Austropotamobius pallipes*
- Sea Lamprey *Petromyzon marinus*
- Brook Lamprey *Lampetra planeri*
- River Lamprey *Lampetra fluviatilis*
- Twaité Shad *Alosa fallax*
- Atlantic Salmon *Salmo salar* (only in fresh water)
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Perennial vegetation of stony banks
- Salicornia and other annuals colonizing mud and sand
- Atlantic salt meadows (*Glaucopuccinellietalia maritima*)
- Otter *Lutra lutra*

- Mediterranean salt meadows (*Juncetalia maritimi*)
- Killarney Fern *Trichomanes speciosum*
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)
- **Taxus baccata* woods of the British Isles

* indicates a priority habitat under the Habitats Directive

LOWER RIVER SHANNON SAC

- Freshwater Pearl Mussel *Margaritifera margaritifera*
- Sea Lamprey *Petromyzon marinus*
- Brook Lamprey *Lampetra planeri*
- River Lamprey *Lampetra fluviatilis*
- Atlantic Salmon *Salmo salar* (only in fresh water)
- Sandbanks which are slightly covered by sea water all the time
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- *Coastal lagoons
- Large shallow inlets and bays
- Reefs
- Perennial vegetation of stony banks
- Vegetated sea cliffs of the Atlantic and Baltic coasts
- Salicornia and other annuals colonizing mud and sand
- Atlantic salt meadows (*Glaucopuccinellietalia maritima*)
- Bottlenose Dolphin *Tursiops truncatus*
- Otter *Lutra lutra*
- Mediterranean salt meadows (*Juncetalia maritimi*)

- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
- *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicetalia)

* indicates a priority habitat under the Habitats Directive

STACK'S TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILL AND MOUNT EAGLE SPA

- Hen harrier *Circus cyaneus* [breeding]

2.2.2. CONSERVATION OBJECTIVES

The Conservation Objectives of the three potentially affected Natura 2000 sites can be summarised as: To maintain or restore the favourable conservation condition of the habitats and species for which the Natura sites have been selected (i.e. the qualifying interests) (see Section 2.2.1. above).

In the case of both the Lower River Shannon SAC and the Blackwater (Cork/Waterford) River SAC, detailed objectives have been presented in NPWS (2012a) and NPWS (2012b) for each of the qualifying interest species and habitats.

2.3. ASSESSMENT OF LIKELY EFFECTS – DIRECT, INDIRECT AND CUMULATIVE

If a plan or project is likely to undermine any of the sites' conservation objectives, it must be considered likely to have a significant effect on that site.

NPWS guidelines state: *"It is important that the NIS applies the precautionary principle and the focus of the statement should be on demonstrating objectively, with supporting evidence, that there will be no adverse effects on the integrity of the Natura 2000 site. Where this cannot be demonstrated, adverse effects must be assumed and the Statement must reflect that."* The need to apply the precautionary principle in making any key decisions in relation to the tests of AA has been confirmed by European Court of Justice case law. Therefore, where significant effects are likely, uncertain or unknown at screening stage, full Appropriate Assessment will be required.

Subject to the precautionary principle, a significant impact constitutes any impact which alone or cumulatively could:

1. Prevent a qualifying interest Annex II species from maintaining itself on a long-term basis as a viable component of its natural habitats.
2. Result in a reduction in the natural range of a qualifying interest Annex II species in the foreseeable future.
3. Reduce the habitat of a qualifying interest Annex II species to below the level where it can maintain its population on a long-term basis.
4. Reduce the natural range of a qualifying interest Annex I habitat.
5. Threaten the long-term existence of the specific structure and functions which are necessary for the long-term maintenance of a qualifying interest Annex I habitat.

6. Threaten the favourable conservation status of the typical species of a qualifying interest Annex I habitat

The Source-Pathway-Receptor (S-P-R) conceptual model for environmental management risk assessment provides a systematic means of determining and evaluating the nature, effect and extent of exposure a vulnerable receptor may experience in relation to a particular hazard. For a risk to exist there must be a source (or hazard or pressure), a pathway, and a receptor (or target) (Daly, 2004). An environmental hazard is an event, or continuing process, which if realised will lead to circumstances having the potential to degrade, directly or indirectly, the quality of the environment (Royal Society, 1992).

*For inspection purposes only.
Consent of copyright owner required for any other use.*

2.3.1. POTENTIAL IMPACTS ON BLACKWATER (CORK/WATERFORD) RIVER SAC

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
<p>Freshwater Pearl Mussel <i>Margaritifera margaritifera</i></p>	<p>The closest known population of Freshwater Pearl Mussel (FPM) downstream of the discharge location is in the main channel of the Blackwater River immediately downstream of the River Allow confluence (c.12km downstream of the proposed discharge) (NPWS 2012a).</p> <p>The Development Applications Unit of the DAHG in its letter of 4 December 2015 (See Appendix 3) stated: <i>“It is currently a conservation target to maintain the distribution of the freshwater pearl mussel within the downstream Rivers Allow and Blackwater. Note that this conservation target does not apply to the River Dalua. Therefore, effects in the River Dalua should be assessed for salmonid water quality, with salmon habitat as the target. The conservation target to maintain the distribution of freshwater pearl mussel, and to restore suitable habitat for this species, applies to the population downstream in the main channel of the River Blackwater, not to the stretch of the River Allow between the confluence of the Dalua and the confluence of the Allow with the Blackwater. ...the draft Allow River sub-basin management plan refers to a comprehensive survey of this section of the river found no mussels and recorded very poor habitat conditions.</i></p> <p><i>The current conservation targets, therefore, relating to the objective to restore the favourable conservation condition of freshwater pearl mussel in the cSAC, apply, for the purpose of your assessment, to the subpopulation just below the Allow confluence. A further survey of the Allow River is not required for the assessment.”</i></p>	<p>No</p>	<p>No</p>

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
	<p>In its letter of 8 February 2016 Department of Arts, Heritage and the Gaeltacht (See Appendix 4) indicates that the Conservation Objectives regarding Freshwater Pearl Mussel no longer apply to the main channel of the Blackwater River. This in combination with the DAHG letter of 4 December 2015 indicates that Freshwater Pearl Mussel are no longer a qualifying interest in any waters downstream of the proposed development.</p>		
<p>White-clawed Crayfish <i>Austropotamobius pallipes</i></p>	<p>The NPWS Conservation Objectives for the Blackwater River (Cork/Waterford) SAC maps the distribution of Crayfish in the SAC and outlines the “area of interest” for the species in the SAC. The “area of interest” is c.16km downstream of the proposed development. (See Map 9 in www.npws.ie/sites/default/files/protected-sites/synopsis/SY002170.pdf)</p> <p>The nearest crayfish records shown on the National Biodiversity Data Centre online mapping are c.56km downstream of the proposed development. Given the nature of the development and the distance from crayfish populations or areas of significant potential for crayfish, there is deemed to be no significant risk to crayfish.</p>	No	No
<p>Sea Lamprey <i>Petromyzon marinus</i></p>	<p>Sea lamprey are present in the River Allow http://www.npws.ie/publications/irishwildlifemanuals/IWM14.pdf and in the Dalua River (NPWS 2012a)</p>	Yes	Yes
<p>Brook Lamprey <i>Lampetra planeri</i></p>	<p>Brook Lamprey are present in the Dalua River and the River Allow (King & Linnane 2004). Brook Lamprey are present in the Rampart Stream (Dr F. Igoe pers. comm.)</p>	Yes	Yes

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
River Lamprey <i>Lampetra fluviatilis</i>	River Lamprey are present in the Dalua River and in the River Allow (King & Linnane 2004)	Yes	Yes
Twaite Shad <i>Alosa fallax</i>	In a survey of Shad in the Munster Blackwater in 2003/2004, the furthest upstream that Shad were recorded was in the Careysville fishery near Fermoy c.25km upstream of the top of the tide. The report states this fish "is likely to have been impeded by the weir at this location". (King & Linnane 2004). As Fermoy is c.65km downstream of the proposed development, it is concluded that there is no significant possibility of shad occurring in the waters potentially affected by the proposed development.	No	No
Atlantic Salmon <i>Salmo salar</i> (only in fresh water)	The Dalua River has a significant salmon population (Inland Fisheries Ireland 2010). Salmon have also been recorded in significant numbers in the Rampart stream as part of the present assessment (See Appendix 1 Section 3.2.3). In addition to potential <i>in situ</i> impacts on salmon in the Dalua River which is within the SAC; for the purposes of screening, potential <i>ex situ</i> impacts include potential impacts on qualifying interest species outside of the SAC, but which spend some of their life cycle within the SAC and are therefore an integral part of the SAC population.	Yes	Yes
Estuaries	Nearest habitat c.100km downstream of proposed development.	No	No
Mudflats and sandflats not covered by seawater at low tide	Nearest habitat >100km downstream of proposed development.	No	No

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Perennial vegetation of stony banks	Coastal habitat. No potential impact source or pathway evident.	No	No
Salicornia and other annuals colonizing mud and sand	Coastal habitat. No potential impact source or pathway evident.	No	No
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Coastal habitat. No potential impact source or pathway evident.	No	No
Otter <i>Lutra lutra</i>	<p><i>“Otter occur along both the Rampart Stream and River Dalua. ... Although no evidence of otter was recorded during terrestrial ecology field survey, it is probable that otter use stretches of the River Dalua for commuting and foraging. Otter are known to have used an artificial otter holt on the eastern (downstream) side of Allen’s Bridge (right hand side), and habitats downstream in close proximity to the bridge. ... “There is an absence of suitable breeding sites at the location of the discharge point and therefore direct impacts on breeding sites are not foreseen. However, suitable breeding sites occur in the surroundings and therefore potential disturbance to resident otter population is possible.” (EIS Chapter 5.1). It is judged that any adverse impacts caused to salmonid fish could have a potential knock-on food chain effect on otters.</i></p>	Yes	Yes
Mediterranean salt meadows (Juncetalia maritimi)	Coastal habitat. No potential impact source or pathway evident.	No	No

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Killarney Fern <i>Trichomanes speciosum</i>	“Not known to occur in proximity to proposed development. Absence of suitable habitat. The nearest known location of this species occurs ca 70km east of the proposed discharge point.” (EIS Chapter 5.1)	No	No
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation	Watercourses characterised by submerged or floating-leaved vegetation (“Ranunculion fluitantis and Callitriche-Batrachion vegetation”) are listed in Annex II of the Habitats Directive. The definition of watercourses characterised by Ranunculion fluitantis and Callitriche-Batrachion communities is very wide, in practice covering the majority of rivers and streams with aquatic plant communities of note (Hatton-Ellis & Grieve 2003). Species characteristic of the habitat type include Callitriche sp., and Potamogeton sp. (European Environment Agency www.eunis.eea.europa.eu/habitats-factsheet.jsp). NPWS (2012a) states that in this SAC “the dominant floating leaved species appears to be the common and widespread stream water-crowfoot (<i>Ranunculus penicillatus</i> subsp. <i>penicillatus</i>) (Green, 2008, O’Mahony, 2009). No high conservation value subtypes are known to occur in the SAC and further survey is required to determine whether any such are present. Only one rare/threatened vascular plant species is known to occur in the SAC, the protected opposite-leaved pondweed (<i>Groenlandia densa</i>), which is abundant in the tidal stretches around Cappoquin (Green, 2008).” In the field survey carried out for this NIS floating river vegetation was observed to be sparse in both the Rampart Stream and the Dalua River downstream of its confluence with the Rampart Stream.	No	No

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Old sessile oak woods with Ilex and Blechnum in the British Isles	No potential impact source or pathway evident. “ <i>Not located in proximity to proposed development, the nearest known location of this habitat type occurs ca 2.5km west of the proposed discharge point.</i> ” (EIS Chapter 5.1)	No	No
*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno Padion, Alnion incanae, Salicion albae)	“ <i>Not located in proximity to the proposed development. This habitat occurs ca 2.5km west and upstream of the proposed discharge points. The nearest mapped downstream residual alluvial forest occurs approximately 36km downstream of the proposed discharge point option A (NPWS 2012a).</i> ” (EIS Chapter 5.1) Even at close proximity it is unlikely that the proposed development would cause any impact on alluvial woodlands.	No	No
* <i>Taxus baccata</i> woods of the British Isles	No potential impact source or pathway evident. “Not located in proximity to proposed development, the nearest known location of this habitat occurs ca 75km east of the proposed discharge point.” (EIS Chapter 5.1)	No	No

Consent of copy for information purposes only. For any further information required, contact the EPA.

2.3.2. POTENTIAL IMPACTS ON LOWER RIVER SHANNON SAC

Qualifying Interest (In lower River Shannon SAC)	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Annex I Habitats		No	No
Sandbanks which are slightly covered by sea water all the time	No potential impact pathway evident	No	No
Estuaries	No potential impact pathway evident	No	No
Mudflats and sandflats not covered by seawater at low tide	No potential impact pathway evident	No	No
*Coastal lagoons	No potential impact pathway evident	No	No
Large shallow inlets and bays	No potential impact pathway evident	No	No
Reefs	No potential impact pathway evident	No	No
Perennial vegetation of stony banks	No potential impact pathway evident	No	No
Vegetated sea cliffs of the Atlantic and Baltic coasts	No potential impact pathway evident	No	No
Salicornia and other annuals colonizing mud and sand	No potential impact pathway evident	No	No
Atlantic salt meadows	No potential impact pathway evident	No	No

Qualifying Interest (In lower River Shannon SAC)	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
(Glauco-Puccinellietalia maritimae)			
Mediterranean salt meadows (Juncetalia maritimi)	No potential impact pathway evident	No	No
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachionvegetation	No potential impact pathway evident	No	No
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	No potential impact pathway evident	No	No
*Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicionalbae)	No potential impact pathway evident	No	No
Annex II Species		No	No
Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>	No potential impact pathway evident	No	No
Sea Lamprey <i>Petromyzon marinus</i>	No potential impact pathway evident	No	No
Brook Lamprey <i>Lampetra planeri</i>	No potential impact pathway evident	No	No
River Lamprey <i>Lampetra fluviatilis</i>	No potential impact pathway evident	No	No

Qualifying Interest (In lower River Shannon SAC)	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Atlantic Salmon <i>Salmo salar</i> (only in fresh water)	No potential impact pathway evident	No	No
Bottlenose Dolphin <i>Tursiops truncatus</i>	No potential impact pathway evident	No	No
Otter <i>Lutra lutra</i>	No potential impact pathway evident	No	No

For inspection purposes only.
Consent of copyright owner required for any other use.

2.3.3. POTENTIAL IMPACTS ON STACK'S TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILL AND MOUNT EAGLE SPA

Qualifying Interest	Observations	Potential Direct / In-situ impacts	Potential Indirect/ Ex-situ Impacts
Hen Harrier <i>Circus cyaneus</i> (breeding)	No potential impact source or pathway evident.	No	No

For inspection purposes only.
Consent of copyright owner required for any other use.

2.4. SCREENING STATEMENT WITH CONCLUSIONS

In order to determine the potential impacts on Natura 2000 sites of the proposed waste water treatment plant upgrade, installation of underground pipeline & discharge of treated wastewater to the Dalua River, from Newmarket Co-Operative Creameries Ltd., County Cork, a screening process was undertaken. The conclusion of the screening process is that in the absence of mitigation, and applying the precautionary principle, the proposed development would have a potential impact on one Natura 2000 site: Blackwater (Cork/Waterford) River Special Area of Conservation (Site Code 002170).

The conclusion of the screening process is that in the absence of adequate mitigation, and applying the precautionary principle, the proposed waste water treatment plant upgrade, installation of underground pipeline & discharge of treated wastewater to Dalua River could have significant indirect impacts on the following qualifying interests (Habitats Directive Annex II Species and Annex I Habitats):

Blackwater (Cork/Waterford) River SAC

	Potential Direct/ In-situ Impact	Potential Indirect/ ex-situ Impact
<i>Salmo salar</i> (Salmon)	✓	✓
<i>Pteromyzon marinus</i> (Sea Lamprey)	✓	✓
<i>Lampetra fluviatilis</i> (River Lamprey)	✓	✓
<i>Lampetra planeri</i> (Brook Lamprey)	✓	✓
<i>Lutra lutra</i> (Otter)	✓	✓

As the proposed waste water treatment plant upgrade, installation of underground pipeline and discharge of treated wastewater to Dalua River

cannot be excluded from AA requirements because it is directly connected with or necessary to the management of the Natura 2000 site, a Natura Impact Statement for the purposes of Appropriate Assessment is presented in the following section to examine in more detail the risk of the proposed project to the SAC, and in particular the risk to the potentially affected qualifying interests identified in the screening process, and to recommend mitigation measures which will prevent any significant potential impact occurring.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

3. NATURA IMPACT STATEMENT FOR THE PURPOSES OF APPROPRIATE ASSESSMENT

In this section the Natura 2000 site which is selected for appropriate assessment, (i.e. Blackwater (Cork/Waterford) River SAC) is described, and the potential impacts resulting from the proposed waste water treatment plant upgrade, installation of underground pipeline and discharge of treated wastewater to the Dalua River (as identified in the screening process) are discussed in relation to the conservation objectives of the SAC.

The location of the proposed WWTP extension, the proposed Newmarket Co-Operative Creamery Ltd discharge and the proposed waste water pipeline are shown in relation to the Blackwater (Cork/Waterford) River SAC on Map 1.

DOEHLG Appropriate Assessment Guidelines state: "*Case law has established that assessments should be undertaken on the basis of the best scientific evidence and methods. Case law of the ECJ has established that AA must be based on best scientific knowledge in the field.*" (DOEHLG 2009)

The following bodies/individuals were invited to submit comments and/or information for this assessment:

- Inland Fisheries Ireland (responsible for conservation of fish species)
- National Parks & Wildlife Service (responsible for conservation of SAC qualifying interest species and habitats)
- Dr Fran Igoe (carried out fishery investigations of Rampart Stream in 2013 & 2014 for IRD Duhallow Life Project)

3.1. CHARACTERISTICS OF THE NATURA 2000 SITE

3.1.1. GENERAL DESCRIPTION OF BLACKWATER (CORK/WATERFORD) RIVER SAC

The Blackwater SAC commences in the River Dalua 5 km north of the Newmarket facility and west of the village of Meelin and extends over the entire watercourse. The SAC encompasses the River Dalua; however the Rampart Stream is not included in the SAC.

The site designated as the Blackwater River cSAC consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond and as far downstream as the tidal stretches into Youghal Harbour as well as the many tributaries along the way, 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 extent of the Blackwater and its tributaries in this site flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. The designated site covers a total area of 15,048 ha. In addition to the Annex I Habitats and Annex II species listed in Section 2.2.1 above the SAC is also noted as supporting a number of protected bird species including wintering waterfowl and other bird species such as Heron, Cormorant, Mute Swan and Long-eared Owl.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the EU 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 EU Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

3.1.2. SAC QUALIFYING INTERESTS

The site is assigned SAC status on the basis of the presence of alluvial wet woodlands and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, Salicornia mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed in Annex II of the Directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the Killarney Fern.

3.1.3. BASELINE CONDITIONS

The status of the five potentially affected qualifying interest species is as follows:

Species	Baseline Status	Reference
Salmon	At favourable conservation status (Above Conservation Limit)	Standing Scientific Committee for Salmon (2014)
Otter	Not at favourable conservation status	NPWS (2012a)
Brook Lamprey	At favourable conservation status	NPWS (2012a)
River Lamprey	At favourable conservation status	NPWS (2012a)
Sea Lamprey	Not at favourable conservation status	NPWS (2012a)

3.2. POTENTIAL IMPACTS

3.2.1. AN ASSESSMENT OF THE POTENTIAL AQUATIC ENVIRONMENTAL IMPACT OF THE PROPOSED DEVELOPMENT DURING THE PERIOD OF CONSTRUCTION

3.2.1.1. Pollution of streams/ivers with suspended solids

In the absence of adequate mitigation, any element of the proposed construction which involves excavation or placement of excavated materials has the potential for suspended solids contamination of surface waters.

- Suspended sediment due to runoff of soil from construction areas, or due to disturbance of fine sub-surface sediments in the course of instream construction and excavation, can have severe negative impacts on invertebrate and plant life and on all life stages of salmonid fish.
- Suspended sediment can settle on spawning areas, infill the intragravel voids and smother the eggs and alevins (newly hatched fish) in the gravel.
- Bed Load (coarse material transported along the bottom of the stream) and settled sediments can infill pools and riffles, reducing the availability and quality of rearing habitat for fish.
- Suspended sediment can reduce water clarity and visibility in the stream, impairing the ability of fish to find food items.
- Settled sediments can smother and displace aquatic organisms such as macroinvertebrates, reducing the amount of food items available to fish.
- Increased levels of sediment can displace fish out of prime habitat into less suitable areas (Chilibeck *et al* 1992).

- Suspended solids can abrade or clog the gills of salmonid fish. It takes a high concentration of solid wastes to clog a fish gill and cause asphyxiation, but only a little to cause abrasions and thus permit the possibility of infections (Solbe 1988).

3.2.1.2. Pollution of watercourses with nutrients due to ground disturbance during construction

The main potential sources of nutrient inputs to freshwater due to ground disturbance are nutrients adsorbed or chemically bound to eroded suspended solids.

Several studies in the United States have found increases in both nitrogen and phosphorus export into streams following ground disturbance, particularly in association with organic particles (Golladay & Webster 1988; Likens *et al* 1970). Busman *et al* (2002) found that *“phosphorus in soils is almost entirely associated with soil particles. When soil particles are carried to a river or lake, phosphorus will be contained in this sediment... Phosphate in soils is associated more with fine particles than coarse particles. When soil erosion occurs, more fine particles are removed than coarse particles, causing sediment leaving a soil through erosion to be enriched in phosphorus”*. It is therefore concluded that in the context of the proposed development the main potential source of nutrient enrichment of surface waters due to soil disturbance will be nutrients associated with eroded soil particles.

3.2.1.3. Pollution of streams/ rivers with other substances associated with the construction process

The potential exists for a range of serious pollutants to enter watercourses during construction. For example any of the following will have deleterious effects on fish, plants and invertebrates if allowed to enter watercourses:

- Raw or uncured concrete and grouts

- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks
- Fuels, lubricants and hydraulic fluids from equipment used on the development site and the pipeline laying route.

3.2.1.4. Introduction or spread of invasive non-native aquatic species during construction

The potential exists for invasive non-native species to be brought onto the construction site on machinery, tools and soil, or for invasive species already present on site to be transported to new locations. When a non-native species displays invasive qualities and is not managed it can potentially:

- i. Out-compete native vegetation, affecting plant community structure and habitat for wildlife,
- ii. Cause damage to infrastructure including road carriageways, footpaths, walls and foundations.
- iii. Result in soil erosion and collapse of river banks through exposure of the soil during winter when plants die back,
- iv. Have an adverse effect on landscape quality through a loss of naturalness, aesthetics and regional identity.

(NRA 2010).

3.2.1.5. Pollution of Streams/Rivers with Surface Runoff from Completed Development

The main pollutants of concern are petrochemicals, which includes petrol, fuel oils, and lubricating oils which may be stored or leaked from vehicles. In unmodified form these are liquid, virtually insoluble and lighter than water. Some hydrocarbons exhibit an affinity for sediments and thus become

entrapped in deposits from which they are only released by vigorous erosion or turbulence (Luker & Montague 1994).

EIFAC (Svobodova et al, 1993) states that “a sensory assessment is preferred to toxicological analysis in determining the highest admissible amounts of oil and oil products that can be present in water; on this basis the highest admissible concentrations are in the range of 0.002 to 0.025 mg per litre”.

Harmful effects include:

- The prevention of gaseous exchange at the water surface, leading to reduced dissolved oxygen in the underlying water (Solbe 1988)
- In the case of turbulent waters the oil becomes dispersed as droplets into the water. In such cases, the gills of fish can become mechanically contaminated and their respiratory capacity reduced (Svobodova *et al* 1993).
- Oil products may contain various highly toxic substances, such as benzene, toluene, naphthenic acids and xylene which are to some extent soluble in water; these penetrate into the fish and can have a direct toxic effect. It is generally agreed that the lighter oil fractions (including kerosene, petrol, benzene, toluene and xylene) are much more toxic to fish than the heavy fractions (heavy paraffins and tars) reduced (Svobodova *et al* 1993).

3.2.1.6. Permanent Loss of Habitat Due to Bank/Stream Alteration

Loss of natural riparian vegetation, particularly native trees has a significant negative impact on the ecological quality of rivers by:

- i. Decreasing plant, invertebrate and bird biodiversity

- ii. Removing an important breeding area for insects, resulting in a reduction in insects which are an important food source for fish.
- iii. Removing vital habitat for many species of wildfowl and mammals such as otters.
- iv. Reducing the protective function of natural riparian habitat which intercepts nutrient and suspended solids runoff from surrounding land, and anchors the bankside soils, protecting them from erosion, particularly during high winter water levels.
- v. Any removal of riparian habitat may result in significant pollution with suspended solids as a result of machinery activity and earth movement.

3.2.2. IMPACT OF DISCHARGE

“Dairy industry wastewater is notable for being variable in composition. The wastewater typically has a high BOD, especially that from the cream, butter, cheese and whey processes. High COD levels and the high concentrations of suspended solids may also be an issue in wastewater from this industry as well as the presence of other pollutants such as phosphorus, nitrogen and chloride. The wide pH range and temperature of the wastewater may also be a consideration. The concentration of pollutants is largely dependent on the water management of a plant (e.g. water re-use, segregation, good housekeeping)” (EPA 2008).

3.2.2.1. Organic pollution

The organic components of the wastewater from dairy processing operations can be classified as proteins, lactose and fat. These will affect the environment in different ways depending on their biodegradability and their solubility. Most of the organic components in dairy processing wastewater are highly biodegradable. In waterways, bacteria will consume the organic components of the waste (<http://nzic.org.nz/ChemProcesses/dairy/3J.pdf>). Following the

introduction of untreated or poorly treated dairy effluent to a river, conditions of existence for many organisms become substantially degraded. Increased turbidity in the water will reduce light penetration, which in turn will reduce the volume of water capable of supporting photosynthesizing plants. Particulate matter in settling will flocculate small floating plants and animals from the water. Within the zone of active decomposition the breakdown of organic products by bacteria may consume all available dissolved oxygen, resulting in the river becoming uninhabitable by fish and many other aquatic species. When organic materials are decomposed, a seemingly inexhaustible food supply is liberated for those particular organisms that are adapted to use this food source, and to surviving in the associated low oxygen and high ammonia conditions. Thus, highly pollution tolerant invertebrate groups may be present at extremely high densities.

Low molecular weight organic compounds promote the growth of certain filamentous slimes in waterways. These bacterial colonies are collectively known as sewage fungus. The most common bacterial species in this category is *Sphaerotilus natans*. One of the major constituents of dairy factory wastewaters is lactose, a low molecular weight sugar that is known to promote sewage fungus growth.

Nitrogen is a very important component of dairy factory wastewaters. Some protein will be lost to the waste streams. Bacteria convert the nitrogen in proteins to inorganic forms including ammonia, and ammonium, nitrite and nitrate ions. Each of these inorganic forms of nitrogen have different environmental effects.

3.2.2.2. Eutrophication: Phosphorus

The most serious threat to water quality of lakes and rivers in Ireland is eutrophication, defined as the enrichment of waters, beyond natural levels, principally by the nutrient phosphorus. This enrichment commonly results in excessive production of cyanobacteria (formerly referred to as blue-green algae), planktonic algae and rooted plants in such waters. Eutrophication of

aquatic ecosystems also results in loss of biodiversity and degradation of aquatic habitats of high ecological quality (EPA 1997).

Standards for Phosphorus, Dissolved Oxygen, Biochemical Oxygen Demand, and biological water quality are laid down in the European Communities Environmental Objectives (Surface Waters) Regulations 2009.

3.2.3. POTENTIAL PRE-MITIGATION IMPACTS ON QUALIFYING INTERESTS OF NATURA 2000 SITE

The qualifying interests of the Natura 2000 site considered to be within the potential zone of influence of the proposed development are Otter, Brook Lamprey, River Lamprey, Sea Lamprey and Atlantic Salmon (See Section 2.4. above). European Commission Guidance states that '*The decision as to whether it (the European Site) is adversely affected should focus on and be limited to the site's conservation objectives*'. The potential pre-mitigation effects of the proposed development on each of the conservation objectives for each of the potentially affected qualifying interests are addressed below.

Consent of copyright owner required for any other use
For inspection purposes only.

3.2.3.1. Atlantic Salmon

The assimilative capacity of the Dalua River has been calculated based on (1) background chemical and biological monitoring data for the Dalua River in the vicinity of the proposed discharge and (2) the requirement for good biological and chemical status as set out in the SAC's Conservation Objectives and in the Environmental Objectives (Surface Waters) Regulations (2009).

At the proposed Emission Limit Values (ELVs) the proposed discharge will utilise 33%, 47%, 66% and 71% respectively of the available assimilative capacity for BOD, Ammonia, Orthophosphate and Nitrate at 95%ile low flow conditions in the Dalua River. (See Appendix 2). It is noted that the predicted contribution of suspended solids from the discharge is 0.24mg/l which represents less than 5% of the 25mg/l standard as set out in the Quality of Salmonid Regulations.

The predicted downstream concentrations in the Dalua River are based on a worst case scenario, as it is unlikely that the facilities discharge quality emission and volumetric emission would be at the maximum proposed values whilst the River Dalua is at its 95%ile flow condition.

Salmon are anadromous migratory fish. Adult fish migrate from the sea to river/stream spawning areas, where the young fish live out their juvenile life stages before migrating as adults to the sea. As part of the present assessment, juvenile salmon were recorded at all six sites assessed on the Rampart Stream (See Appendix 1 Section 3.2.3 & Appendices A & B). Whereas the Rampart Stream is not within the SAC, the salmon population in this stream is an integral part of the SAC salmon population, and salmon spawned in the Rampart Stream spend parts of their life cycle within the SAC. Any impact on salmon in the Rampart stream is therefore treated as an *ex situ* impact on the Salmon which are a qualifying interest of the SAC.

Conservation Objective: To maintain the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	No Potential Impact on channel accessibility	The three proposed stream crossings will involve no instream works or structures so there will be no potential impact on channel accessibility (See Section 2.1.2.)	No instream works or structures proposed so no there will be no potential impact on channel accessibility.
Adult spawning fish number	Conservation Limit (CL) for each system consistently exceeded	No potential water quality mediated impacts on Salmon from proposed discharge at proposed Emission Limit Values.	No potential impact on adult spawning fish numbers	No potential impact on adult spawning fish numbers

		Potential for Impact		
Attribute	Target	Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	No potential water quality mediated impacts on Salmon from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact mediated largely by construction generated pollution impacts on spawning success and survival of juvenile salmon in Rampart Stream and Dalua River.	Potential adverse pre-mitigation impact mediated largely by construction generated pollution impacts on spawning success and survival of juvenile salmon in Rampart Stream and Dalua River.
Out-migrating smolt abundance	No significant decline	No potential water quality mediated impacts on Salmon from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact mediated largely by construction generated pollution impacts on spawning success and survival of juvenile salmon in Rampart Stream and Dalua River.	Potential adverse pre-mitigation impact mediated largely by construction generated pollution impacts on spawning success and survival of juvenile salmon in Rampart Stream and Dalua River.

Consent of copyright owner required for any reuse. For inspection purposes only.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	No potential water quality mediated impacts on Salmon from proposed discharge at proposed Emission Limit Values.	Pre-mitigation potential reduction in spawning redds due particularly to construction generated siltation	Pre-mitigation potential reduction in spawning redds due particularly to construction generated siltation
Water quality	At least Q4 at all sites sampled by EPA	No potential breach of requirement for good biological water quality from proposed discharge at proposed Emission Limit Values.	Pre-mitigation potential impact on downstream Q-values in Dalua River	Pre-mitigation potential impact on downstream Q-values in Dalua River

Consent of EPA is required for any discharge. This is for informational purposes only. Not to be used for any other use.

3.2.3.2. Otter

Conservation Objective: To restore the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Distribution	No significant decline in percentage positive survey sites	No potential impact	No potential impact	No potential impact
Extent of terrestrial habitat	No significant decline in extent of terrestrial habitat. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds.	No potential impact	No potential impact	No potential impact
Extent of marine habitat	No significant decline. In extent of marine habitat. Area mapped and calculated as 647.2ha.	No potential impact	No potential impact	No potential impact
Extent of freshwater (river) habitat	No significant decline in extent of freshwater (river) habitat. Length mapped and calculated as 599.54km.	No potential impact	No potential impact	No potential impact

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Extent of freshwater (lake) habitat	No significant decline. In freshwater (lake) habitat. Area mapped and calculated as 25.06ha.	No potential impact	No potential impact	No potential impact
Couching sites and holts	No significant decline in couching sites and holts.	No potential impact	<i>There is an absence of suitable breeding sites at the location of the discharge point and therefore direct impacts on breeding sites are not foreseen. However, suitable breeding sites occur in the surroundings and therefore potential disturbance to resident otter population is possible.” (EIS Chapter 5.1).</i>	No potential impact

For inspection purposes only. Consent of copyright owner required for any other use.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade Works
Fish biomass available	No significant decline in fish biomass available.	No potential water quality mediated impacts on fish biomass from proposed discharge at proposed Emission Limit Values.	Pre-mitigation potential impact via construction related water quality impacts on fish	Pre-mitigation potential impact via construction related water quality impacts on fish
Barriers to connectivity	No significant increase in barriers to connectivity.	No potential impact	No potential impact	No potential impact

For inspection purposes only. Consent of copyright owner required for any other use.

3.2.3.3. Sea Lamprey

Conservation Objective: To restore the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary. See map 10 in the SAC Conservation Objectives (NPWS, 2012a) for recorded distribution	No potential impact	No potential impact	No potential impact
Population structure of juveniles	At least three age/size groups present	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Juvenile density in fine sediment	Juvenile density at least 1/m ²	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds. See map 10 in the SAC Conservation Objectives (NPWS 2012a) for recorded locations	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Availability of juvenile habitat	More than 50% of sample sites positive. See map 10 in Conservation Objectives for recorded locations	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	No potential impact	No potential impact

3.2.3.4. Brook Lamprey

Conservation Objective: To maintain the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Distribution:	Access to all water courses down to first order streams	No Potential Impact	No potential impact	No potential impact
Population structure of juveniles	At least three age/size groups of brook/river lamprey present	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds.	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Availability of juvenile habitat	More than 50% of sample sites positive. See map 10 in Conservation Objectives (NPWS 2012a) for recorded locations	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	No potential impact	No potential impact

3.2.3.5. River Lamprey

Conservation Objective: To maintain the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Distribution:	Access to all water courses down to first order streams	No potential impact	No potential impact	No potential impact
Population structure of juveniles	At least three age/size groups of brook/river lamprey present	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.

Attribute	Target	Potential for Impact		
		Discharge to Dalua	Installation of Pipeline	WWTP Upgrade
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds.	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.	Potential adverse pre-mitigation impact primarily via siltation of spawning areas due to construction related suspended solids.
Availability of juvenile habitat	More than 50% of sample sites positive. See map 10 in Conservation Objectives (NPWS 2012a) for recorded locations of brook/river lamprey juveniles	No potential water quality mediated impacts on Lamprey from proposed discharge at proposed Emission Limit Values.	No potential impact	No potential impact

3.2.3.6. Ex situ impacts

NPWS AA guidelines state: “*It is important to note here that a plan or project that is not in or even adjoining a Natura 2000 site can still require appropriate assessment. For example, certain types of development in a river catchment could adversely affect a Natura 2000 site located downstream from the development. These are known as ex situ effects.*” (DoEHLG 2009)

European Commission guidelines state: “*It is important that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards being applied to development pressures which are external to a Natura 2000 site but which are likely to have significant effects within it.*” (European Commission 2000)

Potential *ex situ* impacts which have been considered above include (1) potential impacts on water quality within the SAC which have been generated outside the SAC, e.g. potential pollutants entering the Dalua River via the Rampart Stream, and (2) potential impacts on qualifying interest species outside of the SAC but which spend some of their life cycle within the SAC and are therefore an integral part of the SAC population.

Salmon, sea lamprey and river lamprey, which are qualifying interests of the Blackwater River (Cork/Waterford) SAC, are anadromous migratory fish. Adult fish migrate from the sea/estuary to river/stream spawning areas, where the young fish live out their juvenile life stages before migrating as adults to the sea. Salmon and Sea/River Lamprey which are spawned and spend their juvenile stages in tributary streams which are not SAC channels, but which flow to the SAC channels, are an integral component of the SAC population of these species, and are present in the SAC channels when migrating to and from the sea. The Rampart Stream, which is a potentially affected non-SAC tributary stream, is therefore treated as a potential location for *ex situ* impacts on the SAC. Of the three potentially anadromous migratory qualifying interest species, one i.e. Atlantic Salmon is known to occur in the Rampart Stream at significant densities. On the basis of the fish survey data (See Appendix 1 Section 3.2.3 & Appendices A & B of Appendix 1) and habitat assessment data (see Appendix 1

Section 3.2.1), and applying the precautionary principle as is required by the Habitats Directive, it is concluded that the Rampart Stream is a significant spawning and nursery area for salmon running into the stream from the Dalua River and the Blackwater River. The present investigation indicates that the present ecological status of the Rampart Stream downstream of Newmarket is “poor”. The proposed total cessation of WWTP discharges to the Rampart Stream from the Newmarket Co-Op facility is likely to result in improved ecological status in the Rampart Stream, with a likely beneficial *ex situ* effect on Salmon within the SAC.

3.2.3.7. In combination effects

The following projects or landuses are considered in the context of possible in-combination effects on the Blackwater River (Cork/Waterford) cSAC.

AGRICULTURE

Farming is the most widespread activity within the catchment of the Blackwater River SAC. Much of this is pastoral, often with intensive operations, with a scattering of arable as well. Pollution can come about in a variety of ways, including run-off from routine fertiliser application, run-off from land improvement schemes, and direct entry from point sources especially silage effluent discharges.

In the EPA assessment of Water Quality in Ireland, 2007-2009, McGarrigle *et al.* (2010) noted the following for the causes of pollution in rivers and canals ‘*As in previous surveys, the two most important causes of pollution are agriculture and municipal wastewater discharges accounting for 47 and 39 per cent respectively of the 953 polluted sites surveyed. Pollution can be derived from point sources, such as silage effluent discharges, or diffuse sources such as fertiliser run-off.*’

It can be concluded that farming operations have a significant potential to affect the aquatic interests of the Blackwater River (Cork/Waterford) SAC.

FORESTRY

Forestry operations are often intensive on higher ground within the catchment of the Blackwater River. This activity can affect water quality and associated aquatic interests in a number of ways, as follows:

Leaching of fertilisers, especially phosphorus, to local watercourses

Significant movement of phosphorus (P) off site in surface waters has frequently been associated with fertilising of peatland and other soils of low P absorption capacities. The potential for loss of P from peatland soils with low levels of iron and aluminium has been recognised for at least three decades (Cummins & Farrell 2003).

Disturbance of soils during clearfelling operations and subsequent runoff of nutrients to local watercourses

Several studies in the United States have found increases in both nitrogen and phosphorus export into streams following forestry felling, particularly in association with organic particles (Golladay & Webster 1988; Likens et al 1970). Giller *et al* (2002) concluded that phosphates released into streams after clear-felling are mainly attached to small soil particles and are carried into watercourses if there is sediment input and increased erosion following clear-felling.

Decomposition of brash after clearfelling and subsequent runoff of nutrients to local watercourses

“Any organic matter (particularly recently dead material such as brash or roots) that is left on site to rot will release phosphorus and nitrogen. The breakdown of brash, roots and other organic matter takes a number of years. Potentially, therefore, a clearfell site may continue to release phosphorus to the aquatic zone for at least three years after clearfelling. The rate of decomposition is influenced by temperature, moisture and humidity. Consequently, phosphorus loss tends to be greatest during the warmer months and may be particularly problematic during a flood event following a prolonged hot and dry period.” (Forest Service 2008). Recent research and specific pollution incidents in

Ireland are increasingly indicating that nutrients from decomposing brash are likely to form a significant proportion of nutrient runoff from clear felled forestry. The results of research in Finland indicate that “*logging residues are a potential source of the elevated dissolved C and P, K and Ca observed in surface waters soon after clear-cutting, but are not a net source of N during the first three years. The ground vegetation is capable of taking up only a small fraction of the nutrients that are released from logging residues during the first two years after clear-cutting and the decomposing dead ground vegetation is a potential source of leached nutrients.*” (Palviainen 2005) In Ireland it is now recognised that a major potential source of nutrient leaching to receiving waters from forestry on peat comes via decaying organic matter, including the foliage and branches, unwanted stems, stumps and dead roots, left on site after crop thinning or felling which are added to the soil at the same time that nutrient uptake is reduced. (Hutton et al 2008; Kennedy 2005; Campbell & Foy 2008) Dr Martin McGarrigle of EPA indicates that standing crop of 20 kg/ha phosphorus in brash may have loss rates “*similar to intensive farmland with just 10% loss per annum*” (McGarrigle 2008).

Overview of forestry

Forestry is a widespread activity within the catchment of the Blackwater River. While the largest proportion of this is Coillte owned lands, there are also substantial amounts of private forestry. At any one time there are various forestry activities, which include clearfelling, thinning, new plantings (predominantly second rotation) and fertiliser application. Forestry operations may also require construction of new roads and bridges. Whilst Coillte forestry operations are carried out in accordance with FSC criteria and private forestry operations would generally be carried out in accordance with the various Forest Service Guidance documents to minimise water pollution, it can be concluded that forestry operations have a significant potential to affect the aquatic interests of the Blackwater River (Cork/Waterford) SAC.

SETTLEMENTS

There are many towns and villages within the catchment of the Blackwater River. As with any settlement, there exists potential for entry of pollutants to

local water courses from a range of both licensed and unlicensed sources. These include industrial and commercial facilities, private residences and surface run-off. It can be concluded that the various settlements have a significant potential to affect the aquatic interests of the River Blackwater (Cork/Waterford) SAC.

DISCUSSION

This review of potential in-combination effects shows that there is a range of major land use activities within the catchment of the River Blackwater which may be affecting, or have the potential to affect, the conservation objectives of the Blackwater River SAC. Despite the potential for pollution from a wide range of sources, in 2012 EPA described the water quality in the Dalua River as *“Continuing satisfactory with Good and High ecological quality”* (www.epa.ie/qvalue/webusers/) (See Appendix 1), and in the present survey biological water quality in the Dalua River was found to be Good (Q4) at sites in the Dalua upstream and downstream of the proposed discharge location in 2014 and High (Q4-5) on the Dalua River c.2km downstream of the proposed discharge in November 2015 (See Appendix 1 Sections 3.2.2.8 - 3.2.2.10).

The EPA monitoring and the present assessment establish that at present the sum of potential impacts upstream of the proposed discharge location are not preventing the Dalua River from achieving Good ecological status as required by the Environmental Objectives (Surface water) Regulations (2009) and as required by the Conservation Objectives of the SAC. The assessment of the assimilative capacity of the Dalua River at the location of the proposed discharge (see Appendix 2) establishes that at the proposed Emission Limit Values the proposed discharge will not compromise the Good ecological status of the Dalua River. As the proposed discharge will not result in loss of Good status immediately downstream of the discharge location, it follows that it cannot cause a loss of Good status in sections of the Dalua River, Allow River and River Blackwater further downstream (where Good status is also required under the Surface Waters Regulations (2009) and the SAC Conservation Objectives). Note: The Conservation Objectives regarding Freshwater Pearl Mussel requiring High status rather than Good status no longer apply to the

main channel of the Blackwater River (See Department of Arts, Heritage and the Gaeltacht letter of 8 February 2016 in Appendix 4).

Taking all the above into account, it is concluded that there will not be any significant in-combination contribution by the project to possible adverse impacts on the qualifying interests of the Blackwater River SAC.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

3.3. MITIGATION MEASURES

3.3.1. MITIGATION OF THE POTENTIAL AQUATIC IMPACT OF THE PROPOSED WWTP UPGRADE DURING THE PERIOD OF CONSTRUCTION

3.3.1.1. Reduction and prevention of suspended solids pollution

- i. Before earthworks commence on site and before they are needed - erosion control and sediment control measures must be in place and functioning.
- ii. Earth moving and construction activities will be avoided in the area within 10m of the bank of the Rampart Stream and the Mill Race. This area will be fenced off prior to the commencement of works and left undisturbed for the duration of the construction process.
- iii. Release of suspended solids to streams will be kept to a minimum by minimising erosion and preventing runoff from excavated areas. Suspended solids in runoff from construction areas to the Rampart Stream and/or the Mill Stream will not exceed 25mg/l. The key factors in erosion and sediment control are to intercept and manage off- and on-site runoff. This limits the potential for soils to be eroded and enter surface waters in runoff. Runoff and surface erosion control is more effective and less expensive than sediment control with sediment control ponds only. Eroded sediments will be retained on site with erosion and sediment control structures such as sediment traps, silt fences and sediment control ponds. Sediment ponds and grit/oil interceptors will be placed towards the end of drainage channels but sufficiently well back from the receiving streams to avoid any possibility of inundation by these streams in flood conditions.

- iv. Cover temporary fills or stockpiles which are likely to erode into nearby watercourses with polyethylene sheeting.
- v. Divert runoff away from denuded areas.
- vi. Minimise runoff velocities and erosive energy by maximising the lengths of flow paths for precipitation runoff, constructing interceptor ditches and channels with low gradients to minimise secondary erosion and transport, and lining unavoidably steep interceptors or conveyance ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.
- vii. Any dewatering of open trenches etc. will be discharged to a settlement pond to remove suspended solids before being released to surface waters.
- viii. At locations where excavated materials are stored, drains will surround and intercept surface runoff from materials mounds and distribute this water to the controlled drainage system in place.
- ix. Works with a significant risk of suspended solids contamination of streams/rivers will not be carried out between the end of September and the end of April unless otherwise agreed with Inland Fisheries Ireland.

3.3.1.2. Reduction and prevention of other construction generated pollution

1. Raw or uncured waste concrete will be disposed of by removal from the site.
2. Before release to the environment, wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks will be treated to a level which will ensure that total suspended solids in

discharges to surface waters (including drains) will not exceed 25mg/l. Furthermore wash out water will not be released to the environment until it has reached a neutral pH.

3. Only the chute of the concrete delivery truck will be cleaned on site, using the smallest volume of water necessary. Concrete trucks will be directed back to their batching plant for washout.
4. Clearly visible signs will be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site.
5. The arrangements for concrete deliveries to the site will be discussed with suppliers before commencement of work, agreeing routes, prohibiting on-site washout and discussing emergency procedures.
6. So as to avoid spillage concrete will not be transported around the site in open trailers or dumpers. All concrete used will be pumped directly into the shuttered formwork from the delivery truck.
7. Concrete pours will be avoided where prolonged periods of heavy rain are forecast and covers will be available for freshly placed concrete to avoid the surface washing away in heavy rain.
8. Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice (Enterprise Ireland BPGCS005).
9. Fuelling and lubrication of equipment will be carried out in a specially bunded area.

10. Oil booms and oil soakage pads will be kept on site to deal with any accidental spillage.
11. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of.
12. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
13. All pumps using fuel or containing oil will be locally and securely banded when situated within 25m of waters or when sited such that taking account of gradient and ground conditions there is the possibility of discharge to waters.
14. Sites for use as storage areas, machinery depots, site offices, or the disposal of spoil will be located as far as is practicable from watercourses. In general any site which is at least 50m from the nearest watercourse may be chosen. Disposal of spoil or storage of soils will not be carried out in any location where runoff can occur into watercourses.

3.3.1.3. Mitigation of pollution of watercourses with nutrients due to ground disturbance

As much of the potential nutrient input to streams during ground disturbance is associated with suspended soil particles, the measures outlined in Section 3.3.1.1 above apply equally to prevention of nutrient inputs to streams.

3.3.1.4. Mitigation of potential impact of pipe laying

In addition to the mitigation measures outlined in Section 3.3.1 above, the following mitigation measures will also be implemented during the pipe laying process.

1. Pipe-laying activities with a high risk of suspended solids contamination of surface waters, such as laying under or close to the watercourses, will not take place between the end of September and the end of April to prevent damage to spawning and early juvenile trout.
2. Operation of machinery in the immediate vicinity of the streams will be kept to a minimum and disturbance of bankside vegetation will be kept to a minimum.
3. Contamination of water with fuels, lubricants and other pollutants will be avoided.
4. Disturbance of bankside soils and instream sediments will be kept to the minimum required for the pipe laying process.
5. Pre-cast concrete will be used if possible; otherwise all cast-in-place concrete will be isolated from flowing water for a minimum of 48 hours to allow pH to reach neutral levels.
6. Top infilling over the pipe at stream crossings will be with coarse silt-free material.
7. If pumping is required from excavations, the water will be directed first to a suitably constructed settlement pond or other equivalent silt removal facility before discharge to surface waters including drains, to prevent suspended solids contamination. It is important that sufficient area is available to allow for suitably sized silt removal facilities. Suspended solids in discharges to surface waters will not exceed 25mg/l.

8. To protect stream side hedgerows and trees from damage where the pipe is to cross or be laid in close proximity to streams, prior to construction a leave strip will be marked delimiting areas where construction activity is not necessary and which are to remain off limits and undisturbed.

3.3.1.5. Mitigation of potential impact of outfall construction

The proposed discharge outfall is at Allen's Bridge. Malachy Walsh & Partners Newmarket Co-Op Creameries Ltd. Effluent Rising Main Design Report (November 2015) states: "*The ductile iron pipe will be turned through the bridge wall and then vertically downwards to discharge into the Dalua at the eastern arch. The pipe will be anchored to the side of the bridge allowing the effluent to discharge directly into the river.*"

In addition to the mitigation measures outlined in Section 3.3.1.1 to 3.3.1.3 above, the following mitigation measures will also be implemented during the construction of the proposed outfall to the Dalua River.

1. Works will not take place between the end of September and the end of April.
2. No instream works will be carried out
3. Any necessary machinery work will be carried out from the bank/bridge. Entry of machinery into the Dalua River will be avoided.
4. Care will be taken to ensure that no material is allowed to enter the river during the construction of the outfall including old masonry or stone, rubble, soil, concrete/grouts, washdown concrete etc.

3.3.1.6. Mitigation of impacts on otters

In addition to mitigation of water quality related impacts on otters, prior to commencement of works pre-construction surveys for the presence of otter in proximity to the discharge point will be undertaken. Should the presence of otters be confirmed then appropriate measures in accordance with best practice (NRA 2008) will be followed to ensure that potential disturbance is minimised. In the case of a breeding site being confirmed in proximity, this may require timing of works to be scheduled outside of the breeding season (otter breeding season is variable). In the event of unavoidable disturbance impacts on otter, then a license from NPWS will be sought and work will be undertaken in compliance with any conditions attached.

3.3.1.7. Method Statement / Environmental Operating Plan

The appointed contractor will draw up a Method Statement (MS)/Environmental Operating Plan (EOP) that includes detailed mitigation measures as outlined in the EIS. This method statement should be strictly adhered to by the contractor involved in the works. The method statement will detail how these mitigation measures will be monitored for effectiveness by the appointed contractor. There will be on-going consultation with IFI throughout all phases of the works. A mechanism for reporting of pollution incidents will be agreed in advance between the contractor(s) and the developer.

Before works commence on site, the contractor will be required to prepare an Environmental Operating Plan (EOP) which will incorporate all of the avoidance and mitigation measures. In addition, the Contractor will consult with the NPWS and IFI in relation to the final detail of the Plan and shall include their requirements in this regard.

Before earthworks commence on site, and before they are needed - erosion control and sediment control measures must be in place and functioning and must be inspected and approved by the Ecological Clerk of Works (EcOW).

3.3.1.8. Ecological Clerk of Works

- An Ecological Clerk of Works (ECoW) will be employed who will make at least weekly site visits for the duration of the construction works and more frequently at start-up and during critical construction events such as concrete pours as outlined below.
- The ECoW will also be the liaison for the purposes of consulting environmental bodies including the NPWS and IFI. The ECoW will be responsible for carrying out regular audits of the Contractor's EOP on behalf of the proposed developer. In addition, the ECoW will be the primary person involved in the developer's monitoring role. The ECoW will be delegated sufficient powers under the construction contract so that he/she will be able to instruct the contractor to stop works and to direct the carrying out of emergency mitigation/clean-up operations.
- The ECoW will maintain a register indicating whether all mitigation measures have been carried out satisfactorily. This register will be signed off by the contractor's site foreman.

Separate from the on-going monitoring carried out by the contractor as part of the EOP, the ECoW shall carry out the inspection/ monitoring regime described below on behalf of the employer. The results will be stored in the ECoW's monitoring file and will be available for inspection/ audit by the Client, NPWS or IFI staff. The main elements of the inspection/ monitoring regime are as follows;

- Inspect surface water treatment measures (silt fencing, ponds, tanks, mini-dams, sandbags, etc.) on a daily basis,
- Daily visual inspection of the watercourses in proximity to the works,

- Wheel wash facilities shall be inspected on a weekly basis,
- Stockpiles shall be monitored on a daily basis while being filled or emptied and otherwise on a weekly basis,
- Control measures for works at or near water bodies shall be inspected on a daily basis,
- Concrete operations at or near watercourses shall be supervised and designated chute washing out facilities shall be inspected on a daily basis,
- Inspection of attenuation ponds, their release systems and other attenuation features such as silt traps etc.
- The Contractor's EOP monitoring results shall be audited on a frequent basis (weekly at a minimum)

Where the ECoW has carried out an investigation of a release of sediment to a watercourse causing a plume, the following procedure shall be followed:

- The relevant NPWS and IFI staff shall be notified immediately,
- The discharge generating the sediment discharge shall be stopped immediately,
- The contractor will be required to take immediate action and to implement measures to ensure that such discharges do not re-occur.
- Works shall not recommence until appropriate corrective measures to avoid any repetition are put in place. Such measures shall be agreed with the ECoW following consultation with the NPWS and IFI and shall be in accordance with the requirements of these control measures.

- Where the discharge is from one of the control measures associated with the works, the controlled discharge shall not recommence until written consent is received from the ECoW.
- Where the ECoW considers that the risk of a sediment release is high, he/ she shall inform the contractor and request protective action to be taken. Where the contractor does not take immediate action the ECoW shall instruct the contractor to take action and same shall be reported to the Contract Manager and the Client.
- The ECoW will be delegated powers under the contract sufficient for these instructions to be issued and for an instruction to stop works or carry out emergency works.

3.3.1.9. Procedure for contractors

Contractors will establish contact with Inland Fisheries Ireland and National Parks & Wildlife Service before works commence, and there will be ongoing liaison with these bodies throughout the construction process. Contractors will be in possession of, and familiar with the contents of "Control of water pollution from construction sites - Guidance for consultants and contractors" published by the Construction Industry Research and Information Association (CIRIA 2001) (e-mail enquiries@ciria.org.uk).

3.3.2. MITIGATION OF POTENTIAL LONG-TERM AQUATIC IMPACT OF THE EXISTENCE OF THE PROPOSED DEVELOPMENT

3.3.2.1. Mitigation of impact of waste water discharge

In November 2015 the macroinvertebrate status recorded for the present report was indicative of high ecological quality (Q4-5) downstream of the proposed effluent discharge.

The waste water discharge from the proposed development will be treated to a standard which will ensure that the requirements of the Environmental Objectives (Surface Water) Regulations (2009) can continue to be achieved in the sections of the Dalua River, Allow River and River Blackwater downstream of the proposed discharge.

3.3.2.2. Mitigation of pollution of water courses with contaminated water draining paved and roofed areas

A sustainable drainage system will be installed for all surface waters draining from hard areas of the proposed development including access roads, car parks, storage areas, roofs etc. The system installed will have a proven capability of achieving and sustaining at least the following pollution reduction in runoff:

- Total Suspended Solids maximum 25mg/l
- Heavy Metals 50 – 80% reduction
- Chemical Oxygen Demand 50% reduction
- Hydrocarbons 90% reduction

Best management practices for treatment of runoff would include:

- Constructed Wetlands

- Vegetated lagoons
- Swales
- Filter strips
- Filter drains
- Infiltration devices
- Oil/grit separators

In a major EPA funded study of the impact of road runoff on water quality in Ireland (Brien *et al* 2006) it is concluded that “Each of the Best Management Practices outlined have individual advantages in the removal of pollutants from highway runoff. Therefore, a combination of these systems should be used for enhanced and more uniform overall pollutant removal performance. In fact a combination of runoff management and control measures is recommended whenever it is feasible.” This is also the conclusion of the CIRIA Report C608 on SUDS (Wilson *et al* 2004) which concludes that the more techniques used in a runoff treatment and attenuation system, the better the performance is likely to be.

Petrol/oil and grit interceptors will be located at outfalls to watercourses. Design of those interceptors will conform to the recommendations of CIRIA Report No. 142 (Luker & Montague 1994).

As virtually all treatment options require proper maintenance in order to function properly, and as some such as oil interceptors can become a source of pollution if not properly maintained, a program of regular cleaning, maintenance and inspection of the runoff treatment system will be put in place to ensure it functions correctly.

Fuels, lubricants and hydraulic fluids for equipment used at the facility , as well as any solvents, oils, chemicals and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and stored in appropriately bunded areas.

The sustainable drainage system will be designed with a cut-off system to enable any serious spillage of pollutants to be contained within the drainage system and prevented from being released to the Rampart Stream and/or the Mill Race.

3.3.2.3. Mitigation of hydrological impacts

The sustainable drainage system for runoff from all paved and roofed areas will be designed with sufficient attenuation capacity to ensure that no significant increase in peak stream/river flows is caused by the proposed development.

Water abstraction from watercourses for any purpose will only take place at locations, in a manner and during a time period agreed with Inland Fisheries Ireland.

3.3.2.4. Mitigation of habitat loss

One of the most effective methods of minimising loss of stream and riparian habitat during developments is the establishment of Leave Strips. Leave strips are the areas of land and vegetation adjacent to watercourses that are to remain in an undisturbed state, throughout and after the development process (Chilibeck et al 1992). Leave strips are valuable not only because riparian vegetation is a vital component of a healthy stream ecosystem, but because this vegetation acts as an effective screen/barrier between the stream and the development area, intercepting runoff and acting as an effective filter for sediment and pollutants from the development area. Where development is to take place close to rivers/streams, a riparian leave strip at least 20m wide will be clearly marked and its significance explained to machinery operators.

3.3.2.5. Prevention of spread of invasive non-native aquatic species during construction and/or operation of the proposed development

The introduction of Alien Invasive Species (AIS) through spoil on machinery must be avoided. To prevent the instruction of AIS hot power washing of machinery will be carried out before it is introduced to the sites and after site works have been completed before machinery is moved to another site.

3.4. MONITORING

To monitor the proposed development during construction a biological and chemical monitoring system will be put in place on potentially affected streams/rivers.

As a minimum the monitoring system will measure Q-values, suspended solids, molybdate reactive phosphorus & pH on the Rampart Stream and the Dalua River upstream and downstream of the following elements of the proposed development:

1. Potential impact of construction/expansion of WWTP on Rampart Stream and Dalua River
2. Potential impact of pipe laying on Rampart Stream and Dalua River
3. Potential impact of construction of outfall to the Dalua River.

TABLE 1 RECOMMENDED MONITORING DURING CONSTRUCTION

(For location of proposed monitoring sites except Site D1A see Maps 2 & 3 of the baseline report in Appendix 1)

Watercourse	Site	Location	Biological Water Quality Assessment before commencement and after completion of construction phase	Suspended solids, turbidity, molybdate reactive phosphorus & pH at intervals to be agreed with IFI & NPWS	Fish Assessment before commencement and after completion of construction phase
Mill Race	M1	Upstream of proposed WWTP works	✓	✓	
	M2	Downstream of proposed WWTP works	✓	✓	
Rampart Stream	R1	Upstream of proposed WWTP works	✓	✓	✓
	R2	Downstream of proposed WWTP works	✓	✓	
	R3	Downstream of proposed WWTP works	✓	✓	✓

For inspection purposes only. Consent of copyright owner required for any other use.

Watercourse	Site	Location	Biological Water Quality Assessment before commencement and after completion of construction phase	Suspended solids, turbidity, molybdate reactive phosphorus & pH at intervals to be agreed with IFI & NPWS	Fish Assessment before commencement and after completion of construction phase
	R4	Downstream of proposed WWTP works & pipe laying	✓	✓	✓
	R5	Downstream of proposed WWTP works & pipe laying	✓	✓	✓
Dalua River	D1A	Upstream of Allen's Bridge discharge location	✓	✓	
	D1	Downstream of Allen's Bridge discharge and upstream of Rampart Stream confluence	✓	✓	

Consent of copyright owner required for any other use.
For inspection purposes only.

Watercourse	Site	Location	Biological Water Quality Assessment before commencement and after completion of construction phase	Suspended solids, turbidity, molybdate reactive phosphorus & pH at intervals to be agreed with IFI & NPWS	Fish Assessment before commencement and after completion of construction phase
	D2	Downstream of Rampart Stream confluence and all elements of the proposed development	✓	✓	
	D3	c.2km downstream of proposed pipeline and outfall construction	✓	✓	

For inspection purposes only.
Consent of copyright owner required for any other use.

3.5. RESIDUAL IMPACT

If the mitigation measures specified in this NIS are implemented in full the residual negative impact of the proposed development on the qualifying interests of Natura 2000 sites will be insignificant.

It is expected that the proposed development will have a significant positive *ex situ* impact on the Blackwater (Cork/Waterford) River SAC by improving water quality in the Rampart Stream which is a significant nursery and spawning stream for salmon which are a qualifying interest of the SAC.

For inspection purposes only.
Consent of copyright owner required for any other use.

4. REFERENCES

Busman, L. et al (2002) The Nature of Phosphorus in Soils. University of Minnesota

<http://www.extension.umn.edu/distribution/cropsystems/DC6795.html>)

Bruen M., P. Johnston, M. Kelly Quinn, M. Desta, N. Higgins, C. Bradley, S. Burns (2006) Impact Assessment of Highway Drainage on Surface Water Quality Main Report May 12, 2006 Report 2000-MS-13-M2. Environmental Protection Agency, Wexford.

Buddensiek, V. H. Engel, S. Fleischauer-Rossing and K. Wachtler (1993) Studies on the chemistry of interstitial water taken from defined horizons in the fine sediments of bivalve habitats in several northern German lowland rivers. II: Microhabitats of *M. margaritifera* L., *Unio crassus* (Phillipson) and *Unio tumidus* philipson. Arch. Hydrobiol. 127, 151-166.

Campbell, E. & Foy, B. (2008) Lough Melvin Catchment Management Plan. Northern Regional Fisheries Board

Chilibeck, B., G. Chislett, and G. Norris (1992) Land development guidelines for the protection of aquatic habitat. Department of Fisheries and Oceans, Canada. Habitat management division. Ministry of Environment Lands and Parks. Integrated Management Branch.

Cummins, T & Farrell, E. P. (2003) Biogeochemical impacts of clearfelling and reforestation on blanket peatland streams I. phosphorus. Forest Ecology and Management 180 545–555.

Daly, D. (2004) Groundwater at Risk in Ireland - Putting Geoscientific Information and Maps at the Core of Land Use and Environmental Decision-making, John Jackson Memorial Lecture, Royal Dublin Society, November 2004

DOEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities.

EPA (1997) Environmental quality objectives and environmental quality standards – The aquatic environment – A discussion document. Environmental Protection Agency Wexford.

EPA (2008) BAT Guidance Note on Best Available Techniques for the Dairy Processing Sector (1st Edition) Environmental Protection Agency

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

Giller, P.S., Johnson, M. and O'Halloran, J. (2002) Managing the impacts of forest clearfelling on stream environments. GOFORD, Dublin.

Golladay, S.W. and Webster, J.R. (1988) Effects of clear-cut logging on wood breakdown in Appalachian mountain streams. American Midland Naturalist 119(1): 143-155.

Hatton-Ellis, T.W. & Grieve, N. (2003). Ecology of Watercourses Characterised by Ranunculion fluitantis and Callitriche-Batrachion Vegetation. Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough.

Hutton S.A., Harrison S.S.C. & O'Halloran J. (2008) An evaluation of the role of forests and forest practices in the eutrophication and sedimentation of receiving waters. Western River Basin District Project.

Inland Fisheries Ireland (2010) Sampling Fish for the Water Framework Directive. Rivers 2010. South Western River Basin District.

Kennedy, N. (2005) An examination of the causes and factors related to the recent eutrophication of Carrowmore Lake. North Western Regional Fisheries Board.

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.

Likens, G.E., Borman, F.H., Johnson, N.M., Fisher, D.W. and Pierce, R.S. (1970) Effects of forest cutting and herbicide treatment on nutrient budgets in the Hubbard Brook watershed ecosystem. Ecological Monographs 40: 23-47

Luker, M. and Montague, K. (1994) Control of pollution from highway drain discharges. Construction Industry Research and Information Association Report 142. CIRIA.

McGarrigle, M. (2008) Agricultural Phosphorus Losses to Water – A Review. EPA, Castlebar National Water Conference, Galway, 11-12 June 2008
www.epa.ie

McGarrigle, M. J. Lucey, J., M. Ó Cinnéide (2010) Water Quality In Ireland 2007-2009. Environmental Protection Agency

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 (2012b) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NRA (2010) Guidelines On The Management Of Noxious Weeds And Non-Native Invasive Plant Species On National Roads National Roads Authority

Palviainen, N. (2005) Logging residues and ground vegetation in nutrient dynamics of a clear-cut boreal forest. Faculty of Forestry University of Joensuu. The Finnish Society of Forest Science.

Royal Society (1992) Risk: Analysis, Perception and Management. The Royal Society, London (ISBN 0-85403-467-6).

Solbe, J. (1988) Water quality for Salmon and Trout. Atlantic Salmon Trust.

Standing Scientific Committee for Salmon (2014) Independent Scientific Report to Inland Fisheries Ireland. The Status of Irish Salmon Stocks in 2013, with Precautionary Catch Advice for 2013/4. Report to IFI.

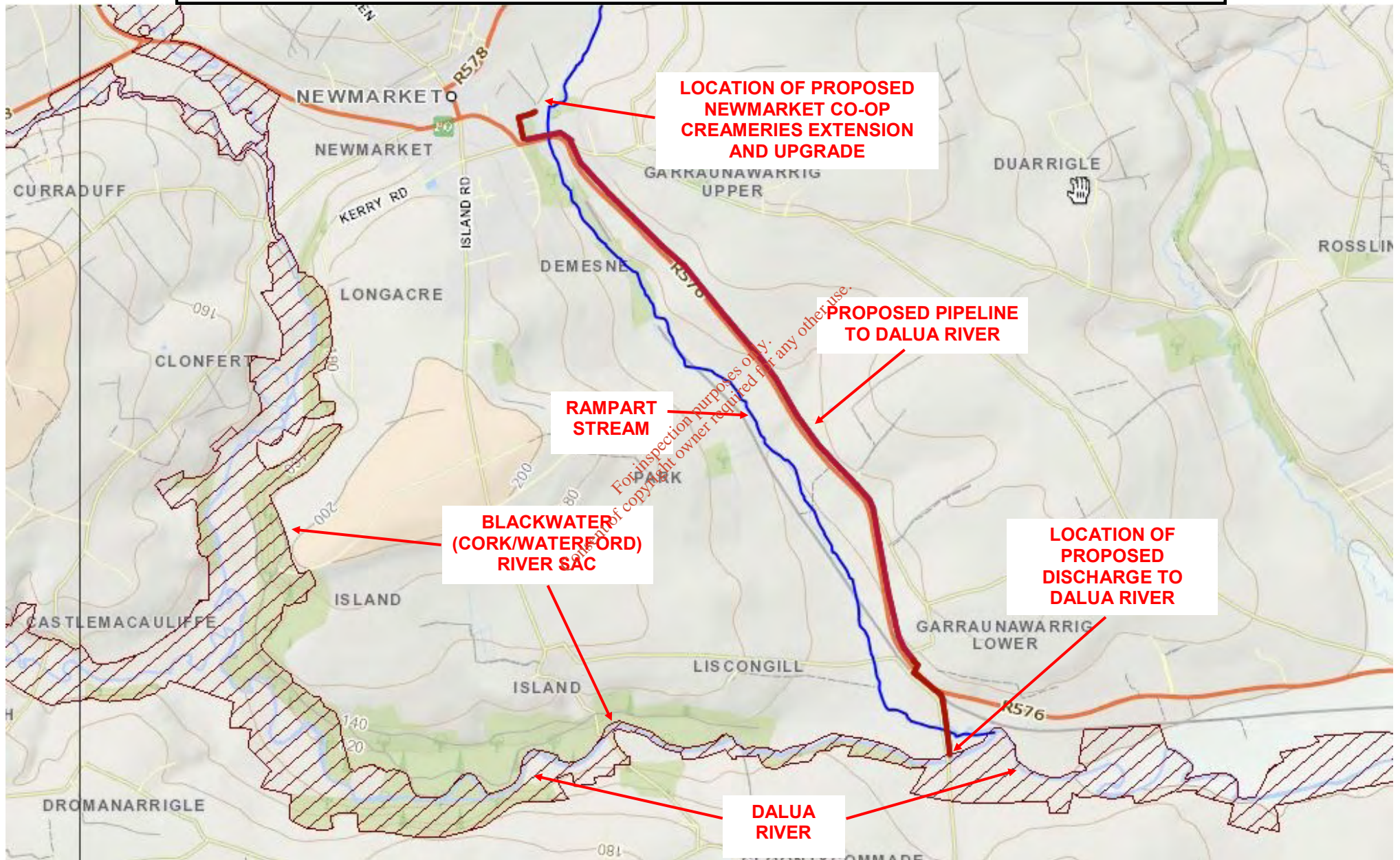
Svobodova et al (1993) Water Quality and Fish Health. EIFAC Technical Paper 54. European Inland Fisheries Advisory Commission.

Valovirta, I. (1989) Conservation of *M. margaritifera* in Finland. Council of Europe Colloquium: The Bern Convention Invertebrates and their conservation. T-PVS (89) 34, 59-63.

Wells, S.M., R.M. Pyle and N.M. Collins (1983) The IUCN invertebrate red data book. IUCN, Gland, Switzerland.

Wilson, S., R. Bray & P. Cooper (2004) Sustainable drainage systems – Hydraulic, structural and water quality advice. CIRIA C609.

**MAP 1 LOCATION OF NEWMARKET CO-OPERATIVE CREAMERIES LTD
DISCHARGE IN RELATION TO BLACKWATER (CORK/WATERFORD) RIVER SAC**



APPENDIX 1

**BASELINE ASSESSMENT OF STREAMS & RIVERS
POTENTIALLY AFFECTED BY PROPOSED UPGRADING OF
WASTE WATER TREATMENT AND DISCHARGE SYSTEMS AT
NEWMARKET CO-OPERATIVE CREAMERIES LTD.,
NEWMARKET, COUNTY CORK**

For inspection purposes only
Consent of copyright owner required for any other use

NATURA IMPACT STATEMENT (NIS)

**BASELINE ASSESSMENT OF STREAMS & RIVERS
POTENTIALLY AFFECTED BY PROPOSED
UPGRADING OF WASTE WATER TREATMENT AND
DISCHARGE SYSTEMS AT NEWMARKET CO-
OPERATIVE CREAMERIES LTD. NEWMARKET,
COUNTY CORK**

10th February 2016

REPORT PREPARED FOR OES Ltd

by

Bill Quirke BSc, MSc, MCIEEM

Helena Twomey BA(Mod), PhD



Conservation Services, Tullaha, Glenflesk, Killarney, Co. Kerry
Tel/Fax 064 6630130 e-mail cs@conservation-services.ie

Client:	OES Consulting
Project	Baseline assessment of streams & rivers potentially affected by proposed upgrading of waste water treatment and discharge systems at Newmarket Co-Operative Creameries Ltd., Newmarket, County Cork
Report No:	15110/NIS/F2
Date	10/02/2016
Status	Final
Prepared by	Bill Quirke BSc, MSc, MCIEEM
Reviewed by	Helena Twomey BA(Mod), PhD

*For inspection purposes only.
Consent of copyright owner required for any other use.*

CONTENTS

1. Introduction	4
2. Methodology	5
2.1. Habitat assessment.....	5
2.1.1. Field procedure	5
2.1.2. Criteria used for assessment of salmonid and lamprey habitat quality	7
2.2. Biological water quality assessment.....	9
2.2.1. Biological sampling sites	9
2.2.2. Biological sampling & analysis	10
2.3. Fish assessment	11
3. Existing environment.....	13
3.1. Desk study	13
3.1.1. Rampart Stream.....	13
3.1.2. Dalua River	13
3.1.3. Allow River	14
3.1.4. Blackwater (Munster)	15
3.2. Assessment of potentially affected waters	17
3.2.1. Habitat Assessment	17
3.2.2. Biological water quality.....	31
3.2.3. Fish survey.....	42
3.2.4. Summary of baseline assessment findings of particular relevance to the appropriate assessment process	43
4. References	45
APPENDIX A	DATA FROM RAMPART STREAM FISH SURVEY 6 th AUGUST 2014
APPENDIX B	SALMONID CATCH PER UNIT EFFORT, MINIMUM DENSITY AND LENGTH FREQUENCY DISTRIBUTION GRAPHS
APPENDIX C	EPA BIOLOGICAL WATER QUALITY DATA FOR DALUA RIVER, ALLOW RIVER & BLACKWATER (MUNSTER) RIVER
APPENDIX D	NPWS SUBMISSIONS OF 4 TH DECEMBER 2015 AND 8 TH FEBRUARY 2016

1. INTRODUCTION

This assessment was carried out to inform the Natura Impact Statement for the the proposed waste water treatment plant upgrade, increase in the milk processing, installation of underground pipeline & discharge of treated wastewater discharge, Newmarket Co-Operative Creameries Ltd. (Newmarket Co-Op), Newmarket County Cork.

As all of the potentially affected qualifying interests of the Blackwater (Cork/Waterford) River Special Area of Conservation (SAC) are aquatic species, a field assessment of the existing aquatic environment was carried out to establish the baseline biological water quality and habitat quality in the potentially affected waters downstream of the existing Newmarket Co-Operative Creameries Ltd Discharge.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

2. METHODOLOGY

2.1. HABITAT ASSESSMENT

Habitat assessment was carried out on 13th October 2014 and 3rd February 2016.

2.1.1. FIELD PROCEDURE

A general assessment of salmonid and lamprey habitat quality was carried out for c.6.75km downstream of the proposed WwTP extension on watercourses shown on the Environmental Protection Agency (EPA) on-line mapping of streams & rivers (<http://gis.epa.ie/Envision>). This included the c.4.75 km of the Rampart Stream from Newmarket to the confluence with the Dalua River and c.2km of the Dalua River downstream of the Rampart Stream confluence. A small tributary of the Rampart Stream which flows under the R576 at Park Bridge will be crossed by the proposed pipeline. The habitat of the lowest c.250m of this tributary was also assessed.

Assessment consisted of walking and/or wading the entire channel length. All stream/river channels were demarcated into habitat sections based on:

1. Stream width and depth
2. Substrate type, i.e. relative dominance of large rocks, cobble, gravel, sand, mud etc.
3. Flow type, i.e. relative dominance of riffle, glide and pool in the sampling area
4. Dominant bank-side vegetation
5. In-stream vegetation

6. Degree of shade by bank-side vegetation

Salmonid and Lamprey habitat quality was assessed, taking into account the environmental features 1-6 listed above. Based on these observations and more detailed criteria outlined in Section 2.1.2 below, the value of each river section for salmonid and lamprey spawning, as a nursery area for juvenile salmonids and lamprey larvae, and as an area for adult salmonids, was estimated on a scale of None/ Poor/ Fair/ Good/ Very Good/ Excellent.

Scale	Assessment
None	The ecologist carrying out the assessment regards it as impossible that the stream could support the species in the relevant life stage
Poor	Unlikely but possible that the stream could support the species in the relevant life stage
Fair	Species life stage likely to be present at low density
Good	Species life stage likely to be present at moderate density
Very Good	Species life stage likely to be present at high density
Excellent	Conditions ideal for the species life stage

This rating assesses the physical suitability of the habitat; the presence/absence/density of salmonids and/or lamprey at the location will also depend on present and historical water quality and accessibility of the site to the species in question.

Salmonid and Lamprey habitat quality was assessed, taking into account the environmental features 1-6 listed above. Based on these observations and more detailed criteria outlined in Section 2.1.2 below, the value of each river section for salmonid and lamprey spawning, as a nursery area for juvenile salmonids and lamprey larvae, and as an area for adult salmonids, was estimated. Locations for identification of habitat sections were recorded as Irish

Grid References using a GPS. Photographs were taken to illustrate the habitat quality.

2.1.2. CRITERIA USED FOR ASSESSMENT OF SALMONID AND LAMPREY HABITAT QUALITY

Habitat quality for in-stream invertebrate and plant communities, and for fish, and riparian birds and mammals, is primarily a function of 'naturalness' and diversity. The more diverse the stream habitat in terms of substrate, flow rate, depth, riparian vegetation, light conditions etc., the richer the biological community is likely to be, and the more suitable it is likely to be for salmonid fish (trout and salmon).

Assessment of the quality of salmonid spawning habitat, nursery habitat and adult habitat is based on personal expertise developed over a period of 20 years of electrofishing and on published information such as the following:

- i. Favourable locations for salmon spawning are likely to occur where the gradient of a river is 3% or less (Mills 1989).
- ii. Preferred current velocity for spawning is within the range 25–90 cm s⁻¹, with a water depth in the range 17–76 cm (Hendry & Cragg-Hine 1997).
- iii. Typical spawning sites are the transitional areas between pool and riffle where flow is accelerating and depth decreasing, where gravel of suitable coarseness is present and interstices are kept clean by up-welling flow (Peterson 1978, Bjorn & Reiser 1991).
- iv. Salmon fry and parr occupy shallow, fast-flowing water with a moderately coarse substrate with cover (Symons & Heland 1978, Baglinière & Champigneulle 1986).

- v. Deep or slow-moving water, particularly when associated with a sand or silt substrate, does not support resident juvenile salmonids (Wankowski & Thorpe 1979, Baglinière & Champigneulle 1986).
- vi. Suitable cover for juveniles includes areas of deep water, surface turbulence, loose substrate, large rocks and other submerged obstructions, undercut banks, overhanging vegetation, woody debris lodged in the channel, and aquatic vegetation (Heggenes 1990; Bjorn & Reiser 1991; Haury et al. 1995).
- vii. The juxtaposition of habitat types is also important. The proximity of juvenile habitat to spawning gravels may be significant to their utilisation. In addition, adults require holding pools immediately downstream of spawning gravels in which they can congregate prior to spawning. Cover for adult salmon waiting to migrate or spawn can be provided by overhanging vegetation, undercut banks, submerged vegetation, submerged objects such as logs and rocks, floating debris, deep water and surface turbulence (Bjorn & Reiser 1991).
- viii. Bjorn & Reiser (1991) suggest that proximity of cover to spawning areas may be a factor in the selection of spawning sites by some salmonid species.

Lamprey habitat preferences change with the stages of their life cycle. They show a preference for gravel-dominated substratum for spawning. After hatching the larvae swim or are washed downstream by the current to areas of sandy silt in still or slow flowing water where they burrow and spend the next few years in tunnels. Lampreys therefore require mainly silt and sand dominated substratum for nursery habitat. Other important environmental characteristics for optimal ammocoete habitat are shallow waters with low water velocity, and the presence of organic detritus and/or plant material. Sub-optimal habitat supporting only a few individuals may consist of a few square centimetres of suitable silt in an open, comparatively high-velocity, boulder-strewn streambed. Spate rivers, with high flow velocities, tend to support fewer

ammocoetes because they contain smaller areas of stable sediment (Maitland 2003).

2.2. BIOLOGICAL WATER QUALITY ASSESSMENT

2.2.1. BIOLOGICAL SAMPLING SITES

Biological water quality assessment was carried out at 9 locations (see Maps 1 & 2):

Site Code	Grid Reference	Sampling Date	Location
M1	R31774 07488	21/10/14	Mill Stream immediately upstream of Newmarket facility
M2	R32108 07409	13/10/14	Mill Stream immediately downstream of Newmarket facility
R1	R32216 07513	28/7/15	Rampart Stream immediately upstream of Newmarket facility and confluence with Mill Stream
R2	R32130 07268	28/7/15	Rampart Stream immediately downstream of Newmarket facility and confluence with Mill Stream
R3	R32396 06858	3/9/15	c.750m downstream of Newmarket facility
R4	R33406 05553	4/9/15	c.2.5km downstream of Newmarket facility
R5	R34264 04598	4/9/15	c.3.8km downstream of Newmarket facility
D1	R34263 04536	21/10/14	Dalua River downstream of proposed discharge location and upstream of confluence with Rampart Stream

Site Code	Grid Reference	Sampling Date	Location
D2	R34353 04490	21/10/14	Dalua River immediately downstream of confluence with Rampart Stream
D3	R35171 04436	5/11/15	Dalua River c. 2km downstream of confluence with Rampart Stream and proposed discharge location

2.2.2. BIOLOGICAL SAMPLING & ANALYSIS

Invertebrates were sampled using the standard kick sampling method. After field sampling the sample was thoroughly sieved and live sorted for 30 minutes under laboratory conditions. Invertebrates were preserved in 70% alcohol, examined microscopically and identified to the taxonomic level required to calculate Q-ratings by the EPA methodology (McGarrigle *et al* 2002). The preserved samples were archived for future examination or verification. Based on the relative abundance of indicator species, a biotic index (Q-rating) was determined in accordance with the biological assessment procedure used by the Environmental Protection Agency (McGarrigle *et al* 2002 & S.I. No. 258 of 1998) and more detailed unpublished methodology (McGarrigle, Clabby and Lucey pers. comm.)

Submerged and emergent aquatic plants were assessed at each site by means of direct observation and recorded as % cover of the substratum.

Biotic Index	Water Framework Directive Ecological Quality	Quality Status
Q5	High	Unpolluted Waters
Q4-5	High	
Q4	Good	
Q3-4	Moderate	Slightly Polluted Waters

Biotic Index	Water Framework Directive Ecological Quality	Quality Status
Q3	Poor	Moderately Polluted Waters
Q2-3	Poor	
Q2	Bad	Seriously Polluted Waters
Q1-2	Bad	
Q1	Bad	

2.3. FISH ASSESSMENT

- Timed electrofishing was carried out at six sites on the Rampart Stream (Sites A-F, see Map 3) to assess the species of fish present and the qualitative abundance (catch per unit effort/minimum density estimate) and age composition of juvenile and adult salmonids.
- The area electrofished at each site was estimated based on the length and average width of the channel fished.
- At each site a representative stream reach was selected and measured such that all primary physical habitat characteristics (i.e. riffle/glide/pool, if present) of the stream were included within the reach.
- Grid references for the upstream and downstream extremities of the surveyed sections were recorded and representative photographs of each survey site were taken.
- Fish were captured using a Safari Research Surveyor pulsed direct current backpack electrofisher.

- All fish were identified, and fork length of salmonids was measured to the nearest mm.
- Scales were taken from a representative sample of captured trout. Trout age was determined by length frequency distribution combined with scale reading using a high power binocular microscope. Trout were classified according to age as less than 1 year old (0+), 1 year old (1+), and 2 year old (2+).
- Age of juvenile salmon was determined using length frequency distribution.
- All fish captured were carefully handled and returned alive where possible to the water from which they were taken, following the gathering of data.
- Suitable lamprey nursery substrate was identified at three sites (Sites A, D & F) and electrofished for juvenile lamprey using the qualitative method described by O'Connor (2004) following procedure of Harvey & Cowx (2003).
- Inland Fisheries Ireland (IFI) Biosecurity Protocol for Field Survey Work (December 2010) was followed at all times.

3. EXISTING ENVIRONMENT

3.1. DESK STUDY

3.1.1. RAMPART STREAM

The Rampart Stream rises c.4km north of Newmarket and flows for c.8km via Newmarket to the confluence with the Dalua River. Little published information on the Rampart Stream was available for this report. However the Rampart Stream is known to have a population of Salmon.

(www.duhallowlife.com/content/ird-duhallows-work-biodiversity-recognised)

Brook Lamprey have been observed in the Rampart Stream (Dr F. Igoe pers. comm.) Brook Lamprey and Atlantic Salmon are qualifying interests of the Blackwater (Cork/Waterford) River SAC.

3.1.2. DALUA RIVER

The River Dalua rises in north-west Co. Cork, approximately 10km north of Newmarket. It flows in a southeasterly direction towards Kanturk, where it joins the River Allow. The River Allow then continues for approximately 5km before joining the Munster Blackwater. The River Dalua, along with most of the major tributaries of the River Blackwater, is located within the Blackwater River (Cork/Waterford) SAC.

A fish survey was carried out by IFI on the Dalua River in 2011 (IFI 2010). The survey site was located approximately 3km south of Newmarket. A total of five fish species were recorded in the River Dalua site. Salmon was the most abundant species, followed by brown trout, minnow, eel and lamprey. A total juvenile salmon minimum density of 0.629 per m² was recorded at the site. Salmon ranged in length from 2.4cm to 16.9cm. Three age classes (0+, 1+ and 2+) were present, accounting for approximately 71%, 27% and 2% of the total salmon catch respectively.

River and Brook Lamprey are present in the Dalua River (King & Linnane 2004). Mapping in NPWS (2012a) shows Sea Lamprey as present in the Dalua River.

The main channel of the Dalua River is not classified as suitable Freshwater Pearl Mussel habitat in the SAC Conservation Objectives NPWS (2012a). NPWS in its letter of 4/12/15 states that the conservation target for freshwater pearl mussel: “*does not apply to the River Dalua. Therefore, effects in the River Dalua should be assessed for salmonid water quality, with salmon habitat as the target.*” (See Appendix D)

The Conservation Objectives regarding Freshwater Pearl Mussel no longer apply to the main channel of the Blackwater River (see Department of Arts, Heritage and the Gaeltacht letter of 8 February 2016 in Appendix D).

In 2012 EPA described the water quality in the Dalua River as “*Continuing satisfactory with Good and High ecological quality*” (see EPA biological water quality data in Appendix B)

For inspection purposes only.
Consent of copyright owner required for any other use

3.1.3. ALLOW RIVER

The River Allow rises on the eastern flanks of the Mullaghareirk Mountains, flowing in an easterly direction for twelve kilometres before turning south at Freemount, and continuing for a further 12 kilometres to Kanturk town, the main centre of population in the Allow River catchment. 5 km downstream of Kanturk the Allow flows into the Blackwater River, and consequently the Allow is included in the Blackwater River SAC. The Allow catchment is 323.46km². (NS-2 2010)

Sea Lamprey, River lamprey and Brook lamprey (King & Linnane 2004) salmon and Freshwater Pearl Mussel (NS-2 2010) are present in the River Allow and all are qualifying interests of the SAC.

The Freshwater Pearl Mussel Second Draft Allow Sub-Basin Management Plan (NS-2 2010) states that on the basis of the available survey information : *“the population of Margaritifera in the Allow River was found to be in unfavourable condition in the areas surveyed during 3 visits made between September 2008 and September 2009. ...The population is failing in its habitat quality (through evidence of heavy siltation and strong macrophyte growth), and in its population demographic profile, where it is evident that there are not the numbers of juveniles present in the population to provide sustainable replacement of the current adult numbers. The future of the Allow Catchment population is not hopeful, as there is intensive catchment management that would be slow to recover even with stringent measures being undertaken. ... If it took 20 years to implement the measures needed for the catchment, it is likely that half the remaining population would be lost.”*

Freshwater Pearl Mussel are not found in the Allow downstream of the Dalua confluence (NS-2 2010), therefore the closest known population of FPM downstream of the discharge location is in the main channel of the Blackwater River immediately downstream of the River Allow confluence (c.10km downstream of the proposed discharge location). NPWS (2012a). The Conservation Objectives regarding freshwater pearl mussel no longer apply to the main channel of the Blackwater River (see Department of Arts, Heritage and the Gaeltacht letter of 8 February 2016 in Appendix D).

3.1.4. BLACKWATER (MUNSTER)

The River Blackwater is one of Ireland's largest rivers, extending some 160km from source to sea and draining in excess of 3,000km². The river rises in the mountains of east Co. Kerry, traversing much of Co. Cork and west Co. Waterford, before entering the Celtic Sea at Youghal Bay, Co. Cork.

The Freshwater Pearl Mussel Second Draft Munster Blackwater Sub-Basin Management Plan (NS-2 2010) states that the available survey information “*suggests that whilst pearl mussels still may be relatively widespread in the Blackwater, and there are still small localised areas with moderately high densities, the numbers have declined, and the population is composed entirely of aged adults with no evidence of recruitment for at least 20 years.*” Maps in the Draft Sub-Basin Management Plan show Freshwater Pearl Mussel present in the Blackwater upstream and downstream of Allow confluence. It appears that the most recent records at these sites are from pre 1992 (John Lucey EPA unpublished notes). The Conservation Objectives regarding Freshwater Pearl Mussel no longer apply to the main channel of the Blackwater River (see Department of Arts, Heritage and the Gaeltacht letter of 8 February 2016 in Appendix D).

The Blackwater is one of the country's most important game fisheries, and the main channel is a designated salmonid river under the European Communities (Quality of Salmonid Waters) Regulations of 1988 (S.I. No. 293, 1988, implementing the Freshwater Fish Directive (78/659/EEC). O'Reilly (2002) states: “*The river is noted for its enormous run of salmon over the years. The average size of the brown trout is small and it is not a noted sea trout fishery.*”

In 2012 EPA described the water quality in the Blackwater River as “*Satisfactory throughout, with High and Good ecological quality, following improvement at Mallow and Fermoy.*” (see EPA biological water quality data in Appendix C).

3.2. ASSESSMENT OF POTENTIALLY AFFECTED WATERS

3.2.1. HABITAT ASSESSMENT

Habitat sections are shown on Map 4.

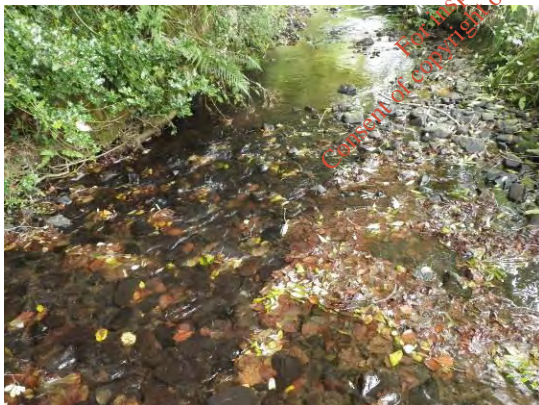
3.2.1.1. Habitat Section 1 – Rampart Stream

Location R32216 07513 to R32146 07303

Length c.150

Description Mostly glide on mud and sand in uniform canalised stream. Some short gravel and cobble riffles. Shade by garden trees c.40%.

Salmonid Adult Habitat	Fair
Salmonid Nursery Habitat	Fair
Salmonid/Lamprey Spawning Habitat	Poor - Fair
Lamprey Nursery Habitat	Fair



Short section of riffle on cobble, gravel & sand



Slow muddy glide



Stream flowing through landscaped garden



Canalised stream with unfirm glide habitat

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2.1.2. Habitat Section 1A – Rampart Stream Tributary

Location R33365 06054 to R33247 05875

Length c.250m

Description Stream 1.5 – 2.5m wide. Mostly riffle over cobble, large rocks and gravel, with some glide on silty gravel and sand. Mostly well shaded by ash, willow, alder and hawthorn. The twin pipe culvert under the N576 at Park Bridge is likely to constitute a major obstacle to upstream movement of fish. A 1m fall a short distance downstream from the bridge is likely to constitute an obstacle to upstream fish movement except at high flows.

Salmonid Adult Habitat	Fair
Salmonid Nursery Habitat	Good
Salmonid/Lamprey Spawning Habitat	Good
Lamprey Nursery Habitat	Poor - Fair



Riffle on cobble and gravel upstream of road



Twin culvert at Park Bridge



Riffle over cobble and large rocks



Cobble riffle just upstream of Rampart confluence

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2.1.3. Habitat Section 2 – Rampart Stream

Location R3145 07303 to R32495 06830

Length c.600m

Description Stream 1 - 2m wide with mixture of riffle over cobble and glide over mud and cobble.

Salmonid Adult Habitat Fair

Salmonid Nursery Habitat Fair - Good

Salmonid/Lamprey Spawning Habitat Fair

Lamprey Nursery Habitat Fair - Good



Stream at downstream end of triple culvert under R576



Riffle over cobble and mud



Riffle & glide through forestry plantation



Section of canalised stream with riffle and glide through forestry



Section of channel after habitat enhancement diversification works



Section of channel after habitat enhancement diversification works



Slow shallow glide over sand and mud substrate

For reproduction purposes only.
Consent of copyright owner required for any other use.

3.2.1.4. Habitat Section 3 – Rampart Stream

Location R32495 06830 to R33329 05739

Length c.1.9km

Description Stream 4-5m wide with good mix of riffle, glide and pool. Mostly shaded with native deciduous tree mixed with laurel and conifers.

Salmonid Adult Habitat Fair - Good

Salmonid Nursery Habitat Good

Salmonid/Lamprey Spawning Habitat Fair

Lamprey Nursery Habitat Fair



Diverse stream habitat with woodland riparian vegetation



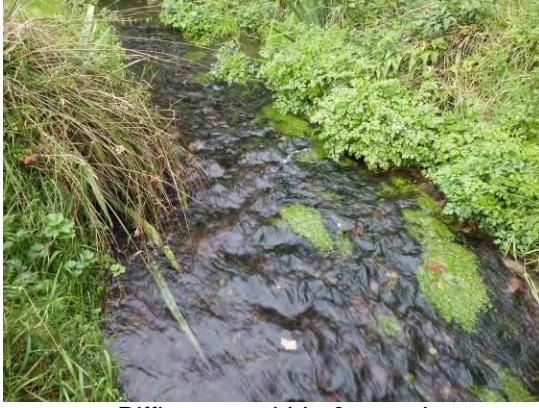
Shallow glide on sandy mud



Diverse mix of riffle, glide and run



Moderately shaded section of riffle and glide



Riffle over cobble & gravel



Glide over sand, gravel & cobble

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2.1.5. Habitat Section 4 – Rampart Stream

Location R33329 05739 R34272 04562

Length c.2km

Description Stream 4-5 m wide. Good mix of riffle, glide & pools. Mostly heavily shaded by alder, willow, ash and sycamore. Significant areas of silt suitable as lamprey nursery

Salmonid Adult Habitat	Good
Salmonid Nursery Habitat	Good
Salmonid/Lamprey Spawning Habitat	Fair
Lamprey Nursery Habitat	Fair - Good



Shallow riffle & run



Diverse mix of riffle, run & glide over cobble



Large deep pool



Shallow riffle & glide



Riffle & glide with eroded bank on bend



Shallow riffle & glide over silt cobble & gravel



Shallow riffle and glide over sand, silt and gravel



Slow glide close to Dalua confluence

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2.1.6. Habitat Section 5 – Dalua River

Location R34035 04432 to R35155 04442

Length c.2km

Description River 15 – 18m wide. Good mix of riffles over cobble, large rocks and gravel with moderate siltation, and glides ranging from fast shallow glides to deep slow glides. Good bankside cover of mature ash, alder and willow along much of the section, with sections with pasture extending to the river bank. Some sections of significantly eroding river bank.

Salmonid Adult Habitat	Good
Salmonid Nursery Habitat	Good
Salmonid/Lamprey Spawning Habitat	Fair
Lamprey Nursery Habitat	Poor – Fair



Shallow riffle & glide over cobble & gravel



Well developed bankside cover of mature ash, alder and willow



Shallow Glide



Deep Glide



Section of reinforced bank



Riffle & Glide



Shallow glide



Severely eroding river bank

For inspection purposes only
Consent of copyright owner required for any other use

3.2.1.7. Habitat Section 6 – Dalua River

Location R35155 04442 to R37194 03821

Length c.3km

Description River in spate and turbid, visibility of substrates poor at time of assessment. Mostly rapid run and riffle with some fast glide. Cobble and larger rock substrate dominant where substrates visible. Bank cover of alder, willow and ash scattered in lower part of section, but good cover on both banks in upper part of section

Salmonid Adult Habitat Good – Very Good*

Salmonid Nursery Habitat Good*

Salmonid/Lamprey Spawning Habitat Good*

Lamprey Nursery Habitat Fair*

*Rating tentative due to poor visibility of substrates



Cascade possibly over bedrock



Spate run over large rocks



Deep glide



Riffle over cobble



Turbid run in spate



Riffle & glide

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2.2. BIOLOGICAL WATER QUALITY

Locations of biological water quality assessment sites are shown on Maps 1 & 2.

3.2.2.1. SITE M1 - Mill Stream upstream of Newmarket Co-Operative Creameries Ltd facility

The invertebrate community at this site merits a Q-rating of Q3-4 indicating slightly polluted conditions and moderate ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Protonemura sp.</i>	1
	<i>Ecdyonurus sp.</i>	5
	<i>Heptagenia sp.</i>	2
	<i>Rhithrogena sp.</i>	8
	Heptageniidae (small/damaged)	1
Group B - Moderately Pollution Sensitive	<i>Agapetus sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancylus sp.</i>	3
	<i>Potamopyrgus antipodarum</i>	c.1000
	<i>Gammarus duebeni</i>	c.500
	<i>Baetis rhodani</i>	1
	<i>Hydropsyche sp.</i>	8
	Dytiscidae	1
	Elmidae	14
	Chironomidae	1
	Pediciidae	4
	Simuliidae	1
Group D - Very Pollution Tolerant	Erpobdellidae	16
	<i>Glossiphonia sp.</i>	5
	<i>Lymnaea peregra</i>	1
	<i>Physa sp.</i>	2
	<i>Asellus aquaticus</i>	2
Group E - Most Pollution Tolerant	Tubificidae	4
Not assigned to an indicator group	Lumbricidae	2
	Lumbriculidae	3

3.2.2.2. SITE M2 - Mill Stream downstream of Newmarket Co-Operative Creameries Ltd facility

The invertebrate community at this site merits a Q-rating of Q2-3 indicating moderately polluted conditions and poor ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	None recorded	
Group B - Moderately Pollution Sensitive	<i>Agapetus sp.</i>	1
	<i>Sericostoma sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancyclus fluviatilis</i>	1
	<i>Potamopyrgus antipodarum</i>	c.5000
	<i>Gammarus duebeni</i>	8
	<i>Hydropsyche sp.</i>	6
	Dytiscidae	1
	Chironomidae	6
Group D - Very Pollution Tolerant	Erpobdellidae	8
	<i>Lymnaea peregra</i>	25
	<i>Asellus aquaticus</i>	c.2000
Group E - Most Pollution Tolerant	<i>Chironomus sp.</i>	19
	Tubificidae	17

3.2.2.3. SITE R1 - Rampart Stream upstream of Mill Stream confluence

The invertebrate community at this site merits a Q-rating of Q4 indicating unpolluted conditions and good ecological quality, with no significant change since October 2014.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Isoperla grammatica</i>	2
	<i>Ecdyonurus</i> sp.	11
	<i>Rhithrogena</i> sp.	44
	Heptageniidae (small/damaged)	1
Group B - Moderately Pollution Sensitive	<i>Leuctra</i> sp.	24
	<i>Baetis muticus</i>	6
	<i>Glossosoma</i> sp.	4
	Limnephilidae	3
	<i>Odontocerum albicorne</i>	1
	<i>Sericostoma personatum</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancyclus fluviatilis</i>	4
	<i>Potamopyrgus antipodarum</i>	4
	<i>Gammarus duebeni</i>	30
	<i>Baetis rhodani</i>	35
	<i>Serratella ignita</i>	84
	<i>Hydropsyche</i> sp.	25
	<i>Plectrocnemia</i> sp.	1
	<i>Polycentropus</i> sp.	9
	<i>Rhyacophila</i> sp.	9
	<i>Velia</i> sp.	1
	Dytiscidae	1
	Elmidae	30
	<i>Hydraena</i> sp.	1
	Chironomidae	27
	Pediciidae	1
Simuliidae	14	
Group D - Very Pollution Tolerant	Erpobdellidae	9
	<i>Lymnaea peregra</i>	1
Group E - Most Pollution Tolerant	Tubificidae	1

3.2.2.4. SITE R2 - Rampart Stream downstream of Mill Stream confluence

The invertebrate community at this site merits a Q-rating of Q3 indicating moderately polluted conditions and poor ecological quality, an improvement compared with Q2-3 in October 2014.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Rhithrogena sp.</i>	1
Group B - Moderately Pollution Sensitive	<i>Leuctra sp.</i>	3
	Limnephilidae	3
	<i>Odontocerum albicorne</i>	1
	<i>Sericostoma personatum</i>	1
Group C - Moderately Pollution Tolerant	<i>Potamopyrgus antipodarum</i>	1
	<i>Gammarus duebeni</i>	16
	<i>Serratella ignita</i>	12
	<i>Hydropsyche sp.</i>	3
	<i>Polycentropus sp.</i>	2
	<i>Rhyacophila sp.</i>	59
	<i>Velia sp.</i>	1
	Dytiscidae	1
	Elmidae	8
	<i>Hydraena sp.</i>	1
	Ceratopogonidae	4
	Chironomidae	77
	Pediciidae	1
	Simuliidae	38
Group D - Very Pollution Tolerant	Erpobdellidae	4
	<i>Helobdella stagnalis</i>	1
	<i>Lymnaea peregra</i>	1
	<i>Asellus aquaticus</i>	9
Group E - Most Pollution Tolerant	Tubificidae	3
Not assigned to an indicator group	Enchytraeidae	1
	Lumbricidae	1
	Naididae	1

3.2.2.5. SITE R3 - Rampart Stream

The invertebrate community at this site merits a Q-rating of Q3 indicating moderately polluted conditions and poor ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	None recorded	
Group B - Moderately Pollution Sensitive	<i>Leuctra sp.</i>	4
	<i>Sericostoma sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancylus fluviatilis</i>	1
	<i>Potamopyrgus antipodarum</i>	5
	<i>Gammarus duebeni</i>	2
	<i>Baetis rhodani</i>	8
	<i>Serratella ignita</i>	1
	<i>Hydropsyche sp.</i>	68
	<i>Polycentropus sp.</i>	7
	<i>Rhyacophila sp.</i>	38
	<i>Tinodes waeneri</i>	1
	Ceratopogonidae	2
	Chironomidae	103
	Simuliidae	65
	Dytiscidae	1
	Elmidae	1
Group D - Very Pollution Tolerant	Erpobdellidae	5
	<i>Glossiphonia complanata</i>	3
	<i>Lymnaea peregra</i>	6
	<i>Asellus aquaticus</i>	34
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Enchytraeidae	1
	Lumbriculidae	1

3.2.2.6. SITE R4 - Rampart Stream

The invertebrate community at this site merits a Q-rating of Q3 indicating moderately polluted conditions and poor ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Protonemura sp.</i>	1
Group B - Moderately Pollution Sensitive	<i>Leuctra sp.</i>	6
	Limnephilidae	1
	<i>Sericostoma sp.</i>	1
	<i>Silo sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancylus fluviatilis</i>	5
	<i>Potamopyrgus antipodarum</i>	c.400
	<i>Gammarus duebeni</i>	4
	<i>Serratella ignita</i>	2
	<i>Hydropsyche sp.</i>	2
	<i>Polycentropus sp.</i>	5
	<i>Rhyacophila sp.</i>	9
	Ceratopogonidae	2
	Chironomidae	99
	Dixidae	1
	Dytiscidae	2
	Elmidae	28
Group D - Very Pollution Tolerant	Erpobdellidae	10
Group E - Most Pollution Tolerant	Tubificidae	6
Not assigned to an indicator group	Naididae	1

3.2.2.7. SITE R5 - Rampart Stream

The invertebrate community at this site merits a Q-rating of Q3 indicating moderately polluted conditions and poor ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	None recorded	
Group B - Moderately Pollution Sensitive	<i>Leuctra sp.</i>	23
	Glossosomatidae	2
	Limnephilidae	2
	<i>Sericostoma sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancylus fluviatilis</i>	1
	<i>Potamopyrgus antipodarum</i>	c.800
	<i>Gammarus duebeni</i>	46
	Hydracarina	2
	<i>Serratella ignita</i>	6
	<i>Hydropsyche sp.</i>	3
	<i>Polycentropus sp.</i>	33
	<i>Rhyacophila sp.</i>	3
	Geratopogonidae	4
	Chironomidae	14
	Pediciidae	9
	Simuliidae	1
	Dytiscidae	6
	Elmidae	14
Group D - Very Pollution Tolerant	<i>Glossiphonia complanata</i>	8
Group E - Most Pollution Tolerant	Tubificidae	13

3.2.2.8. SITE D1- Dalua River upstream of Rampart Stream confluence

The invertebrate community at this site merits a Q-rating of Q4 indicating unpolluted conditions and good ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Perla bipunctata</i>	17
	<i>Ecdyonurus sp.</i>	9
Group B - Moderately Pollution Sensitive	<i>Sericostoma sp.</i>	2
Group C - Moderately Pollution Tolerant	<i>Ancylus fluviatilis</i>	1
	<i>Gammarus duebeni</i>	10
	Hydracarina	1
	<i>Hydropsyche sp.</i>	168
	<i>Polycentropus sp.</i>	1
	<i>Rhyacophila sp.</i>	13
	Chironomidae	3
Group D - Very Pollution Tolerant	<i>Aseelus aquaticus</i>	1
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Naididae	1

3.2.2.9. SITE D2 - Dalua River downstream of Rampart Stream confluence

The invertebrate community at this site merits a Q-rating of Q4 indicating unpolluted conditions and good ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Perla bipunctata</i>	17
	<i>Protonemura sp.</i>	3
	<i>Ecdyonurus sp.</i>	7
Group B - Moderately Pollution Sensitive	Goeridae	1
	<i>Sericostoma sp.</i>	1
Group C - Moderately Pollution Tolerant	<i>Potamopyrgus antipodarum</i>	1
	<i>Gammarus duebeni</i>	18
	<i>Baetis rhodani</i>	10
	<i>Hydropsyche sp.</i>	103
	<i>Polycentropus sp.</i>	6
	<i>Rhyacophila sp.</i>	19
	Elmidae	8
	<i>Hydraena sp.</i>	1
	Chironomidae	5
Pediciidae	1	
Group D - Very Pollution Tolerant	Erpobdellidae	3
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Ceratopogonidae	1

3.2.2.10. SITE D3 - Dalua

The invertebrate community at this site merits a Q-rating of Q4-5 indicating unpolluted conditions and high ecological quality.

INDICATOR GROUP	TAXON	Numbers
Group A - Very Pollution Sensitive	<i>Perla bipunctata</i>	4
	<i>Protonemura sp.</i>	1
	<i>Ecdyonurus sp.</i>	24
	<i>Heptagenia sp.</i>	1
	Heptageniidae (small/damaged)	11
	<i>Rhithrogena sp.</i>	25
Group B - Moderately Pollution Sensitive	<i>Leuctra sp.</i>	3
	<i>Glossosoma sp.</i>	6
	Limnephilidae	1
	<i>Sericostoma personatum</i>	1
Group C - Moderately Pollution Tolerant	<i>Potamopyrgus antipodarum</i>	1
	<i>Baetis rhodani</i>	28
	<i>Hydropsyche sp.</i>	14
	<i>Rhyacophila sp.</i>	3
	Chironomidae	4
	Pediciidae	2
	Elmidae	11
	<i>Hydraena sp.</i>	1
Group D - Very Pollution Tolerant	Erpobdellidae	3
Group E - Most Pollution Tolerant	None recorded	

3.2.2.11. Summary of Biological Water Quality Data 2014 & 2015

	SITE	October 2014	July 2015	September 2015	November 2015
Mill Race upstream of Newmarket Facility	M1	Q3-4 (Fair)	-	-	-
Mill Race downstream of Newmarket Facility	M2	Q2-3 (Poor)	-	-	-
Rampart Stream upstream of Newmarket	R1	Q4 (Good)	Q4 (Good)	-	-
Rampart Stream downstream of Newmarket	R2	Q2-3 (Poor)	Q3 (Poor)	-	-
	R3	-	-	Q3 (Poor)	-
	R4	-	-	Q3 (Poor)	-
	R5	-	-	Q3 (Poor)	-
Dalua River proposed discharge location	D1	-	-	Q4 (Good)	-
Dalua River downstream of proposed discharge location	D2	-	-	Q4 (Good)	-
Dalua River c.2km downstream of proposed discharge location	D3	-	-	-	Q4-5 (High)

3.2.3. FISH SURVEY

Full fish assessment data are presented in Appendix A and salmonid catch per unit effort, minimum density and length frequency distribution graphs are presented in Appendix B. Locations of fish assessment sites are shown on Map 3.

TABLE A SUMMARY OF FISH CATCH AT SITES ON THE RAMPART STREAM

Site	0+ trout	1+ trout	2+ trout	0+ salmon	1+ salmon	Eel	Stone Loach	3-spined stickleback
A	73	1	0	2	1	1	0	0
B	42	7	0	5	1	1	0	1
C	37	8	2	6	1	1	0	0
D	10	15	1	14	5	0	0	0
E	25	11	4	24	2	0	0	0
F	18	8	3	32	4	0	1	0

TABLE B SUMMARY OF SALMONID CATCH PER UNIT EFFORT AT SITES ON THE RAMPART STREAM

To calculate catch per unit effort, the catch figures and fishing time are combined to calculate the theoretical catch per 5 minutes fishing.

Site	0+ trout	1+ trout	2+ trout	0+ salmon	1+ salmon
A	19.2	0.3	0.0	0.5	0.3
B	9.5	1.6	0.0	1.1	0.2
C	8.4	1.8	0.5	1.4	0.2
D	2.8	4.2	0.3	3.9	1.4
E	5.0	2.2	0.8	4.8	0.4
F	4.5	2.0	0.8	8.0	1.0

TABLE C SUMMARY OF MINIMUM DENSITY OF FISH SPECIES AT SITES ON THE RAMPART STREAM

Minimum density/m², based on a single electrofishing pass; actual densities may be more than double these figures.

Site	Juvenile trout	Adult trout	Juvenile salmon	Eel	Stone Loach	3-spined stickleback
A	0.123	0.000	0.005	0.002	0.000	0.000
B	0.251	0.000	0.031	0.005	0.000	0.005
C	0.129	0.006	0.020	0.003	0.000	0.000
D	0.078	0.003	0.059	0.000	0.000	0.000
E	0.096	0.011	0.069	0.000	0.000	0.000
F	0.052	0.006	0.072	0.000	0.002	0.000

3.2.4. SUMMARY OF BASELINE ASSESSMENT FINDINGS OF PARTICULAR RELEVANCE TO THE APPROPRIATE ASSESSMENT PROCESS

- i. Juvenile salmon were recorded at all of the six sites assessed on the Rampart Stream, including the site immediately upstream of Newmarket. The density of juvenile salmon progressively increased between Newmarket and the Dalua confluence. (Salmon are a qualifying interest of the Blackwater River SAC into which the Rampart Stream flows).
- ii. The results of the surveys indicate that the Rampart Stream is a significant spawning and nursery area for both trout and salmon in the context of the Dalua/Allow system. If measures were taken to improve the water quality of the Rampart Stream downstream of Newmarket, and to reduce the silt load to the river, the quality of the stream as a salmonid nursery and spawning area would be likely to significantly increase.
- iii. In 2014 & 2015 biological water quality in the Rampart Stream was found to be good immediately upstream of Newmarket and poor downstream of the town.

- iv. In 2015 poor biological water quality was recorded in the Rampart Stream from Newmarket as far downstream as the confluence with the Dalua River.
- v. The poor water quality recorded (Q3) indicates that the water quality of the Rampart Stream downstream of Newmarket is likely to be borderline for the survival of salmonid fish (trout & salmon).
- vi. The Dalua River has good ecological status upstream and downstream of its confluence with the Rampart Stream. The biological water quality status of the river was found to be high c.2km downstream of the proposed discharge location in November 2015.
- vii. The 2km section of the Dalua confluence was found to have good adult and nursery habitat for salmon and fair salmonid and lamprey spawning habitat. Lamprey nursery habitat was classified as poor-fair. Lamprey and salmon are Annex II qualifying interests of the Blackwater SAC of which the Dalua River forms a part.

For inspection purposes only.
Consent of copyright owner required for any other use.

4. REFERENCES

Bagliniere J.L. & Champigneulle A. (1986). Population estimates of juvenile Atlantic salmon (*Salmo salar*,) as indices of smolt production in the Scorff River, Brittany, France. *Journal of Fish Biology* 29, 4, 467–482.

Bjorn T.C. & Reiser D.W. (1991). Habitat requirements of salmonids in streams. In: Meehan WR (ed). *Influences of forest management on salmonid fishes & their habitats*. American Fisheries Society, Bethesda

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.

Haury J., Baglinière J.L. & Maisse G. (1995) Analysis of spatial and temporal organisation in a salmonid brook in relation to physical factors and macrophytic vegetation. *Hydrobiologia* 300/301, 269–277.

Heggenes J. (1990). Habitat utilisation and preferences in juvenile Atlantic salmon (*Salmo salar*) in streams. *Regulated Rivers Research & Management* 5, 341–354.

Hendry K. & Cragg-Hine D. (1997). Restoration of riverine salmon habitats. *Fisheries Technical Manual 4* Environment Agency, Bristol.

I

Inland Fisheries Ireland (2010) Sampling Fish for the Water Framework Directive. Rivers 2010. South Western River Basin District.

Kennedy, G.J.A. (1984). Evaluation of techniques for classifying habitats for juvenile Atlantic Salmon (*Salmo salar* L.). Atlantic Salmon Trust Workshop on Stock Enhancement

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.

Maitland P.S. (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.

McGarrigle, M. et al (2002) Water Quality in Ireland 1998-2000. EPA.

Mills D. (1989). Ecology and Management of Atlantic Salmon. Chapman and Hall, London.

Mills D. (1989). Ecology and Management of Atlantic Salmon. Chapman and Hall, London.

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.

NS-2 (2010) Freshwater Pearl Mussel Second Draft Allow Sub-Basin Management Plan

O'Connor, W. (2004) A survey of the juvenile lamprey populations in the Moy catchment. Wildlife Manuals No. 15. National Parks & Wildlife Service.

O'Reilly, P. (2002) Rivers of Ireland – A Flyfisher's Guide. Merlin Unwin Books. 5th edition.

Peterson R.H. (1978). Physical characteristics of Atlantic spawning salmon gravel in some New Brunswick streams. Fisheries and Marine Service Technical Report 785, Fisheries and Environment St Andrews, New Brunswick, Canada.

Symons P.E.K. & Heland M (1978). Stream habitats and behavioural interactions of underyearling and yearling Atlantic salmon. *Journal of the Fisheries Research Board of Canada* 35, 175–183.

Wankowski J.W.J. & Thorpe J.E. (1979). Spatial distribution and feeding in Atlantic salmon (*Salmo salar*) juveniles. *Journal of Fish Biology* 14, 3, 239–242.


For inspection purposes only.
Consent of copyright owner required for any other use.

APPENDIX A

FISH SURVEY DATA

*For inspection purposes only.
Consent of copyright owner required for any other use.*

SITE A

Site Code	A
Date	03/09/2015
Grid Reference u/s	R 32232 07526
Grid Reference d/s	R 32189 07444
Site Photographs	
Width (m)	5-8
Depth (cm)	15-30
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Cobble 2. Mud 3. Sand 4. Gravel Heavily silted cobble and mud
Flow Type	Riffle 30% Glide 70%

Instream Vegetation	Filamentous algae <1% <i>Iris pseudacorus</i> <1%
Dominant Bankside Vegetation	Beech, Horse Chestnut
Estimated Summer Cover of Stream by Bankside Vegetation	65%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Good-Fair
Salmonid Spawning Habitat	Poor
Lamprey Nursery	Fair
Lamprey Spawning	Poor
Margaritifera Habitat	None
Crayfish Habitat	Fair-Poor
Water clarity	Clear
Fishing Time (min.)	19
Area fished (m ²)	600

Consent of copyright owner required for any other use.
For inspection purposes only.

Brown Trout Fork Length (cm)	Age
5.5	0+
5.9	0+
6.0	0+
6.2	0+
6.2	0+
6.2	0+
6.5	0+
6.6	0+
6.6	0+
6.8	0+
6.9	0+
7.0	0+


Brown Trout Fork Length (cm)	Age
8.5	0+
8.6	0+
8.6	0+
8.6	0+
8.6	0+
8.6	0+
8.8	0+
8.8	0+
9.0	0+
9.2	0+
9.4	0+
9.5	0+
9.7	0+
16.1	1+

Salmon Fork Length (cm)	Age
6.0	0+
7.5	0+
13.6	1+

Eel Length (cm)
26.4

For inspection purposes only.
Consent of copyright owner required for any other use.

SITE B

Site Code	B
Date	03/09/2015
Grid Reference u/s	R 32268 06910
Grid Reference d/s	R 32396 06858
Site Photographs	
Width (m)	2-5
Depth (cm)	15-30
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Cobble 2. Gravel 3. Mud 4. Sand Heavy siltation

Flow Type	Riffle 40% Glide 40% Pool 20%
Instream Vegetation	Silt-slime 30% Filamentous algae 20% <i>Lemna minor</i> 10% <i>Callitriche sp.</i> 5% <i>Oenanthe crocata</i> <5%
Dominant Bankside Vegetation	Willow, Alder, Conifers, <i>Oenanthe</i> , Grass, Rush
Estimated Summer Cover of Stream by Bankside Vegetation	45%
Salmonid Adult Habitat	Fair
Salmonid Nursery Habitat	Good-Fair
Salmonid Spawning Habitat	Poor
Lamprey Nursery	Poor
Lamprey Spawning	Poor
Margaritifera Habitat	None
Crayfish Habitat	Poor
Water clarity	Clear
Fishing Time (min.)	22
Area fished (m ²)	195

Brown Trout Fork Length (cm)	Age
6.5	0+
6.6	0+
6.6	0+
6.8	0+
6.9	0+
7.0	0+
7.3	0+

Brown Trout Fork Length (cm)	Age
7.4	0+
7.5	0+
7.6	0+
7.6	0+
7.7	0+
7.8	0+
7.9	0+
7.9	0+
8.0	0+
8.1	0+
8.1	0+
8.1	0+
8.2	0+
8.2	0+
8.2	0+
8.3	0+
8.4	0+
8.4	0+
8.4	0+
8.5	0+
8.7	0+
8.9	0+
9.0	0+
9.0	0+
9.1	0+
9.1	0+
9.6	0+
9.8	0+
9.9	0+
10.0	0+
10.0	0+
10.2	0+
10.6	0+
10.6	0+
11.0	0+
15.9	1+
16.8	1+
16.9	1+
17.2	1+
17.5	1+
18.0	1+
19.4	1+

For inspection purposes only.
Consent of copyright owner required for any other use.


Salmon Fork Length (cm)	Age
6.8	0+
7.2	0+
7.2	0+
8.2	0+
8.3	0+
12.9	1+

Eel Length (cm)
22.0

Three spined stickleback Length (cm)
5.2

*For inspection purposes only.
Consent of copyright owner required for any other use.*

SITE C

Site Code	C
Date	03/09/2015
Grid Reference u/s	R 32928 06272
Grid Reference d/s	R 32968 06215
Site Photographs	
Width (m)	4-7
Depth (cm)	15-40
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Cobble 2. Sand 3. Gravel 4. Mud Heavily silted

Flow Type	Riffle 50% Glide 45% Pool 5%
Instream Vegetation	Filamentous algae 40% Silt-slime 20% Bryophyta 20% <i>Oenanthe crocata</i> <5% <i>Callitriche sp.</i> <1%
Dominant Bankside Vegetation	Alder (fine large old coppiced), Bramble, Willow, Ash
Estimated Summer Cover of Stream by Bankside Vegetation	45%
Salmonid Adult Habitat	Good-Fair
Salmonid Nursery Habitat	Good
Salmonid Spawning Habitat	Fair
Lamprey Nursery	Poor
Lamprey Spawning	Fair
Margaritifera Habitat	None
Crayfish Habitat	Good-Fair
Water clarity	Clear
Fishing Time (min.)	22
Area fished (m ²)	350

Brown Trout Fork Length (cm)	Age
6.4	0+
6.4	0+
6.5	0+
6.5	0+
6.6	0+
6.7	0+
6.8	0+

Brown Trout Fork Length (cm)	Age
6.8	0+
6.8	0+
7.0	0+
7.0	0+
7.0	0+
7.0	0+
7.3	0+
7.3	0+
7.3	0+
7.4	0+
7.4	0+
7.8	0+
7.9	0+
8.0	0+
8.2	0+
8.2	0+
8.3	0+
8.4	0+
8.4	0+
8.5	0+
8.5	0+
8.5	0+
8.6	0+
8.6	0+
8.6	0+
9.0	0+
9.2	0+
9.7	0+
10.2	0+
10.4	0+
13.2	1+
15.0	1+
15.0	1+
16.3	1+
16.7	1+
16.8	1+
16.8	1+
17.5	1+
20.6	2+
21.4	2+


For inspection purposes only.
Consent of copyright owner required for any other use.

Salmon Fork Length (cm)	Age
6.4	0+
6.6	0+
6.9	0+
7.0	0+
7.7	0+
8.2	0+
12.7	1+

Eel Length (cm)
23.5

*For inspection purposes only.
Consent of copyright owner required for any other use.*

SITE D

Site Code	D
Date	04/09/2015
Grid Reference u/s	R 33406 05553
Grid Reference d/s	R 33448 05498
Site Photographs	
Width (m)	4-6
Depth (cm)	10-70
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Cobble 2. Gravel 3. Sand 4. Mud Heavily silted

Flow Type	Riffle 45% Glide 50% Pool 5%
Instream Vegetation	Bryophyta 10% <i>Oenanthe crocata</i> <5% <i>Callitriche sp.</i> <1%
Dominant Bankside Vegetation	Alder, Willow, Beech
Estimated Summer Cover of Stream by Bankside Vegetation	70%
Salmonid Adult Habitat	Good
Salmonid Nursery Habitat	Good
Salmonid Spawning Habitat	Fair
Lamprey Nursery	Fair
Lamprey Spawning	Fair
Margaritifera Habitat	None
Crayfish Habitat	Fair
Water clarity	Clear
Fishing Time (min.)	18
Area fished (m ²)	320


Brown Trout Fork Length (cm)	Age
6.0	0+
6.3	0+
6.4	0+
6.7	0+
6.9	0+
7.0	0+
7.2	0+
7.8	0+
9.3	0+

Brown Trout Fork Length (cm)	Age
9.5	0+
12.3	1+
12.3	1+
13.2	1+
14.0	1+
14.0	1+
14.3	1+
14.6	1+
15.2	1+
16.2	1+
16.3	1+
16.5	1+
17.3	1+
17.8	1+
19.1	1+
19.5	1+
26.1	2+

Salmon Fork Length (cm)	Age
5.0	0+
5.4	0+
5.9	0+
6.0	0+
6.2	0+
6.3	0+
6.5	0+
6.6	0+
6.6	0+
6.6	0+
6.8	0+
7.0	0+
7.9	0+
8.0	0+
11.0	1+
12.0	1+
12.3	1+
13.4	1+
13.5	1+

For inspection purposes only.
Consent of copyright owner required for any other use.

SITE E

Site Code	E
Date	04/09/2015
Grid Reference u/s	R 33683 04951
Grid Reference d/s	R 33716 04914
Site Photographs	
Width (m)	5
Depth (cm)	10-50
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Cobble 2. Sand 3. Gravel 4. Large rocks Heavy siltation

Flow Type	Riffle 50% Glide 45% Pool 5%
Instream Vegetation	Bryophyta 30% <i>Oenanthe crocata</i> <5%
Dominant Bankside Vegetation	Alder, Ash, Willow, Sycamore
Estimated Summer Cover of Stream by Bankside Vegetation	60%
Salmonid Adult Habitat	Good-Fair
Salmonid Nursery Habitat	Very Good-Good
Salmonid Spawning Habitat	Fair
Lamprey Nursery	Poor
Lamprey Spawning	Fair
Margaritifera Habitat	None
Crayfish Habitat	Fair
Water clarity	Clear
Fishing Time (min.)	25
Area fished (m ²)	375

Brown Trout Fork Length (cm)	Age
6.0	0+
6.0	0+
6.1	0+
6.7	0+
6.9	0+
7.0	0+
7.0	0+
7.1	0+
7.1	0+
7.2	0+

Brown Trout Fork Length (cm)	Age
7.2	0+
7.3	0+
7.3	0+
7.4	0+
7.5	0+
7.6	0+
7.7	0+
7.9	0+
8.0	0+
8.1	0+
8.5	0+
8.6	0+
8.8	0+
9.0	0+
9.1	0+
12.4	1+
13.9	1+
14.0	1+
14.2	1+
14.4	1+
14.4	1+
14.7	1+
15.0	1+
15.0	1+
16.1	1+
18.0	1+
20.5	2+
20.9	2+
21.0	2+
22.5	2+


For inspection purposes only.
Consent of copyright owner required for any other use.

Salmon Fork Length (cm)	Age
5.0	0+
5.6	0+
5.7	0+
5.8	0+
5.8	0+
5.9	0+
6.2	0+
6.3	0+
6.5	0+
6.6	0+
6.6	0+
6.7	0+
6.7	0+

Salmon Fork Length (cm)	Age
7.0	0+
7.0	0+
7.0	0+
7.1	0+
7.5	0+
7.6	0+
7.8	0+
8.0	0+
8.2	0+
8.3	0+
8.9	0+
11.6	1+
12.8	1+

*For inspection purposes only.
Consent of copyright owner required for any other use.*

SITE F

Site Code	F
Date	04/09/2015
Grid Reference u/s	R 34178 04560
Grid Reference d/s	R 34264 04598
Site Photographs	 <p style="color: red; transform: rotate(-45deg); opacity: 0.5; font-size: small;">Consent of copyright owner required for any other use.</p>
Width (m)	4-6
Depth (cm)	10-50
Substrate (order of dominance)	<ol style="list-style-type: none"> 1. Sand 2. Gravel 3. Cobble 4. Mud 5. Large rocks <p>Heavy siltation</p>

Flow Type	Riffle 30% Glide 60% Pool 10%
Instream Vegetation	<i>Ranunculus sp.</i> <1% <i>Callitriche sp.</i> <1%
Dominant Bankside Vegetation	Ash, Alder, Sycamore
Estimated Summer Cover of Stream by Bankside Vegetation	65%
Salmonid Adult Habitat	Good
Salmonid Nursery Habitat	Good
Salmonid Spawning Habitat	Fair
Lamprey Nursery	Poor
Lamprey Spawning	Fair
Margaritifera Habitat	None
Crayfish Habitat	Fair
Water clarity	Clear
Fishing Time (min.)	20
Area fished (m ²)	500

Brown Trout Fork Length (cm)	Age
6.3	0+
6.5	0+
6.6	0+
6.7	0+
6.9	0+
7.0	0+
7.0	0+
7.2	0+
7.2	0+
7.3	0+

Brown Trout Fork Length (cm)	Age
7.4	0+
7.5	0+
7.7	0+
7.8	0+
8.1	0+
8.5	0+
8.6	0+
8.9	0+
12.4	1+
12.5	1+
13.7	1+
13.8	1+
14.0	1+
15.5	1+
16.0	1+
16.3	1+
20.6	2+
25.0	2+
26.3	2+

Salmon Fork Length (cm)	Age
5.3	0+
5.4	0+
5.4	0+
5.5	0+
5.7	0+
5.7	0+
5.8	0+
5.8	0+
5.8	0+
5.9	0+
6.0	0+
6.0	0+
6.0	0+
6.1	0+
6.2	0+
6.2	0+
6.2	0+
6.3	0+
6.3	0+
6.3	0+
6.4	0+
6.5	0+
6.5	0+
6.6	0+

For inspection purposes only.
Consent of copyright owner required for any other use.

Salmon Fork Length (cm)	Age
6.8	0+
7.1	0+
7.3	0+
7.4	0+
7.7	0+
7.9	0+
8.2	0+
8.3	0+
10.9	1+
11.0	1+
11.8	1+
12.4	1+

Stone Loach Length (cm)
9.0

*For inspection purposes only.
Consent of copyright owner required for any other use.*

APPENDIX B

SALMONID CATCH PER UNIT EFFORT, MINIMUM DENSITY AND LENGTH FREQUENCY DISTRIBUTION GRAPHS

For inspection purposes only.
Consent of copyright owner required for any other use.

Fig. 1 Trout catch per unit effort

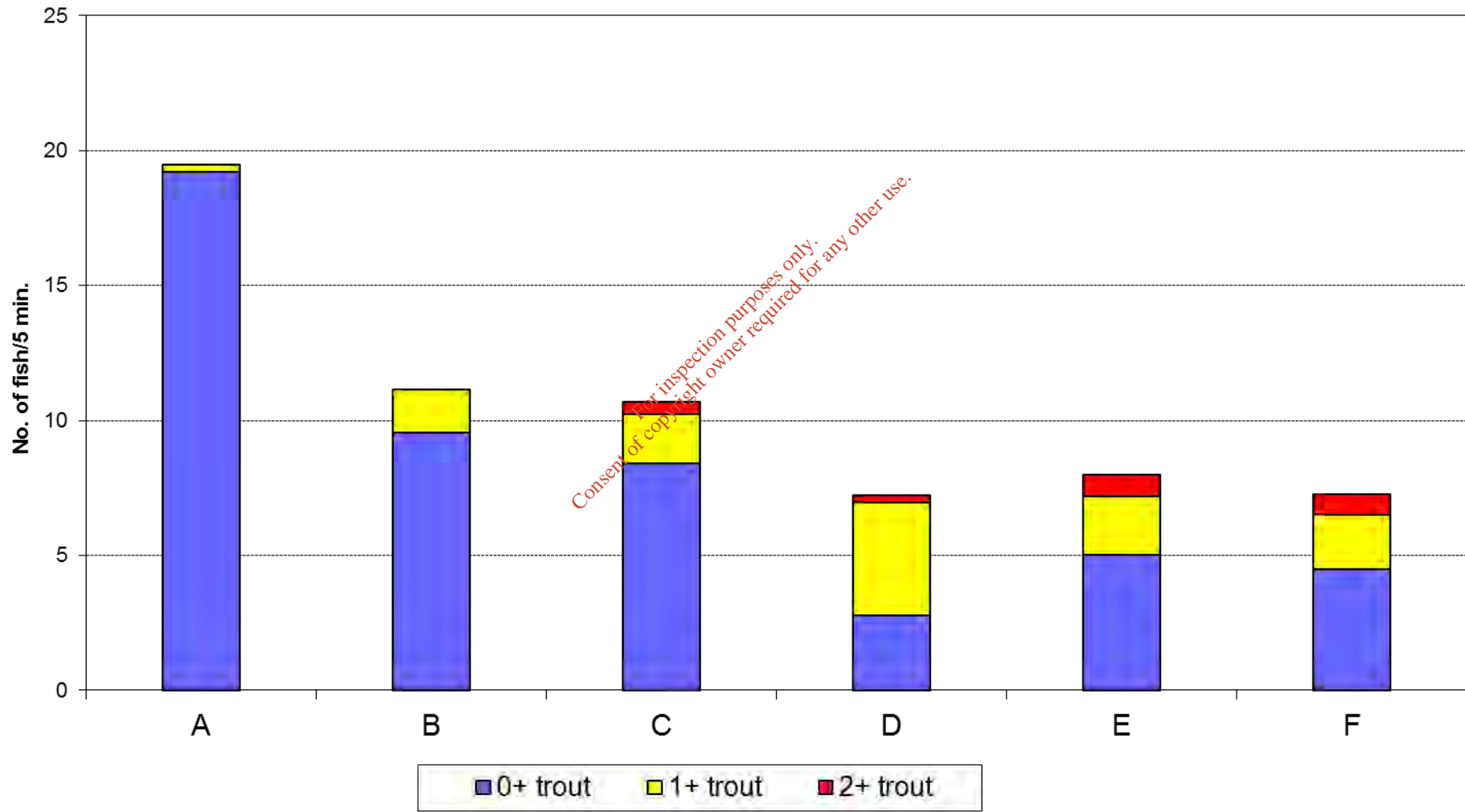


Fig. 2 Salmon catch per unit effort

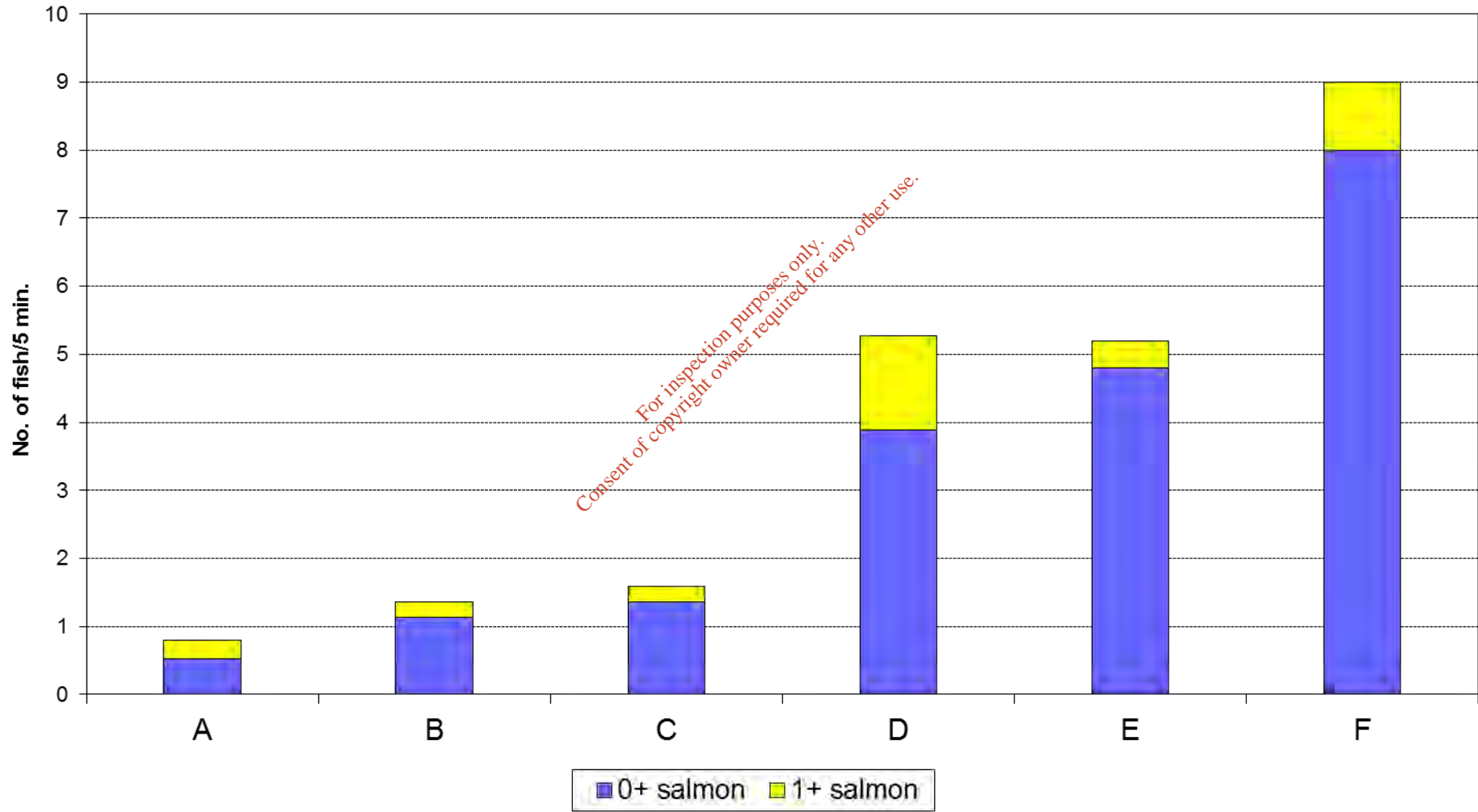


Fig. 3 Salmonid minimum density

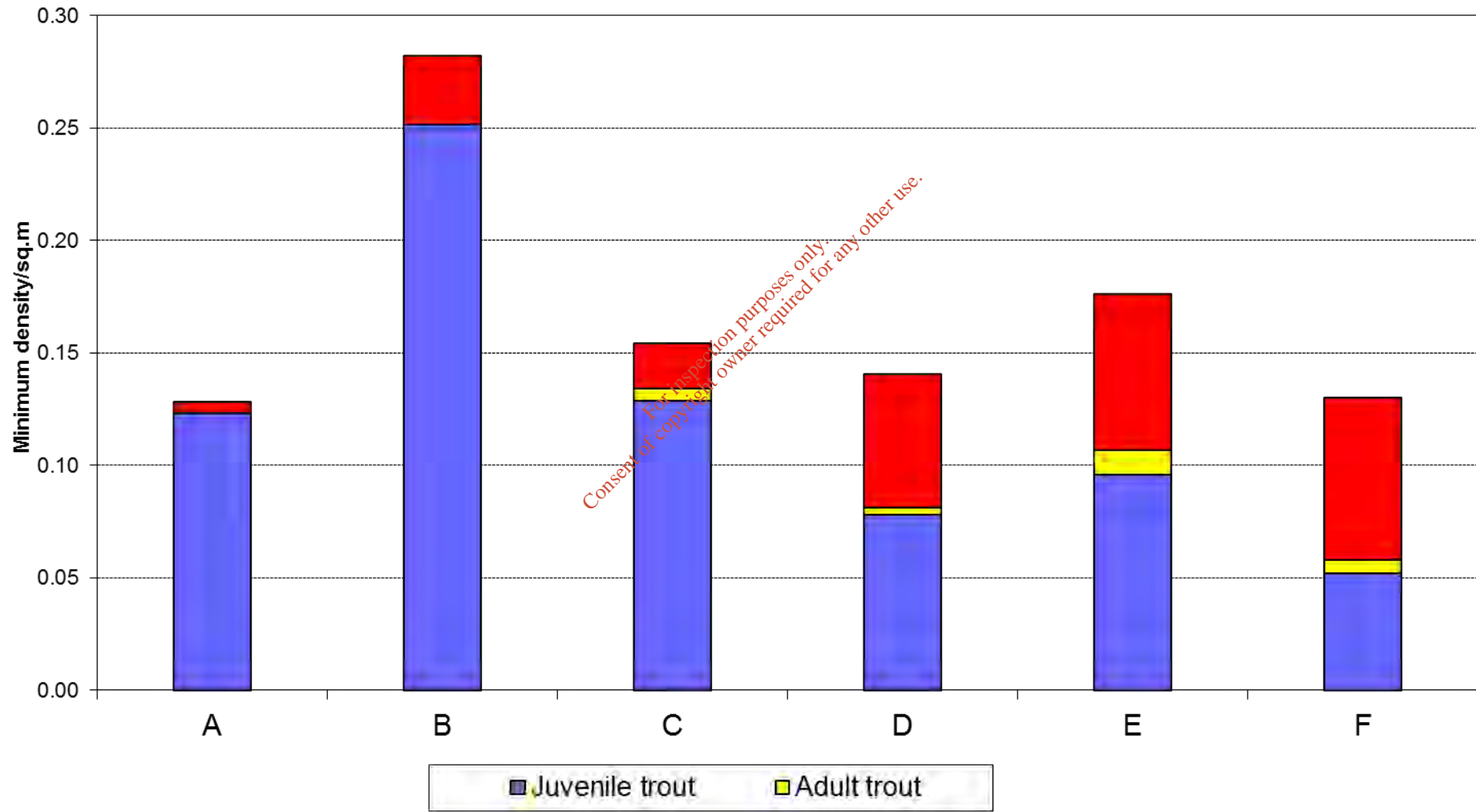


Fig. 4 Trout Length Frequency (All Sites)

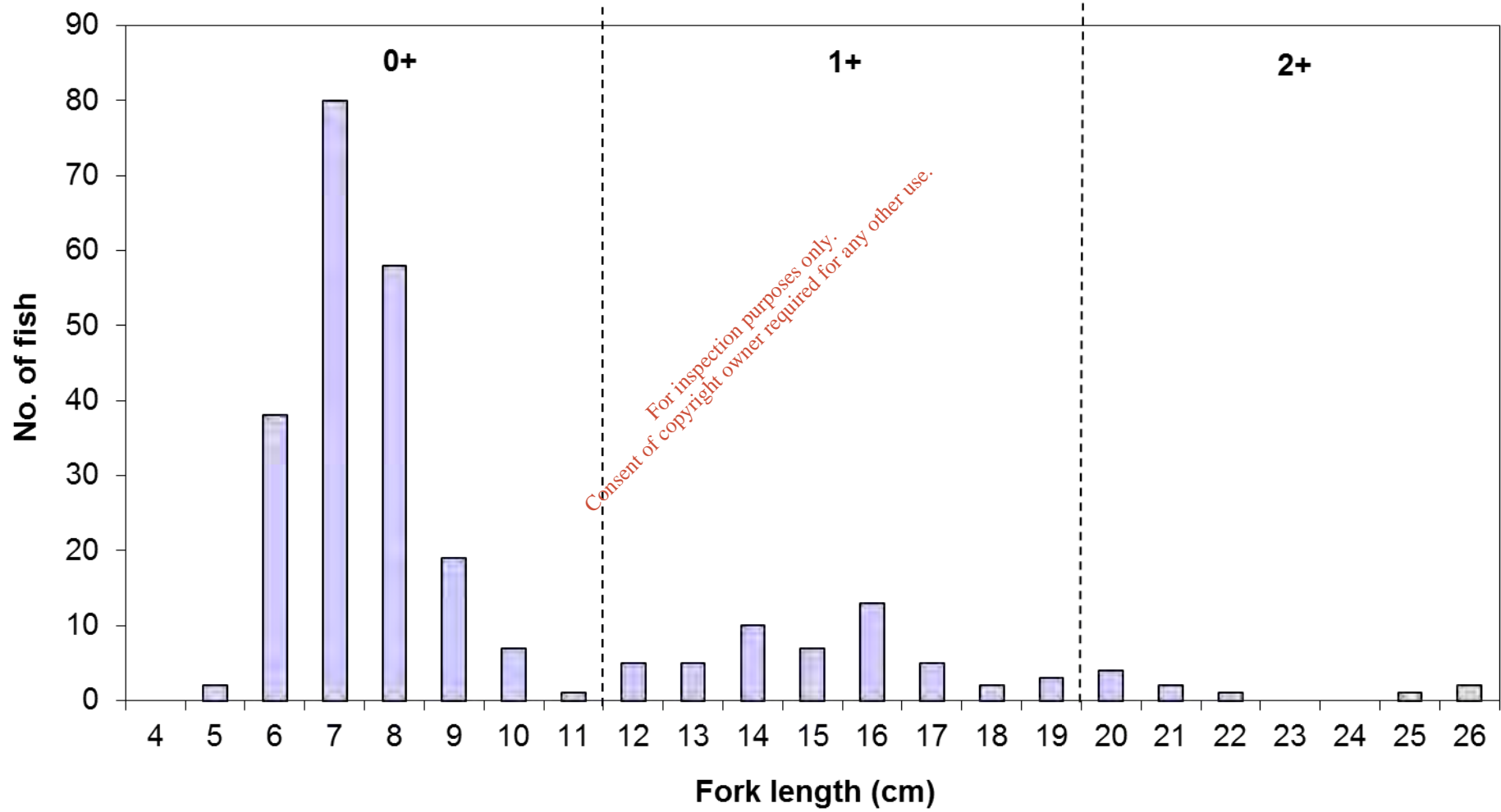
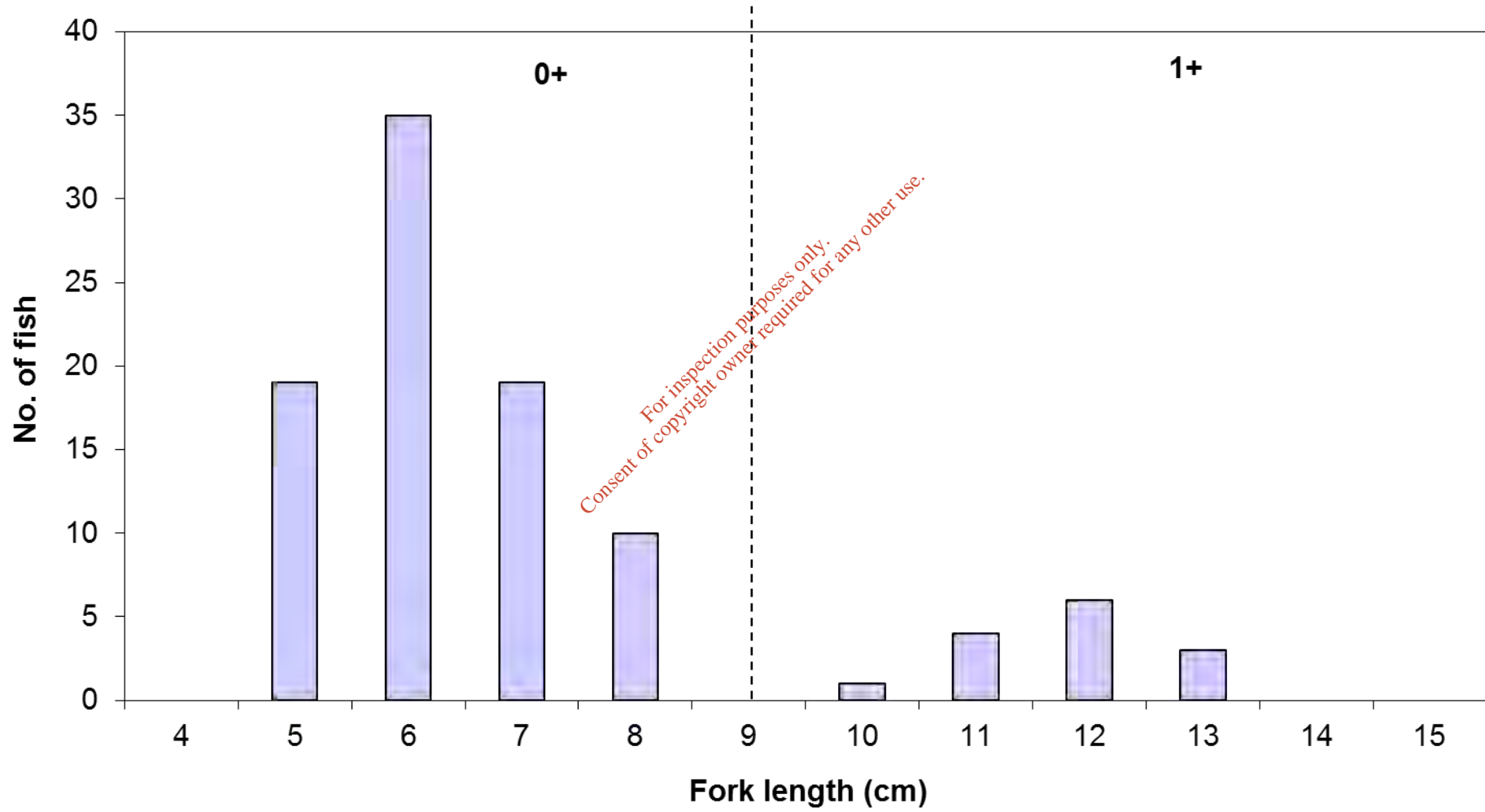


Fig. 5 Salmon Length Frequency (All Sites)



APPENDIX C

EPA BIOLOGICAL WATER QUALITY DATA FOR DALUA RIVER, ALLOW RIVER & BLACKWATER (MUNSTER) RIVER

For inspection purposes only.
Consent of copyright owner required for any other use.

River and Code: **DALUA**

18D01

Tributary of: 18A02 ALLOW

OS Catchment No: 190

OS Grid Ref of confluence: R 382 032

Date(s) Surveyed: 31/12/1981, 31/12/1986, 31/12/1990, 31/12/1994, 31/12/1997, 10/8/2000, 11/8/2000, 27/8/2003, 10/8/2006, 11/8/2006, 29/7/2009, 30/7/2009, 13/8/2012, 14/8/2012, 20/8/2012

Station Nos.	Biological Quality Ratings (Q Values)									
	1981	1986	1990	1994	1997	2000	2003	2006	2009	2012
0050	-	-	4	4-5	4	4	3-4	3-4	4	4
0070	-	-	4	4-5	4	4	3-4	-	-	-
0100	5	5	4-5	4	3-4	4	4	-	-	-
0190	-	-	3/0	-	-	-	-	-	-	-
0200	4	4	3	4	3	3	3	-	4	4
0210	-	-	-	3	3	3	3	3-4	-	-
0300	5	5	4-5	4-5	4-5	4	4	4	4-5	4-5
0400	5	5	4-5	-	-	-	-	-	-	-
0500	5	5	5	4	4-5	3-4	4	4	4	4
0600	5	4	4-5	4-5	4-5	3	3-4	-	-	-

Assessment: Continuing satisfactory with Good and High ecological quality. . .

Station No.	Station Location	National	Grid Ref.	Discovery Series No.	County Code
		↓	Y		
0050	Br NE of Meengorman	128710	111961	72	CK
0070	Br at knockduff Lower	129089	110653	72	CK
0100	Aldworth Br	130403	107778	72	CK
0190	Anne's Br	131015	106672	72	CK
0200	0.3km d/s Anne's Br	131015	106672	72	CK
0210	0.3km d/s Anne's Br (LHS)	131015	106672	72	CK
0300	Foot-bridge SW of Liscongill	132477	104581	72	CK
0400	Allen's Br	134032	104426	72	CK
0500	Just d/s Owenare R confl	136564	104458	72	CK
0600	Foot-bridge in Kanturk	137903	103294	72	CK

River and Code: **ALLOW**

18A02

Tributary of: 18B02 BLACKWATER (MUNSTER)

OS Catchment No: 190

OS Grid Ref of confluence: W 385 988

Date(s) Surveyed: 31/12/1971, 31/12/1974, 31/12/1975, 31/12/1978, 31/12/1980, 31/12/1982, 31/12/1986, 31/12/1990, 31/12/1994, 31/12/1997, 27/7/2000, 28/7/2000, 12/6/2003, 10/8/2006, 9/8/2006, 22/7/2009, 14/8/2012

Biological Quality Ratings (Q Values)

Station Nos.	1971	1974	1975	1978	1980	1982	1986	1990	1994	1997	2000	2003	2006	2009	2012
0020	-	-	-	-	-	-	-	4-5	4-5	4-5	4-5	4-5	4	4	4
0100	5	-	5	5	5	-	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
0200	3-4	3-4	4	3	4	-	4	3	4	4	4	4	-	-	-
0300	4-5	3	4	3-4	4	4	4	4	4	4-5	4-5	4-5	4-5	4-5	4-5
0400	-	-	-	-	3-4	3-4	3-4	5	4-5	4-5	4-5	4	-	-	-
0490	-	-	-	-	-	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	4	4
0600	2	3	2-3	3-4	3-4	3-4	3-4	3-4	4-5	4	4	4	4	4	4

Assessment: Continuing satisfactory with High and Good ecological quality. .

Station No.	Station Location	National X	Grid Ref. Y	Discovery Series No.	County Code
0020	Br nr Rowls Aldworth	131300	116419	72	CK
0100	Raheen Br	136631	115606	72	CK
0200	Allow Br, Freemount	139292	113807	72	CK
0300	John's Br	139481	109832	72	CK
0400	0.5km u/s Kanturk Br	138173	103724	72	CK
0490	1.3km d/s Kanturk Br	138385	101989	72	CK
0600	Leader's Br	138494	98912	79	CK

For inspection purposes only. Consent of copyright owner is required for any other use.

River and Code: **BLACKWATER (MUNSTER)**

18B02

Tributary of:

OS Catchment No: 190

OS Grid Ref of confluence: X 098 997

Date(s) Surveyed: 31/12/1971, 31/12/1974, 31/12/1975, 31/12/1978, 31/12/1979, 31/12/1980, 31/12/1982, 31/12/1984, 31/12/1986, 31/12/1990, 31/12/1994, 31/12/1997, 11/9/2000, 12/9/2000, 13/9/2000, 14/9/2000, 15/9/2000, 18/8/2003, 19/8/2003, 20/8/2003, 21/8/2003, 22/8/2003, 25/8/2005, 24/7/2006, 25/7/2006, 26/7/2006, 2

Biological Quality Ratings (Q Values)

Station Nos.	1971	1974	1975	1978	1979	1980	1982	1984	1986	1990	1994	1997	2000	2003	2006	2007	2008	2009	2012
0050	5	-	5	-	-	-	-	-	-	4	4	4-5	4	3-4	3-4	-	-	4	4
0060	-	-	-	-	-	-	-	-	-	4	4	4	4	4	4	-	-	-	-
0075	-	-	4-5	-	-	-	-	-	-	4	4	4	4	3-4	3-4	-	-	4	4

0100	-	-	-	-	-	-	-	-	-	4	4	4	4	4	-	-	-	-	-
0200	5	-	5	5	-	5	-	-	4	4	4	4	4-5	4	4	-	-	4-5	4-5
0300	4-5	4-5	4	4-5	-	4-5	4-5	4-5	4-5	4	-	-	-	-	-	-	-	-	-
0400	3-4	3	1	3	-	4	3-4	2-3	3	3	4	3-4	4	3-4	3-4	-	-	4	4
0500	-	3-4	3-4	2-3	-	4	-	-	-	4	-	-	-	-	-	-	-	-	-
0600	4-5	4-5	4	4	-	4	-	4	4	4	4	4-5	4-5	4-5	4-5	-	-	4	4-5
0700	5	-	4-5	-	4	4	-	-	4	4	-	-	-	-	-	-	-	-	-
0750	-	-	-	-	-	-	-	-	-	-	4-5	4-5	4-5	4-5	4-5	-	-	4-5	4-5
0800	5	-	5	-	5	4	-	-	4	4	4	4	4-5	4	-	-	-	-	-
0810	-	-	5	-	5	4	-	-	2-3	4	4	4	4-5	4	-	-	-	-	-
0900	-	-	-	-	4-5	4	-	-	4	4-5	5	4-5	4-5	4	4-5	-	-	4-5	4-5
1000	5	-	5	-	5	5	-	-	4-5	4-5	4-5	4-5	4-5	4-5	4-5	-	-	4-5	4-5
1100	-	-	-	-	5	5	-	-	4-5	4	5	4-5	4	4-5	4-5	-	-	-	-
1200	5	-	5	-	4-5	5	-	-	4-5	4-5	4-5	4-5	4	4	4-5	-	-	4-5	4-5
1300	5	-	5	-	4-5	5	-	-	3-4	4	5	4-5	4	4	4	-	-	-	-
1400	5	5	5	4-5	-	5	4-5	4-5	4	4	4	4	4	4	4	-	-	4-5	4-5
1450	-	-	-	-	-	-	4	-	-	4	-	-	-	-	-	-	-	-	-
1460	-	-	-	-	-	3-4	3	-	3-4	3-4	-	-	-	-	-	-	-	-	-
1500	-	-	-	-	-	-	4	3	3-4	3	4	3-4	3-4	3-4	3-4	-	-	-	4
1510	-	3	4	3-4	-	3-4	3	3	3-4	3	4	3-4	3-4	3-4	3-4	-	-	3-4	4
1700	-	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-
1800	3	3	2-3	3	-	3	3	3	3	3	4-5	3-4	3-4	4	4	-	-	4	4
1900	4	3	3-4	3-4	-	3	3-4	3	3	3-4	4	3-4	3-4	4	4	3-4	4	4-5	4
2000	4	-	4	-	-	4	4	-	3-4	3-4	4-5	3-4	4	4	4	-	-	4	4
2100	4	-	4	-	-	4	3-4	-	3-4	4	-	-	-	-	-	-	-	-	-
2200	-	-	-	-	-	-	-	-	-	-	4	3	3	2	3	-	-	3	4
2210	-	-	-	-	-	-	-	-	-	-	4	3-4	3-4	4	4	-	-	4	4
2300	4	-	4	-	-	-	3-4	-	-	-	-	-	-	-	-	-	-	-	-
2400	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-
2450	-	-	5	-	-	4	4	-	4	-	4-5	4	3-4	4	3-4	-	-	4	4
2500	5	-	5	-	-	3-4	4	-	4	4	4	3-4	4	4	4	-	-	4	4
2600	-	-	-	-	-	4	-	-	4	3-4	4	4	4	4	4	-	-	4	4
2700	5	-	5	-	-	3-4	4	-	4	3-4	4	4	4	4	4	-	-	4	4

Assessment: Satisfactory throughout, with High and Good ecological quality, following improvement at Mallow and Fermoy. With the recent colonisation by crayfish, the Blackwater is now home to the two protected aquatic invertebrates - the other being the pearl mussel...

Station No.	Station Location	National X	Grid Ref. Y	Discovery Series No.	County Code
0050	Doctor's Hill Br	114486	106717	72	CK
0060	Kingwilliamstown Br	115164	103781	72	CK
0075	Newquarter Br	115294	100829	72	KY
0100	Lisheen Br	115976	97496	79	KY
0200	Nohaval Br	117274	94272	79	KY
0300	Duncannon Br	118006	93143	79	KY
0400	U/s Awnaskirtaun R confl	118644	93139	79	CK
0500	D/s Awnaskirtaun R confl	0	0	0	CK
0600	Shamrock Br	122125	93563	79	CK
0700	Charles' Br	124818	94397	79	CK
0750	Ford SW of Dromsicane	126834	92720	79	CK
0800	Keale Br (RHS)	129518	93541	79	CK
0810	Keale Br (LHS)	129518	93541	79	CK
0900	Colthurst Br	132816	95469	79	CK
1000	Ballymaquirk Br	138152	98787	79	CK
1100	1.5km d/s Ballymaquirk Br	139545	99251	79	CK
1200	Roskeen Br	144272	98875	80	CK
1300	Lombardstown Br	146412	96954	80	CK
1400	Longfield's Br	151654	97625	80	CK
1450	2km u/s Rly Br Mallow (LHS)	0	0	0	CK
1460	2km u/s Rly Br Mallow (RHS)	0	0	0	CK
1500	Rly Br, Mallow (LHS)	155040	97910	80	CK
1510	Rly Br, Mallow (RHS)	155040	97910	80	CK
1700	1.5km d/s Mallow Br	157538	98144	80	CK
1800	Ne of Ballymagooly	159473	99156	80	CK

1900	Killavullen Br	164841	99774	80	CK
2000	Ballyhooly Br	172905	98743	80	CK
2100	Cregg Castle	177904	98435	80	CK
2200	Br in Fermoy (LHS)	181219	98556	81	CK
2210	Fermoy Br (RHS)	181227	98557	81	CK
2300	2km d/s Fermoy Br	182523	99572	81	CK
2400	Careysville	185560	99575	81	CK
2450	W of Kilmurry South	187495	99578	81	CK
2500	Ballyduff Br	196540	99120	81	WD
2600	Lismore Br	204832	98762	81	WD
2700	2km d/s Lismore Br	206647	98827	81	WD

*For inspection purposes only.
Consent of copyright owner required for any other use.*

APPENDIX D

NPWS SUBMISSIONS OF 4th DECEMBER 2015 AND 8TH FEBRUARY 2016

*For inspection purposes only.
Consent of copyright owner required for any other use.*



**An Roinn
Ealaíon, Oidhreachta agus Gaeltachta**
**Department of
Arts, Heritage and the Gaeltacht**

Our Ref: G Pre00291/2015

04 December 2015

OES Consulting
FBD House
Fels Point
Tralee
Co Kerry

Via email: david.heelan@oes.ie

Re: Pre-planning enquiry - Newmarket cheese plant

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to your consultation letters of 14 and 28 September 2015 with regard to the above proposed development, and the meeting between Kerry Group, OES Consulting and the NPWS in Newmarket on 24 September 2015.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Nature Conservation

The proposed upgraded WWTP would discharge into the River Dalua part of the Blackwater River (Cork/Waterford) candidate Special Area of Conservation (cSAC) (2170), designated under the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997) as replaced by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The cSAC was designated for a number of habitats and species, including the freshwater pearl mussel which has very high water quality requirements. The conservation objectives for this site are available in NPWS (2012) at

http://www.npws.ie/sites/default/files/protectedsites/conservation_objectives/CO002170.pdf

Guidance and legislation relating to appropriate assessment and EIA can be found on the websites of the NPWS and the Department of the Environment, Community and Local Government.

Effects on freshwater pearl mussel – downstream target population

It is currently a conservation target to maintain the distribution of the freshwater pearl mussel within the downstream Rivers Allow and Blackwater (see green-marked channel in Map 8 in NPWS 2012 (ref. above)). Note that this conservation target does not apply to the River Dalua. Therefore, effects in the River Dalua should be assessed for salmonid water quality, with salmon habitat as the target.

The conservation target to maintain the distribution of freshwater pearl mussel, and to restore suitable habitat for this species, applies to the population downstream in the main channel of the

River Blackwater, not to the stretch of the River Allow between the confluence of the Dalua and the confluence of the Allow with the Blackwater. As you mention, the draft Allow River sub-basin management plan refers to a comprehensive survey of this section of the river found no mussels and recorded very poor habitat conditions.

The current conservation targets, therefore, relating to the objective to restore the favourable conservation condition of freshwater pearl mussel in the cSAC, apply, for the purpose of your assessment, to the subpopulation just below the Allow confluence. A further survey of the Allow River is not required for the assessment.

Effects on freshwater pearl mussel – phosphate concentrations

The Fourth Schedule of the Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I. No. 296 of 2009) cites five ecological quality objectives for freshwater pearl mussel habitat. The NIS must establish whether these can be met with the discharge from the proposed facility, in combination with other best-practice discharges in the catchment. This is especially so in terms of orthophosphate which leads to reduced EQR (ecological quality ratio), and in some cases filamentous algal growth. These are the same objectives as the conservation objectives for the site (pp. 15-16 in NPWS 2012).

Juvenile freshwater pearl mussels require an extremely low concentration of phosphate in the interstitial water in which they live. According to the Freshwater Pearl Mussel Sub-basin Management Plans Literature Review (May 2010, Subsection 3.1.13), "...the normal background ortho-phosphate level of 0.005 mg/l P is considered to be essential to the maintenance of oligotrophic waters for reproducing pearl mussel rivers (Moorkens, 2006a)."

Pipeline and outfall in the River Dalua (east of Allen's Bridge)

Conservation issues that the Natura Impact Statement (NIS) should assess here include:

- Effects on otter habitat, in particular breeding habitat and resting places (note that a Regulation 54 derogation licence will be required if breeding sites or resting places of otter are damaged or if there is deliberate disturbance of otters during periods of breeding or rearing);
- Effects on water crowfoot / starwort vegetation, if this occurs at or significantly downstream of the discharge point (this would need to be assessed before winter high water levels);
- Effects on salmon and lamprey (brook/river) spawning habitat;
- Effects on silty sediment habitat of juvenile lamprey (brook/river);
- Effects on alluvial forest habitat (91E0), if this occurs downstream of the discharge point;
- Effects of potential introduction of invasive aquatic and riverbank plants during construction;
- Effects of the discharge on erosion, sedimentation and scouring in the river;
- Effects on nutrient enhancement on the macroinvertebrate fauna on the river at and downstream of the discharge point;
- Effects of silt, fresh cement and oils from construction works.

Conservation issues that the Environmental Impact Statement (EIS) should address here (not exclusive) include:

- Effects on badgers which may have breeding sites or resting places (setts) along the route of the pipeline);
- Effects on breeding kingfisher, a Birds Directive Annex 1 species;
- Effects on breeding river birds (e.g. grey wagtail, an amber listed species).

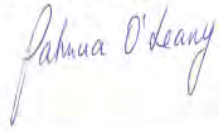
The Department wishes to apologise for the delay in sending this response to your consultation.

You are requested to send further communications to Development Applications Unit (DAU) via email to manager.dau@ahg.gov.ie; if emailing is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas



Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482

*For inspection purposes only.
Consent of copyright owner required for any other use.*



An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Our Ref: G Pre00291/2015 Letter 2 of 2

08 February 2016

OES Consulting
FBD House
Fels Point
Tralee
Co Kerry

Via email: david.heelan@oes.ie

Re: Pre-planning enquiry - Newmarket cheese plant

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to the Department's letter of 4 December 2015 in response to your consultation letters of 14 and 28 September 2015 with regard to the above proposed development, and the meeting between Kerry Group, OES Consulting and the NPWS in Newmarket on 24 September 2015.

Nature Conservation

The conservation objective relating to freshwater pearl mussel in the Blackwater River (Cork/Waterford) candidate Special Area of Conservation (cSAC) (2170) will be changed, and will no longer relate to the main channel of the Munster Blackwater River. It will, however, still relate to the River Allow. As a consequence, the advice in the Department's letter of 4 December 2015, concerning the main channel of the Munster Blackwater under the headings 'Effects on freshwater pearl mussel', no longer applies.

You are requested to send further communications to Development Applications Unit (DAU) via email to manager.dau@ahg.gov.ie. If emailing is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas

Patricia O'Leary

Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482

*For inspection purposes only.
Consent of copyright owner required for any other use.*

For inspection purposes only.
Consent of copyright owner required for any other use.

APPENDIX 2

ASSESSMENT OF THE POTENTIAL IMPACT OF THE PROPOSED UPGRADING OF WASTE WATER TREATMENT AND DISCHARGE SYSTEMS AT NEWMARKET CO-OPERATIVE CREAMERIES LTD. ON CHEMICAL WATER QUALITY OF THE RECEIVING WATERS

OES Consulting

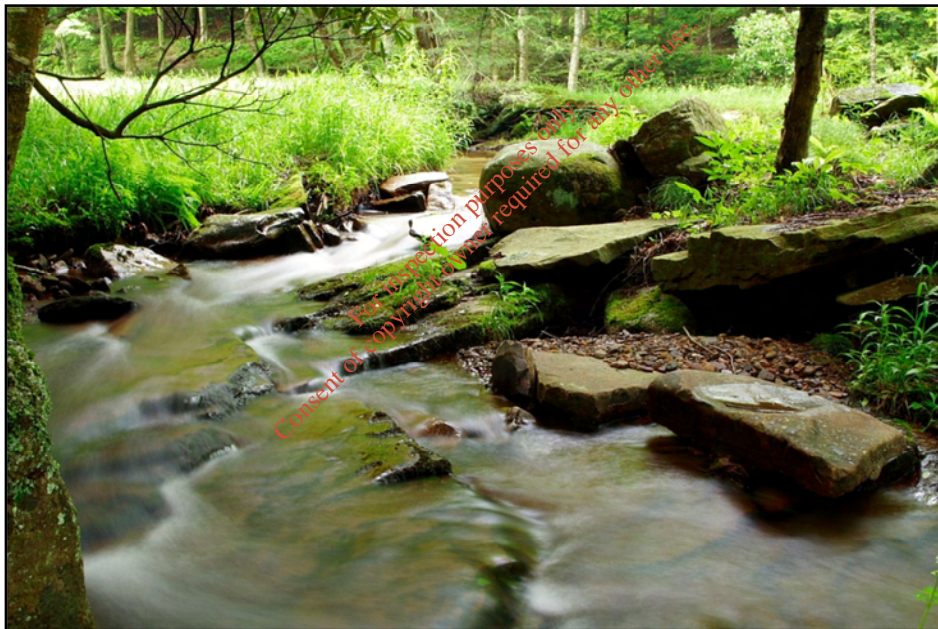
FBD House, Fels Point, Tralee, Co. Kerry

*For inspection purposes only
Consent of copyright owner required for any other use*



Newmarket Co-Operative Creameries Ltd.

Scarteen Lower, Newmarket, Co. Cork
Industrial Emissions Licence Reg No P0793-02.



Impact Assessment of Upgrade Works to WWTP and Increased Discharge to the River Dalua

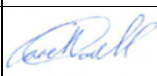
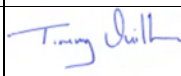
February 2016



Unit 2E, Liber House, Monavalley
Tralee, Co Kerry
LoCall 1890 130 007

OES Consulting
Anfield House, Unit D
Baldonnell Business Park, Dublin 22
www.oes.ie

Control Sheet

Document Title:		Impact Assessment of Upgrade Works to WWTP and Increased Discharge to the River Dalua		Document No.	R1_116031
Rev	Description	Originator	Reviewer	Change	Date
00	Draft	GC	TQ	Draft	22/12/2015
01	Final			Final	08/02/2016

This report is produced solely for the benefit of Newmarket Co-Op and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing. This report refers, within the limitations stated, to the data source available and relied upon at the time of undertaking the impact assessment.

For inspection purposes only.
Consent of copyright owner required for any other use.

Newmarket Co-Op

Impact Assessment of Treated WWTP Discharge to the River Dalua

Contents

1. Introduction	1
1.1 Background to Assessment	1
1.2 Statutory Requirements	2
1.3 Current Discharges to Water	2
2. Methodology	3
2.1 Impact Assessment Methodology	3
2.1.1 Model Assessment Input Criteria	4
2.1.2 Assessment Standards	4
3. Baseline Description of Existing Conditions	5
3.1 Receiving Water Body (Morphology)	5
3.2 River Basin Management Requirements	6
3.3 Ecological Designations	6
3.4 River Water Quality	7
4. Assimilative Capacity Assessment	8
4.1 Background Data	8
4.2 Assimilative Capacity –R. Dalua	9
4.3 Proposed Amendments to Discharge Characteristics	9
4.4 Predicted Impact	9
4.5 Predicted Impact – Blackwater	10
5. Assessment of Impacts (Construction and Operational)	12
5.1 Construction Phase	12
5.1.1 Phase 1 (WWTP)	12
5.1.2 Phase 2 (Underground Pipeline)	12
5.2 Operational Phase	13
5.2.1 BOD	13
5.2.2 Orthophosphate	14
5.2.3 Ammonia	14
5.2.4 Nitrate	14
5.2.5 Suspended Solids	14
6. Proposed Mitigation and Enhancement Measures	15
6.1 Construction Phase	15
6.2 Operational Phase	17
7. Summary and Conclusion	17

Attachments

Attachment 1	Figure 1 Proposed Site Plan Figure 2 Proposed Pipeline Route Figure 3 Current Emission Point Locations Figure 4 EPA Biological Water Quality Stations
Attachment 2	River Dalua and River Blackwater Water Quality Data Summary
Attachment 3	EPA Hydrotool Report

*For inspection purposes only.
Consent of copyright owner required for any other use.*

1. Introduction

Newmarket Co-Operative Creameries Ltd (Newmarket Co-Op) engaged OES Consulting to undertake an impact assessment on proposed development which includes an upgrade to the Waste Water Treatment Plant (WWTP) and relocation of the outfall point for treated effluent discharged from the site. Newmarket Co-Op has already applied to the Environmental Protection Agency for an amendment of the emission limit values associated with the discharge of treated effluent in the site Industrial Emissions Licence (P0793-02).

The purpose of the onsite Waste Water Treatment Plant (WWTP) is to treat process wash waters generated from the milk processing activity on the site. Currently the treated effluent from the WWTP is discharged from emission point SW-1 to the River Dalua via the Rampart stream. The proposed relocation of the outfall will be facilitated by the installation of an underground pipeline and will ensure that the physical location of the outfall is consistent with the location referred to in the current IE Licence.

The impact of the proposed amendments to the discharge emission limit values at SW-1, upgrade works to the WWTP and the relocation of the discharge point will be assessed.

1.1 Background to Assessment

The facility has been licensed by the Environmental Protection Agency (EPA) since September 2009 (IPPC Licence Reg.No. P0793-01) and in June 2011 the EPA initiated a review of the facilities licence to ensure compliance with the EC Environmental Objectives (Surface Waters) Regulations 2009 S.I. 272 of 2009. A revised licence was issued by the EPA in May 2012(IPPC Licence Reg.No. P0793-02).

Due to proposed amendments to milk processing operations on the site which will see milk being processed over 7 days and a broadening of the peak processing period across the year, the facility is proposing to modernise the WWTP and ensure efficient treatment of wastewaters.

The development works at the WWTP will involve the construction of concrete tanks to provide treatment based the existing treatment concept (Extended Aeration Activated Sludge Plant complete with anaerobic zone and anoxic zones for biological phosphorous and nitrogen removal and aeration zone for BOD removal). A plan of the proposed upgrades is provided in Figure 1 of Attachment 1.

The development works will also include the installation of an underground pipeline to convey treated wastewater from the facility to a discharge point on the River Dalua, approximately 4 kilometers (km) to the south east of the facility. It is noted that the River Dalua is considered the receiving water in the facility's current industrial emissions license. A plan of the proposed pipeline route is included in Figure 2 of Attachment 1.

In order to establish the ability of the water course to accept a discharge of treated effluent, the assimilative capacity at the point of discharge has been established. Background water quality data was obtained from EPA datasets and additional information was provided by Cork County Council. The flow conditions in the watercourses were obtained from nearby hydrometric stations and using the EPA Hydrotool for estimation of flow in ungauged catchments.

1.2 Statutory Requirements

The assessment has taken due regard to the water quality requirements of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272 of 2009) to ensure that the receiving water quality is not impaired by the discharge from Newmarket Co-Op.

1.3 Current Discharges to Water

Newmarket Co-Op discharge surface water runoff, cooling water and treated process effluent to surface water. All of the discharge points from the site are included in the facilities IE licence.

Emission point reference SW-1 relates to the discharge of treated effluent and discharge point SW-2 is a discharge of cooling water and surface water. Both of these emission points are subject to continuous monitoring in respect of volume and quality. The remaining discharges (SW3-12) from the site are associated with roof and yard areas arising as a result of rainfall. These discharge points are not monitored directly due to their inaccessibility and with agreement of the Agency, monitoring of surface water quality is based on samples taken upstream and downstream of the facility.

The waste water treatment plant currently consists of balance tanks, dissolved air floatation (DAF) unit, bio- tower, an anoxic tank, oxidation ditch, phosphate reduction dosing, clarifier and sand filters. The facility also has a sludge treatment process for removing excess water from wasted activated sludge. Sludge is removed off site by an approved contractor and is sent for land spreading/composting once treated.

It is noted that the surface water from the carpark area of the site passes through a Class 1 bypass separator prior to discharge to surface water (Mill Race).

The current IE Licence Limit values assigned to emission point SW-1 are presented in Table 1. The location of the current emission point can be seen in Figure 3 of Attachment 1.

Table 1: Emission Limit Values (SW-1)

Emission Point Reference No.: SW-1
 Name of Receiving Water: River Dalua (via Rampart Stream)
 Monitoring Location: 132082E 107452N
 Volume to be emitted: Maximum in any one day: 2000m³
 Maximum rate per hour: 100m³

Parameter	Emission Limit Value	
Temperature	25 °C (Max)	
pH	6-9	
Toxicity	5 TU	
	mg/l	Kg/day
BOD	10	10
COD	50	50
Suspended Solids	15	15
Total Nitrogen (as N)	20	20
Nitrates (as N)	15	15
Ammonia (as N)	0.5	0.50
Molybdate Reactive Phosphate	0.5	0.50
Total Phosphorous (as P)	1	1
Oils, Fats and Greases	10	10

2. Methodology

2.1 Impact Assessment Methodology

The impact assessment methodology is based on a determination of the available assimilative capacity in the River Dalua for the pollutants of concern which are discharged from the site. In addition, an assessment (mass balance) was undertaken to establish the maximum downstream concentration of pollutants of concern and specifically those specified in S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009

The methodology used to determine the assimilative capacity is based on the following:

$$\text{Assimilative capacity} = (C_{\text{max}} - C_{\text{back}}) \times F_{95} \times 86.4 \text{ kg/day}$$

Where:

C_{max} = maximum permissible concentration (EQS – 95%ile value) (mg/l)

C_{back} = background upstream concentration (mg/l mean value)

F₉₅ = the 95%ile flow in the river (m³/s)

Note: (60x60x24)/1000 = 86.4

The output of the calculation of assimilative capacity is the total mass of the pollutant which can be discharged to a watercourse.

In order to work out a mass balance for the discharge, a mixing model is used, this based on the following calculation:

$$C_{\text{final}} = \frac{(C_{\text{back}} * F_{\text{river}}) + (C_{\text{discharge}} * F_{\text{discharge}})}{(F_{\text{river}} + F_{\text{discharge}})}$$

Where:

C final = Resultant concentration after discharge (mg/l)

C back = Background (u/s) concentration in river (mg/l)

F river = Flow in River (m³/s)

C discharge = Maximum concentration in discharge (mg/l)

F discharge = Flow of discharge (m³/s)

The output of this assessment for each parameter (C final) can be compared against the target values set out in the regulations (S.I. 272 of 2009).

The input parameters required for the assessment are set out in section 2.1.1.

2.1.1 Model Assessment Input Criteria

In order to carry out the impact assessment, background water quality and flow in the receiving water are required. In assessing discharges to waters the EPA has specified the following requirements:

- C back, the background concentration of the emission to be assessed in the receiving water is to be taken as the mean river from records at a point upstream of the discharge point.
- F river, the flow of the receiving water is to be taken as the 95%ile flow in receiving water.
- C discharge and F discharge is to be taken as the maximum discharge volume and concentration from the assessed discharge point.

2.1.2 Assessment Standards

In assessing the impact of the discharge against BOD, Ammonia and Orthophosphate requirements of S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009, the target level to be achieved is the 95%ile concentration value, whilst the model is set up as outlined in 2.1.

The 95%ile BOD, Orthophosphate and Ammonia target concentrations are provided in Table 2.

Table 2. 95%ile BOD, Ammonia and Orthophosphate for 'Good' Status River

Parameter	95%ile (mg/l)
BOD	2.6
Ammonia (as N)	0.140
Ortho P	0.075

Nitrate and Suspended Solids have also been included in the impact assessment of the wastewater treatment plant discharge. Nitrate, a nutrient in surface water systems, is used to assess the ecological status of a water body. Although no target concentration has been identified for nitrate in SI 272 of 2009, a criteria used to assess nitrate target concentration has been derived for high and good status surface waters (source 2012 EPA Integrated Water Quality Report – Monaghan Louth 2011). Mean and 95%ile nitrate target standard of for good status waters has been developed as 1.8mg/l and 2.7mg/l NO₃-(as N) respectively.

In the case of suspended solids, the River Dalua does not fall within the scope (not listed in Schedule I) of the European Communities (Quality of Salmonid Waters) Regulations 1988, (S.I. 293 of 1988). However, the River Blackwater is included in the Regulations. The Quality of Salmonid Waters Regulations set the only legislative benchmark for which suspended solids can be assessed against.

Irrespective of the non-inclusion of the River Dalua within Schedule I, given that the Dalua is a tributary of the Blackwater the target concentration for suspended solids set out in the Quality of Salmonid Waters is used in this assessment.

3. Baseline Description of Existing Conditions

A summary of the receiving environment including river morphology, designations, quality and targets are provided in the following sections.

3.1 Receiving Water Body (Morphology)

The receiving water body for the discharge from SW-1 is the River Dalua in the sites current IE license. Currently, the discharge is conveyed to the Dalua through a short stretch (~60m) of a man made channel (historical mill race) and then into the Rampart Stream which meets the River Dalua approximately 3.5 kilometres south of the town of Newmarket. The proposed development will see the installation of an underground pipeline which will convey the treated water directly to the River Dalua.

The River Dalua flows into the River Allow in Kanturk, Co Cork approximately 11 kilometres downstream of the Newmarket Co-Op facility. The River Allow then converges with the River Blackwater, at a point approximately 2 Kilometres North of Banteer, County Cork.

3.2 River Basin Management Requirements

The Newmarket Co-Op facility is located in the South Western River basin and as a result falls under the South Western River Basin Management Plan. This plan was developed by the South Western Regional Fisheries Board, which is coordinated by Cork County Council. The river basin management plan sets out a framework for achieving the targets set out under the Water Framework Directive through Water Unit Action Plans. The current plan runs from 2009 to 2015 and is currently under review, the revised plans are not due to be published until 2017, and will run from 2017 to 2021.

A target of 'Good Ecological Status' has been assigned to the River Dalua in the Water Unit Action Plan (WMU).

Due to the presence of Freshwater Pearl Mussel populations in the River Allow and Blackwater, a sub region Management Plan has been established for the catchment in which the Newmarket Co-Op facility is located. The management plan currently available is the Freshwater Pearl Mussel Second Draft Allow Sub-Basin Management Plan (March 2010).

3.3 Ecological Designations

The Blackwater River is a designated Special Area of Conservation (SAC) (assigned Site Code 002170), draining a large proportion of County Cork including five ranges of mountains. The SAC encompasses the River Dalua. The Blackwater SAC commences in the River Dalua 5 kilometres north of the facility and west of the village of Meelin and extends over the entire watercourse.

The site is assigned SAC status on the basis of the presence of alluvial wet woodlands, and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, Salicornia mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive.

The site is also selected for the following species listed in Annex II of the Directive-Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the Killarney Fern.

The SAC is noted as supporting a number of protected bird species including wintering waterfowl and other bird species such as Heron, Cormorant, Mute Swan and Long-eared Owl.

Maintaining the nutrient balance within watercourses discharging to the SAC form an integral part of ensuring species diversity is not impacted.

It is noted that in the context of the review of the discharge licence undertaken by the Agency in 2011, the current discharge from Newmarket Co-Op was not considered to have a significant impact on the Blackwater SAC.

3.4 River Water Quality

Historically, water quality monitoring has been undertaken by Cork County Council in the River Dalua as part of routine monitoring and also in the implementation of SI No. 258/1998-Local Government (Water Pollution) Act, 1977 (Water Quality for Phosphorous) Regulations, 1998. However, these Regulations have now been revoked by S.I. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations which drive the implementation of the Water Framework Directive.

The Water Framework Directive (environmental legislation which requires watercourses to achieve at least 'Good' status by 2015) has been established to ensure that all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats are protected. The Surface Water Regulations (S.I. 272 of 2009) set out the biological and chemical criteria to be achieved to ensure the watercourses achieve the objectives set by the Water Framework Directive (WFD).

In order to monitor the status of surface watercourses with regard to the requirements of the (WFD) water quality surveillance sites have been established and are routinely monitored by the EPA for biological and chemical elements (Cork County Council undertake some chemical sampling and analysis and results are provided to the EPA for review and compilation to the WFD compliance file).

It is noted that the objective for the River Dalua is to achieve 'Good Ecological Status' by 2021. Surveillance monitoring is typically undertaken every two years by the Agency and the most recent data (2012 monitoring) determined water quality to be at Good Ecological Status (Q4). Furthermore, biological water quality monitoring undertaken by Conservation Services in November 2015 determined that biological water quality was to be at High Ecological Status (Q4-5) in the River Dalua, 2km downstream of confluence with Rampart Stream and proposed discharge location.

A map showing the location of EPA biological water quality surveillance sites and their accompanying status is illustrated on Figure 4 of Attachment 1.

Physiochemical monitoring is also undertaken in the River Dalua by the EPA and Cork County Council. The mean of BOD, ammonia and orthophosphate results from records obtained from the EPA are presented in the Table 3 below (record period January 2010 to December 2014).

Table 3. Physiochemical Water Quality Results River Dalua (Location Reference Point 18D01_0200) (Footbridge South West of Lisconghill)

Parameter	Mean (mg/l)	Mean Surface Water Targets S.I. 272 of 2009
BOD	1.2800	2.6
Ammonia (as N)	0.0295	0.065
Orthophosphate	0.0214	0.045

4. Assimilative Capacity Assessment

The assimilative capacity assessment and results are presented in the following sections. The assessment is focussed on the oxygenation, nutrients and suspended solids associated with the discharge.

4.1 Background Data

The background conditions used for water quality have been obtained from monitoring results generated at an EPA surveillance site in the River Dalua upstream of the discharge from Newmarket Co-op. The reference for the monitoring point is 18D01_0200.

Mean quality data for orthophosphate, BOD and ammonia is provided in Table 4 below. The mean results have been developed from records provided by the EPA from January 2014 to October 2014. The records obtained are appended as Attachment 2.

Table 4. Mean BOD, Ammonia & Orthophosphate Reference Point 18D01_0200) (Footbridge Southwest Lisconghill)

Parameter	Mean (mg/l)
BOD	1.280
Ammonia (as N)	0.0295
Orthophosphate	0.0214

Nitrate analysis records were not available on the sampling dates used to derive the mean BOD, Ammonia, and Orthophosphate concentrations in Table 3. However, nitrate analysis undertaken at the monitoring point between August 2008 and September 2011 has been reviewed to provide an indicative background concentration. Using this data, the background nitrate concentration was found to be 0.9mg/l nitrate (as N).

With respect to suspended solids, neither Cork County Council nor the EPA undertake suspended solids analysis in the River Dalua. However a past sampling and analysis campaign undertaken by Newmarket Co-Op found suspended solids to be 2mg/l or <2mg/l. Due to the limited nature of this dataset and likely fluctuation of suspended solids concentration during flood events this data may not be representative of background conditions. A conservative approach has been adopted in identifying a background value for suspended solids where half the mean (25mg/l target value) as set out in the European Communities (Quality of Salmonid Waters) Regulations, 1988 (SI.293 of 1988) is assumed.

As there is no active hydrometric station on the River Dalua, the EPA hydrotool was used to determine the 95%ile flow in the receiving water. Using the tool, it was estimated that the 95%ile flow rate is 0.268m³/s. A copy of the report is presented in Attachment 3.

4.2 Assimilative Capacity –R. Dalua

The assimilative capacity of the River Dalua at the proposed discharge point was calculated using the method described in section 2.1.

The available assimilative capacity for Ammonia, BOD and Orthophosphate has been calculated as 2.56kg, 59.71kg and 1.25kg respectively. Although based on assumed background levels, the assimilative capacity of suspended solids and nitrate has been calculated as 289.4 kg and 41.7kg respectively.

4.3 Proposed Amendments to Discharge Characteristics

The proposed emission limit values associated with the discharge volume to the River Dalua is presented in Table 5. The location of the proposed emission point can be seen in Figure 2 of Attachment 1.

Table 5. Requested Emission Limit Values at New Emission Point

Parameter	Requested ELV	
Volume	20 m ³ /hr	
	2700 m ³ /day	
Parameter/Units	mg/l	Kg/d
BOD	10	20
COD	75	202.5
Suspended Solids	15	40
Total Nitrogen (as N)	20	40
Nitrates (as N)	15	30
Ammonia (as N)	0.75	1.22
Molybdate Reactive Phosphate	0.5	0.86
Total Phosphorous (as P)	1	2
Oils, Fats and Greases	10	20

The ELV's identified in the table above, are presented as both concentration levels and mass emissions of BOD, Ammonia, Orthophosphate, Nitrate and Suspended Solids representing 33%, 47%, 66%, 71% and 14% respectively of the available assimilative capacity in the receiving watercourse. It is noted that the assimilative capacity used up by the Newmarket Co-Op discharge is based on an extreme worst case scenario where the site is discharging at its limit during low river flow, in practice this is unlikely to occur.

It is noted that final ELV's will be provided by the Agency once they have undertaken their own assessment on the discharge.

4.4 Predicted Impact

The predicted downstream concentration of BOD, Ammonia and Orthophosphate from the Newmarket Co-Op facility was determined using the method described in section 2.1, the results are presented in Table 6. Predicted nitrate and suspended concentrations are also included in the assessment. It is

noted that the assessment is based on the discharge being emitted at the maximum proposed emission limit values.

Table 6. Predicted Maximum Downstream Concentration

Parameter	Predicted Concentration @ 95%ile flow	*95%ile Target Concentration (mg/l)	Compliant
BOD	1.92	<2.6	Yes
Ammonia(as N)	0.07	<0.140	Yes
Orthophosphate	0.05	<0.075	Yes
Nitrate	1.97	<2.7	Yes ¹
Suspended Solids	12.74	25	Yes ²

1. Nitrate target concentration has been derived for high and good status surface waters (source 2012 EPA Integrated Water Quality Report –Monaghan Louth 2011). Mean and 95%ile nitrate target standard of for good status waters has been developed as 1.8mg/l and 2.7mg/l NO₃ (as N) respectively.

2. European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I. 293 of 1988)

Again, it is noted that the predicted downstream concentrations are based on an extreme worst case scenario, as it is unlikely that the facilities discharge quality emission limits and volumetric emission limits would be at the maximum proposed values for any duration whilst the River Dalua is at its 95%ile flow condition.

4.5 Predicted Impact – Blackwater

The River Dalua joins the Allow River approximately 4km downstream of the proposed discharge point. The River Allow then in turn joins the Blackwater below Banteer, approximately 15km downstream of Newmarket Co-Op. It is noted that the Blackwater is known to support populations of freshwater pearl mussels downstream of the site and therefore the potential impact on this watercourse from the Newmarket Co-Op site has been considered.

In order to quantify the impact of the discharge from the site, a comparison was made to the 95%ile flow rate in the Blackwater. It was determined from the EPA Hydrotool that the flow rate in the Blackwater where it converges with the River Allow is 2.31m³/s. The maximum discharge from the Newmarket Co-Op facility represents 1.35% of the 95%ile flow and therefore is considered to have an insignificant impact on the River Blackwater, given that at maximum discharge from the site, approximately 100 dilutions are available.

In addition, the assimilative capacity of the River Blackwater where it converges with the River Allow was calculated to assess the impact of the discharge using the method described in section 2.1.

Physiochemical monitoring is undertaken in the River Blackwater by the EPA and Cork County Council. Mean quality data for orthophosphate, BOD and ammonia (Location Reference Point 18B02_1000) is provided in Table 7 below. The mean results have been developed from records provided by the EPA from

February 2013 to October 2014. The records obtained are appended as Attachment 2.

Table 7. Mean Physiochemical Water Quality Results River Blackwater (Location Reference Point 18B02_1000) (Ballymaquirk Bridge)

Parameter	Mean (mg/l)
BOD	1.525
Ammonia (as N)	0.0274
Orthophosphate	0.017

The available assimilative capacity for Ammonia, BOD and Orthophosphate has been calculated as 22.44kg, 514.86kg and 11.56kg respectively. The predicted downstream concentrations of BOD, Ammonia and Orthophosphate are presented in Table 8.

Table 8. Predicted Maximum Concentration in the River Blackwater

Parameter	Predicted Concentration @ 95%ile flow	*95%ile Target Concentration (mg/l)	Compliant
BOD	1.60	<2.6	Yes
Ammonia(as N)	0.03	<0.140	Yes
Orthophosphate	0.02	<0.075	Yes

Again, it is noted that the predicted downstream concentrations are based on an extreme worst case scenario as it is unlikely that the facilities discharge quality emission limits and volumetric emission limits would be at the maximum proposed values for any duration whilst the River Blackwater is at its 95%ile flow condition.

The proposed ELV's for Ammonia, Orthophosphate and BOD will use only 5.41%, 7.24% and 3.88% of the available assimilative capacity in the receiving watercourse at the 95%ile flow condition respectively and therefore emphasising the above consideration that the discharge from the Newmarket Co-Op facility will have an insignificant impact on the River Blackwater.

5. Assessment of Impacts (Construction and Operational)

5.1 Construction Phase

5.1.1 Phase 1 (WWTP)

The construction phase of the upgrade of the site WWTP will involve the excavation of soils for foundation construction to provide a base for new tank infrastructure.

It is anticipated that soil clearance for foundation construction will be shallow and therefore will not encounter groundwater.

One of the main potential impacts which could arise with this project is an impact on the water quality in nearby water courses (Rampart Stream). This would occur with washing out of fines (suspended solids) as a result of breaking out existing ground, foundation excavations, concrete washout or spoil storage.

There could also be potential degradation of surface water quality resulting from a spill of hydrocarbon associated with plant and machinery used in the construction works. In this regard, it is noted that there are no significant water features in the immediate vicinity of the proposed works. However, the Rampart Stream which is a tributary of the River Dalua flows along the south eastern boundary of the site.

5.1.2 Phase 2 (Underground Pipeline)

The proposed pipeline route travels along the R576 until it reaches the River Dalua downstream of Allen's Bridge. The majority of pipeline route will be constructed on made ground (within Newmarket Co-Op site and along public road).

The route does not traverse any designated site however it is located in close proximity to the Black Water SAC 00120

The proposed pipe will traverse watercourses in 3 different locations. The pipeline has been designed so as not to interfere with the natural water courses of either the Rampart Stream or the Dalua River. Stoneville bridge road surface has sufficient cover over the arches so that any works will not have any adverse effect on the Rampart Stream. At the second watercourse crossing over a tributary of the Rampart (at Park Bridge), the stream will not be affected by the construction works as the pipe will be laid in the road. The final crossing of the Rampart Stream at Bridge A will not have any effect on the watercourse. Care will also be taken during construction to ensure that these water courses are not adversely affected by the contractor. All works in the vicinity of the watercourses crossing will require particular care and the implementation of mitigation measures to avoid water pollution. A Construction Environmental Management Plan (CEMP) will

be prepared in advance of undertaking the works which will outline the work methods, control measures to be adopted, monitoring and inspection requirements together with roles and responsibilities of those involved.

Agreement will be sought from Cork County Council with respect to the location of trenches on roads to ensure no damage is caused to storm-water drains, water-mains or other services. All drain and culverts affected by the works are to be re-instated to the satisfaction of Cork Co. Council.

Public road sections and road crossings will be fully reinstated in accordance with Cork County Council road opening licence conditions. Where trenches are to be excavated in blacktop roads, trench edges are to be cut and milled prior to excavating the trench to avoid unnecessary damage to the existing road.

Surface water courses could be affected during the civil works for installation of the pipeline along the public road and at the outfall location. Contamination of surface watercourses could occur from wash out fines (suspended solids) as a result of trench excavation works, concrete spill or spills of hydrocarbons during refuelling of plant and machinery.

It is noted that works will be undertaken off the bank of the River Dalua at the outfall location. When these works are being undertaken there is a risk that these works could result in suspended solids being released to the River.

5.2 Operational Phase

The predicted ELV's associated with the treated effluent discharged to the River Dalua are described below.

5.2.1 BOD

The predicted BOD concentration in the River Dalua downstream of the Newmarket Co-Op discharge will not result in an exceedence of the 95%ile concentration target value for BOD at the 95%ile flow condition.

It is noted that the proposed BOD ELV will use only 33% of the available assimilative capacity in the receiving watercourse at the 95%ile flow condition.

The proposed BOD ELV can therefore be accommodated whilst remaining compliant with the requirements of S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009, and accordingly not cause a significant environmental impact.

5.2.2 *Orthophosphate*

The predicted orthophosphate concentration in the River Dalua downstream of the Newmarket Co-Op discharge will not result in an exceedence of the 95%ile concentration target value at the 95%ile flow condition.

It is noted that the proposed for orthophosphate will use 66% of the available assimilative capacity in the receiving watercourse at the 95%ile flow condition.

The proposed orthophosphate ELV can therefore be accommodated whilst remaining compliant with the requirements of S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009, and accordingly not cause a significant environmental impact.

5.2.3 *Ammonia*

The predicted ammonia concentration in the River Dalua downstream of the Newmarket Co-Op discharge has demonstrated that the ammonia load from the proposed discharge point will not result in an exceedence of the 95%ile concentration target value at the 95%ile flow condition.

It is noted that the proposed ELV for ammonia will use 47% of the available assimilative capacity in the receiving watercourse at the 95%ile flow condition.

The proposed ammonia ELV can therefore be accommodated whilst remaining compliant with the requirements of S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009, and accordingly not cause a significant environmental impact.

5.2.4 *Nitrate*

The predicted concentration of nitrate in the River Dalua downstream of the Newmarket Co-Op discharge has been demonstrated to be below the calculated concentration 95%ile target value of 2.7mg/l at 2.06mg/l and therefore the impact of the discharge is not considered to cause a significant impact on water quality within the River Dalua.

5.2.5 *Suspended Solids*

The predicted concentration of suspended solids downstream of the Newmarket Co-Op facility has been found to have a negligible increase on the assumed background concentration of 12.5mg/l and therefore the discharge from the wastewater plant is not considered to be of significance. It is noted that the predicted contribution from the

discharge is 0.24mg/l which represents less than 5% of the 25mg/l standard as set out in the Quality of Salmonid Regulations.

On the basis of the predicted emission values outlined in Table 6, it appears feasible to discharge directly to the River Dalua without causing an impact on water quality.

6. Proposed Mitigation and Enhancement Measures

6.1 Construction Phase

The mitigation factors and measures for the control of pollution and general protection of surface water and groundwater are described below.

Control of both erosion and sediment entrainment in runoff will be a key undertaking during the construction phase of the project. It will be necessary to ensure that the risk of potential washout of fines to surface water is minimised.

Contamination of watercourses with silt will be prevented by managing materials which have potential to give rise to siltation at source.

The proposed route will involve the crossing of watercourses at three different locations. Stoneville bridge road surface has sufficient cover over the arches so that any works will not have any adverse effect on the watercourse. At the second watercourse crossing (Park Bridge) and final watercourse crossing (Bridge A) the pipeline will be laid within current bridge infrastructure, thereby avoiding in-stream works.

Given the nature of the works being undertaken as part of the installation, it is noted that risks to water quality for the most part are not considered significant; however measures will need to be adopted where works are being undertaken in the vicinity of water crossings.

Stockpiling of excavated material may occur on site subject to appropriate management. Any stockpiled materials will be stored in low mounds at the Newmarket Co-Op facility and they will be located as far as possible from any existing water bodies. There will be no materials stored within 50m of nearby watercourses.

For pipeline works, where possible, excavated material from the construction works will be used predominantly for trench backfill and/or landscaping. Any excess materials will be disposed of to a licensed disposal facility.

To minimise impacts from disturbance, pipelines will be laid in small trenches along the edge of existing road and track infrastructure as far as possible.

Excavation of trenches will be carried out over short distances, with frequent backfilling of trenches in order to minimise opportunity for the ingress of water into open trenches.

The reinstatement of trenches on public roads will be carried out in accordance with the DOE publication, "Guidelines for Opening, Backfilling and Reinstatement of Trenches in Public Roads".

All oils and fuel required for the project must be stored in a bunded area with provisions of adequate spill retention capacity (a minimum of 110% tank capacity).

The issue of accidental spillage of hydrocarbons such as diesel and lubrication oil during refuelling of plant machinery is a potential risk during the construction phase. A purpose designed, removable, drip tray will be provided beneath connection points to catch any residual oil during filling and disconnection of the flexible tanker hose. The drip tray will be regularly emptied and disposed of off-site by a specialist licensed contractor.

Vehicle refuelling will not occur within 50 m of any watercourse and all machinery will be maintained in good working order, free from leakage of fuel or hydraulic fluid. Oil booms and oil soakage pads will be maintained on-site and on all operated machinery to enable a rapid and effective response to any accidental spillage or discharge.

Where required, wet concrete will be manufactured at an offsite batching plant and where necessary transported to the required route area by Ready Mix Trucks during pipeline installation works. The pouring of concrete will be controlled to ensure quality control, safe working operation and no impact on the environment.

The transport of concrete in Ready Mix Trucks will be strictly controlled to ensure the safe passage of the material while on route, with particular attention given to spillage. All transport deliveries shall be carried out strictly within the permitted truck carrying capacity and no allowance will be permitted for exceeding the carrying specification of the lorry.

Any spillages will be cleaned up and disposed of correctly. Surplus concrete will be returned to batch plant after completion of a pour.

When constructing the final outfall to the River Dalua the appointed Civil Contractors will adhere to the following measures at a minimum;

- An Environmental Scientist is to be present for this element of the works to ensure that all necessary control measures are put in place and to monitor water quality downstream of the works area.
- All excavation arising's not used for backfill will be transported from the area for reinstatement. Excess materials will be disposed of at licensed facilities.
- Rock armouring will be placed around the outfall location to prevent scouring of the river bank around the discharge pipe.
- Visual inspection of the Dalua upstream and downstream of the works area. Field hydrochemistry samples to be collected before, during and after the works. Turbidity monitoring to form part of field monitoring.

- Collection of water samples for suspended solids, ammonia and orthophosphate analysis prior to, during and after works have been completed.

6.2 Operational Phase

The site is currently licensed by the Environmental Protection Agency and final ELV's to be adopted will be subject to their assessment and agreement. Newmarket Co-Op will monitor the treatment system performance internally to ensure that it is working effectively and will also monitor the quality of the final discharge on a continuous basis.

7. Summary and Conclusion

Mitigation measures have been proposed to ensure protection of surface waters during both the constructional and operational stage.

Both erosion and sediment entrainment in runoff produced during excavation works is considered the most significant risk to surface water during the construction stage. The proposed mitigation measures will ensure that this risk is kept to a minimum. It is noted that additional care will be required when working at water crossings and during concrete pours.

The impact assessment of the discharge from the proposed emission point downstream of Allen's Bridge will not result in an exceedance of any of the target concentrations set out in the Surface Water regulations (S.I. 272 of 2009) for achievement of a 'good status' watercourse.

The proposed ELV's for volume and associated mass emission of BOD, Ammonia and Orthophosphate have been shown, using approved methodology, to be compliant with S.I. No. 272 of 2009 European Communities Environmental objectives (Surface waters) Regulations 2009 for attaining Good status in the River Dalua. In addition, the impact of the nitrate and suspended solids emissions has been demonstrated as not causing an impact on the receiving water.

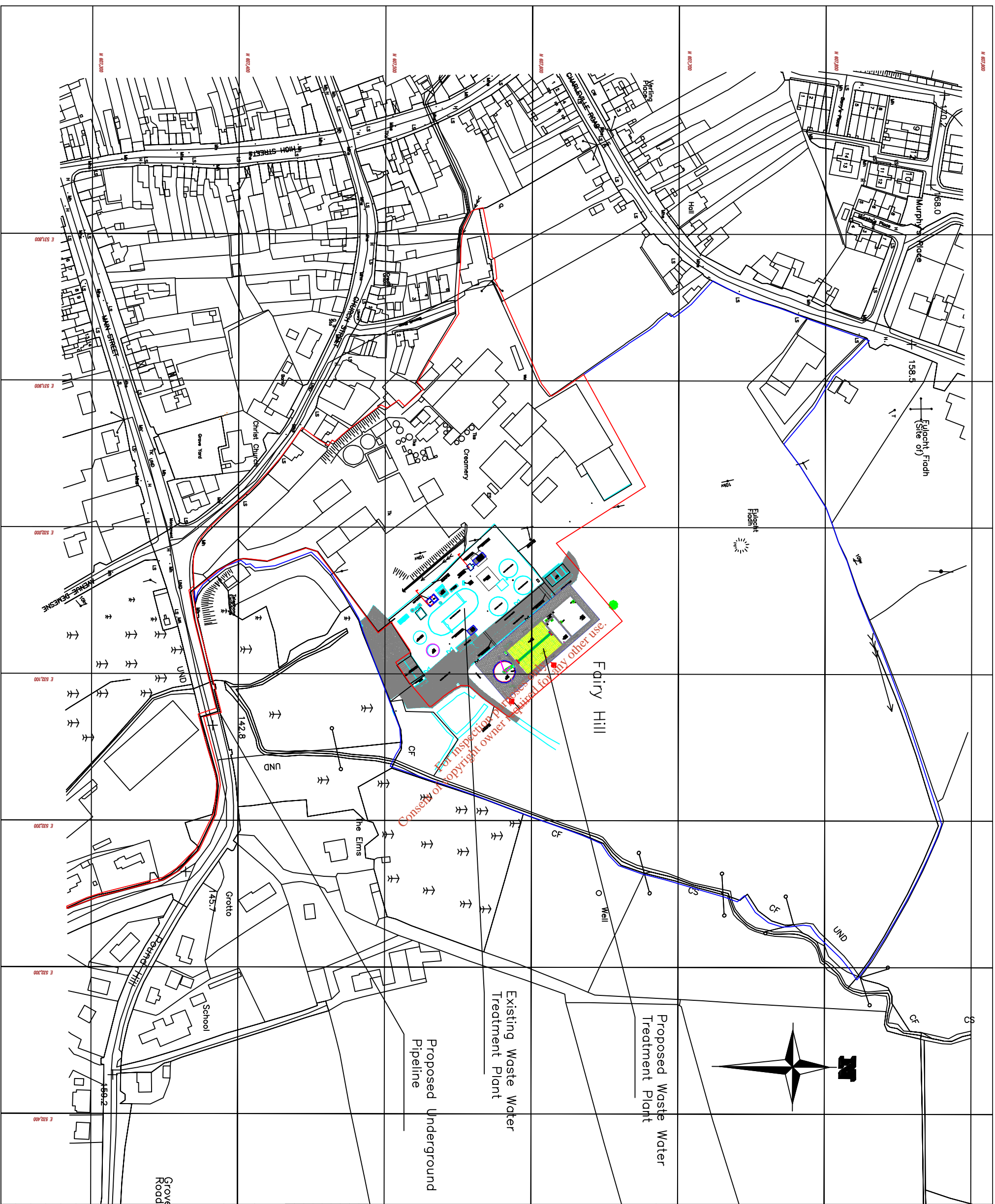
For inspection purposes only.
Consent of copyright owner required for any other use.



Attachment 1 Figures

Notes:

- Planning Boundary
- Ownership Boundary



Consent on copyright owner required for any other use.

For this project only

Rev.	Date	Description	by	ch'd	app
03	05.02.16	Updated	GC	DH	DH
02	14.12.15	Grid Reference	GC	DH	DH
01	10.11.15	FINAL	GC	DH	DH

Project Assessment of Upgrade Works to WWTP and Increased Discharge to the River Dulu

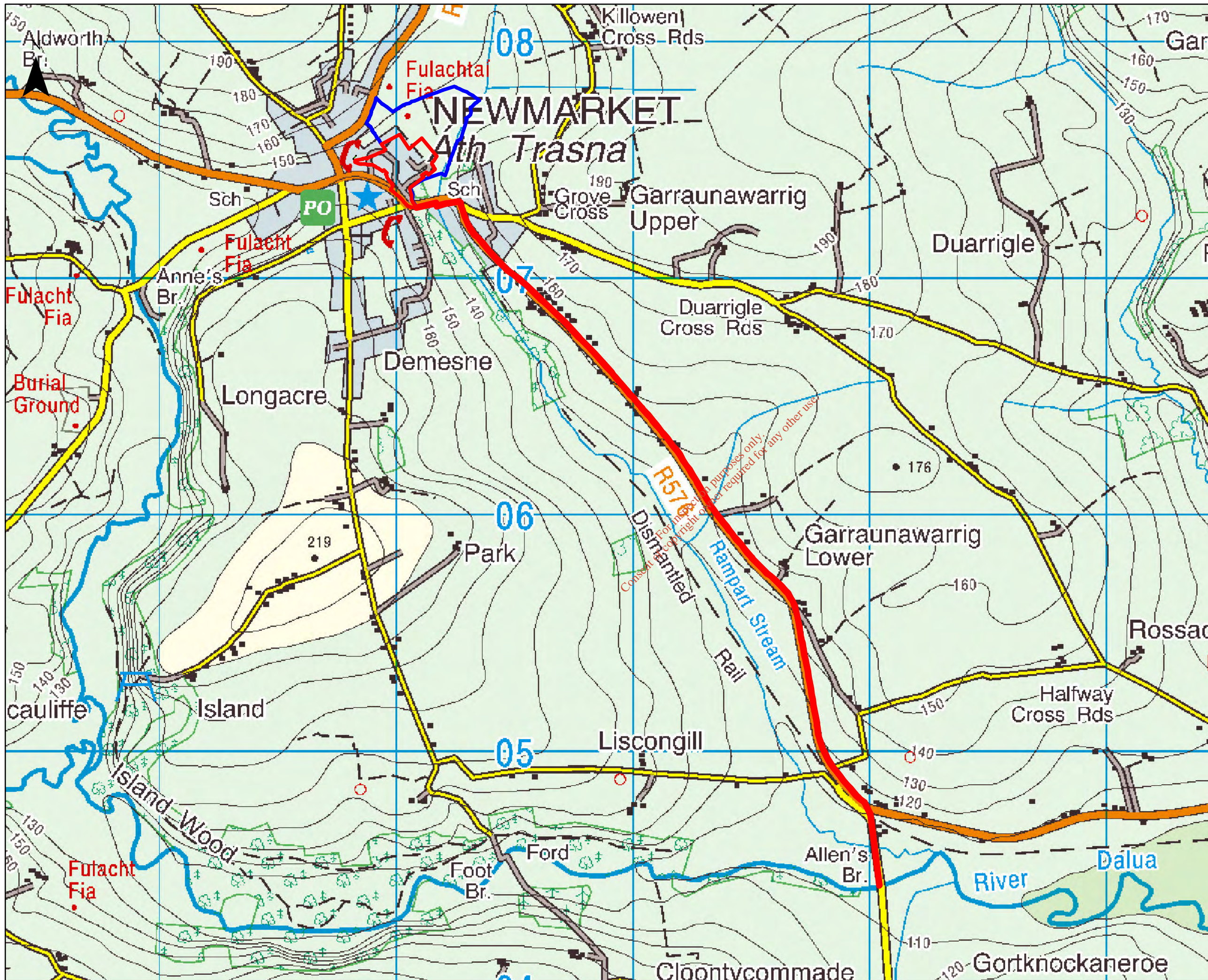
Figure 1 – Proposed Site Layout



Energy, Environment & Safety

environmental health and safety engineering project management
 Copyright of OES Consulting, FBD House, Fals Point, Tralee Co. Kerry
 Tel: 353 (0)867128321 Fax: 353 (0)867180061 Email: info@oes.ie

Drawn By:	GC	Dwg:	1160_31_01	Rev.	03
Ch'd (D.O.):	DH				
Ch'd (Eng):	DH				
Approved:	DH				



Legend

- Ownership Boundary
- Planning Boundary

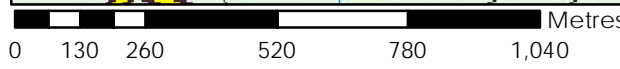
KERRY

OES
Energy, Environment & Safety

OES Consulting 2nd Floor, FBD House, Fels Point, Tralee, Co Kerry
T: (066) 7128321 F: (066) 7180061 E: info@oes.ie

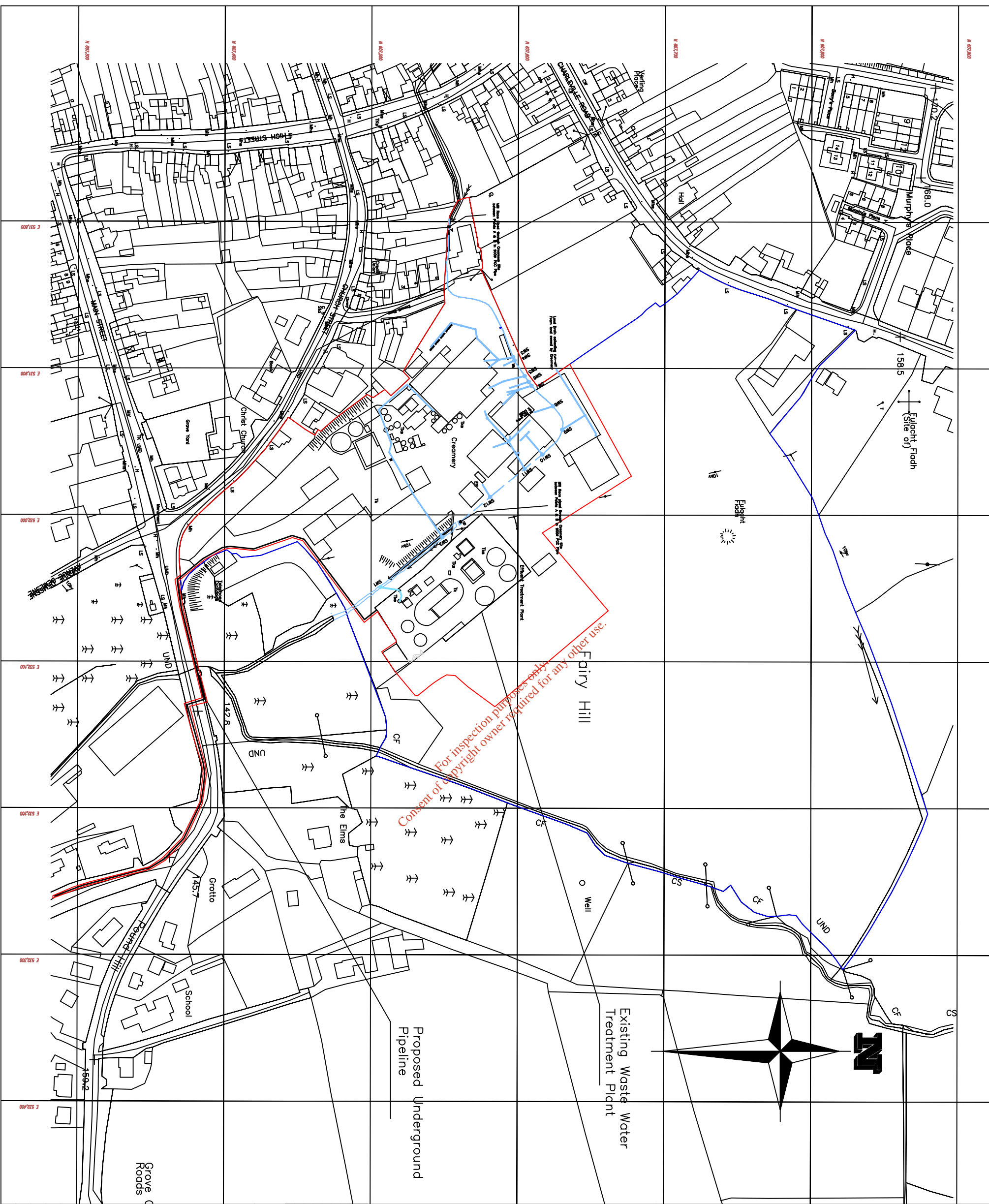
Client:	Newmarket Cooperative Creamery	
Project:	Impact Assessment of Upgrade Works to WWTP and Increased Discharge to the River Dalua	
Title:	Proposed Discharge Route	
Scale:	1:15,000 @ A3 Paper Size	
Ref:	Figure 2	
OES Ref:	F-11603102-01	
Revision:	01	
Document Control:	Date:	05/02/2016
	Drawn By:	GC
	Checked By:	DH
	Approved By:	DH

Ordnance Survey Ireland
All Rights Reserved
Licence number EN0059514



Notes:

- Planning Boundary
- Ownership Boundary



Rev.	Date	Description	by	ch'd	app
04	05.02.16	Updated Boundary	GC	DH	DH
03	20.01.16	Updated	GC	DH	DH
02	14.12.15	Grid Reference	GC	DH	DH
01	10.11.15	FINAL	GC	DH	DH

Project Assessment of Upgrade Works to WWTP and Increased Discharge to River Doulis

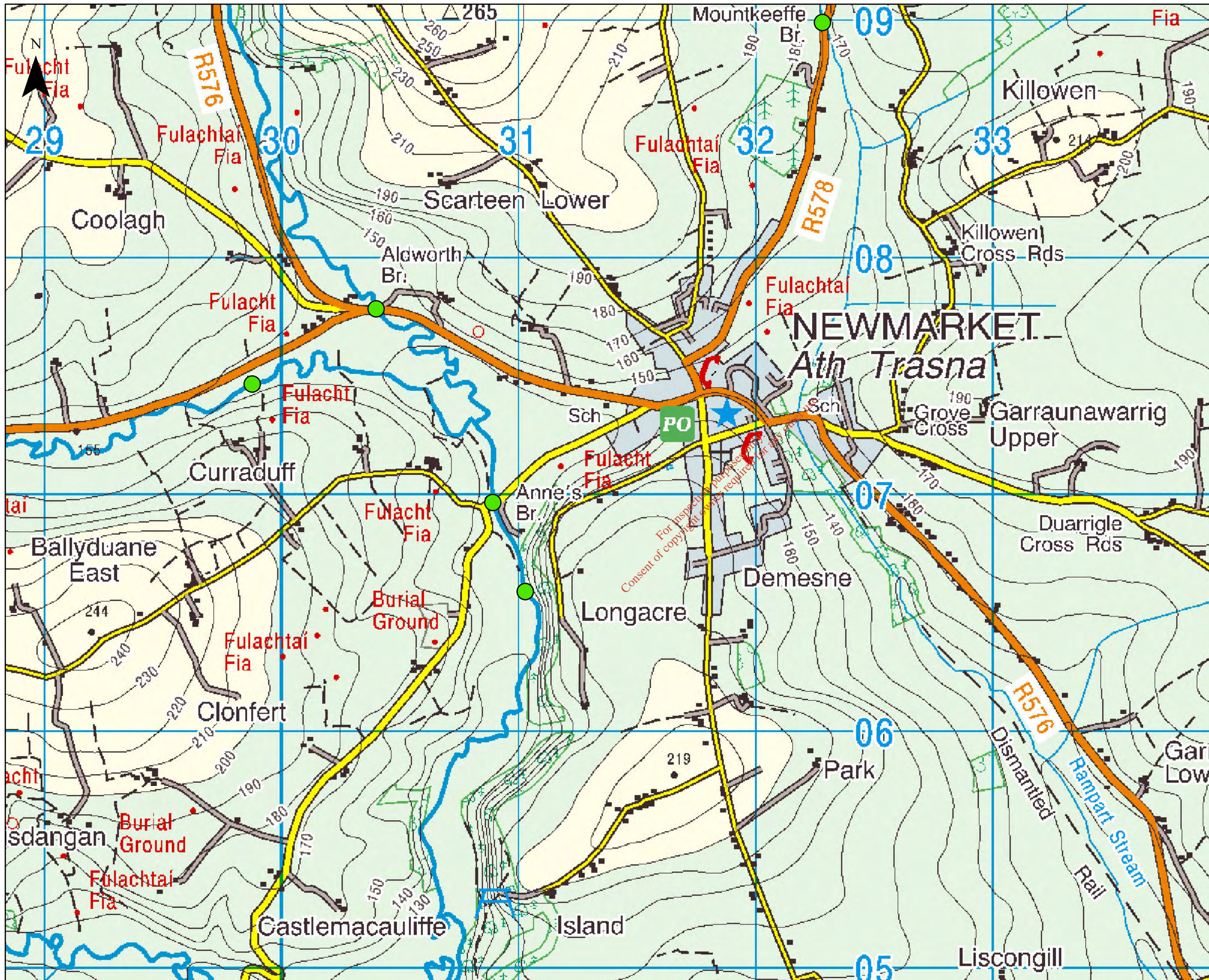
Title

Figure 3 – Current Emission Point Locations



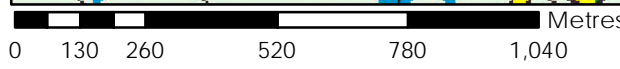
environmental health and safety engineering project management
 Copyright of OES Consulting, FBD House, Fair Point, Tralee Co. Kerry
 Tel: 353 (0)867128321 Fax: 353 (0)867180061 Email: info@oes.ie

Scales:	1:2500 @ A3	Dwg.	Rev.
Drawn By:	GC		
Ch'd (D.O.):	DH	1160_31_03	04
Ch'd (Eng.):	DH		
Approved:	DH		



Legend
● Mon_QStations_27102015

KERRY	
OES Energy, Environment & Safety	
<small>OES Consulting 2nd Floor, FBD House, Fels Point, Tralee, Co Kerry T: (066) 7128321 F: (066) 7180061 E: info@oes.ie</small>	
Client:	Newmarket Cooperative Creamery
Project:	Impact Assessment of Upgrade Works to WWTP and Discharge to the River Dalua
Title:	Surface Water Quality Monitoring Locations
Scale:	1:15,000 @ A3 Paper Size
Ref:	Figure 4
OES Ref:	F-11603104-01
Revision:	01
Document Control:	Date: 05/02/2016
	Drawn By: GC
	Checked By: DH
	Approved By: DH
<small>Ordnance Survey Ireland All Rights Reserved Licence number EN0059514</small>	



For inspection purposes only.
Consent of copyright owner required for any other use.



Attachment 2 River Dalua and River Blackwater Water Quality Data Summary

River Dalua Water Analysis Data - Monitoring Point Ref. 18D010200- Source EPA

Date	Orthophosphate (as P) (mg/l)	Ammonia (as N) (mg/l)	BOD (mg/l)
29/01/ 2014	0.013	0.021	0.500
26/02/ 2014	0.016	0.034	0.500
25/03/ 2014	0.022	0.034	1.000
29/04/ 2014	0.014	0.010	0.500
27/05/ 2014	0.030	0.076	1.700
10/06/ 2014	0.037	0.042	1.500
15/07/ 2014	0.037	0.010	0.500
26/08/2014	0.029	0.010	1.400
09/09/2014	0.026	0.010	0.500
07/10/2014	0.025	0.010	1.100
13/11/2014	0.053	0.043	3.700
09/12/2014	0.020	0.022	0.500
Mean	0.027	0.027	1.117

River Blackwater Water Analysis Data - Monitoring Point Ref. 18B021000- Source EPA

Date	Orthophosphate (as P) (mg/l)	Ammonia (as N) (mg/l)	BOD (mg/l)
13/02/2013	0.029	0.052	2.100
14/03/2013	0.016	0.012	0.100
10/04/2013	0.014	0.043	1.000
12/06/2013	0.003	0.026	1.200
09/10/2013	0.019	0.006	0.900
13/11/2013	0.023	0.023	0.700
26/03/2014	0.020	0.028	0.800
30/04/2014	0.015	0.010	1.000
23/07/2014	0.036	0.038	1.200
20/08/2014	0.019	0.028	1.000
18/09/2014	0.003	0.010	3.700
08/10/2014	0.009	0.053	4.600
Mean	0.017	0.027	1.525

For inspection purposes only.
Consent of copyright owner required for any other use.



Attachment 3 EPA Hydrotool Report

River Name	Dalua(18_1762)
XY Location	130896,104737 (ING)

River Segment Map



Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

Disclaimer

The source of hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

The user should familiarise himself/herself with the catchment being studied and confirm that the ungauged site is in a natural catchment where flows conditions are suitable for the use of the model.

It is strongly recommended that the user examine the catchment descriptors contained in the report produced and confirm that the percentages of the various constituent elements are comparable to a natural catchment.

If the flow in a catchment is not entirely natural, the estimation of flows using the model in these catchments could be affected due to:

- existence of local conduit karst within the catchment;
- the selected location itself is on local conduit karst;
- regulation of the river flow on the river channel (e.g. power station, sluice gates etc)
- impacts of abstractions upstream of the selected location or the impact of the discharge associated with the abstraction into the same/different catchment;
- estimates of flow being sought at locations effected by storage effects at, or near, lake outfalls;
- lack of similar catchments with observed flows, ie where catchment descriptors lie outside the range of available gauging station catchments (e.g. the catchment area is under 5 km²);
- any other special circumstances that may affect river flows.

Expert judgement will be required to ensure that the estimate of flow is not unduly affected by any of these influences.

Please note that the model does not provide estimates of flood peaks and, specifically, should not be used for that purpose.

The EPA has also prepared estimates of DWF and long term 95 percentile flows which are also presented on the EPA web site. These data are presented at <http://www.epa.ie/whatwedo/monitoring/water/hydrometrics/data/>

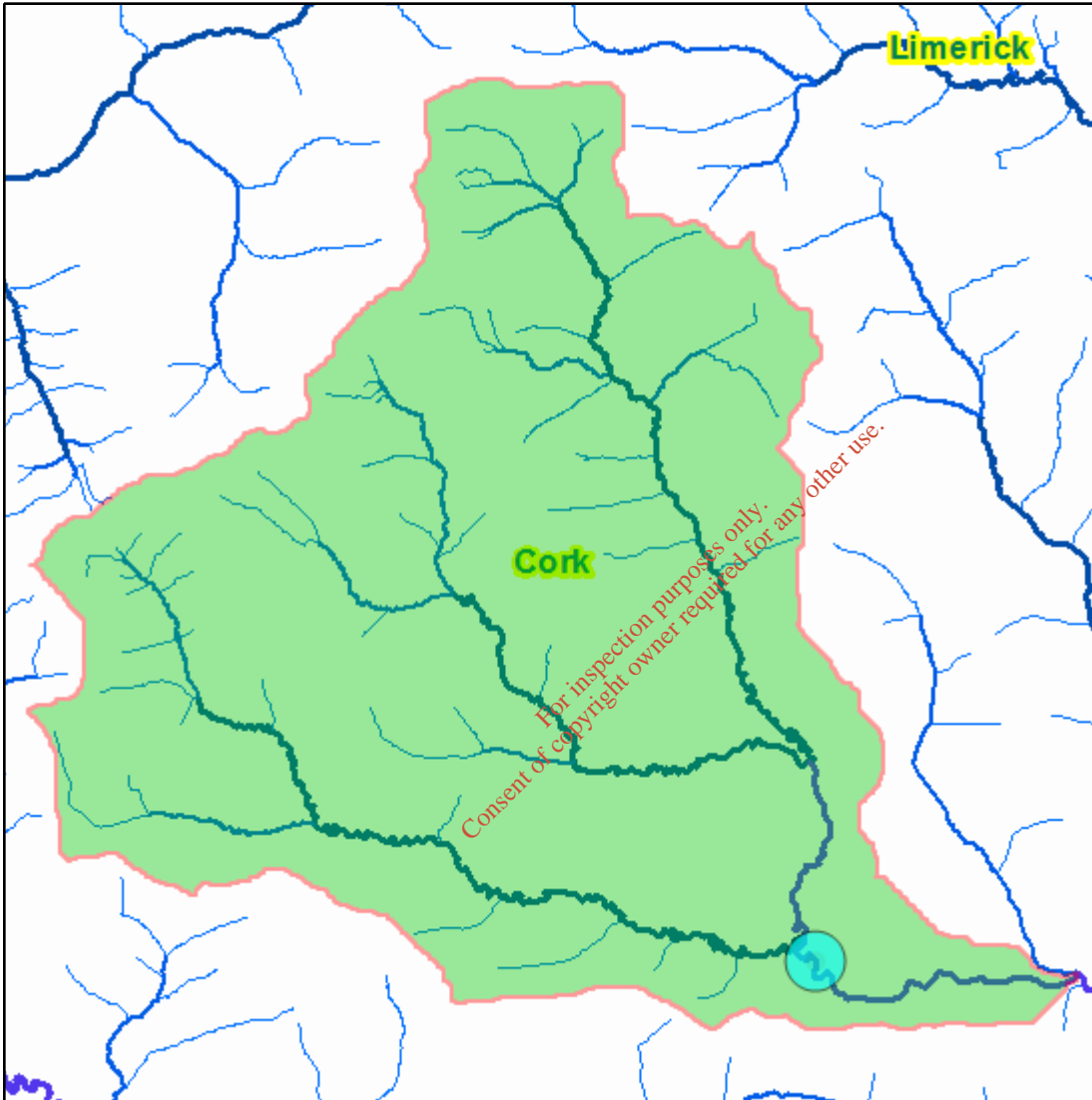
The data produced by the model for specific stations should be compared to the data contained in this file of DWF and long term 95percentile flows.

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

River Name	Dalua(18_1762)
XY Location	130896,104737 (ING)

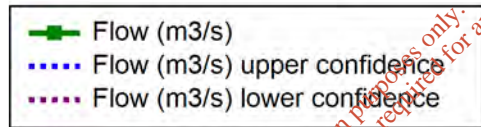
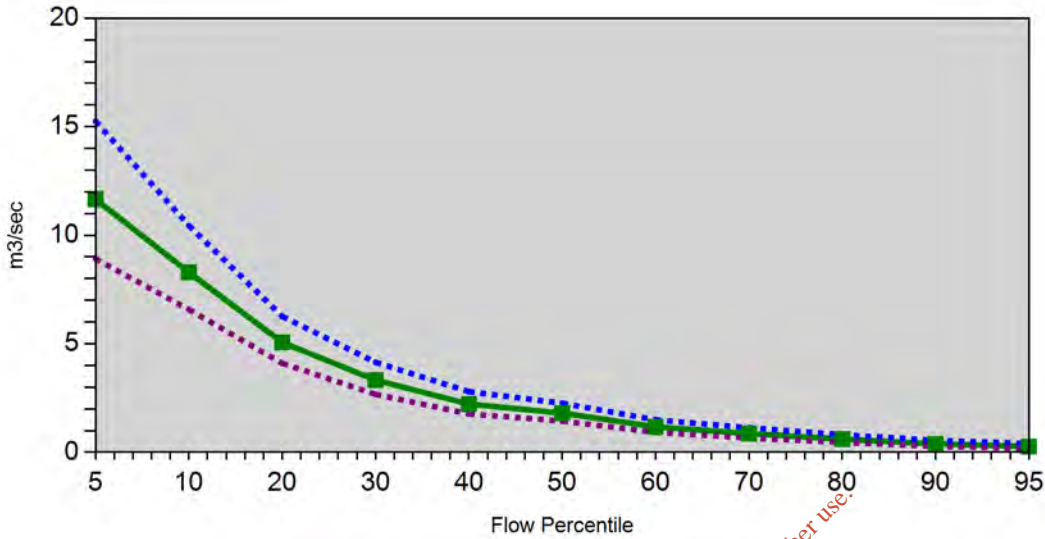
Nested Catchment Map



Disclaimer
The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Flow Duration Curve (Flow in m3/sec)



%ile	flow(m3/sec)	upper 95% confidence limit m3/sec	lower 95% confidence limit m3/sec
5	11.66	15.251	8.914
10	8.291	10.447	6.58
20	5.065	6.261	4.098
30	3.329	4.148	2.672
40	2.224	2.796	1.769
50	1.806	2.262	1.441
60	1.175	1.496	0.923
70	0.865	1.131	0.662
80	0.608	0.812	0.456
90	0.388	0.548	0.275
95	0.268	0.402	0.179

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Catchment Descriptors		
General		
Descriptor	Unit	Value
Area	sq km	88.1
Average Annual Rainfall (61-90)	mm/yr	1405
Stream Length	km	101.2
Drainage Density	Channel length (km)/catchment area (sqkm)	1.1
Slope	Percent Slope	8.6
FARL	Index (range 0:1)	1

Soil	
Code	% of Catchment
Poorly Drained	49.7
Well Drained	33.8
Alluvmin	4.4
Peat	12
Water	0
Made	0.2

For inspection purposes only.
Consent of copyright owner required for any other use.

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Subsoil Permeability		
Code	Explanation	% of Catchment
H	High	0
M	Moderate	1.7
L	Low	67
ML	Moderate/Low	0
NA	No Subsoil/Bare Rock	31.3

Aquifer		
Code	Explanation	% of Catchment
LG_RG	LG: Locally important sand-gravel aquifer RG: Regionally important sand-gravel aquifer	0
LL	Locally important aquifer which is moderately productive only in local zones	97.6
LM_RF	LM: Locally important aquifer which is generally moderately productive RF: Regionally important fissured bedrock aquifer	0
PU_PL	PU: Poor aquifer which is generally unproductive PL: Poor aquifer which is generally unproductive except for local zones	2.4
RKC_RK	Regionally important karstified aquifer dominated by conduit flow	0
RKD_LK	Regionally important karstified aquifer dominated by diffuse flow	0

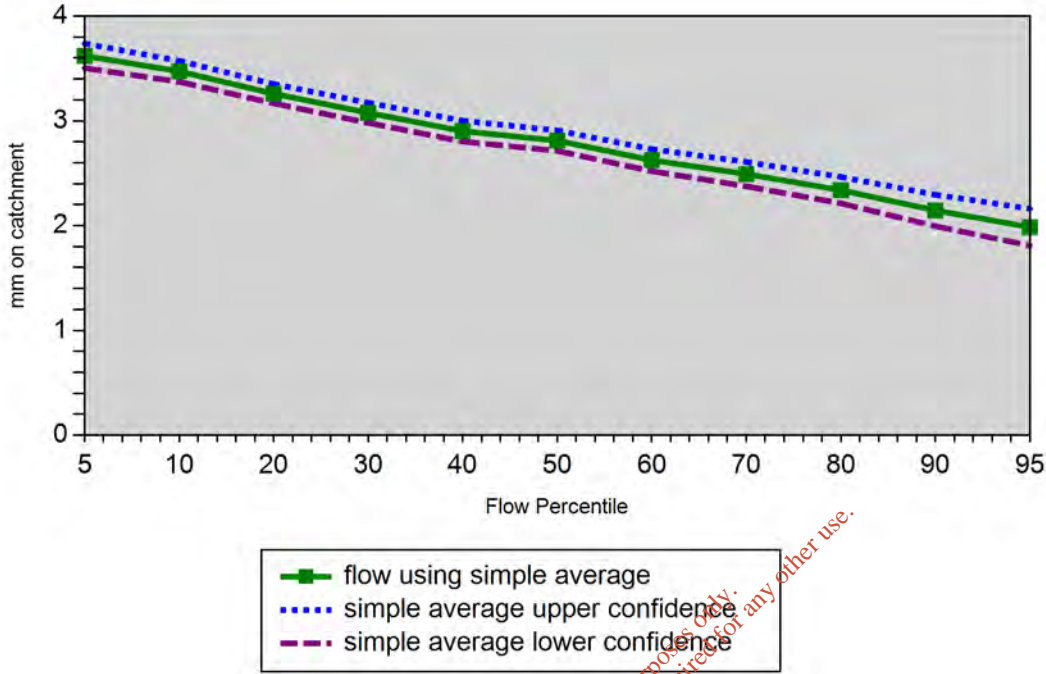
Stations in Pooling group			
%ile Flow	Station 1	Station 2	Station 3
5	23017	36021	23005
10	23017	36021	23005
20	23017	36021	23005
30	23017	36021	23005
40	23017	36021	23005
50	22003	18006	22043
60	22003	18006	23005
70	22003	18006	23005
80	22003	18006	23005
90	22003	18006	23005
95	22003	18006	23005

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Flow Duration Curve (mm on catchment)



Log Flow (mm on catchment)			
%ile	mm	upper 95% confidence limit	lower 95% confidence limit
5	3.621	3.738	3.504
10	3.473	3.573	3.373
20	3.259	3.351	3.167
30	3.077	3.173	2.981
40	2.902	3.001	2.803
50	2.811	2.909	2.713
60	2.625	2.73	2.52
70	2.492	2.608	2.376
80	2.339	2.465	2.213
90	2.145	2.295	1.995
95	1.986	2.162	1.81

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



River Name	Blackwater [Munster](18_5)
XY Location	138682,98587 (ING)

River Segment Map



Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

Disclaimer

The source of hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

The user should familiarise himself/herself with the catchment being studied and confirm that the ungauged site is in a natural catchment where flows conditions are suitable for the use of the model.

It is strongly recommended that the user examine the catchment descriptors contained in the report produced and confirm that the percentages of the various constituent elements are comparable to a natural catchment.

If the flow in a catchment is not entirely natural, the estimation of flows using the model in these catchments could be affected due to:

- existence of local conduit karst within the catchment;
- the selected location itself is on local conduit karst;
- regulation of the river flow on the river channel (e.g. power station, sluice gates etc)
- impacts of abstractions upstream of the selected location or the impact of the discharge associated with the abstraction into the same/different catchment;
- estimates of flow being sought at locations effected by storage effects at, or near, lake outfalls;
- lack of similar catchments with observed flows, ie where catchment descriptors lie outside the range of available gauging station catchments (e.g. the catchment area is under 5 km²);
- any other special circumstances that may affect river flows.

Expert judgement will be required to ensure that the estimate of flow is not unduly affected by any of these influences.

Please note that the model does not provide estimates of flood peaks and, specifically, should not be used for that purpose.

The EPA has also prepared estimates of DWF and long term 95 percentile flows which are also presented on the EPA web site. These data are presented at <http://www.epa.ie/whatwedo/monitoring/water/hydrometrics/data/>

The data produced by the model for specific stations should be compared to the data contained in this file of DWF and long term 95percentile flows.

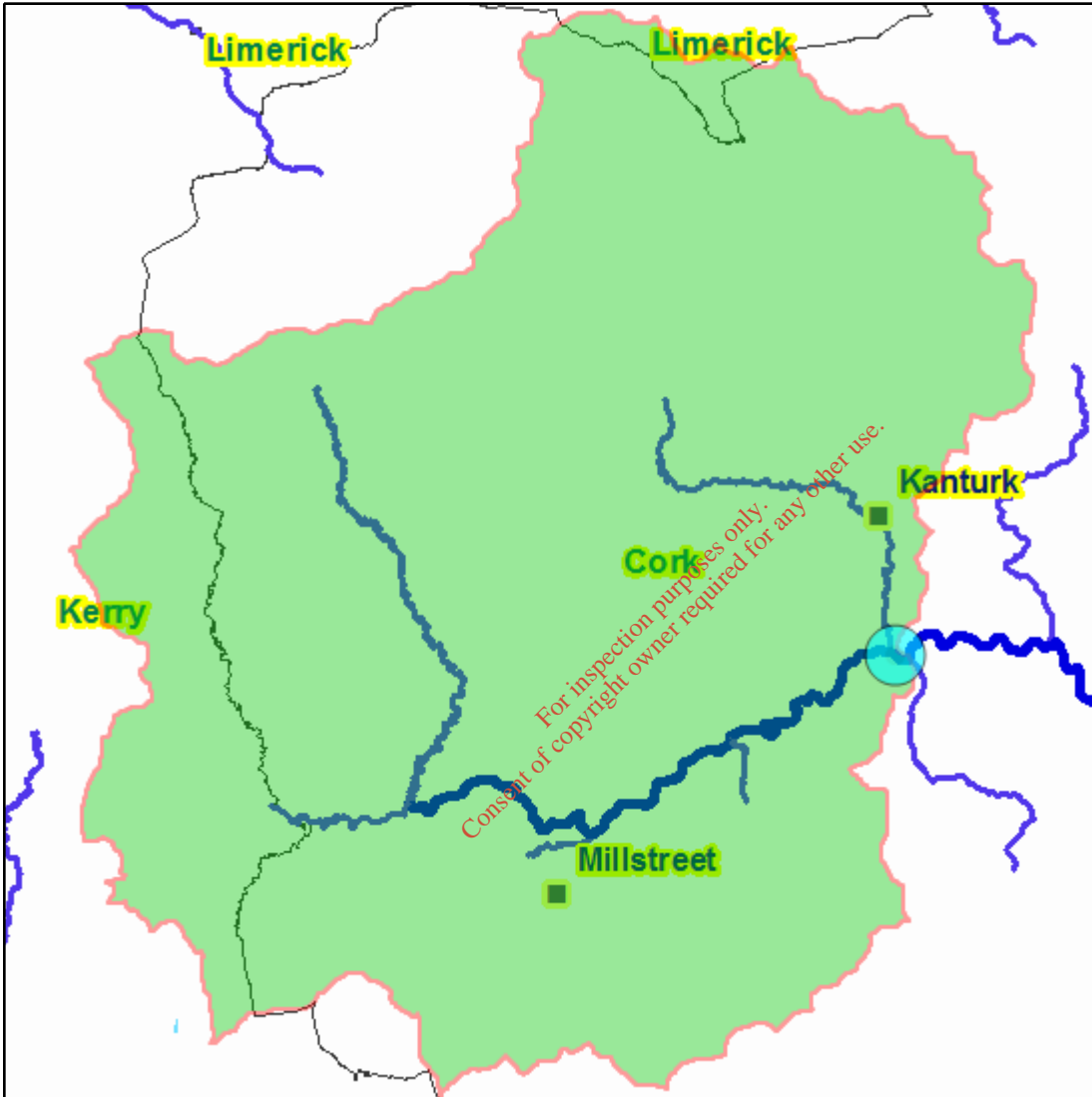
Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



River Name	Blackwater [Munster](18_5)
XY Location	138682,98587 (ING)

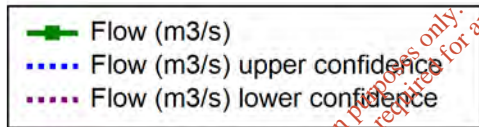
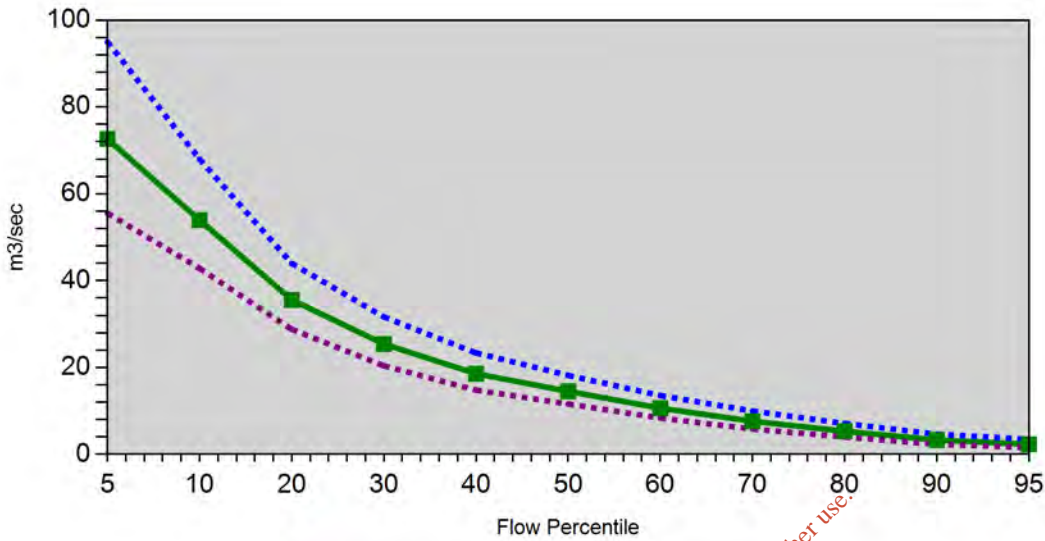
Nested Catchment Map



Disclaimer
The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Flow Duration Curve (Flow in m3/sec)



%ile	flow(m3/sec)	upper 95% confidence limit m3/sec	lower 95% confidence limit m3/sec
5	72.638	95.01	55.533
10	53.958	67.987	42.824
20	35.579	43.976	28.786
30	25.399	31.648	20.385
40	18.579	23.354	14.781
50	14.517	18.19	11.586
60	10.631	13.533	8.351
70	7.622	9.962	5.832
80	5.316	7.096	3.982
90	3.285	4.638	2.326
95	2.307	3.46	1.538

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Catchment Descriptors		
General		
Descriptor	Unit	Value
Area	sq km	791.3
Average Annual Rainfall (61-90)	mm/yr	1390
Stream Length	km	843.5
Drainage Density	Channel length (km)/catchment area (sqkm)	1.1
Slope	Percent Slope	7.1
FARL	Index (range 0:1)	1

Soil	
Code	% of Catchment
Poorly Drained	52.8
Well Drained	27.8
Alluvmin	4.2
Peat	14.6
Water	0
Made	0.5

For inspection purposes only.
Consent of copyright owner required for any other use.

Disclaimer
The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Subsoil Permeability		
Code	Explanation	% of Catchment
H	High	0
M	Moderate	3.5
L	Low	66.6
ML	Moderate/Low	8.2
NA	No Subsoil/Bare Rock	21.7

Aquifer		
Code	Explanation	% of Catchment
LG_RG	LG: Locally important sand-gravel aquifer RG: Regionally important sand-gravel aquifer	0
LL	Locally important aquifer which is moderately productive only in local zones	95.2
LM_RF	LM: Locally important aquifer which is generally moderately productive RF: Regionally important fissured bedrock aquifer	0
PU_PL	PU: Poor aquifer which is generally unproductive PL: Poor aquifer which is generally unproductive except for local zones	3.1
RKC_RK	Regionally important karstified aquifer dominated by conduit flow	0
RKD_LK	Regionally important karstified aquifer dominated by diffuse flow	1.5

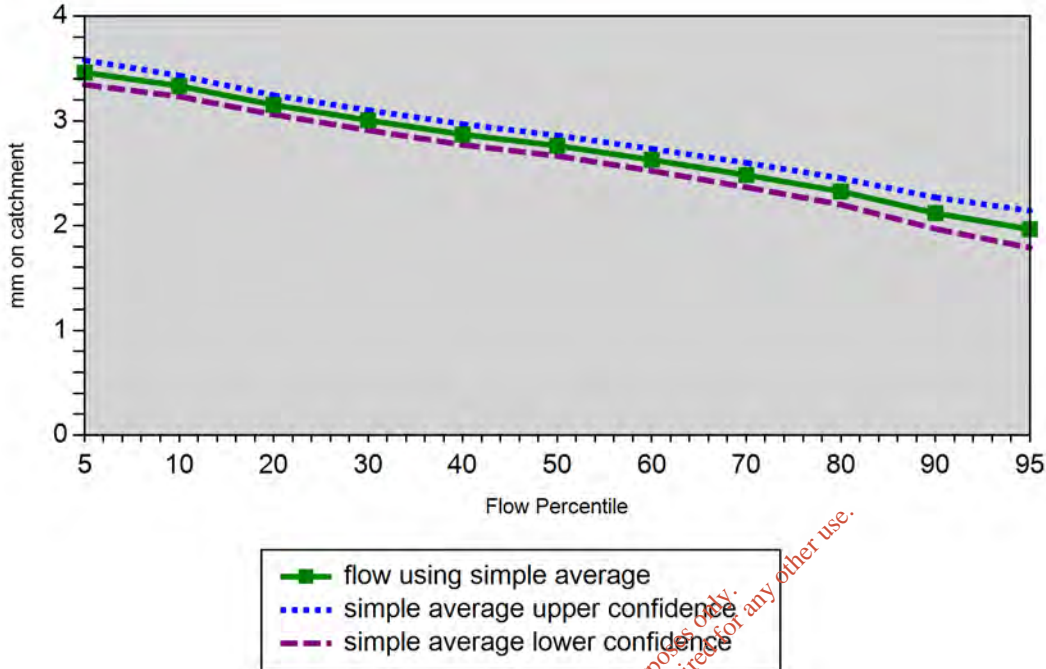
Stations in Pooling group			
%ile Flow	Station 1	Station 2	Station 3
5	23002	18006	35005
10	23002	18006	35005
20	23002	18006	35005
30	23002	18006	35005
40	23002	18006	35005
50	18006	22003	23002
60	18006	22003	23002
70	18006	22003	23002
80	18006	22003	18009
90	18006	22003	18009
95	18006	22003	18009

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



Flow Duration Curve (mm on catchment)



Log Flow (mm on catchment)			
%ile	mm	upper 95% confidence limit	lower 95% confidence limit
5	3.462	3.579	3.345
10	3.333	3.433	3.233
20	3.152	3.244	3.06
30	3.006	3.102	2.91
40	2.87	2.969	2.771
50	2.763	2.861	2.665
60	2.628	2.733	2.523
70	2.483	2.599	2.367
80	2.327	2.453	2.201
90	2.119	2.269	1.969
95	1.966	2.142	1.79

Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

For inspection purposes only.
Consent of copyright owner required for any other use.

APPENDIX 3

NPWS SUBMISSION OF 4th DECEMBER 2015

*For inspection purposes only.
Consent of copyright owner required for any other use.*



**An Roinn
Ealaíon, Oidhreachta agus Gaeltachta**
**Department of
Arts, Heritage and the Gaeltacht**

Our Ref: G Pre00291/2015

04 December 2015

OES Consulting
FBD House
Fels Point
Tralee
Co Kerry

Via email: david.heelan@oes.ie

Re: Pre-planning enquiry - Newmarket cheese plant

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to your consultation letters of 14 and 28 September 2015 with regard to the above proposed development, and the meeting between Kerry Group, OES Consulting and the NPWS in Newmarket on 24 September 2015.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Nature Conservation

The proposed upgraded WWTP would discharge into the River Dalua part of the Blackwater River (Cork/Waterford) candidate Special Area of Conservation (cSAC) (2170), designated under the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997) as replaced by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The cSAC was designated for a number of habitats and species, including the freshwater pearl mussel which has very high water quality requirements. The conservation objectives for this site are available in NPWS (2012) at

http://www.npws.ie/sites/default/files/protectedsites/conservation_objectives/CO002170.pdf

Guidance and legislation relating to appropriate assessment and EIA can be found on the websites of the NPWS and the Department of the Environment, Community and Local Government.

Effects on freshwater pearl mussel – downstream target population

It is currently a conservation target to maintain the distribution of the freshwater pearl mussel within the downstream Rivers Allow and Blackwater (see green-marked channel in Map 8 in NPWS 2012 (ref. above)). Note that this conservation target does not apply to the River Dalua. Therefore, effects in the River Dalua should be assessed for salmonid water quality, with salmon habitat as the target.

The conservation target to maintain the distribution of freshwater pearl mussel, and to restore suitable habitat for this species, applies to the population downstream in the main channel of the

River Blackwater, not to the stretch of the River Allow between the confluence of the Dalua and the confluence of the Allow with the Blackwater. As you mention, the draft Allow River sub-basin management plan refers to a comprehensive survey of this section of the river found no mussels and recorded very poor habitat conditions.

The current conservation targets, therefore, relating to the objective to restore the favourable conservation condition of freshwater pearl mussel in the cSAC, apply, for the purpose of your assessment, to the subpopulation just below the Allow confluence. A further survey of the Allow River is not required for the assessment.

Effects on freshwater pearl mussel – phosphate concentrations

The Fourth Schedule of the Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I. No. 296 of 2009) cites five ecological quality objectives for freshwater pearl mussel habitat. The NIS must establish whether these can be met with the discharge from the proposed facility, in combination with other best-practice discharges in the catchment. This is especially so in terms of orthophosphate which leads to reduced EQR (ecological quality ratio), and in some cases filamentous algal growth. These are the same objectives as the conservation objectives for the site (pp. 15-16 in NPWS 2012).

Juvenile freshwater pearl mussels require an extremely low concentration of phosphate in the interstitial water in which they live. According to the Freshwater Pearl Mussel Sub-basin Management Plans Literature Review (May 2010, Subsection 3.1.13), "...the normal background ortho-phosphate level of 0.005 mg/l P is considered to be essential to the maintenance of oligotrophic waters for reproducing pearl mussel rivers (Moorkens, 2006a)."

Pipeline and outfall in the River Dalua (east of Allen's Bridge)

Conservation issues that the Natura Impact Statement (NIS) should assess here include:

- Effects on otter habitat, in particular breeding habitat and resting places (note that a Regulation 54 derogation licence will be required if breeding sites or resting places of otter are damaged or if there is deliberate disturbance of otters during periods of breeding or rearing);
- Effects on water crowfoot / starwort vegetation, if this occurs at or significantly downstream of the discharge point (this would need to be assessed before winter high water levels);
- Effects on salmon and lamprey (brook/river) spawning habitat;
- Effects on silty sediment habitat of juvenile lamprey (brook/river);
- Effects on alluvial forest habitat (91E0), if this occurs downstream of the discharge point;
- Effects of potential introduction of invasive aquatic and riverbank plants during construction;
- Effects of the discharge on erosion, sedimentation and scouring in the river;
- Effects on nutrient enhancement on the macroinvertebrate fauna on the river at and downstream of the discharge point;
- Effects of silt, fresh cement and oils from construction works.

Conservation issues that the Environmental Impact Statement (EIS) should address here (not exclusive) include:

- Effects on badgers which may have breeding sites or resting places (setts) along the route of the pipeline);
- Effects on breeding kingfisher, a Birds Directive Annex 1 species;
- Effects on breeding river birds (e.g. grey wagtail, an amber listed species).

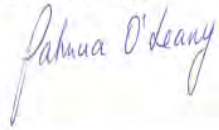
The Department wishes to apologise for the delay in sending this response to your consultation.

You are requested to send further communications to Development Applications Unit (DAU) via email to manager.dau@ahg.gov.ie; if emailing is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas



Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482

*For inspection purposes only.
Consent of copyright owner required for any other use.*

APPENDIX 4

NPWS SUBMISSION OF 8th FEBRUARY 2016

*For inspection purposes only.
Consent of copyright owner required for any other use.*



An Roinn
Ealaíon, Oidhreacht agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Our Ref: G Pre00291/2015 Letter 2 of 2

08 February 2016

OES Consulting
FBD House
Fels Point
Tralee
Co Kerry

Via email: david.heelan@oes.ie

Re: Pre-planning enquiry - Newmarket cheese plant

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to the Department's letter of 4 December 2015 in response to your consultation letters of 14 and 28 September 2015 with regard to the above proposed development, and the meeting between Kerry Group, OES Consulting and the NPWS in Newmarket on 24 September 2015.

Nature Conservation

The conservation objective relating to freshwater pearl mussel in the Blackwater River (Cork/Waterford) candidate Special Area of Conservation (cSAC) (2170) will be changed, and will no longer relate to the main channel of the Munster Blackwater River. It will, however, still relate to the River Allow. As a consequence, the advice in the Department's letter of 4 December 2015, concerning the main channel of the Munster Blackwater under the headings 'Effects on freshwater pearl mussel', no longer applies.

You are requested to send further communications to Development Applications Unit (DAU) via email to manager.dau@ahg.gov.ie. If emailing is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas

Patricia O'Leary

Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482

*For inspection purposes only.
Consent of copyright owner required for any other use.*