ATTACHMENT NO: D.1

NEAR FIELD MODELLING ASSESSMENT

Irish Water

Cork UTAS

Castletownshend Water Quality - Near Field Dilution Modelling

Issue | 9 March 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 257589-00

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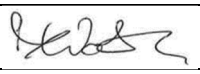
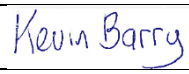
		Signature			
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Appendix A

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1 Introduction

1.1 Background

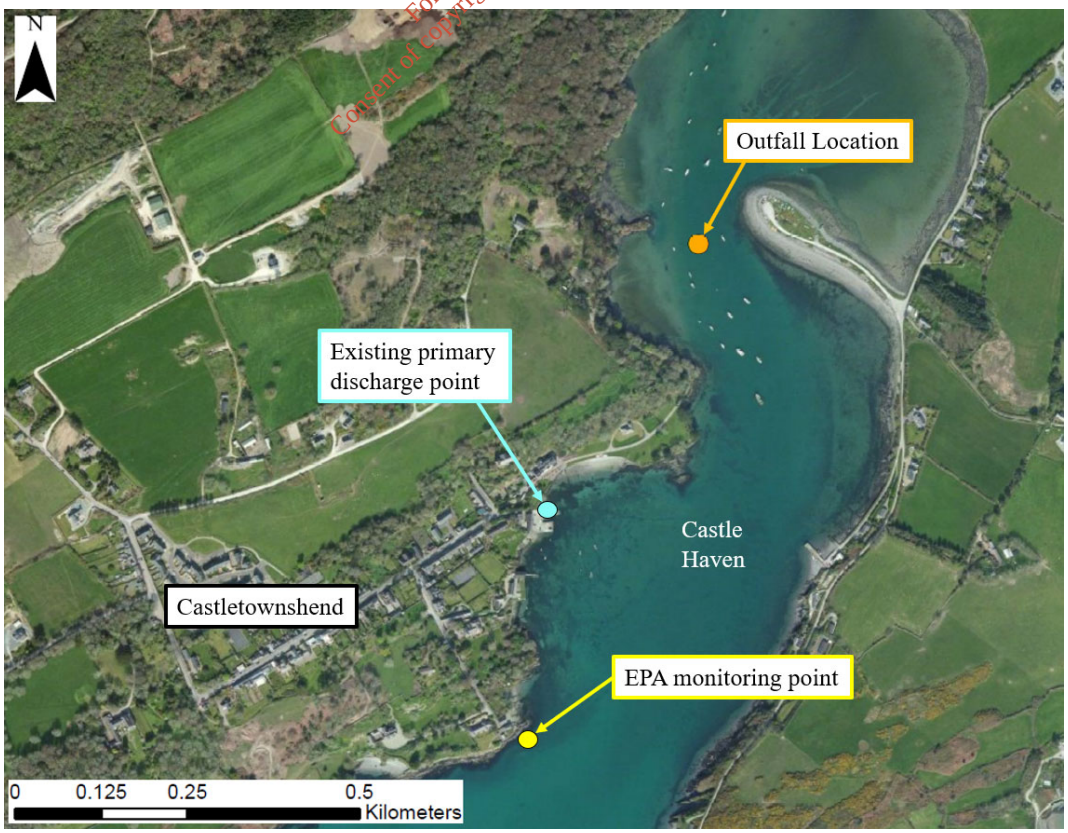
As part of the Cork UTAS project, Arup/BL has been commissioned by Irish Water to undertake dilution modelling for the proposed Wastewater Treatment Plant (WWTP) at Castletownshend in order to assess the compliance of the effluent discharge from the plant with the relevant water quality legislation. This report presents the findings of the study.

1.2 Proposed WWTP

Sewage from Castletownshend is currently discharged untreated into Castle Haven bay. It is therefore proposed to build a new foul network and WWTP to provide primary treatment (initial screening and a primary settlement tank) for the effluent in order to significantly improve existing water quality in the bay.

The WWTP is to be located to the north of Castletownshend village with the treated effluent discharged via a proposed outfall pipeline to Castle Haven Bay. The proposed outfall location and the existing discharge location are shown in Figure 1 below. The proposed scheme layout, including the proposed WWTP location, is presented in Appendix A.

Figure 1: Aerial image showing the proposed outfall discharge location and the closest EPA monitoring point



1.3 Water Body Designation under the WFD

Castle Haven forms part of the larger Rosscarbery Bay waterbody which is designated as "Coastal" under the Water Framework Directive (WFD). This coastal waterbody was not assigned a WFD ecological status for the 2013-2018 cycle. It is however designated as "at risk" of failing to meet its WFD objectives by 2027.

1.4 Phased approach to the study

This study has been undertaken in accordance with the Irish Water Technical Standards [1]. In line with the standards, a phased approach has been adopted for the work:

Phase 1:

- Data gathering and quality assurance;
- Screening assessment to determine relevant Water Quality (WQ) parameters at each site;
- Near field[1] dilution modelling to calculate concentrations of the relevant WQ parameters at the water surface in the immediate vicinity of the outfall, where the buoyancy and momentum of the effluent discharge dominate the mixing process;
- Assess the near field concentrations of the relevant WQ parameters against the minimum Environmental Quality Standards (EQS) at the site;
- If the findings of the Phase 1 indicate that any of the WQ parameters will exceed their EQS limit then a Phase 2 study is required. Recommendations for the scope of Phase 2 works (if required) are detailed as part of Phase 1.

Phase 2:

- Where required, procure and manage a marine hydrographic survey which has been recommended and scoped as part of Phase 1. It is noted that a Marine Survey may also be undertaken as part of Phase 1 of the study if required;
- Where required, undertake far field[2] dispersion modelling of the relevant WQ parameters at each site;
- Undertake a compliance assessment for the relevant minimum Environmental Quality Standards (EQS) at the site;
- If the EQS's of the site are exceeded, advise on what level of additional treatment and/or dilution is required in order to meet with the requirements.

This report details the findings of Phase 1 of the study for Castletownshend and provides recommendations on Phase 2.

[1] The near field relates to the initial mixing zone area immediately adjacent to the outfall where the buoyancy and momentum of the outfall discharge is dominant

[2] The far field relates to the mixing zone outside the near field where the outfall discharge loses all its initial buoyancy and momentum and becomes passive

1.5 Guidance documents

The following guidance documents have been assessed as part of the study:

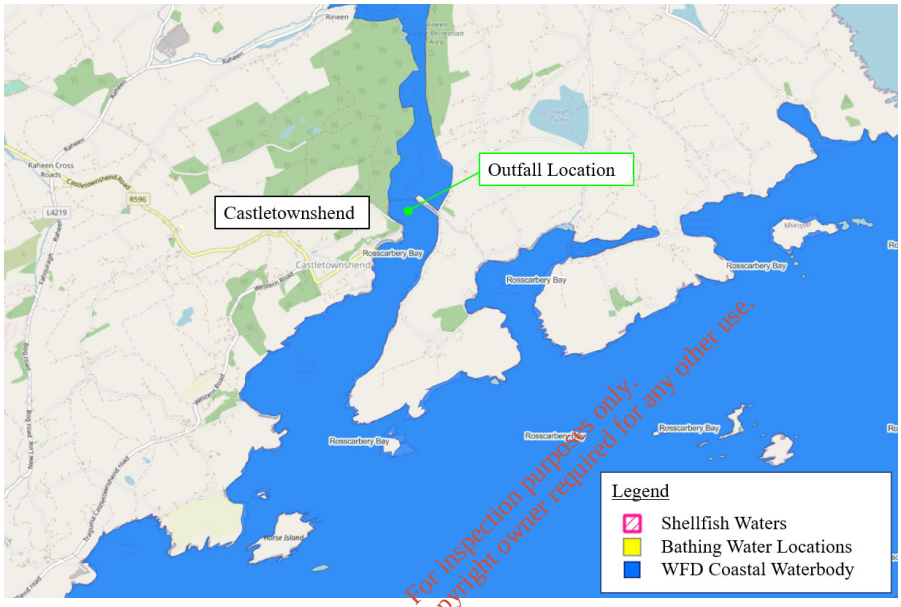
- Irish Water Technical Standards for Marine Modelling [1];
- UTAS Design Report and Technical Notes for the site (AECOM/Jennings O'Donovan);
- Relevant Regulatory Framework documents:
  - Urban Wastewater Treatment Regulations 2001 [2];
  - Surface Water Regulations 2009 [3];
  - The Bathing Water Regulations 2008 [4];
  - The Shellfish Directive 2006/113/EC [5].

2 Water Quality legislation

2.1 Screening assessment

An initial screening assessment was undertaken to determine the Water Quality Legislation that is enacted at the site. As shown in Figure 2, there are no designated bathing water locations or shellfish waters in the vicinity of the outfall. No other sensitive receptors were identified for this waterbody.

Figure 2: Key receptors in study area



In agreement with Irish Water the Surface Water Regulations, 2019 [3] have therefore been adopted as the governing legislation for the site. As the site is designated as a Coastal Water Body the WQ parameters that need to be assessed in order to demonstrate compliance are:

- Dissolved Oxygen (DO), and
- Dissolved Inorganic Nitrogen (DIN).

IW have advised Arup that Biochemical Oxygen Demand (BOD) can be used as a surrogate representative of oxygen conditions i.e. BOD can used instead of DO when assessing the compliance against the Surface Water Regulations.[3] This approach has therefore been adopted as part of the study.

In addition to the legislative requirements, Arup has consulted with Irish Water on the water quality parameters to be assessed.

[3] It is noted that the BOD EQS limits in the Surface Water Regulations relate to Transitional water bodies. There are no EQS limits for BOD for Coastal water bodies. Our use of BOD as a surrogate measure of DO conditions therefore involves utilising a Transitional water body EQS for a Coastal water body.

In order to comply with the wider Water Framework Directive objectives, Arup has been instructed by Irish Water to also include Molybdate Reactive Phosphorus (MRP), Total Ammonia (TA) and Unionised Ammonia (UiA) as part of the assessment. The five water quality parameters assessed as part of the study are therefore:

- Biochemical Oxygen Demand (BOD);
- Molybdate Reactive Phosphorus (MRP);
- Unionised Ammonia (UiA);
- Dissolved Inorganic Nitrogen (DIN);
- Total Ammonia (TA).

3 Near field dilution modelling

3.1 Background

The near field concentrations of the WQ parameters listed in Section 2 have been calculated using Visjet which is an internationally recognised industry standard software for undertaking near field modelling[4]. Developed by the University of Hong Kong, Visjet simulates buoyant jets in ambient currents using a robust Lagrangian Jet model and allows for the buoyancy and momentum of the effluent discharge as well as the hydrodynamic conditions of receiving water to be accounted for. The model has been extensively validated against experimental data [6].

3.2 Marine survey

A marine survey was commissioned to provide data on the tidal characteristics of the site.[5] The survey was undertaken in July 2018 by Irish Hydrodata Ltd. Water depth, current speed, current direction, temperature and salinity measurements were taken at the proposed outfall discharge location (Figure 1) using an Acoustic Doppler Current Profiler.

Data was collected at 30-minute intervals for a 12-hour period during a spring tide on 2nd July 2018. Data was collected at three points in the water column to allow the variation in currents in the vertical direction to be assessed. Data was collected (1) near the surface, (2) at mid depth and (3) near the bed. The data from this survey is presented in Appendix B.

Recorded water depths and current speeds were used as a direct input to the near field Visjet model to inform the ambient water conditions required for the initial dilution modelling.

3.3 Data requirements

The data requirements and sources for the near field dilution modelling are listed in Table 1.

Table 1: Near field modelling data requirements and sources for Castletownshend

Data	Sources
Ambient background WQ concentrations	EPA data for the Castletownshend Ambient Monitoring Point (CW05003177RY1001) 2016 – 2020. Refer to Figure 1.

[4] The Springer Handbook of Ocean Engineering 2016 lists Visjet (which is also known as Jetlag) as an industry standard near-field software on page 15 (Section C).
[5] As noted in Section 1.1, while a Marine Survey is typically undertaken as part of Phase 2 far field assessment, it can also be undertaken as part of Phase 1 in order to inform on the near field assessment.

Data	Sources
Tidal data and datums	2018 hydrographic survey data (refer Section 3.2.1) and UK/Ireland Admiralty Tide Tables. MIKE21 Global Tide Model Prediction tool has been used to generate neap tides for the site.
Outfall configuration	A single horizontal diffuser port outfall with a diameter of 80mm (refer to Section 3.5)
Current speed	Spring current speed data from a 2018 hydrographic survey. Neap current speed data estimated based on spring tide data (refer to Section 3.2).
Water Depths	Spring water depth data from 2018 survey. Neap water depth derived from astronomical tide data
Effluent loadings and concentrations	Provided by Irish Water.
Target levels	BOD: 4mg/l (95%ile) DIN: 0.25mg/l (50%ile) MRP: 0.04mg/l (50%ile) TA: 1mg/l (50%ile) UIA: 0.02mg/l (50%ile)

Data was not available to assess the seasonal variability of salinity in the estuary. It is not however expected to vary significantly at the outfall location. The EPA have designated the waterbody as Coastal which indicates that the salinity remains relatively constant and it is not subject to any significant dilution from freshwater.[6] Seasonal variations of nutrient background concentrations have therefore not been assessed.

Concentrations from the existing untreated effluent discharge are accounted for in the ambient WQ background concentrations used in this study. With the proposed scheme in place however these contributions will be eliminated. The background concentrations used in this study are therefore quite conservative.

Both spring and neap tides have been used to determine the 95%ile and 50%ile dilutions. Spring tidal level and current speed data has been taken from the marine survey. Neap tidal level data has been derived from an astronomical tide which was generated using the MIKE21 Global Tide Model Prediction tool by DHI.

The Spring tide current speed data was adjusted in order to derive neap tide current data. An 83% reduction in current speed was applied to the recorded spring current speeds for every 30-minute timestep of the tidal cycle. This value was determined by comparing the averaged recorded current speeds for several spring and neap tidal cycles at two other Cork UTAS sites at Castletownbere and Whitegate in Cork Harbour.

[6] Saline waterbodies substantially influenced by freshwater flows are classified as Transitional waterbodies by the EPA.

3.4 Loadings from the outfall

Table 2 presents the flow and concentrations for the proposed outfall. The flow rate was derived using flow data presented in the Jennings O'Donovan/AECOM Design Report for the Castletownshend agglomeration [7]. The predicted Summer and Winter mean flows for the existing scenario up to the 30-year future scenario were averaged to derive the flow value used in the study. The flow rate is therefore equivalent to circa 13-year future flow.

The parameter concentrations were supplied by Irish Water.

Table 2: Effluent concentrations (following primary treatment)

Parameter	Castletownshend
Mean Flow (m^3/s)	0.0014 (constant)
BOD (mg/l O_2)	280
DIN (mg/l)	41
MRP (mg/l)	12
TA (mg/l)	50
UIA (mg/l)	0.8

3.5 Diffuser port configuration

A high-level assessment of the diffuser configuration was undertaken as part of the study. A higher exit velocity from the port is favourable to the design given that it decreases the risk of seawater intrusion into the outfall [8] and it also increases dilution of the effluent in the near field. While this suggests smaller openings are favourable Wood et al [9] recommend a minimum diameter of 65mm for a diffuser port.

A single port with an 80mm diameter was determined as the optimal configuration for the outfall in Castletownshend. As the design flow is relatively low there is therefore very limited scope for including additional ports as this would result in the reduction of the port exit velocity. The port size is also greater than the minimum size specified by Wood.

The diffuser port was set at a height of 200mm above the seabed. This height was selected to mitigate against sedimentation on the seabed blocking the port, while also providing a plume length that optimizes dilution.

These port dimensions are used in this study to inform the geometric outfall and jet inputs to the Visjet model. This concept design for the outfall arrangement needs however to be reviewed and assessed as part of the detailed design of the outfall with consideration of the range of expected effluent flow, the ambient hydrodynamic conditions, and other design constraints.

3.6 Near field dilution modelling results

3.6.1 Overview of initial dilution

The dilution value when the plume reaches the water surface was predicted by the near field modelling at half hour intervals for a spring and neap tidal cycle. The 95%ile and 50%ile exceedance values were then estimated from these predicted dilution values. The results of the analysis are presented in Table 3.

Table 3: Dilution factors at the water surface

Scenario	Castletownshend
95%ile scenario	105
50%ile scenario	2315

The Irish Water Marine Modelling Standards state that an initial 95%ile dilution of 100 is recommended for primary treated effluents in the near field. The 95%ile dilution factor for Castletownshend is 105 and therefore higher than the standard. This requirement is therefore achieved with the proposed outfall.

3.6.2 Castletownshend near field concentrations

The results for the near field dilution modelling for Castletownshend for both percentile scenarios are presented in Table 4 and further below in Table 5 respectively. These results represent the predicted dilution of the plume at its interaction with the water surface.

Table 4: 95%ile scenario: Initial Dilution of 105

Parameter	Treated Eff. Conc.	Background Conc.	Conc. After Initial Dilution	Target Level	Additional Far Field Dilution Required
BOD (mg/l O_2)	280	1.8	4.4	4	1

It can be seen from Table 4 that the predicted concentration of BOD is marginally above the target level in the near field. It is however very reasonable to assume that the target level will be met immediately outside the near field as a relatively small amount of additional dilution in the far field will reduce the concentrations below the threshold. Further we note (and as discussed in Section 3.3) the assumed background concentrations account for the impact of the existing untreated effluent discharges. Given that these concentrations will be eliminated in the proposed scenario the background concentrations used as part of our assessment are conservative. Should the values used in the assessment (1.8mg/l) be reduced then the concentration of BOD after initial dilution would also therefore also be reduced. This would bring the near field concentrations closer to, or less than, the target value.

It can therefore be concluded that the concentrations of BOD will fall below the target EQS values in the far field of Castle Haven and discharges from the outfall do not present an environmental risk to the Bay. A more detailed modelling study is therefore not required. As BOD has been used in this study as a surrogate measure of DO it can also be concluded that a further assessment of DO in the far field using hydrodynamic modelling is also not required.

Table 5: 50%ile scenario: Initial Dilution of 2315

Parameter	Treated Eff. Conc.	Background Conc.	Conc. After Initial Dilution	Target Level	Additional Far Field Dilution Required
DIN (mg/l N)	41	0.20	0.22	0.25	0
MRP (mg/l)	12	0.017	0.022	0.04	0
TA (mg/l)	50	0.04	0.06	1	0
UIA (mg/l)	0.8	0.0005	0.0008	0.02	0

From Table 5 it can be seen that the predicted concentrations of DIN, MRP, TA and UiA are below the EQS target levels for the 50%ile scenario in the near field and are therefore in compliance with all the relevant governing water quality legislation in the near field. Consequently, no further assessment of these parameters in the far field is required as part of this study.

3.7 30-year project horizon

The results presented in the previous section utilised an outfall flow rate of 0.0014m^3/s which corresponds to a circa 13-year future flow scenario. The 30-year future flow as calculated by Jennings/AECOM report is 0.0028 m^3/s in Summer and 0.0011 m^3/s in winter. The average of these flows is 0.0019m^3/s which represents an increase of 36% over the flow used as part our assessment.

Based on the results presented in the previous section it is likely that a number of the parameters assessed as part of this study would exceed their EQS threshold in the near field under this future flow scenario. It is however also likely that they would fall below their EQS threshold in the far field for the following reasons:

- The relatively low loading from the outfall even in the 30-year scenario;
- The high degree of dispersion offered to treated effluent by the semi-diurnal tides of the Irish Coast;
- The high degree of dilution offered by the coastal water of Castle Haven.

There are no sensitive receptors in Castle Haven at the present time. It is recommended that the impact of a 30-year project loading on the bay is reassessed as part of any future efforts to designate the bay or its surrounding area as a bathing water or shellfish area.

4 Conclusion

The Water Quality parameters assessed as part of this study are as follows:

- BOD
- DIN
- MRP
- TA
- UiA

The predicted concentrations of DIN, MRP, TA and UiA are all below the EQS target levels for the 50%ile scenario in the near field and are therefore in compliance with the relevant legislation. No further assessment of the impact of these nutrients in the far field is therefore required. The predicted 95%ile concentration for BOD is marginally above the EQS target level. It is however very reasonable to expect that the concentrations will fall below the threshold once the plume undergoes additional dilution in the far field given that it is so close to the threshold in near field. A more detailed assessment of the impact of BOD in the far field is therefore not deemed to be necessary. As BOD has been adopted as a surrogate measure of DO as part of this study it can also be concluded that a more detailed assessment of DO in the far field is not required.

From the near field modelling analysis presented in this report it is evident that the discharges from the proposed WWTP in Castletownshend will be in compliance with the relevant WQ legislation. The proposed level of treatment and outfall arrangements are appropriate, and the operation of the WwTP is compatible with the achievement of the WFD objectives for the receiving coastal waterbody. A more detailed Phase 2 assessment is therefore not required.

The results presented in the previous section utilised an outfall flow rate that corresponds to a circa 13-year future flow scenario. The 30-year future flow (averaged over Summer and Winter) is 0.0019 m3/s which represents an increase of 36% over the flow used in this study. It is recommended that the impact of a 30-year project loading on the bay is reassessed as part of any future efforts to designate the bay or its surrounding area as a bathing water or shellfish area.

References

[1] Irish Water, “IW Marine Modelling Standard Rev 1.91,” IW, 2018.

[2] Statutory Instruments No. 254 of 2001, “Irish Statutory Requirements, 2001. S.I. No. 254/2001 - Urban Wastewater Treatment Regulations,” SI, 14 June 2001.

[3] European Communities, “S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations,” European Communities, 2009.

[4] Statutory Instruments No. 79 of 2008, “S.I. No. 79/2008 - Bathing Water Quality Regulations,” SI, 2008.

[5] Irish Statutory Requirements No. 79 of 2006, “Irish Statutory Instruments, 2006 European Communities (Quality of Shellfish Waters) Regulations,” SI, 22 May 2006.

[6] The University of Hong Kong, “VISJET 2.0 User Manual”.

[7] Jennings O Donovan AECOM, UTAS Study Design Report, Castletownshend, Co Cork, 2016.

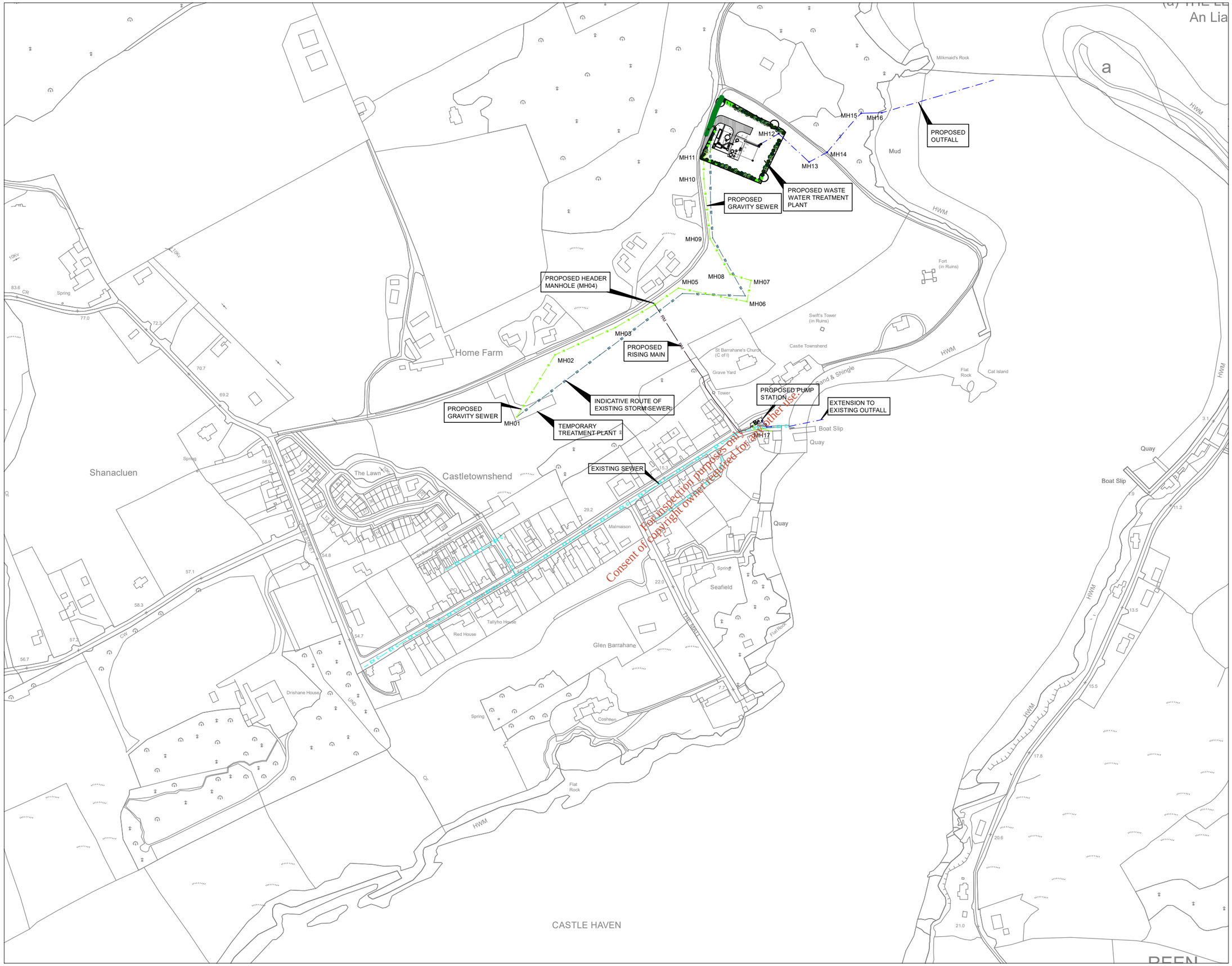
[8] “The Springer Handbook of Ocean Engineering 2016”.

[9] I.R. Wood, R.G. Bell, D.L. Wilkinson, “Ocean Disposal of Waste (World Scientific, Singapore 1993)”.

Appendix A

Proposed Scheme Layout

A1



GENERAL NOTES

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NOTES:

1. ORDNANCE SURVEY IRELAND LICENCE NUMBER EN 3-3-34.
2. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
3. ALL DIMENSIONS TO BE CHECKED ON SITE.
4. ANY QUERIES OR DISCREPANCIES SHOULD BE REFERRED TO THE EMPLOYERS REPRESENTATIVE IMMEDIATELY.
5. EXISTING & PROPOSED PIPE LOCATIONS ARE INDICATIVE ONLY.

LEGEND:

EXISTING COMBINED SEWER — EX C — EX C —
EXISTING STORM SEWER — SD — SD — SD —
PROPOSED SEWER — FS — FS — FS —
PROPOSED RISING MAIN — RM — RM —
PROPOSED OUTFALL

Rev	Date	Description	By	Chk	App
F5	19.06.20	WWTP LAYOUT UPDATED	LT	OL	KT
A4	20.03.20	REVISED GRAVITY SEWER AND OUTFALL ROUTE	OL	OL	KT
A3	05.11.19	WWTP LAYOUT UPDATED	LT	OL	KT
A2	22.10.19	PIPE ROUTES REVISED, EXISTING SERVICES ADDED	LT	OL	KT
A1	22.08.19	WWTP & PS LAYOUT UPDATED	LT	OL	KT

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PROJECT
UTAS – CORK BUNDLE
CASTLETOWNSHEND

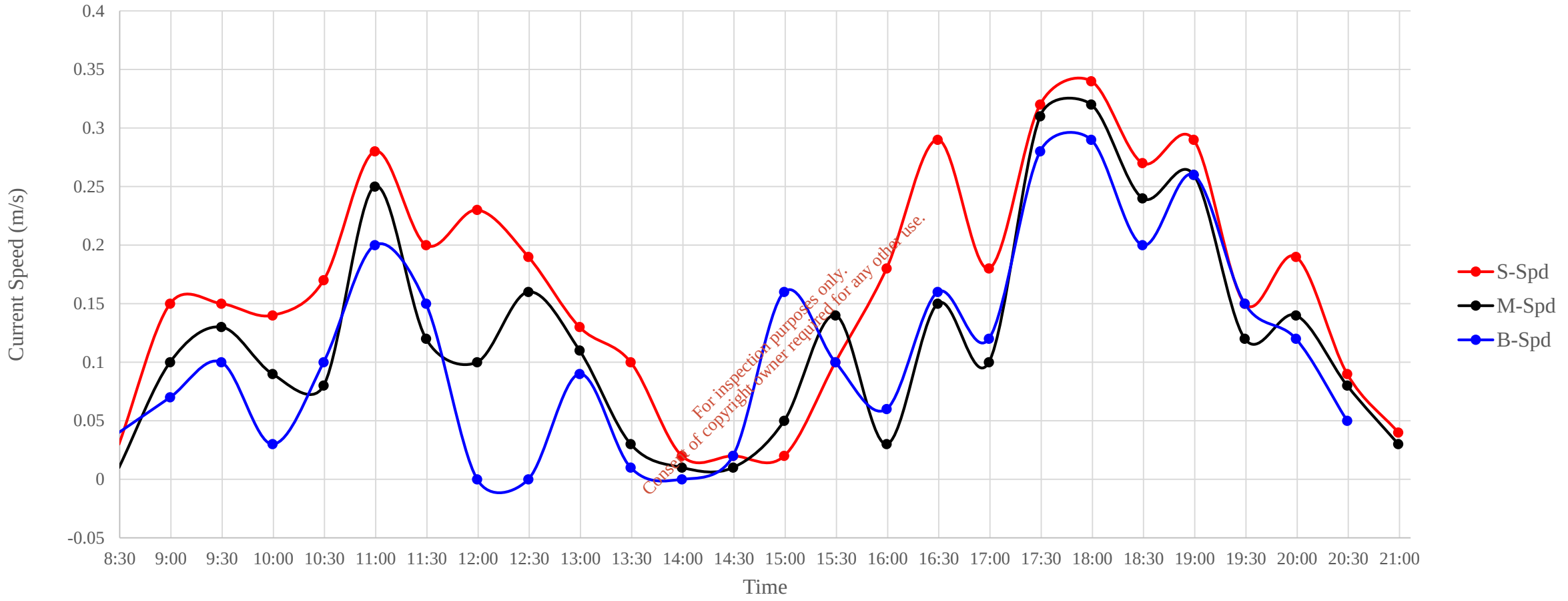
DRAWING TITLE
PROPOSED SCHEME LAYOUT

STATUS
FOR INFORMATION

Date: 10.05.19	Scale: 1:2000	Drawn: LBR	Chk: OL	App: KT
Project No: 257589_00	Drg. No: IW-10015228-04-01-001			Rev: F5

Appendix B

Marine Survey Data



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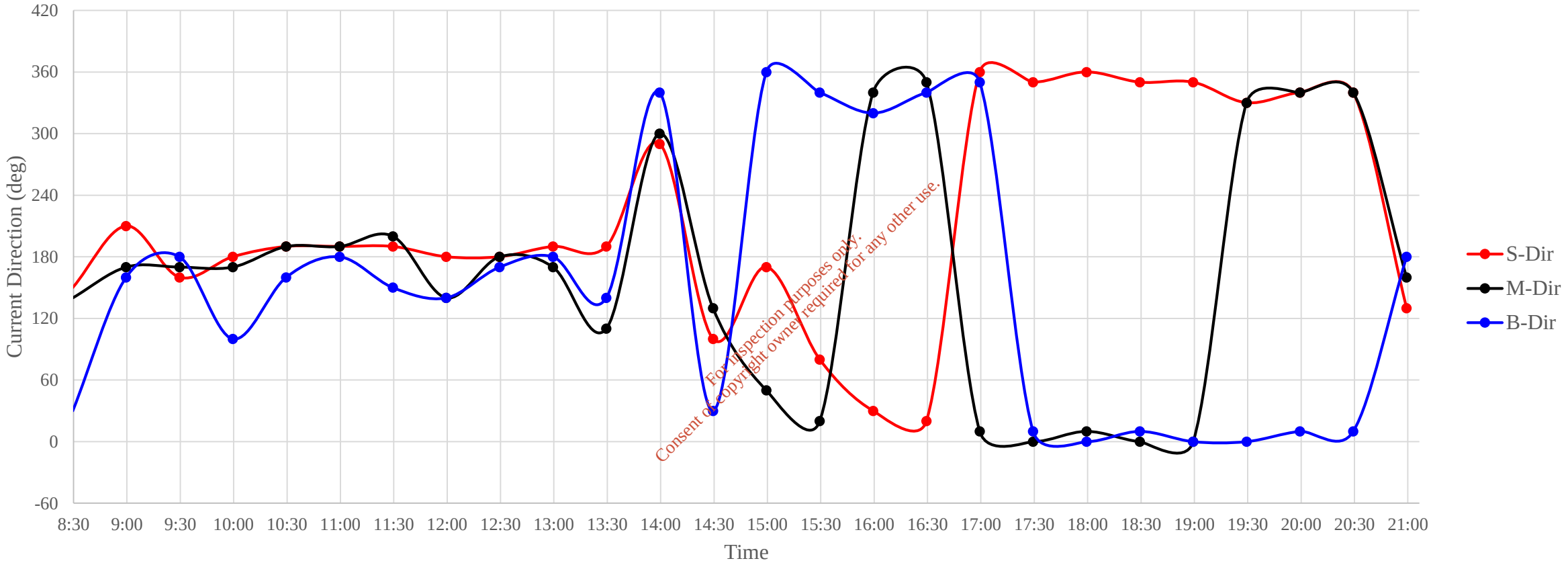

Location:	
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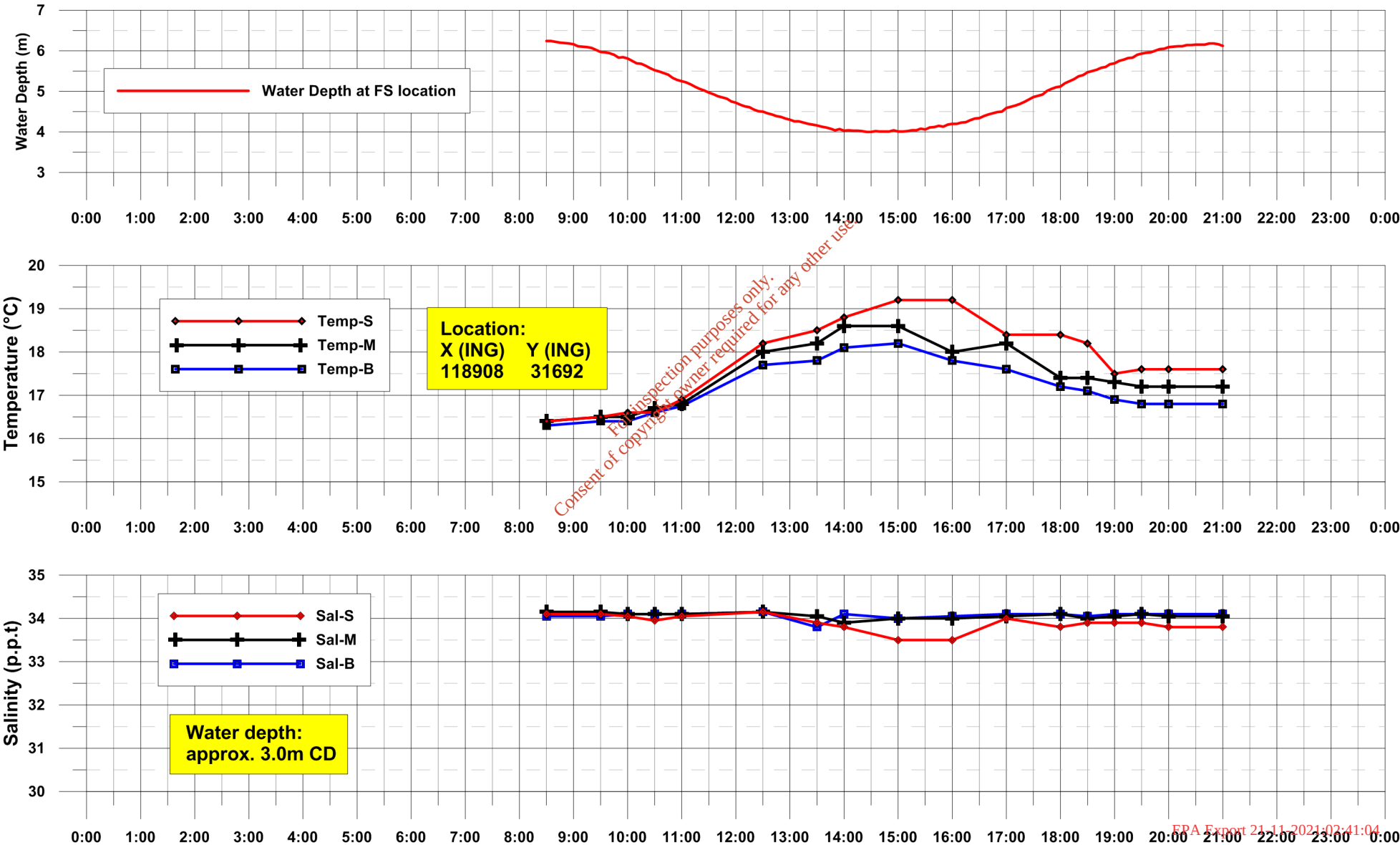
118908	31692

UTAS Surveys for Arup & Irish Water

Castletownshend

Fixed Station Temperature and Salinity - July 2nd 2018



ATTACHMENT NO: D.2

AA SCREENING REPORT

Habitats Directive

Screening for Appropriate Assessment Report

Ecological Assessment of

Likely Significant Impacts of a Proposed Development at

Castletownshend, Co. Cork,

on Conservation Objectives of Natura 2000 Sites

April 2020

Prepared by:
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1.0 INTRODUCTION

1.1 Legislative Background and Context

The primary purpose of this report is to provide relevant material to inform a decision by the public authority, as required under Article 6.3 of the EU Habitats Directive, as to whether the proposed development is likely to have any significant impacts of on the Conservation Objectives of a Natura 2000 site.

Section 42 (1) of S.I. No. 477 of 2011, the European Communities (Birds and Natural Habitats) Regulations 2011 states: "*A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site*."

Where the screening process cannot exclude the possibility that a plan or project, individually or in combination with other plans or projects, could have a significant effect on a European site, there is a requirement under Article 42 (9) of these Regulations for the preparation of a Natura Impact Statement to inform the Appropriate Assessment process.

In this report, the Department of the Environment, Heritage and Local Government guidance *"Appropriate Assessment of Plans and Projects in Ireland – guidance for Planning Authorities, 2009"* and the European Commission guidelines (EC, 2018) are followed.

It is necessary to examine all aspects of the proposed development which could potentially impact on the Conservation Objectives of any Natura 2000 site within the potential impact zone of the proposed development. The site of the proposed development is not within any Natura 2000 site. The following four Natura 2000 sites are within 15km of the proposed development (see Appendix 4):

- Castletownshend Special Area of Conservation (SAC 001547), located within 200m to the north of the proposed WWTP site. The Qualifying Interest is Killarney Fern (*Trichomanes speciosum*) [Code 1421].
- Moyross Woods Special Area of Conservation (SAC 001070), located c. 5km to the northeast of the proposed development. The Qualifying Interest is Killarney Fern (*Trichomanes speciosum*) [Code 1421].
- Sheep's Head to Toe Head Special Protection Area (SPA 004156), located c. 5km to the southwest of the proposed development. The Features of Interest are Peregrine (*Falco peregrinus*) [Code A103] and Chough (*Pyrrhocorax pyrrhocorax*) [Code A346]
- Lough Hyne Reserve and Environs Special Area of Conservation (SAC 000097), located over 9km to the southwest of the proposed development and approximately 12km from the subject site by sea. The Qualifying Interests are Large Shallow Inlets and Bays [Code 1160], Reefs [Code 1170] and Submerged or Partially Submerged Sea Caves [Code 8330].

In this report, the implications of all aspects of the proposed development are assessed, individually and in combination with any other relevant developments, plans or projects, in light of:

- information relating to the ecology of the Natura 2000 site;
- the status of Qualifying Interests of the Natura 2000 site (Annex I habitats and Annex II species of the EU Habitats Directive) and the relevant conservation status and objectives for these species;
- the key structural and functional relationships maintaining the integrity of the Natura 2000 site;
- the scale and nature of the aspects of the project in relation to the Natura 2000 site.

The aim of the report is to provide the public authorities with the relevant information necessary to inform the decision-making process, while ensuring that the requirements of the EU legislation quoted above are fully complied with.

1.2 Ecological Consultancy Engaged

Pascal Sweeney was engaged to carry out this report. Qualifications and past experience are presented in Appendix 3.

2.0 PROPOSED DEVELOPMENT

2.1 Proposed Development Description

The proposed development is for an upgrade of wastewater collection and treatment under the Castletownshend Collection and Treatment System UTAS project. The existing sewerage scheme consists of an old stone culvert acting as a combined sewer taking foul and surface water from the older properties fronting onto Main Street and pavement run-off. The culvert discharges directly into the harbour through an outfall adjacent to the Boat Slip (Appendix 4). Some properties at the southern end of the village have individual septic tanks, discharging to soakaways and in a few instances, the foreshore. The housing fronting onto Cross Street and the R595, as well as three houses at the top of Main Street are served by individual septic tanks and soakaways.

The proposed development comprises of the following:

1. The Castle pumping station (PS), a proposed underground pumping station and associated infrastructure within the curtilage of the Castle B&B including an underground pump sump, underground stormwater storage tank, vent pipe, kiosks and surge vessel.
2. Proposed extension to the existing culvert outfall adjacent to the slipway to below low tide extent
3. A proposed rising main and gravity sewer to convey flows from the Castle pumping station to the Waste Water Treatment Plant (WWTP) site.
4. A proposed WWTP with associated ancillary development works including inlet works, tanks, kiosks, pumping station, entrance, hardstanding and perimeter boundary fencing.
5. A proposed outfall pipe to convey treated effluent and storm flows to Castle Haven Bay.
6. All associated ancillary site development works above and below ground.

The scheme will also include the following infrastructure which is considered to be exempt from requiring planning permission in accordance with S.I. No. 29/2018 (Class 58 (b)) of the Planning and Development (Amendment) Regulations 2018

1. Gravity sewer from the existing culvert to the Pumping Station (PS).
2. Gravity sewer from the Lawn housing estate to the header manhole.
3. Separation of waste water from existing culvert with the laying of a new gravity sewer on Main Street.

2.2 Relevance of Proposal to Management of Natura 2000 Sites

The proposed development is not directly connected with or necessary to the management of any Natura 2000 site and, as such, does not undertake measures for the sites' conservation management.

3.0 SITE ASSESSMENTS

3.1 Natura 2000 Sites

While SAC 001547 is located within 200m to the north of the proposed WWTP site (see Appendix 6), Killarney fern, its sole Qualifying Interest is a terrestrial species, growing in woodland that will not be disturbed by the proposed development.

The Qualifying Interest of SAC 001070, located c. 5km from the proposed development, is also Killarney fern. It will not be disturbed by the proposed development.

While it would be possible for peregrine and/or chough (the two Features of Interest of SPA 004156) to visit the subject site, there are no suitable nesting areas for either species here and the vegetation in the grassland is too high for chough foraging. The proposed development will not impact on the Conservation Objectives of SPA 004156.

At a distance of approximately 12km by sea from the subject site to SAC 000097, this Natura 2000 site is outside the potential impact zone of a proposed development of this nature (see the Dispersion Modelling Report which accompanies the Castletownshend Sewerage Scheme planning application).

3.2 Subject Site Field Assessments

Field work was carried out on four occasions: 02 May 2018, 14 September 2018 and 20 August 2019 by Pascal Sweeney and a shoreline survey at the proposed outfall location was carried out by Geoff Oliver on 18 May, 2018.

4.0 SCREENING FOR APPROPRIATE ASSESSMENT

4.1 Screening of Potential Impacts: Construction Phase

As there are no potential pathways for impacts arising from the proposed works to affect SAC 001547 or SAC 001070, as the subject site is c. 5km from SPA 004156, with no suitable habitat for the two Features of Interest, neither of which would be affected by water quality issues, and as the the distance to SAC 000097 is c. 12km via surface waters, a distance to which pollutants potentially released by a project of this nature and scale would not have potential to reach, there will be no impacts on the Conservation Objectives of these sites at construction phase of the project and impacts can be screened out.

4.2 Screening of Potential Impacts: Operational Phase

At operational phase, the proposed development cannot impact on the terrestrial species for which SAC 001547, SAC 001070 or SPA 004156 are designated. As the only pathway to SAC 000097 is via surface waters, at a distance of approximately 12km, treated effluent from the proposed development will not impact on this Natura 2000 site. For further information on the treated effluent dispersion during the operational phase, please see the Near Field Dilution ModellingReport which accompanies the Castletownshend Sewerage Scheme planning application.Therefore, due to the location of the proposed development in relation to Natura 2000 sites, there will be no impacts on the Conservation Objectives of these sites at operational phase of theproject and impacts can be screened out.

4.3 Assessment of Significance

The proposed development will not result in any loss or fragmentation of habitats for which any Natura 2000 site is designated.

The proposed development will not have any significant negative impacts on the Qualifying Interests for which any Natura 2000 site is designated.

The proposed development will not have any significant negative impacts on the Conservation Objectives of any Natura 2000 site.

4.4 Cumulative Impacts

No other proposed plans or projects that could add to the cumulative impact are known.

The proposed development will not, on its own, negatively impact on the Conservation Objectives of any Natura 2000 site. Neither will it add to the other cumulative impacts on the Natura 2000 site from other sources

4.5 Conclusions of Screening Report

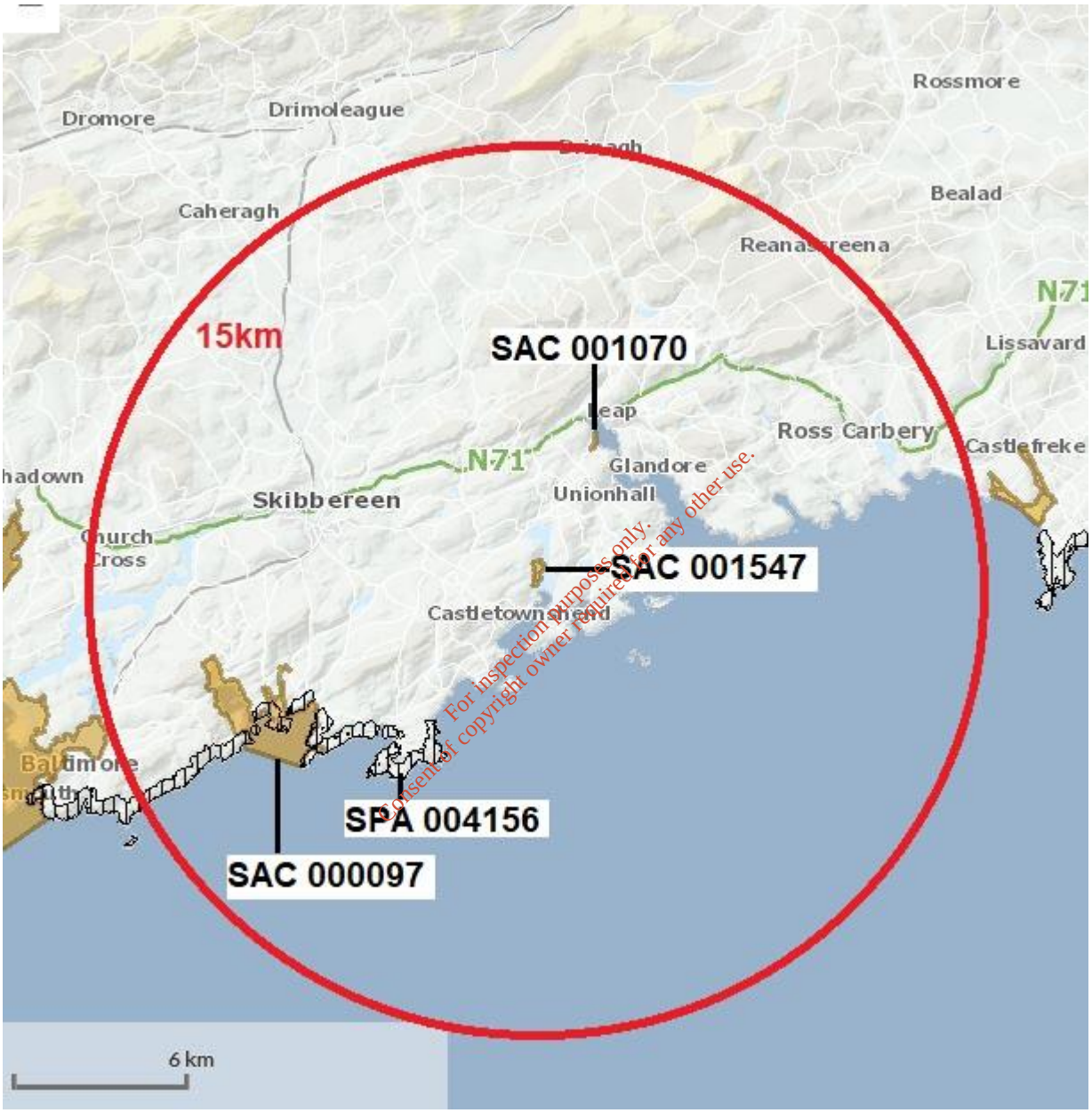
Having assessed all relevant potential effects of the proposed development, it is considered that all potential impacts on the Conservation Objectives and integrity of Natura 2000 sites can be screened out. It is therefore considered that it is not necessary to proceed to Natura Impact Statement.

APPENDIX 1
REFERENCES

EC (2018). Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

APPENDIX 2

NATURA 2000 SITES WITHIN 15KM



APPENDIX 3
PASCAL SWEENEY: QUALIFICATIONS & EXPERIENCE

QUALIFICATIONS: B.Sc., M.Sc., MCIEEM.

M.Sc. thesis by research on aquatic insect populations and eutrophication in the Killarney Lakes. Member of the Institute of Ecology and Environmental Management, the Freshwater Biological Association and the Botanical Society of the Britain and Ireland.

MAIN RELEVANT EXPERIENCE:

Habitats Directive Appropriate Assessment:

Over 200 reports for Appropriate Assessment (Screening Reports and Natura Impact Statements) for a wide variety of proposed developments, including local authority waste water treatment plants, flood defence schemes, fish passes, bridge improvements, landfills, large industrial developments and private housing.

Freshwater Biological Water Quality Monitoring:

Yearly monitoring of biological water quality of rivers for the EPA Q-scheme monitoring programme from 2012 to 2019. Water quality surveys for local authorities (Wexford, Kilkenny, Kildare Waterford and Tipperary Co. Cos.), and industries (e.g. Glanbia, Dairygold, Irish Sugar, Irish Distillers, Lisheen Mine, Carbury Mushrooms). Profundal species analysis of over 600 lake samples for EPA and 250 lake samples for NIEA.

Estuarine Monitoring:

Analysis of oligochaete communities in 66 Munster estuaries for a Praeger Grant funded research project. Analysis of estuarine fauna of 10 estuaries for discharge licences or NIS.

Impact Assessment:

Impact assessment of proposed developments on freshwater habitats and recommendation of mitigation measures. These developments include roads, gas pipelines, landfills, quarries, hydropower stations, intensive agriculture and industries.

Agri-Environmental Schems REPS, AEOS and NPWS Hen Harrier Farm Plans:
Ecological surveying of lands in NHA/SAC/SPA sites and preparation of Environmental Reports throughout Munster (over 700 reports).

Commonage Framework Planning:
Surveyed habitats, assessed vegetation condition and recommended management requirements on mountain and coastal commonages in Cork Tipperary, Limerick, Clare, Carlow and Wexford.

Habitat Surveys and Management Planning of Coillte Property:
Habitat and botanical surveys of potential Biodiversity Areas in Cork and Waterford.

Native Woodland Scheme:
Approved by the Forest Service as a Participating Ecologist. Preparation of the ecological aspects of the Ecological Survey/Management Plans. (49 plans).

Bat Surveys:
Bat surveys at a variety of structures at proposed development sites, including buildings, road bridges and tree lines. Participant in the All Ireland Daubenton's Bat Waterways Monitoring Survey, co-ordinated by Bat Conservation Ireland.

Freshwater Pearl Mussel Surveys:
Licensed surveys for *Margaritifera margaritifera* in the following river catchments: Munster Blackwater, Lee, Bandon, Slaney, Barrow, Nore, Suir, Corrib and Moy.

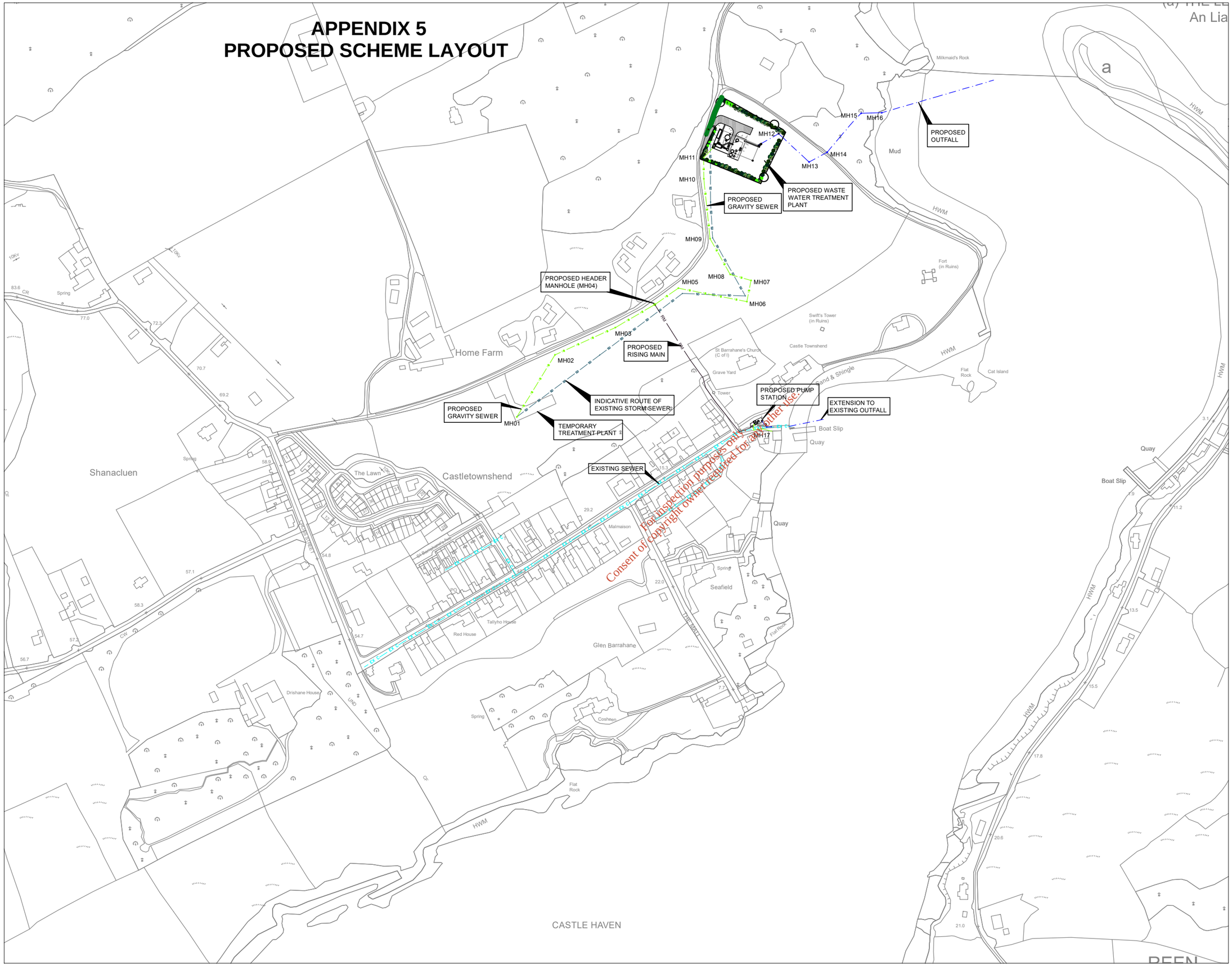
White-Clawed Crayfish Surveys:
Licensed surveys in the Liffey, Shannon, Munster Blackwater, Bandon, Barrow, Nore and Suir catchments.

APPENDIX 4

OUTFALL LOCATIONS

A1

APPENDIX 5
PROPOSED SCHEME LAYOUT



GENERAL NOTES

NOTES:

1. ORDNANCE SURVEY IRELAND LICENCE NUMBER EN 3-3-34.
2. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
3. ALL DIMENSIONS TO BE CHECKED ON SITE.
4. ANY QUERIES OR DISCREPANCIES SHOULD BE REFERRED TO THE EMPLOYERS REPRESENTATIVE IMMEDIATELY.
5. EXISTING & PROPOSED PIPE LOCATIONS ARE INDICATIVE ONLY.

LEGEND:

- EXISTING COMBINED SEWER
- EXISTING STORM SEWER
- PROPOSED SEWER
- PROPOSED RISING MAIN
- PROPOSED OUTFALL

Rev	Date	Description	By	Chk	App
F5	19.06.20	WWTP LAYOUT UPDATED	LT	OL	KT
A4	20.03.20	REVISED GRAVITY SEWER AND OUTFALL ROUTE	OL	OL	KT
A3	05.11.19	WWTP LAYOUT UPDATED	LT	OL	KT
A2	22.10.19	PIPE ROUTES REVISED, EXISTING SERVICES ADDED	LT	OL	KT
A1	22.08.19	WWTP & PS LAYOUT UPDATED	LT	OL	KT

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Working in Partnership

PROJECT
UTAS – CORK BUNDLE
CASTLETOWNSHEND

DRAWING TITLE
PROPOSED SCHEME LAYOUT

STATUS
FOR INFORMATION

Date: 10.05.19	Scale: 1:2000	Drawn: LBR	Chk: OL	App: KT
Project No: 257589_00	Drg. No: IW-10015228-04-01-001			Rev: F5

APPENDIX 6

SAC 001547 LOCATION