

Cork County Council

**River Owenacurra and River  
Dungourney (Midleton) Flood  
Relief Scheme**

Constraints Report

Issue 2 | 31 October 2017

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Job number 252803-00



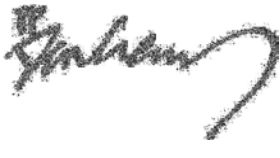
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Midleton FRS Public Consultation Report May 2017

## Glossary

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Architectural Conservation Area

<b>BCT</b>	Bat Conservation Trust
<b>CHS</b>	Cultural Heritage Site
<b>cSAC</b>	candidate Special Area of Conservation
<b>DAHG</b>	Department of Arts, Heritage and the Gaeltacht
<b>EIA</b>	Environmental Impact Assessment
<b>EIS</b>	Environmental Impact Statement
<b>EPA</b>	Environmental Protection Agency
<b>FRS</b>	Flood Relief Scheme
<b>GSI</b>	Geological Survey of Ireland
<b>Ha</b>	Hectare
<b>IDL</b>	Irish Distillers Limited
<b>IFI</b>	Inland Fisheries Ireland
<b>IPPC</b>	Integrated Pollution Prevention Control
<b>LAP</b>	Local Area Plan
<b>NHA</b>	Natural Heritage Area
<b>NIAH</b>	National Inventory of Architectural Heritage
<b>NMS</b>	National Monuments Service
<b>NPWS</b>	National Parks and Wildlife Service
<b>OD</b>	Ordnance Datum
<b>OPW</b>	Office of Public Works
<b>PFRA</b>	Preliminary Flood Risk Assessment
<b>pNHA</b>	Proposed Natural Heritage Area
<b>PID</b>	Public Information Day

<b>RMP</b>	Record of Monuments and Places
<b>RPS</b>	Record of Protected Structures
<b>SAC</b>	Special Area of Conservation
<b>SMR</b>	Sites and Monuments Record
<b>SPA</b>	Special Protection Area
<b>WFD</b>	Water Framework Directive
<b>WMU</b>	Water Management Unit

## Executive Summary

This report presents the environmental constraints relating to the River Owenacurra and River Dungourney (Midleton) Flood Relief Scheme (Midleton FRS). Constraints have been documented under the following headings<sup>1</sup>:

**Population and Human Health**  
**Biodiversity**  
**Hydrology**  
**Hydrogeology**  
**Soils and Geology**  
**Archaeology, Architectural and Cultural Heritage**  
**Landscape and Visual**  
**Noise, Air Quality and Climate**  
**Material Assets**

Under each heading, the methodology is described, followed by a description of the study area, or 'receiving environment'. Finally, the key constraints and implications for the proposed scheme are summarised.

In addition to the specialist desk and field studies, a public information day (PID) was held to present the study area to the public and invite feedback regarding the proposed scheme. Submissions were also invited from statutory bodies, relevant organisations, and political representatives. Information gathered during this consultation process has been included in this report.

This report is one stage in the environmental assessment process, which continues through the planning and design of the project. Information gathered or alternatives suggested arising from the public information days, meetings with stakeholders and written representations are being considered with regard to engineering, environmental, community and economic issues.

## Summary of Key Constraints

### **Population and Human Health**

The scheme design should take into account the value (both cultural and economic) of any buildings (residential, retail, etc.) or structures of conservation interest likely to be adversely affected by the scheme. Any design proposals should ensure that any bridges over watercourses are maintained where feasible so that temporary or permanent disruption on local transport links and access to homes and businesses in the study area are minimised.

Impacts on public amenity areas adjacent to the rivers such as riverside walks, parks and playgrounds should be considered in addition to impacts on sensitive receptors such as schools, crèches, playschools and medical facilities. The proposed scheme should also consider the zoning objectives, and relevant specific objectives set out in the *Cork County Development Plan 2014-2020*, the *East Cork Municipal District Local Area Plan Draft 2017*, the *South West Regional Planning Guidelines 2010-2022*, and any future developments in the study area.

<sup>1</sup> These headings have been selected with due regard to the likely environmental impacts of the proposed scheme, and the statutory requirements for EIA as set out in EU Directives and associated Irish legislation.

## Biodiversity

Given the legal protection and conservation importance afforded to sites designated under the Habitats and Birds Directives, the most significant ecological constraints which need to be considered relate to those water courses with direct connectivity with those European sites located in Cork Harbour i.e. the Cork Harbour SPA and Great Island Channel SAC. Impacts on nationally designated sites and sites of local ecological interest located within the study area also need to be considered.

## Hydrology

The scheme design should take into consideration the main objectives of the South West River Basin District Management Plan, by ensuring that any works proposed do not result in the deterioration of water quality and achieve the protected areas objective. Impacts on drinking water supplies both from surface water and groundwater sources also need to be considered and the hydro-geomorphology of the receiving waters is considered a constraint.

## Soils, Geology and Hydrogeology

Constraints to be considered during the design development include depth to bedrock, soft soil and palaeofeatures, presence of mines and quarries/pits, geological heritage areas and karst features. The presence of any land and water contamination and any geohazards also need to be considered. Finally impacts on aquifers and groundwater resources need to be considered.

## Archaeology, Architectural and Cultural Heritage

There are a number of protected sites of archaeological, architectural and cultural heritage interest within the study area. The sites to be considered as key constraints are as follows:

- All sites listed as National Monuments.
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full).
- All archaeological sites considered to be of international, national or regional importance.
- All buildings or structures listed in the Record of Protected Structures.
- Areas of Archaeological Potential

Consideration will need to be given to avoiding/minimising impacts on these sites during the design development.

Sections of the Owenacurra and Dungourney Rivers and the Owenacurra Estuary are considered to be Areas of Archaeological Potential and are therefore key constraints. It is likely that the rivers have been impacted in localised areas in the past when they were used as a power source for various mills and industrial activities. It is recommended that further proposed works to the rivers should be archaeologically assessed in advance of works taking place.



### **Landscape and Visual**

Key constraints in respect of the proposed Midleton FRS relate to landscape and scenic designations in the Cork County Development Plan as well as places of local and recreational amenity, particularly riverside walks and linear parks.

There is a substantial area of 'High Sensitivity' landscape covering the settlement of Midleton and the coastal landscape in the south-western corner of the study area. Any works within the Owenacurra River corridor or estuary will need to be cognisant of the landscape and design policies within this landscape zoning.

Scenic routes S44, S43 and S51 (from the Cork County Development Plan) are all potentially relevant to any flood relief works within the Owenacurra catchment, but with the latter two in closer alignment with the River itself.

### **Air Quality, Climate, and Noise and Vibration**

Consideration will need to be given to potential impacts of air and noise emissions on sensitive receptors (such as schools, medical facilities etc.) during the construction phase of the proposed flood relief scheme. The potential impacts of climate change will need to be considered in the design of the proposed scheme.

### **Material Assets**

Impacts on services and utilities such as watermains, gas mains, underground powerlines etc. will all need to be considered during the design process. The possible interruption of these services and utilities should be minimised if at all possible. The protection of water supply from the Owenacurra River and the future provision of additional capacity in the water supply and wastewater treatment networks, and the future provision of widespread broadband, are key constraints. Furthermore, impacts on road and rail infrastructure and land ownership will need to be considered.

# 1 Introduction

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## 1.1 Overview

Cork County Council, acting as an agent for the Office of Public Works (OPW), intends to develop a flood relief scheme for the Owenacurra and Dungourney Rivers, particularly in the vicinity of Midleton. Midleton and surrounding areas have experienced a number of extreme flood events in recent years. This project follows on from the Lee Catchment Flood Risk Assessment and Management Study (CFRAMS) and the major flood event of December 2015.

Following on from the findings of the Lee CFRAMS, and from assessments of the December 2015 flood event, Cork County Council has recognised that there are four sources of flood risk in the Owenacurra and Dungourney River catchments comprising of fluvial (river), tidal, pluvial (rainfall) and groundwater flooding. A robust flood relief scheme is required to address these flood sources. The Draft Catchment Flood Risk Management Plan was published in February 2010 and recommended the following for the Midleton sub-catchment;

- Review feasibility of Fluvial Flood Forecasting System.
- Targeted Public Awareness and Education Campaign.
- Permanent Flood Walls and/or Embankments.

The name of the proposed scheme is the River Owenacurra & River Dungourney (Midleton) Flood Relief Scheme and is referred to as the Midleton FRS in this report. The purpose of the Midleton FRS is to assess and develop a viable, cost effective and sustainable Flood Relief Scheme to alleviate flooding along the Owenacurra and Dungourney Rivers. Arup has been appointed by Cork County Council to undertake the design and implementation of the Midleton FRS.

The information gathered during the constraints stage will inform subsequent decisions about feasible options and the selection of a preferred option. It will also be used to describe the existing environment at a general scale when preparing the Environmental Impact Assessment Report and will help to inform the information gathering process for Appropriate Assessment Screening and Appropriate Assessment (if required).

This constraints report presents the findings of the constraints study.

## 1.2 Constraints Study Methodology

The purpose of the constraints study is to identify the key environmental aspects which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the viability and/or design of these measures. The scheme context and background is described in **Section 2** of this report. This includes an overview of flooding events in the study area, future changes in flooding patterns and potential flood risk management measures which may be considered for the proposed scheme.

Arup and its specialists have undertaken a series of desk studies and preliminary site visits as part of the constraints study. Further details on constraints are presented in **Section 3** of this report. Information has been gathered with due regard to the likely environmental impacts of the proposed scheme, and the statutory requirements for Environmental Impact Assessment and Appropriate Assessment as set out in the EU Directives and associated Irish legislation.

Consultation has been carried out with the public and various stakeholders, the purpose of which was to engage with them, to gather local knowledge on flooding and environmental constraints and opportunities for addressing flood risk in the area. Further details on consultation are presented in **Section 4** of this report. The constraints study has had regard in general to the following guidance and information sources as mentioned below. Specific guidance and information sources are referenced in individual specialist sub- sections.

### **Guidance**

- Guidelines on the information to be contained in Environmental Impact Statements, 2002 (Environmental Protection Agency) and Draft Revised Guidelines, 2017.
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Environmental Protection Agency, 2003) and Draft Revised Notes, 2015.
- Department of Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities
- European Communities (2000) Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC
- EC Environment Directorate-General (2000) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Department of Environment, Heritage and Local Government (2010) Circular NPW1/10 & PSSP 2/10 Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities
- Office of Public Works (2010) Lee CFRAMS SEA Environmental Report
- Office of Public Works (2010) Lee CFRAM Study Report
- Office of Public Works (2014) Lee CFRAM Catchment Flood Risk Assessment and Management Study.

### **Information Sources**

- Environmental Protection Agency ENVision Online Database [www.epa.ie](http://www.epa.ie)
- Environmental Protection Agency My Local Environment (Timpeall an Ti) online Database [www.epa.ie](http://www.epa.ie)

- Inland Fisheries Ireland Website [www.fisheriesireland.ie](http://www.fisheriesireland.ie)
- Ordnance Survey Discovery Series Mapping at 1:50,000 scale
- Fáilte Ireland, *Annual Report 2015*

### 1.3 Study area

The scheme study area (i.e. the area where flood alleviation measures may be carried out) for the proposed scheme includes all of the Owenacurra River catchment and any part of the Cork Harbour sub catchment that potentially affects flooding in Midleton.

It includes the channels, floodplains and immediate surrounding areas of the rivers. The Owenacurra River catchment has two main rivers; the Owenacurra River and the Dungourney River and is broken into six subcatchments. The Owenacurra River rises in the northwest of the catchment and discharges to Cork Harbour south of the town of Midleton where water levels are influenced by the tidal cycle in Cork Harbour. The Owenacurra River predominantly drains the west of the catchment, while the Dungourney River drains the east of the catchment. The Dungourney River has its confluence with the Owenacurra River in Midleton and is the most significant tributary of the Owenacurra. The scheme study area includes a number of settlements such as Midleton, Dungourney, Lisgoold, Leamlara, Ballincurragh and Ballynacorra. The scheme study area is presented in **Figures 1.2.1 and 1.2.2.**



Figure 1.2.1: Scheme Study area



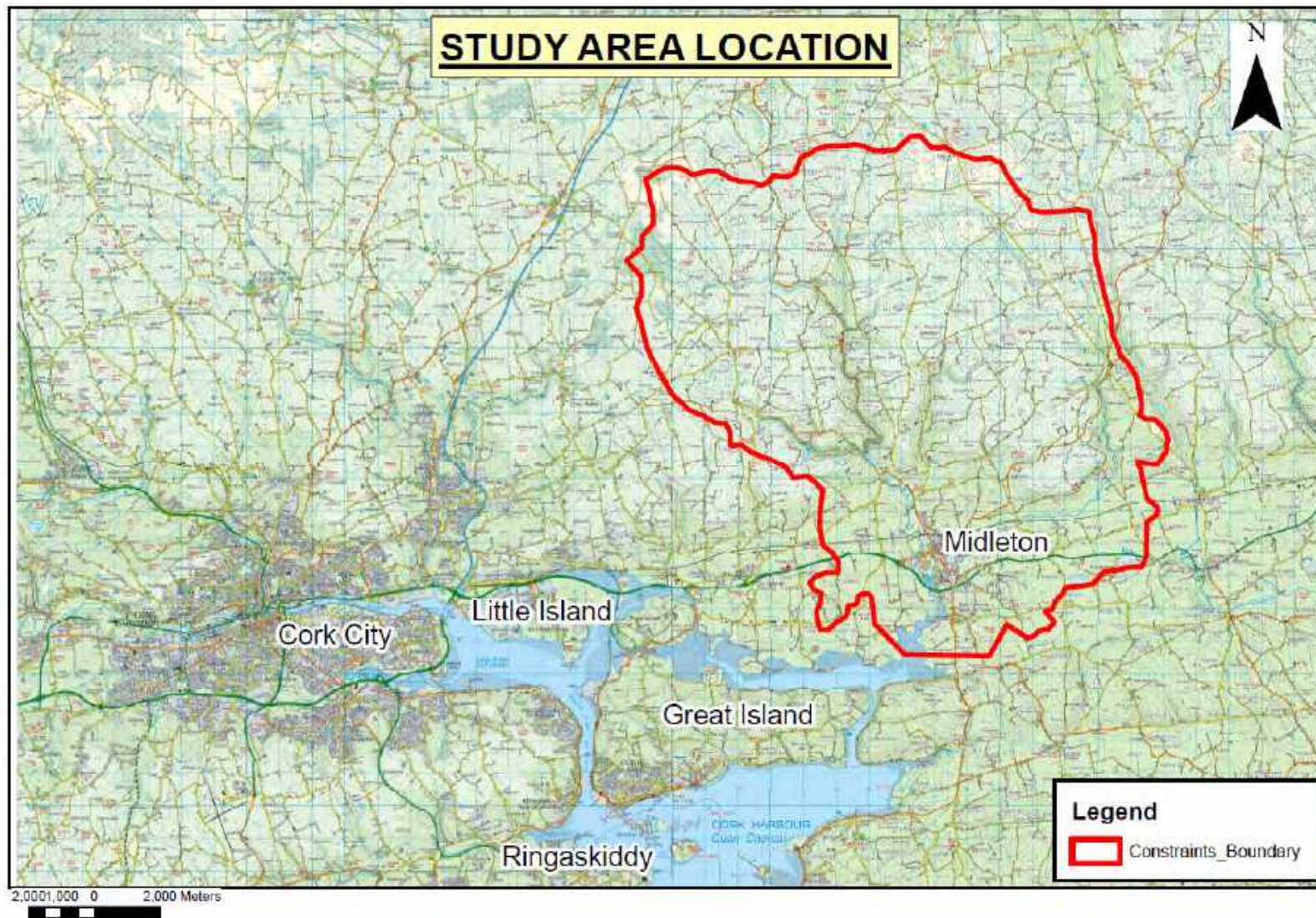


Figure 1.2.2: Scheme Study Area Location Overview

The constraints study area for each environmental discipline varies depending on the range and extent of potential impacts (both direct and indirect) from the proposed scheme. For some environmental disciplines, the constraints study area extends beyond the boundary of the scheme study area due to potential indirect impacts whereas for others, the potential impacts are more localised and direct. For example, potential indirect downstream impacts of the proposed scheme are considered for both hydrology and biodiversity disciplines. The constraints study area is defined in each of the specialist sections of this report.

## 1.4 Consultation

A public information day (PID) was held on Thursday 23 March 2017 in the Midleton Park Hotel. The purpose of the PID was to engage with the public, outline the process involved in the preparation for the Midleton FRS, and gather local knowledge on flooding and environmental constraints and opportunities for addressing flood risk in the area. Further details on the PID are presented in **Section 4** of this report. All consultation documents are provided in **Appendix 4.1**. In addition to the public information day, comments and information were also sought from other consultees. The list of consultees is included as **Appendix 4.1** to this report, together with a copy of the letter and attachments issued to consultees. Copies of any written correspondence received are also provided in **Appendix 4.1**.







**Table 2.1.1: Summary of Previous Flooding in Midleton**

Date of flooding	Location	Type	No. of properties affected
29-31 Dec 2015	Main street	Pluvial	50 businesses and 20 houses
8 October 2014	Ballick Road	Tidal	Unknown
3 Feb 2014	Lower Main Street and Ballick Road	Tidal	No properties impacted
2 Jan 2014	Lower Main Street and Ballick Road	Tidal	No properties impacted
25 July 2013	New Cork Road, Mill Road, Beechwood Estate, Youghal Road	Pluvial	8 residential, 10 commercial
5 June 2012	Predominantly Distillery Walk/Lower Main Street. Also the Woodlands	Pluvial/Tidal	14 residential and 14 commercial
May 2005	Ballick Road	Tidal	Unknown
27 Oct 2004	Ballick Road	Tidal	Unknown
05 Nov 2000	WaterRock, Bilburry Road, Bloomfield West.	Fluvial	Unknown

The social and health impacts of flood events have been severe. During the December 2015 flood event, residents of certain areas were trapped within their homes as flood waters rose, and they took measures to protect their properties. Homes were flooded with extensive damage to property and possessions. Housing estates were blocked by floodwaters on the roads and access/egress became impossible.

Inundations lasted for several days in many properties, including many homes and the Midleton Rugby Club. Risks to human health were increased when the basement of the Midleton Community hospital was flooded. As floodwaters receded, large amounts of debris were left behind. These included tree branches and significant vegetation. Public rubbish bins were also inundated with anecdotal evidence of rubbish left behind in the streets after the recession of waters. Health risks are associated these forms of debris.

Moore's Bridge in Midleton, an arched bridge structure made of flat concrete with concrete column supports at the side of the channel and two further supports spread evenly across the channel, was reported by Cork County Council to have overtopped. This indicates that upstream water levels were in excess of 14m OD. Flooding events of this magnitude are a significant cause of distress and can incur financial losses.

## 2.2 Future Changes

The risk of flooding may increase with time. Future changes that have the potential to affect the risk of flowing include:

- Climate change resulting in higher rainfall and higher tide levels.

- Geomorphological processes, such as sediment transport – which affects the area of conveyance of the river channel – and erosion.
- Development within the catchment of the Rivers Owenacurra and Dungourney and their tributaries, which does not conform to the principles of sustainable drainage and which adversely affects the response of the catchment to rainfall.
- Changes in land use, including forestation and land drainage.

## 2.3 Potential Flood Risk Management Measures

An engineering study is being carried out in parallel with the environmental assessment of the FRS. The constraints identified in this report will inform the selection of the flood relief measures as part of the engineering study.

The range of engineering measures typically considered for flood alleviation schemes in an engineering study include, but are not limited to, the following:

- Do nothing (i.e. implement no new flood alleviation measures).
- Non-Structural Measures (e.g. flood warning system or individual property protection).
- Relocation of properties and/or infrastructure.
- Reconstruction of properties and/or infrastructure at a higher level.
- Flow Diversion (e.g. river diversion or flood flow bypass channel).
- Flow Reduction (e.g. upstream catchment management or flood storage).
- Flood Containment through Construction of Flood Defences.
- Increase Conveyance of Channel (upstream and/or through and/or downstream of the town).
- Sediment Deposition and Possible Sediment Traps.
- Pump storm waters from behind flood defences.

It is not possible, at this stage, to define the number of scheme options that will require study, although a typical engineering study of this nature will identify between three and five viable options.

## 3 Environmental Constraints

### 3.1 Introduction

The purpose of this section of the report is to describe the key environmental aspects relating to the Midleton FRS Study area which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the viability and/or design of these measures. The key issues covered include the following:

- Angling, tourism, recreational use and flood-related or socio-economic issues.
- Flora and fauna, fisheries, and habitats.
- Water quality.
- Soils, geology and hydrogeology.
- Archaeology, architectural and cultural heritage.
- Landscape and visual amenity.
- Air quality, climate and material assets.

### 3.2 Methodology

The first stage of the Midleton FRS project is to undertake a constraints study in order to identify the key environmental issues which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the viability and/or design of these measures. The study is being carried out in accordance with relevant guidance as provided in **Section 1.4**.

Information has been gathered under the relevant headings in the EPA Guidelines.

Arup has employed archaeological, ecological, and landscape specialists to carry out studies under the following headings:

**Table 3.2.1: Specialists' Areas**

Study	Specialist
Archaeology, Architectural and Cultural Heritage.	Lane Purcell Archaeology.
Biodiversity.	Moore Group Archaeological and Environmental Services.
Landscape and Visual.	Macro Works.

### 3.3 Population and Human Health

This section sets out the principal constraints in relation to population and human health. These include the socio-economic, amenity/recreation/tourism, and public health matters characterising the study area that may impact on the selection of the flood alleviations measures for the proposed scheme, and which relate to the main settlement areas near which any flood relief measures are likely to be undertaken.

#### 3.3.1 Methodology

A desktop study was undertaken to identify the key population and human health constraints within the study area. The following sources of information were used in the preparation of this section:

- Cork County Development Plan 2014-2020.
- East Cork Municipal District Local Area Plan (Draft 2017).
- Regional Planning Guidelines for the South West Region 2010-2022.
- Censuses of Ireland 2011 and 2016.

Sensitive receptors and potential constraints have been identified. Many other datasets and environmental media will have interactions with population and human health, e.g. noise, vibration, air quality, climate, and material assets. These are dealt with in the other relevant sections of the report. Further detail on the socio-economic impacts of flooding events has been provided in **Sections 2 and 4**.

#### 3.3.2 Receiving Environment

The scheme study area is comprised of rural areas, small villages and settlements, farmland, open spaces and the main town of Midleton. Midleton is located approximately 25km to the east of Cork City with an approximate area of 6.22km<sup>2</sup> (CSO Census 2011). A railway line and bus route connect Cork City to Midleton.

Private residences, schools, medical care facilities, places of worship, businesses and amenity/recreation/tourist facilities are located in and around the Midleton Town area, and within the scheme study area as a whole. These are considered to be sensitive receptors and constraints both in terms of potential positive impacts due to reduced flood risk arising from the scheme, and also potential negative impacts due to e.g. temporary construction impacts (such as noise, dust construction traffic, disruption to services etc.).

Other impacts to population that are also concerned with human health, such as utilities, water supply, and wastewater treatment, have been given due consideration in **Section 3.10** of this report.

##### 3.3.2.1 Population

Data from the 2016 census indicated that the population in Midleton Town and its environs was recorded at 12,496 in April 2016, compared with 12,001 in the 2011

census. This represents an increase of 495 persons or 4.1%. This increase is in line with similar increases in Cork city and county.

The total population of Cork county (incorporating all county and city) was recorded at 543,836 in April 2016, up from 519,032 in 2011 and represents an increase of 4.6%. The population of Cork City was recorded at 125,617 in April 2016, up from 119,230 in 2011 and represents an increase of 5.4%. The population of Cork County (excl city) was recorded at 417,211 in April 2016, up from 399,802 in 2011 and represents an increase of 4.4%. There are also a number of smaller towns and villages are located in the area surrounding Midleton.

### **3.3.2.2 Housing, Schools and Medical Facilities**

According to the 2016 census, the total housing stock in Midleton was 5,135, of which vacant dwellings numbered 626. A total of 3,208 families were recorded in the town, and a total of 4,355 households. There is a proposal in the Midleton Local Area Plan 2013 to develop lands at Water-Rock. The proposal for these lands includes the provision of up to 2,500 housing units, 2 primary school sites and 1 post primary school site, a neighbourhood centre and amenity areas to include a green corridor and a linear park along the Owenacurra River.

Midleton is serviced by a number of primary and post-primary schools. These are mainly concentrated in the centre of the town, to the north of the national road N25, and include Midleton College. Additional primary schools are present in the scheme study area, located further to the north.

Medical care facilities are present in Midleton. Our Lady of Lourdes Hospital and Home is located in the town centre, and the HSE also has a health centre and Welfare home, situated at the Fair Green. A rehabilitation centre is run by COPE at Avoncore. There are no primary health care teams in Midleton at present. Brookfield Care Centre is located outside Leamlara in the north-western part of the scheme study area.

### **3.3.2.3 Employment and Industry**

Midleton is the central hub of business for the East Cork area. Around Midleton and in the scheme study area, there are a number of business parks and industrial estates. There are many sources of employment in the area, including shops, supermarkets, restaurants, public houses, golf courses and temporary accommodation. Of particular note is the IDL Distillery (Jameson Distillery). Midleton serves as an important commuter town for Cork City, with approximately one third of the working population working outside the East Cork Dáil Constituency area (CSO, 2013). The most common industries providing employment in Midleton Town and its environs were manufacturing, commerce and trade, and professional services (CSO, 2011). In the wider scheme study area, the most common industries providing employment were agriculture, forestry and fishing, manufacturing, and professional services (CSO, 2013).

A number of Integrated Pollution Prevention and Control (IPPC) licensed facilities (IPC/IE) are located in the area, including Dawn Meats, Dairygold Co-Operative Society, Merck Millipore Ltd., Socomore Ireland Ltd., Kepak Cork, and

Mogeely's pig farm. One SEVESO site is located in the study area, which is the IDL Distillery (Jameson Distillery).

### 3.3.2.4 Recreation, Amenity and Tourism

Although Midleton is not currently a popular tourist destination, many recreational and amenity facilities, used by tourists and locals alike, are present in the surrounding area, including the scheme study area.

Within the rural hinterland to the north of Midleton are the Water Rock and East Cork Golf courses and there are also several Coillte forest walks. The Coillte Recreation Map identifies three recreation areas within the Study area, all three of which are located in close proximity to watercourses. Refer to **Section 3.8** for further detail. There are also (non-designated) scenic viewpoints in each of the recreation areas. The areas are listed below:

- Ballyannan (Bluebell) Woods- located just south west of Midleton on the Ballynacorra River.
- Curragh Wood - North of Midleton and includes sections of the Rivers Leamlara and Owenacurra.
- Moanbaun Forest – is in the far north west of the Study area at Carroll's Pond.

The Owenacurra River and Dungourney River both pass through and converge in the settlement of Midleton. There are a number of road and rail bridges over these rivers within and around Midleton that afford elevated amenity views along the river corridors. There are also several amenity areas and riverside walks including 'Distillery Walk' near the IDL Distillery (Jameson Distillery) building, which itself lies adjacent to the River Dungourney. Dwellings, businesses and roads flank the Owenacurra River and Dungourney Rivers and draw visual amenity from these watercourses as they pass through Midleton.

Watercourses in the scheme study area are used for angling. For example, Angling Roxboro and the East Cork Angling Centre organise local fishing trips. Angling is also organised in the Roxboro River, that rises north of Dungourney and flows south and west. It is noted that the Owenacurra River has been closed to angling (Atlantic Salmon and Sea Trout) since January 1<sup>st</sup> 2017.

Numerous sports facilities are provided in the study catchment, including GAA Clubs, Rugby clubs, and several golf courses.

In terms of tourism, the settlement of Midleton is synonymous with the IDL Distillery (Jameson Distillery), which has a popular visitors' centre. The renowned Midleton Farmers' market takes place on Saturday mornings from 10:30-13:30 at Mill Rd, and is both a local amenity and a tourist attraction. A Birds of Prey educational centre, surf school, and activity centre in Ballynacorra, offering fishing and other water sports. Midleton plays a key role in facilitating access to other tourist attractions in the area, such as Fota Island, Trabolgan, Yougal, Ballymaloe, Ballycotton, Garryvoe, or Roches Point. The town is also ideally placed on the major tourist routes between Rosslare international ferry terminal and West Cork, as well as having rail and nearby airport access (Cork

Airport).

Tourism is a major contributor to the national economy and is a significant source of full-time and seasonal employment. Overseas visitors to Ireland were estimated at 8 million in 2015, with a combined expenditure of €4.3bn, whereas domestic tourism accounted for €1.7bn (Fáilte Ireland, Annual Report 2015).

### 3.3.3 Key Constraints

Sensitive receptors e.g. homes, schools and medical facilities should be considered key constraints in the design of the flood relief scheme. The scheme design should take into account the value (both cultural and economic) of any buildings (residential, retail, etc.) close to the rivers' edges or likely to be adversely affected by the scheme within the scheme study area. Damage to hospitals and medical facilities in the scheme study area can have important human health impacts and must be given due consideration. Flooding events over recent years have caused devastation to homes, businesses and local facilities, with social and human health impacts. Refer to **Section 2.1**. Their specific protection through adequate flood defences should be considered in the design of the scheme.

Any design proposals should ensure that any bridges over watercourses are maintained where feasible so that temporary or permanent disruption of local transport links and access to homes and businesses in the study area are minimised.

Public and tourist amenities and facilities should also be considered key constraints. Impacts on public amenity areas adjacent to and requiring access to the rivers such as riverside walks, parks and playgrounds should be considered, with replacement mitigation proposed if necessary. Impacts on tourist facilities, recreation and amenity facilities in the area should be considered constraints, especially those requiring access to the watercourses in the area.

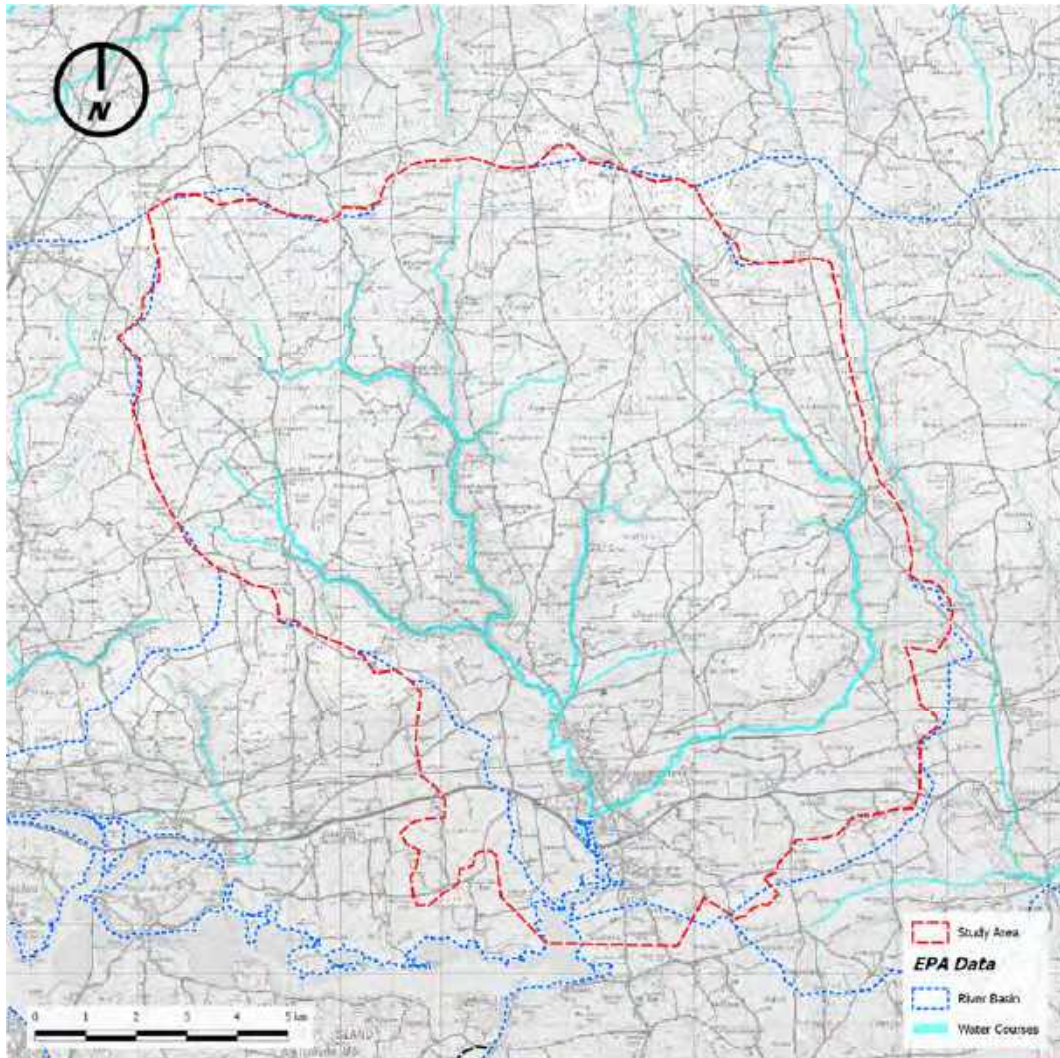
The proposed scheme should take consideration of the zoning objectives, and relevant specific objectives set out in the *Cork County Development Plan 2014-2020*, the *East Cork Municipal District Local Area Plan Draft 2017*, the *South West Regional Planning Guidelines 2010-2022*, and any future developments in the study area.

Other impacts to population that are also concerned with human health, including material assets such as water supply, wastewater treatment, and utilities should also be given due consideration.



## 3.4 Biodiversity

This section of the report identifies the ecological constraints within the study area for the Midleton FRS, which is presented in **Figure 3.4.1**.



**Figure 3.4.1: Study area.**

### 3.4.1 Methodology

A desktop study approach was used to collate information from readily available sources that will be used to inform the later stages of the assessment of proposed flood defences.

The study has been carried out in accordance with the following Guidelines:

- Fossitt, J. (2000) *A Guide to Habitats in Ireland*. The Heritage Council;
- *Guidelines on the Information to be contained in Environmental Impact Statements Draft September* (EPA, 2002);
- *Advice Notes on for Preparing Environmental Impact Statements Draft September* (EPA, 2003);



- *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011);
- *EPA Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports, EIAR* (EPA, 2017).
- *EPA Advice Notes for Preparing Environmental Impact Statements Draft September* (EPA, 2015);
- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2016);
- *The NRA Planning and Construction Guidelines Series* (2004 – 2009) including in particular:
  - Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008);
  - Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);

The following sources were consulted in order to identify ecological constraints:

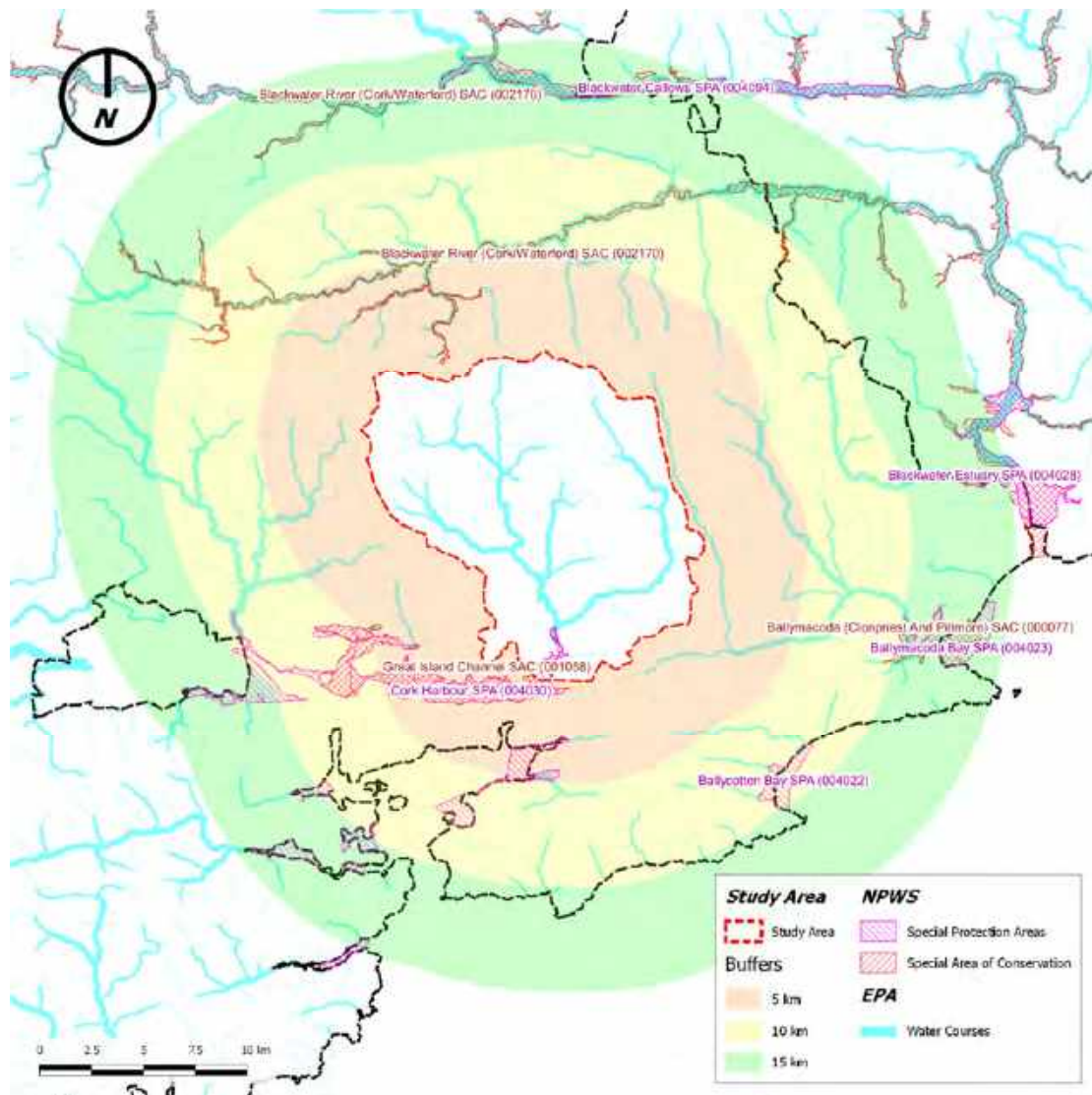
- Ordnance Survey Ireland maps;
- OSI, Google & Bing Aerial photography (1995 – 2017);
- National Biodiversity Data Centre data: <http://www.biodiversityireland.ie/>;
- National Parks and Wildlife Service (NPWS) Mapviewer: <http://www.npws.ie/en/MapsData/>
  - Designated sites and sites proposed for designation (SACs, SPAs, NHAs, pNHAs);
  - Records of protected species from 10km squares; and
  - Species-related publications.

Once all designated sites had been identified during the initial research, the sites were plotted onto a map of the study area in GIS format. In addition, further constraints, which may not be subject to statutory protection, but should nonetheless be considered as ecological constraints, were also added. These include sites of National Heritage importance e.g. Leamlara Wood and Loughs Aderry and Ballybutler which are proposed Natural Heritage Areas (pNHA).

A number of other factors that are also relevant to ecology due to their interactions, e.g. hydrology, hydrogeology and population and human health, are detailed in the relevant sections of this report.

### 3.4.2 Receiving Environment

This section describes the ecological constraints identified within the study area. Constraints associated with Ecology within the scheme area are described. Ecological constraints are presented in **Figures 3.4.2 and 3.4.3**.



**Figure 3.4.2: Natura Sites within 15km of the study area (black dashed boundary indicates Central Statistics Office 2011 County and City Boundaries)**

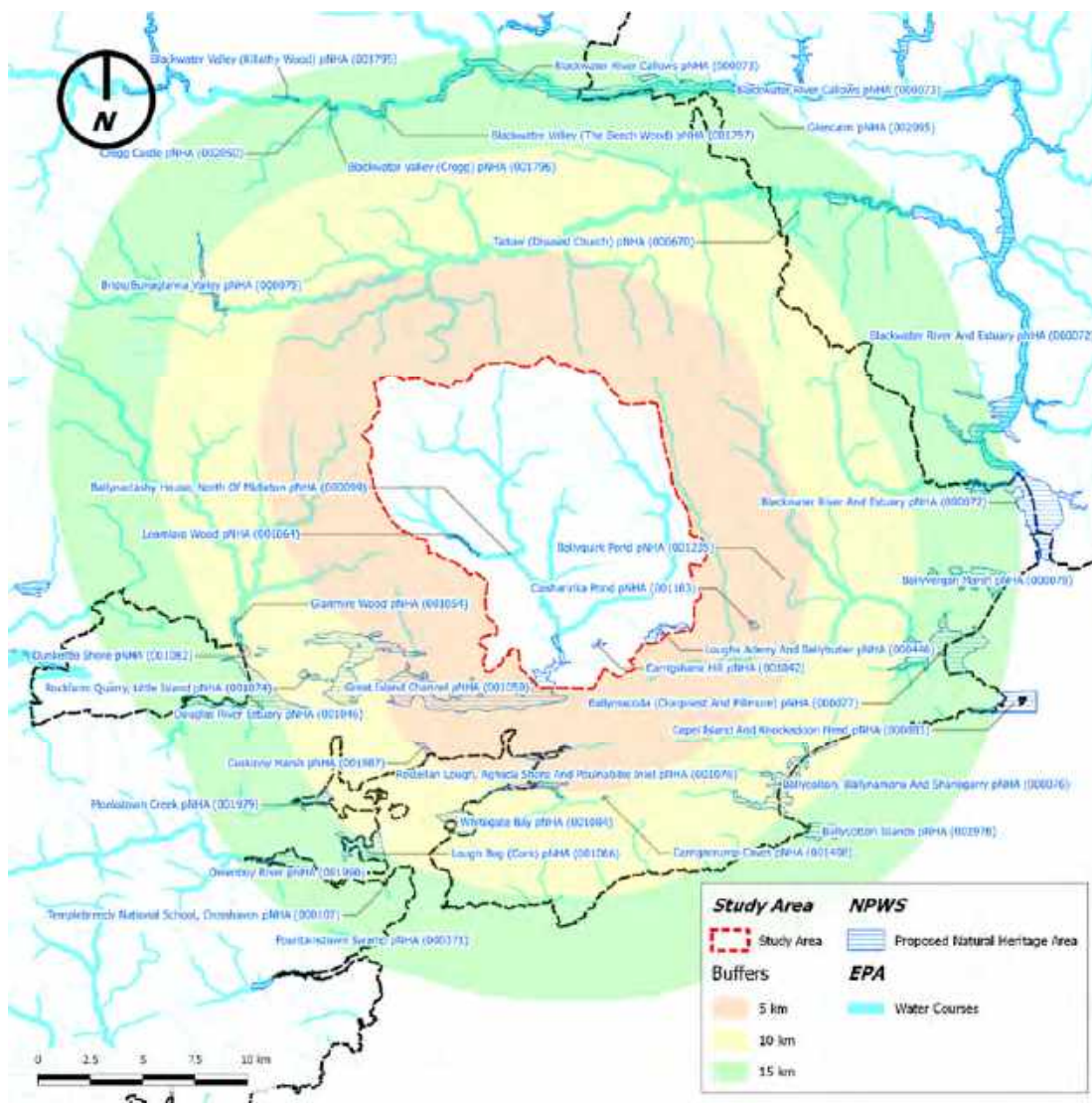


Figure 3.4.3: Proposed Natural Heritage Areas within 15km of the study area.

### 3.4.2.1 Desktop Study

#### *Natura 2000 Sites and Ecological Network Supporting Natura 2000 Sites*

Departmental guidance suggests an assessment of Natura 2000 sites within a zone of influence of 15 km which can be revised depending on the proposed development and location of Natura 2000 sites and on biological and hydrological connectivity. Natura 2000 sites located within a 15km radius of the project study area are presented in **Tables 3.4.1** and **3.4.2** (with distances in km from the study area).

There are 42 designated areas, or areas proposed to be designated, for nature conservation within 15 km of the scheme Study area, consisting of:

- Three Special Areas of Conservation (SACs);
- Five Special Protection Areas (SPAs); and
- 34 proposed Natural Heritage Areas (pNHAs).

There are no Natural Heritage Areas located within 15 km of the study area.

**Table 3.4.1: European Sites (SACs and SPAs) within 15km of the study area**

Site Details	Distance (km)	Reasons for Designation – Qualifying Interests or Special Conservation Interests. * indicates a priority habitat under the Habitats Directive
Ballymacoda (Clonpriest and Pillmore) SAC (Site Code 000077)	9.53	<p>[1130] Estuaries</p> <p>[1140] Mudflats and sandflats not covered by seawater at low tide</p> <p>[1310] Salicornia and other annuals colonising mud and sand</p> <p>[1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p>
Great Island Channel SAC (Site Code 001058)	0	<p>[1140] Mudflats and sandflats not covered by seawater at low tide</p> <p>[1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p>
Blackwater River (Cork/Waterford) SAC (Site Code 002170)	0.8	<p>[1029] Freshwater Pearl Mussel <i>Margaritifera margaritifera</i></p> <p>[1092] White-clawed Crayfish <i>Austropotamobius pallipes</i></p> <p>[1095] Sea Lamprey <i>Petromyzon marinus</i></p> <p>[1096] Brook Lamprey <i>Lampetra planeri</i></p> <p>[1099] River Lamprey <i>Lampetra fluviatilis</i></p> <p>[1103] Twait Shad <i>Alosa fallax</i></p> <p>[1106] Atlantic Salmon <i>Salmo salar</i> (only in fresh water)</p> <p>[1130] Estuaries</p> <p>[1140] Mudflats and sandflats not covered by seawater at low tide</p> <p>[1220] Perennial vegetation of stony banks</p> <p>[1310] Salicornia and other annuals colonizing mud and sand</p> <p>[1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p> <p>[1355] Otter <i>Lutra lutra</i></p> <p>[1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>[1421] Killarney Fern <i>Trichomanes speciosum</i></p> <p>[3260] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</p> <p>[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p>

Site Details	Distance (km)	Reasons for Designation – Qualifying Interests or Special Conservation Interests. * indicates a priority habitat under the Habitats Directive
		[91E0] *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno</i> □ <i>Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91J0] * <i>Taxus baccata</i> woods of the British Isles
Ballycotton Bay SPA (Site Code 004022)	7.89	[A052] Teal <i>Anas crecca</i> [A137] Ringed Plover <i>Charadrius hiaticula</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A142] Lapwing <i>Vanellus vanellus</i> [A156] Black-tailed Godwit <i>Limosa limosa</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A160] Curlew <i>Numenius arquata</i> [A169] Turnstone <i>Arenaria interpres</i> [A182] Common Gull <i>Larus canus</i> [A183] Lesser Black-backed Gull <i>Larus fuscus</i> [A999] Wetland & Waterbirds
Ballymacoda Bay SPA (Site Code 004023)	10	[A050] Wigeon <i>Anas penelope</i> [A052] Teal <i>Anas crecca</i> [A137] Ringed Plover <i>Charadrius hiaticula</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A142] Lapwing <i>Vanellus vanellus</i> [A144] Sanderling <i>Calidris alba</i> [A149] Dunlin <i>Calidris alpina alpina</i> [A156] Black-tailed Godwit <i>Limosa limosa</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A160] Curlew <i>Numenius arquata</i> [A162] Redshank <i>Tringa totanus</i> [A169] Turnstone <i>Arenaria interpres</i> [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A182] Common Gull <i>Larus canus</i> [A183] Lesser Black-backed Gull <i>Larus fuscus</i> [A999] Wetland & Waterbirds
Blackwater Estuary SPA (Site Code 004028)	12.75	[A050] Wigeon <i>Anas Penelope</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A142] Lapwing <i>Vanellus</i> [A149] Dunlin <i>Calidris alpina</i>

Site Details	Distance (km)	Reasons for Designation – Qualifying Interests or Special Conservation Interests. * indicates a priority habitat under the Habitats Directive
		[A156] Black□tailed Godwit <i>Limosa</i> [A157] Bar□tailed Godwit <i>Limosa lapponica</i> [A160] Curlew <i>Numenius arquata</i> [A162] Redshank <i>Tringa tetanus</i> [A999] Wetland & Waterbirds
Cork Harbour SPA (Site Code 004030)	0	[A004] Little Grebe <i>Tachybaptus ruficollis</i> [A005] Great Crested Grebe <i>Podiceps cristatus</i> [A017] Cormorant <i>Phalacrocorax carbo</i> [A028] Grey Heron <i>Ardea cinerea</i> [A048] Shelduck <i>Tadorna</i> [A050] Wigeon <i>Anas penelope</i> [A052] Teal <i>Anas crecca</i> [A054] Pintail <i>Anas acuta</i> [A056] Shoveler <i>Anas clypeata</i> [A069] Red-breasted Merganser <i>Mergus serrator</i> [A130] Oystercatcher <i>Haematopus ostralegus</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A142] Lapwing <i>Vanellus</i> [A149] Dunlin <i>Calidris alpina</i> [A156] Black-tailed Godwit <i>Limosa</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A160] Curlew <i>Numenius arquata</i> [A162] Redshank <i>Tringa totanus</i> [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A182] Common Gull <i>Larus canus</i> [A183] Lesser Black-backed Gull <i>Larus fuscus</i> [A193] Common Tern <i>Sterna hirundo</i> [A999] Wetland & Waterbirds
Blackwater Callows SPA (Site Code 004094)	12.26	[A038] Whooper Swan <i>Cygnus</i> [A050] Wigeon <i>Anas penelope</i> [A052] Teal <i>Anas crecca</i> [A156] Black-tailed Godwit <i>Limosa</i> [A999] Wetland & waterbirds

**Table 3.4.2: Proposed Natural Heritage Areas within 15km of the Study area**

Site Details	Distance (km)	Features of Interest <sup>2</sup>
Blackwater River and Estuary (Site Code 000072)	12.67	Intersects the Blackwater Estuary SPA (Site Code 004028) and the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Blackwater River Callows (Site Code 000073)	12.26	Intersects the Blackwater Callows SPA (Site Code 004094) and the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Ballycotton, Ballynamona and Shanagarry (Site Code 000076)	7.55	Intersects the Ballycotton Bay SPA (Site Code 004022)
Ballymacoda (Clonpriest and Pillmore) (Site Code 000077)	9.53	Intersects Ballymacoda Bay SPA (Site Code 004023)
Ballyvergan Marsh (Site Code 000078)	10.54	The site includes the largest freshwater coastal marsh in Co. Cork and supports a diversity of well-developed plant communities. It is of additional botanical importance as a site for the rare Wild Clary. Ballyvergan Marsh is also of ornithological importance, as a pre-migration stop-over point for various passerine species on their way to wintering grounds further south, and as a breeding site for Reed Warbler, still a very localised species in Ireland. The presence of Hen Harrier is of significance as this species is listed on Annex I of the E.U. Birds Directive.
Bride/Bunaglan Valley (Site Code 000079)	7.8	Site specific data unavailable, also intersects the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Capel Island and Knockadoon Head (Site Code 000083)	13.69	Capel Island is grazed consistently so has a grassy vegetation cover in which heath plants are suppressed. On the mainland, however, these develop well and there is an interesting mosaic of heathland types. The mainland cliffs also have Cormorants, Herring Gulls, some Fulmars and a few Black Guillemots. Much of the area, including the seabed between the island and the mainland, is protected as a National Nature Reserve, created in 1985.
Ballynaclashy House, North of Midleton (Site Code 000099)	0	A nursery colony of the Whiskered Bat ( <i>Myotis mystacinus</i> ) was recorded in the attic of Ballynaclashy House, north of Midleton, Co. Cork, in 1987. Approximately 30 bats were recorded in the attic, roosting between the felt and the slates. As the national population of this species is only several hundred, all nursery colonies are of national importance.
Templebreedy National School, Crosshaven (Site Code 000107)	11.61	This is a nursery roost for Leisler's Bats ( <i>Nyctalus leisleri</i> ) which roost in the attic of a Church of Ireland primary school building. As approximately 100 bats were recorded at the house in 1987, this is a site of international importance. There are plans to carry out some repair work to the roof of the school but this should not interfere with the bats.

<sup>2</sup> Information taken from the site synopses, where available, from <https://www.npws.ie/protected-sites>



Site Details	Distance (km)	Features of Interest <sup>2</sup>
Fountainstown Swamp (Site Code 000371)	14.16	<p>The young woodland at the northern end consists of Grey Willow (<i>Salix cinerea</i>) and Alder (<i>Alnus glutinosa</i>), and shows a good transition landwards into Ash (<i>Fraxinus excelsior</i>) and Hazel (<i>Corylus avellana</i>). There are sheets of Golden-saxifrage (<i>Chrysosplenium oppositifolium</i>) beneath the mossy trees, with Bugle (<i>Ajuga reptans</i>), Hemlock Water-dropwort (<i>Oenanthe crocata</i>) and Wood Anemone (<i>Anemone nemorosa</i>), running into Bluebell (<i>Hyacinthoides non-scripta</i>), Primrose (<i>Primula vulgaris</i>) and Pignut (<i>Conopodium majus</i>). Swamp woodland which shows no signs of former management is unusual and there are as yet no introduced species in the flora (though these do occur to the west).</p> <p>The trees open out towards the coast where the vegetation becomes a rich floating fen. The main large species are Meadowsweet (<i>Filipendula ulmaria</i>), Branched Bur-reed (<i>Sparganium erectum</i>), Yellow Iris (<i>Iris pseudacorus</i>), Common Nettle (<i>Urtica dioica</i>) and Hemlock Water-dropwort. The abundance of this latter plant in open conditions is one of the most remarkable features of the site. Normally it is a species of riverbanks, ditches and wet woodland. Scattered mounds of the Greater Tussocksedge (<i>Carex paniculata</i>) add variety to the community and there are also a few willow (<i>Salix</i> spp.) bushes and Bulrush (<i>Typha latifolia</i>).</p>
Loughs Aderry and Ballybutler (Site Code 000446)	0	<p>The Rare Plant Survey of Co. Cork (1992-93) recorded a very rare grass Orange Foxtail (<i>Alopecurus aequalis</i>) growing on exposed mud at the edge of a marshy pool between the two loughs. Associated species included Unbranched Burreed (<i>Sparganium emersum</i>) and other grasses.</p> <p>This survey also confirmed the presence of abundant Musk Thistle (<i>Carduus nutans</i>), growing in re-seeded and semi-improved fields to the north of Ballybutler Lough. This very rare and threatened species, is listed in the Irish Red Data Book. This site is also of ornithological value, with Lough Aderry supporting nationally important numbers of Gadwall (average peak 92, 1984/85-1986/87). In addition, both lakes support a variety of waterfowl including Mute Swan, Wigeon, Teal, Mallard, Shoveler, Pochard, Coot and Lapwing.</p>
Tallow (Disused Church) (Site Code 000670)	11.41	<p>Leisler's Bats (<i>Nyctalus Leisleri</i>) were first recorded at this site in 1986 and were still using the roof of the church in June 1993. This site is a nursery roost and can contain 50 to 100 bats over a summer and is therefore of international importance.</p>
Carrigshane Hill (Site Code 001042)	0	<p>This area is important as a representative of the herb-rich community found near the exposed limestone, a habitat under threat from quarrying. The presence of Thick-leaved Stonecrop adds further interest to the site as this is one of the few locations for this plant in the county where it appears native.</p>
Douglas River Estuary (Site Code 001046)	8.6	Intersects Cork Harbour SPA (Site Code 004030)
Glanmire Wood	8.55	Intersects Cork Harbour SPA (Site Code 004030)



Site Details	Distance (km)	Features of Interest <sup>2</sup>
(Site Code 001054)		
Great Island Channel (Site Code 001058)	0	See above Great Island Channel SAC (Site Code 001058), also intersects Cork Harbour SPA (Site Code 004030)
Leamlara Wood (Site Code 001064)	0	The woodland is dominated by oak ( <i>Quercus</i> spp.) which reach up to 20-24m in height. While oak is the major canopy species, there are also quite large areas of Hazel ( <i>Corylus avellana</i> ), birch ( <i>Betula</i> spp.) and willow ( <i>Salix</i> spp.), especially on the richer ground towards the river. These trees also form an understorey with Holly ( <i>Ilex aquifolium</i> ) beneath the oaks. The ground flora consists of Bramble ( <i>Rubus fruticosus</i> agg.), Great Wood-rush ( <i>Luzula sylvatica</i> ), Hay-scented Buckler-fern ( <i>Dryopteris aemula</i> ) and Hard Fern ( <i>Blechnum spicant</i> ). The abundance of Hay-scented Buckler-fern is noteworthy as, although this species is common in Ireland, it is considered vulnerable in European terms.
Lough Beg (Cork) (Site Code 001066)	9.18	Intersects Cork Harbour SPA (Site Code 004030)
Rockfarm Quarry, Little Island (Site Code 001074)	7.76	Intersects Cork Harbour SPA (Site Code 004030)
Rostellan Lough, Aghada Shore and Poulnabibe Inlet (Site Code 001076)	2.86	Intersects Cork Harbour SPA (Site Code 004030)
Dunkettle Shore (Site Code 001082)	8.51	Intersects Cork Harbour SPA (Site Code 004030)
Whitegate Bay (Site Code 001084)	6.79	Intersects Cork Harbour SPA (Site Code 004030)
Clasharinka Pond (Site Code 001183)	2.6	The rare species Orange Foxtail ( <i>Alopecurus aequalis</i> ) is found on peaty mud around the pond at the summer water level. Thousands of plants of this species grow here and the population is healthy, in a good habitat whose management is conducive to the growth of this species and unlikely to change under the present owner. There is however, another possible threat to this habitat - that of housing or industrial development of the area because of its proximity to the town of Castlemartyr.
Ballyquirk Pond (Site Code 001235)	3.73	Species here include, amongst others, Bulrush ( <i>Typha latifolia</i> ), Lesser Spearwort ( <i>Ranunculus flammula</i> ), Jointed Rush ( <i>Juncus articulatus</i> ), Soft Rush ( <i>J. effusus</i> ), Remote Sedge ( <i>Carex remota</i> ), HairySedge ( <i>C. hirta</i> ), Common Spike-rush ( <i>Eleocharis palustris</i> ), Bugloss ( <i>Anchusa arvensis</i> ), Water-plantain ( <i>Alisma plantago-aquatica</i> ) and Common Duckweed ( <i>Lemna minor</i> ). Also, on the northern, muddy edge of the pond are found a few flowering plants of the rare Orange Foxtail ( <i>Alopecurus aequalis</i> ).
Carrigacrump Caves (Site Code 001408)	5.22	The core system has eight entrances and most of the passages are of the canyon type and water flooded. The entrances of the caves are in a disused quarry which contains some areas of undisturbed limestone grassland that includes some locally rare plants such as Carline Thistle ( <i>Carlina vulgaris</i> ) and Long-stalked Crane's-bill

Site Details	Distance (km)	Features of Interest <sup>2</sup>
		( <i>Geranium columbinum</i> ). In addition, the naturalised flora is unusual.
Blackwater Valley (Killathy Wood) (Site Code 001795)	13.78	Intersects the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Blackwater Valley (Cregg) (Site Code 001796)	12.98	Intersects the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Blackwater Valley (The Beech Wood) (Site Code 001797)	12.42	Intersects the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Ballycotton Islands (Site Code 001978)	10.82	Intersects the Ballycotton Bay SPA (Site Code 004022)
Monkstown Creek (Site Code 001979)	9.11	Intersects Cork Harbour SPA (Site Code 004030)
Cuskinny Marsh (Site Code 001987)	4.57	Intersects Cork Harbour SPA (Site Code 004030)
Owenboy River (Site Code 001990)	12.29	Intersects Cork Harbour SPA (Site Code 004030)
Cregg Castle (Site Code 002050)	13.51	Intersects the Blackwater River (Cork/Waterford) SAC (Site Code 002170)
Glencairn (Site Code 002095)	14.58	This is a nursery roost for Leisler's Bat ( <i>Nyctalus leisleri</i> ) which roost in a hipped roof of an old privately owned dwelling house approximately 3km west of Lismore. Over one hundred bats were recorded at the house in 1994, which was the first year the bats had used the house so it is probable that the number will increase in the future. It is already a site of national importance.

### Article 17 Habitats

The following Article 17 Habitats intersect the study area, Owenacurra Catchment:

- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles;
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*);
- 1130 Estuaries; and
- 1140 Mud Flats.

The following habitats are located outside the study area but with downstream connectivity:

- 1150 Coastal Lagoons;
- 1160 Large shallow inlets and bays; and
- 1210 Annual vegetation of drift lines.
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

### Aquatic habitats

The study area includes several watercourses of conservation value in terms of having connectivity with coastal designated sites, these include:

- Dungourney (River);
- Leamlara (River);
- Owenacurra (River);
- Templebodan (River) and
- Loughs Aderry and Ballybutler.

### 3.4.2.2 Records of Protected, Rare and Other Notable Species

The following protected species are noted in the NPWS's Site Synopsis Portfolio for pNHAs<sup>3</sup>. Only pNHAs that are intersected by the study area (Owenacurra Catchment) are listed.

#### ***Ballynaclashy House, North of Midleton (Site Code: 000099) Site Synopsis (4/11/2009)***

A nursery colony of the Whiskered Bat (*Myotis mystacinus*) was recorded in the attic of Ballynaclashy House, north of Midleton, Co. Cork, in 1987. Approximately 30 bats were recorded in the attic, roosting between the felt and the slates.

#### ***Loughs Aderry and Ballybutler (Site Code: 000446) Site Synopsis (6/11/2009)***

More recently, the Rare Plant Survey of Co. Cork (1992-93) recorded a very rare grass Orange Foxtail (*Alopecurus aequalis*) growing on exposed mud at the edge of a marshy pool between the two loughs. Associated species included Unbranched Burreed (*Sparganium emersum*) and other grasses.

This survey also confirmed the presence of abundant Musk Thistle (*Carduus nutans*), growing in re-seeded and semi-improved fields to the north of Ballybutler Lough. This very rare and threatened species is listed in the Irish Red Data Book.

This site is also of ornithological value, with Lough Aderry supporting nationally important numbers of Gadwall (average peak 92, 1984/85-1986/87). In addition, both lakes support a variety of waterfowl including Mute Swan, Wigeon, Teal, Mallard, Shoveler, Pochard, Coot and Lapwing.

#### ***Carrigshane Hill (Site Code: 001042) Site Synopsis (6/11/2009)***

This site is situated 4km southeast of Midleton in East Cork. The underlying geology of this hill is limestone and this is frequently outcropping.

In 1986 An Foras Forbartha provided the following description of the site – A rich calcicole flora occurs including Sheep's-fescue (*Festuca ovina*), Common Bird's-foottrefoil (*Lotus corniculatus*), Thick-leaved Stonecrop (*Sedum dasyphyllum*), Marjoram (*Origanum vulgare*), Shining Crane's-bill (*Geranium lucidum*) and Long-stalked Crane's-bill (*G. columbinum*).

<sup>3</sup> [https://www.npws.ie/sites/default/files/general/pNHA\\_Site\\_Synopsis\\_Portfolio.pdf](https://www.npws.ie/sites/default/files/general/pNHA_Site_Synopsis_Portfolio.pdf) (downloaded 30th May 2017)

Around the walls and cultivated parks Fennel (*Foeniculum vulgare*) and Dwarf Spurge (*Euphorbia exigua*) are found amidst a large group of alien plants.

The main land use within the site boundary is grazing by cattle. The exposed limestone of the area is being quarried away and this is reducing the area of interest. This area is important as a representative of the herb-rich community found near the exposed limestone, a habitat under threat from quarrying. The presence of Thicketleaved Stonecrop adds further interest to the site as this is one of the few locations for this plant in the county where it appears native.

### ***Leamlara Wood (Site Code: 001064) Site Synopsis (17/11/2009)***

This site is situated 6km north-west of Midleton in the steep sided valley of the Leamlara River.

In 1986 An Foras Forbartha provided the following description of the site:

The woodland is dominated by oak (*Quercus* spp.) which reach up to 20-24m in height. While oak is the major canopy species, there are also quite large areas of Hazel (*Corylus avellana*), birch (*Betula* spp.) and willow (*Salix* spp.), especially on the richer ground towards the river. These trees also form an understorey with Holly (*Ilex aquifolium*) beneath the oaks. The ground flora consists of Bramble (*Rubus fruticosus* agg.), Great Wood-rush (*Luzula sylvatica*), Hay-scented Buckler-fern (*Dryopteris aemula*) and Hard Fern (*Blechnum spicant*).

The abundance of Hay-scented Buckler-fern is noteworthy as it is considered vulnerable in European terms, although this species is common in Ireland. The main land use occurring within the woodland is shooting.

This area is considered of local importance as there are few areas of semi-natural oak woodland in east Cork and it is a good example of this community.

### ***Article 17 Species***

The following Article 17 Species are found in or in the vicinity of the study area:

- [1213] Common frog (*Rana temporaria*)
- [1309] Common pipistrelle (*Pipistrellus pipistrellus*)
- [1314] Daubenton's bat (*Myotis daubentonii*)
- [1322] Natterer's bat (*Myotis nattereri*)
- [1326] Brown long-eared bat (*Plecotus auritus*)
- [1330] Whiskered bat (*Myotis mystacinus*)
- [1331] Leisler's bat (*Nyctalus leisleri*)
- [1334] Irish hare (*Lepus timidus*)
- [1355] Otter (*Lutra lutra*)
- [1357] Pine marten (*Martes martes*)
- [5009] Soprano pipistrelle (*Pipistrellus pygmaeus*)

Other aquatic faunal species located in habitats that are hydrologically connected to the proposed study area include occasional cetaceans in Cork Harbour.

### 3.4.2.3 Invasive Species

Invasive Species surveys were undertaken by surveying water courses and adjacent banks for the presence of invasive species such as Japanese Knotweed. Notes of other non-native species were made during the surveys. The surveys were carried out on the 17 - 19th May (**Appendix 3.4.1**) and 31<sup>st</sup> July of 2017 (**Appendix 3.4.2**).

The locations of records of Invasive Species during the May survey are presented in **Figure 3.4.4** below and the location details of each record are presented in **Table 3.4.3**.

- There were 14 records of Japanese Knotweed (*Fallopia japonica*) in the survey area. The size and extent of cover extends from one plant to relatively large stands up to c. 30 m in length.
- Giant rhubarb (*Gunnera tinctoria*) was recorded at only one location in Midleton.
- One relatively small stand of Rhododendron spp. was recorded adjacent to the Dungourney River.
- Three-cornered Leek (*Allium triquetrum*) is widespread in the survey area and is therefore not mapped. It is listed as a "Non-native species subject to restrictions under Regulations 49 and 50" in the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011. It may be considered naturalised and is considered of moderate risk and may pose a threat to biodiversity where the plant forms early season dense monocultural masses, particularly at protected sites.
- Winter heliotrope (*Petasites fragrans*), considered invasive but not of major concern, is also frequent along water course banks and disturbed areas and is widespread and not mapped.
- Butterfly bush (*Buddleia davidii*), considered invasive but not of major concern, is frequent in disturbed areas throughout the survey area and is not mapped.

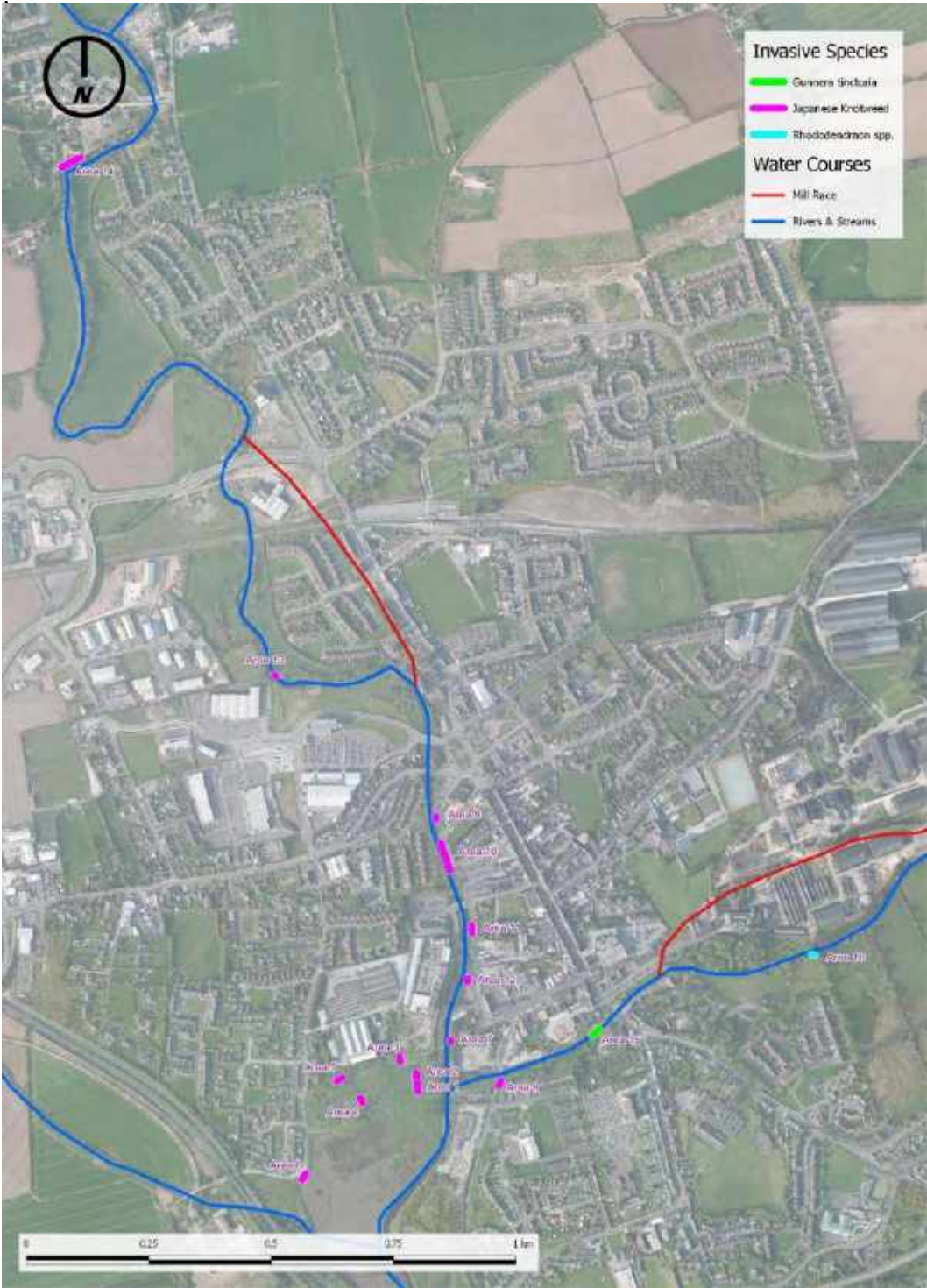


Figure 3.4.4: Locations of invasive species recorded during the May 2017 survey



**Table 3.4.3: Invasive species locations recorded in May 2017**

Area No.	Species	ITM_X	ITM_Y	Location
1	Japanese Knotweed	587854	573197	Mogeesha 1
2	Japanese Knotweed	587851	573220	Mogeesha 2
3	Japanese Knotweed	587818	573253	Mogeesha 3
4	Japanese Knotweed	587740	573168	Mogeesha 4
5	Japanese Knotweed	587695	573211	Mogeesha 5
6	Japanese Knotweed	587622	573012	Riversfield Estate
7	Japanese Knotweed	587922	573290	Owenacurra Footbridge
8	Japanese Knotweed	588023	573203	Bailick Road Bridge
9	Japanese Knotweed	587892	573745	Riverside Way 1
10	Japanese Knotweed	587911	573665	Riverside Way 2
11	Japanese Knotweed	587965	573518	Riverside Way 3
12	Japanese Knotweed	587957	573414	Riverside Way 4
13	Japanese Knotweed	587564	574035	Market Green
14	Japanese Knotweed	587146	575087	Knockgriffin
15	<i>Gunnera tinctoria</i>	588219	573307	Midleton House
16	<i>Rhododendron</i> spp.	588661	573466	Midleton Lodge

The July surveys recorded similar locations of invasive species in addition to a number of other areas which were not accessible or visible during the May surveys. These additional infestations are referred to as JK5002, JK5001, JK5003 and JK5008 and are presented in **Appendix 3.4.2**.

### 3.4.3 Key Constraints

Given the legal protection and conservation importance afforded to sites designated under the Habitats and Birds Directives, the most significant ecological constraints relate to those water courses with direct connectivity with those European sites located in Cork Harbour particularly in the Owenacurra-Ballynacorra estuary areas.

The receiving environment in Cork Harbour is designated as part of the Great Island Channel SAC and includes important habitats such as Atlantic salt meadows and Mudflats and sandflats not covered by seawater at low tide.

These habitats provide roosting and feeding areas for several species of waterbirds which are listed as part of the Cork Harbour SPA. The Great Island north channel subsites, east of Marino Point to Ballynacorra, support nationally important numbers of Cormorant, Shelduck, Pintail, Golden Plover, Lapwing, Dunlin, Black-tailed Godwit and Redshank. All mudflats support feeding birds, and the main roost sites are located at Weir Island and Brown Island to the north of Foaty Island at Killaclyne and Harpers Island. Further east, Ahanesck also supports a roost (Crowe, 2005).

This SPA in turn may have connectivity to *ex situ* sites such as those associated with the Blackwater Callows and Blackwater Estuary, Ballymacoda Bay and Ballycotton Bay SPA's. There are 13 waterbird species which are listed as special conservation interests in all five SPAs, see Table 3.4.4.

**Table 3.4.4: Waterbird species common to five SPAs with connectivity to the study area.**

Waterbird species
[A050] Wigeon <i>Anas penelope</i>
[A052] Teal <i>Anas crecca</i>
[A054] Pintail <i>Anas acuta</i>
[A056] Shoveler <i>Anas clypeata</i>
[A069] Red-breasted Merganser <i>Mergus serrator</i>
[A130] Oystercatcher <i>Haematopus ostralegus</i>
[A140] Golden Plover <i>Pluvialis apricaria</i>
[A141] Grey Plover <i>Pluvialis squatarola</i>
[A142] Lapwing <i>Vanellus</i>
[A149] Dunlin <i>Calidris alpina</i>
[A156] Black-tailed Godwit <i>Limosa</i>
[A157] Bar-tailed Godwit <i>Limosa lapponica</i>
[A160] Curlew <i>Numenius arquata</i>
[A162] Redshank <i>Tringa totanus</i>
[A179] Black-headed Gull <i>Chroicocephalus ridibundus</i>
[A182] Common Gull <i>Larus canus</i>
[A183] Lesser Black-backed Gull <i>Larus fuscus</i>

Nationally designated sites also located within the study area include terrestrial sites such as Leamlara Wood pNHA and Loughs Aderry and Ballybutler pNHA. These sites have limited biological connectivity to Cork Harbour and the European sites located in Cork Harbour.

The results of the desktop review highlight the range of habitats and species and the ecological constraints in the study area and the connectivity of watercourses with areas of conservation concern and species of conservation concern, which are likely to be affected depending on options being considered at the option selection stage.

## 3.5 Hydrology

This section of the constraints study describes the existing hydrological environment and identifies the key hydrological constraints.



### 3.5.1 Methodology

The methodology followed is in line with the NRA Guidance document ‘Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes’ (NRA, 2008). This document outlines the procedures that should be undertaken for constraints studies, including the relevant information that should be gathered.

Due to the linear nature of flood relief schemes, these guidelines are deemed to be relevant to this assessment.

A desktop study was undertaken to establish the overall hydrological regime within the study area. This was supplemented by a number of site visits in January, March and June 2017. The hydrological study area consists of the Owenacurra River Catchment, Owenacurra Estuary and Cork Harbour downstream of Midleton. None of these waters has been identified as Salmonid Habitats.

The sources of information consulted in order to identify possible hydrological constraints within the study area, included:

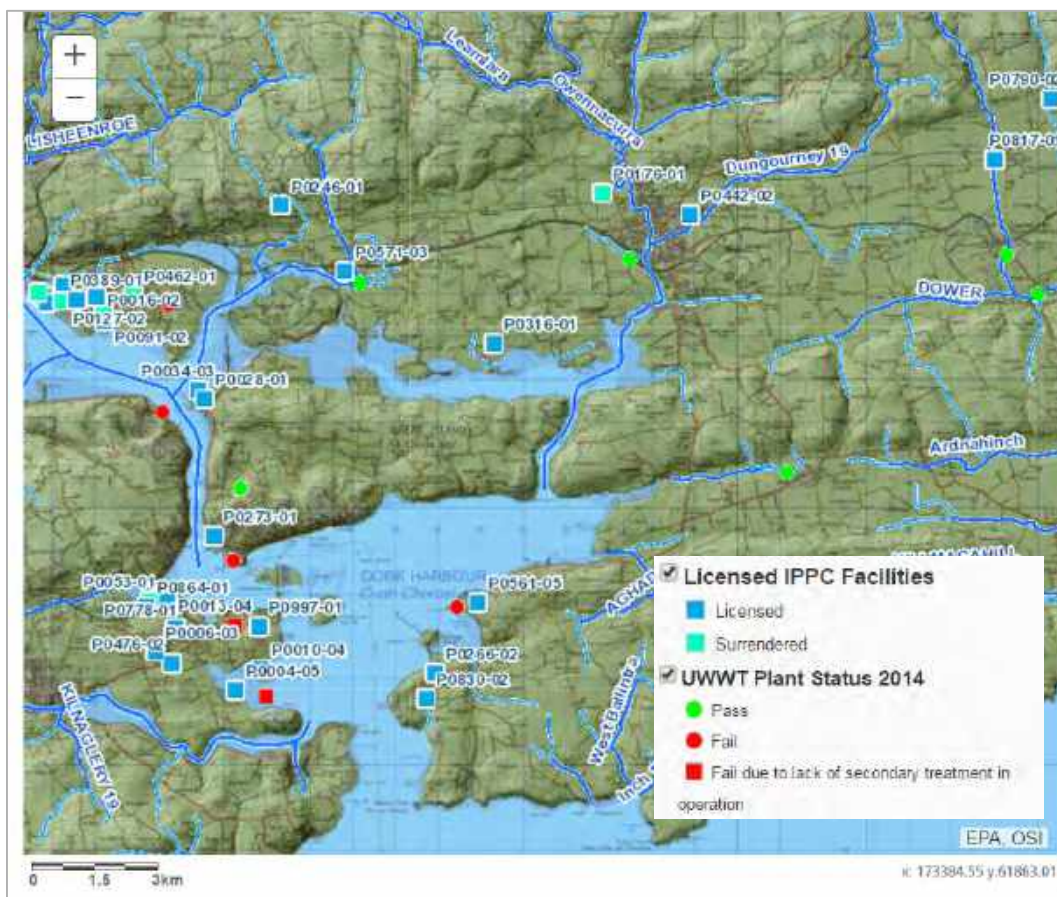
- EPA water quality database and maps;
- Geological Survey of Ireland, (GSI), online groundwater well data;
- EPA online database and mapping of Hydrometric Stations;
- Water Framework Directive website [www.wfd.ie](http://www.wfd.ie) ;
- South West River Basin District Management Plan 2009-2015; and
- Lee CFRAMS SEA Environmental Report (2010).

A number of other datasets are also relevant to hydrology due to their interactions, e.g. ecological sites and hydrogeological features. These have been dealt with in other relevant sections of this report.

### 3.5.2 Receiving Environment

#### Water Supply and Discharges

Within the Owenacurra River Catchment, there is one Urban Waste Water Treatment (UWWT) Plant at Midleton and one active IPPC licence (P0442-02) at Irish Distillers Limited (IDL). There are also a number of IPC/IE licence facilities and UWWT Plants located along the Owenacurra Estuary and Cork Harbour. The locations of these are shown in the following **Figure 3.5.1**.



**Figure 3.5.1: Envision Map showing IPC/IE licence facilities and WWTPs**

The town of Midleton is serviced by a Public Water Supply (PWS), which is located approximately 1.5 km north of Midleton Town. The supply has one raw water source; the Owenacurra River. The design treatment capacity is 200m<sup>3</sup>/day and serves a population of 8851 (EPA, 2015).

### Existing Groundwater Abstractions and Public Water Supply Zone

There are no public water supply protection areas in the Owenacurra River catchment. Please refer to **Section 3.6** on hydrogeology for further detail on existing groundwater abstraction.

### Hydrometric Stations

Consultation with the EPA has been carried out as part of the data collation for this study. There are two hydrometric gauges operated by the EPA, one on the Owenacurra River (19200) and the other on the Dungourney River (19038). There are two additional hydrometric gauges located on the Dungourney River operated by IDL. The locations of the Hydrometric Stations are shown in the following **Table 3.5.1**.

**Table 3.5.1: Details of Hydrometric Stations**

Station	Ref	Type	Easting	Northing	Waterbody	Responsible Authority	Active
Ballyedmond	19020	Recorder	185923	76618	Owenacurra	Cork County Council	Yes
Dungourney	19038	Staff Only	193284	79487	Dungourney	Cork County Council	Yes
Shanty Bridge	NA	Recorder	189766	74512	Dungourney	Irish Distillers Ltd	Yes
Pitch & Put	NA	Recorder	188662	73398	Dungourney	Irish Distillers Ltd	Yes

## Flooding

Midleton has a long history of flooding. Over the past 40 years, flooding has occurred in Midleton on a number of occasions. In recent years, the most notable flooding events occurred in November 2000, October 2004, June 2012, July 2013, January 2014, February 2014, October 2014, December 2015 and January 2016. These events included both fluvial and tidal events as well as groundwater flooding and pluvial flooding events. Flood mechanisms are complex as there is interaction between the various sources of flooding. Further detail of flooding and flooding mechanisms is provided in **Section 2.1. Appendix 2.1** provides a summary report of historical flood events.

## Surface Water Features

Surface water features within the study area comprise the Owenacurra River, its tributaries, Owenacurra Estuary and Cork Harbour.

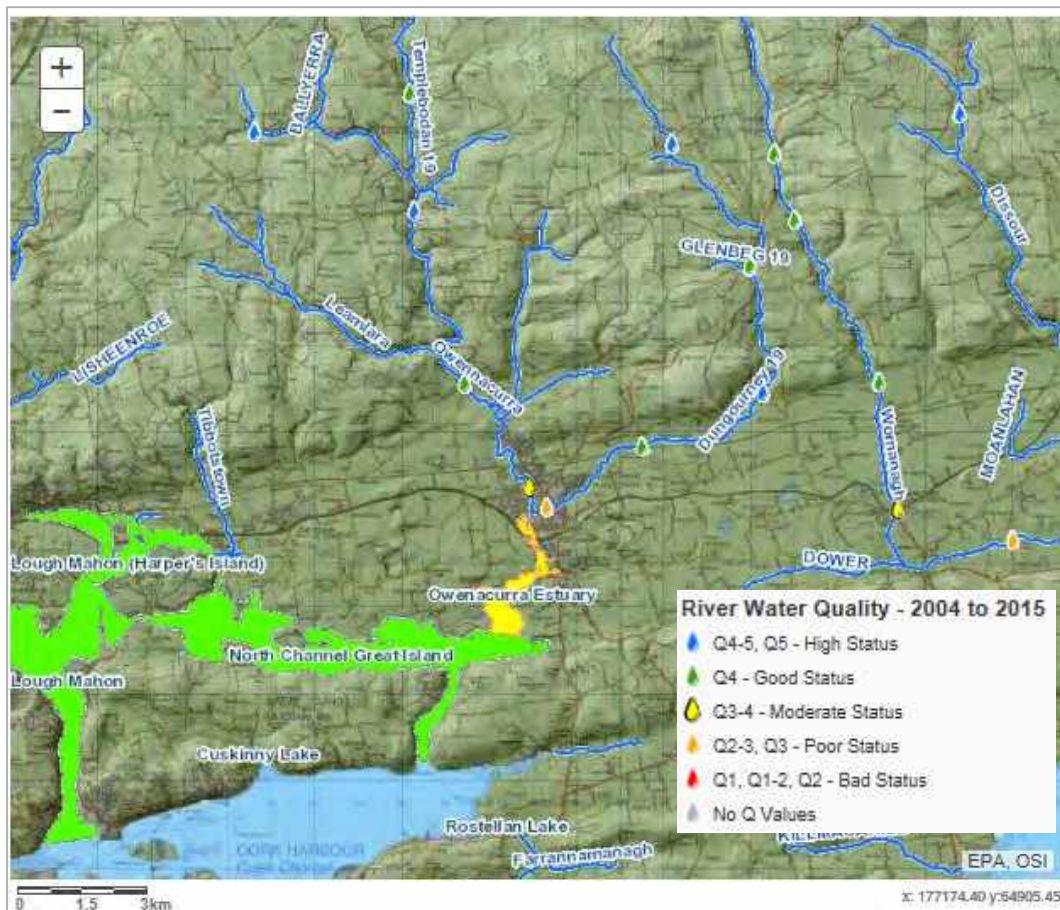
The Lee CFRAMS Hydrology Report (Halcrow 2008) describes the Owenacurra River catchment as covering a total area of 170km<sup>2</sup>. It has two main rivers; the Owenacurra River and the Dungourney River and is broken into six subcatchments. The Owenacurra River rises in the northwest of the catchment and discharges to Cork Harbour south of the town of Midleton where water levels are influenced by the tidal cycle in Cork Harbour. The Owenacurra River predominantly drains the west of the catchment, while the Dungourney River drains the east of the catchment. The Dungourney River has its confluence with the Owenacurra River in Midleton and is the most significant tributary of the Owenacurra. Both rivers flow through undulating landscape with narrow river valleys in the upper catchment opening out to wide flat floodplains towards the town of Midleton. The ground levels vary in the catchment from 244m Above Ordnance Datum (AOD) in the northeast of the catchment to approximately 5mAOD at Cork Harbour. The steeper topography of the upper catchment, and the presence of the urban area of Midleton to the south of the catchment, results in a slightly higher runoff potential than rural or flat areas.

Midleton Town is the largest urban area in the catchment and the town is located on the confluence of the Owenacurra and Dungourney Rivers stretching southwards along the estuary. Ballynacurra is located on the estuary of the river to the south of Midleton (Lee CFRAMS).

## Water Quality

There are ten river water quality monitoring points in the Owenacurra River Catchment. The latest EPA data (2004 to 2015) suggest that water quality in the upper reaches of the Owenacurra and Dungourney River is of Good to High Status and this is shown at eight monitoring points. The two monitoring points, one on the Dungourney River and the other on the Owenacurra River upstream of its confluence at Midleton shows Poor to Moderate Status.

In estuarine waterways, the EPA rates water quality as ‘Unpolluted’, ‘Intermediate’, ‘Potentially Eutrophic’ and ‘Eutrophic’. The water quality of the Owenacurra Estuary is classified as Potentially Eutrophic, which would be considered as unsatisfactory. **Figure 3.5.2** presents the EPA Water Quality Map.

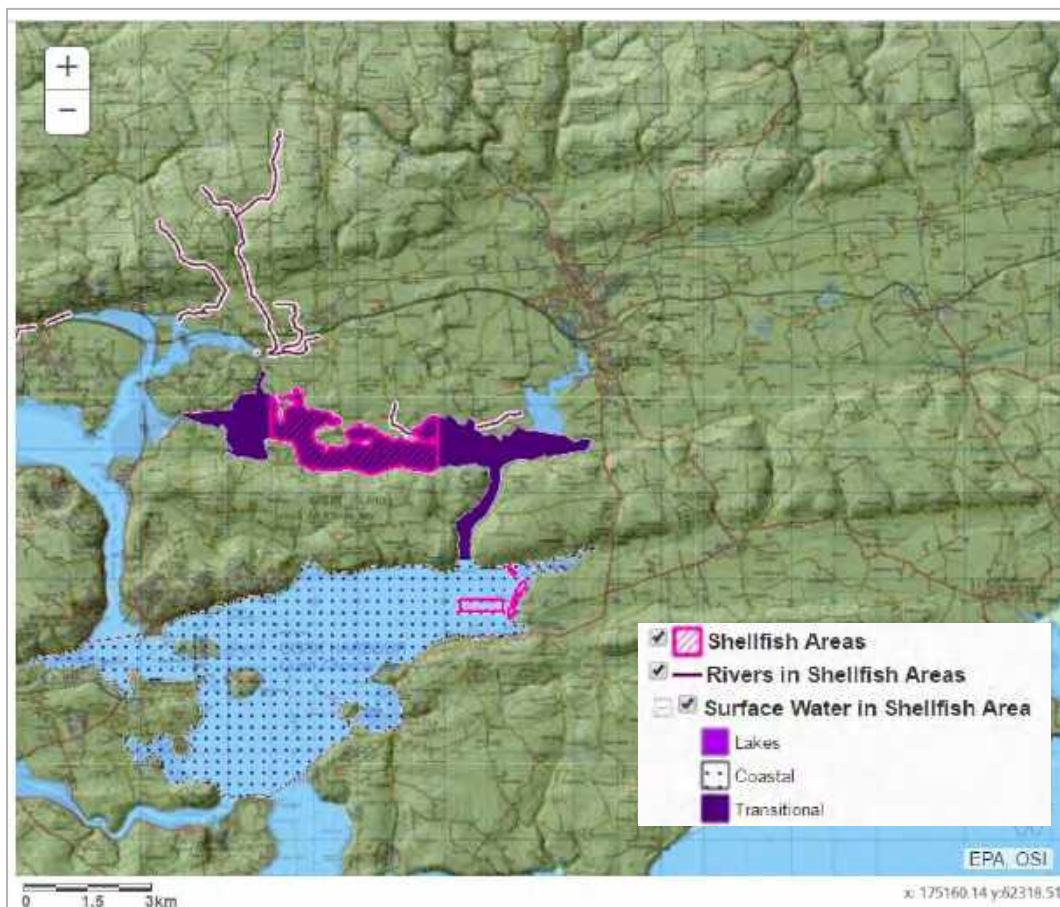


**Figure 3.5.2: Envision Maps showing River Water Quality Scores (2004-2015)**

## Shellfish Areas

There are three Shellfish Areas located to the East of Cork Harbour. A large area of the Owenacurra Estuary is also identified as a Shellfish Area. **Figure 3.5.3** presents the Shellfish Areas.





**Figure 3.5.3: Envision Maps showing Shellfish Areas**

### Hydro-Geomorphology

The geomorphic processes and response are important to understand due to the direct impact that they can have on altering flood capacity and changing flood risk levels. It is also important in terms of maintaining or improving biotic and hydromorphological health through the creation and development of ecological habitats impacting on water body hydro-geomorphological status which is a fundamental component of the European Water Framework Directive (WFD).

A key element of defining the hydromorphology will be the interaction between surface water, groundwater and the natural environment, particularly the influence of the karst-conduits on the surface water environment.

A site specific hydro-geomorphological assessment will be carried out as part of preparing the EIAR.

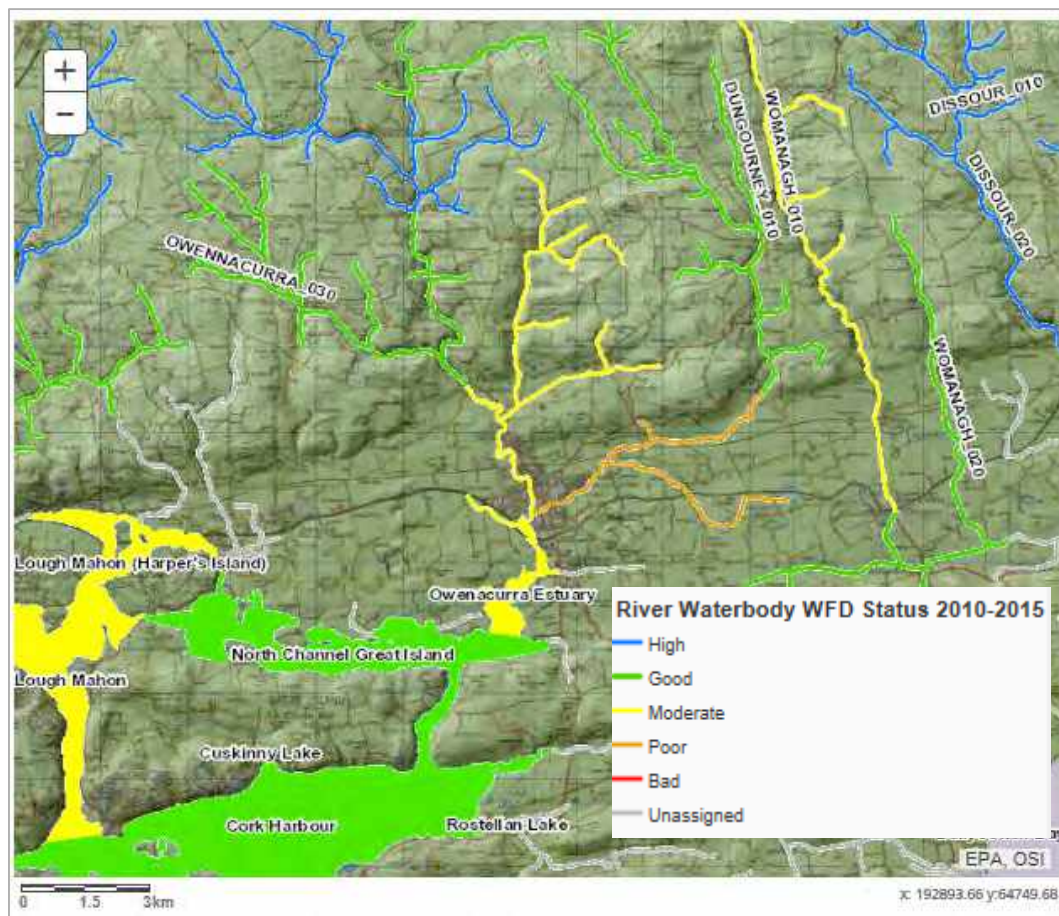
### Water Framework Directive

The Water Framework Directive (WFD) is a key initiative aimed at improving water quality throughout the EU. It applies to rivers, lakes, groundwater, and coastal waters. The Directive requires an integrated approach to managing water quality on a river basin basis; with the aim of maintaining and improving water quality. The Directive requires that management plans be prepared on a river basin basis and specifies a structured approach to developing those plans.

It requires that a programme of measures for improving water quality be brought into effect.

The Water Frameworks Directive assesses the water quality of rivers and coastal water bodies and ranks their status as follows: 'High', 'Good', 'Moderate', 'Poor', 'Bad' and 'Yet to be determined'. Review of the WFD Status (2010-2015) shows that the majority of the upper reaches of the Owenacurra and Dungourney River are of Good to High Status. The lower reach of the Owenacurra is classified as being of Moderate Status.

The lower reach of the Dungourney River is classified as being of Poor Status. **Figure 3.5.4** presents the River Waterbody WFD Status Map.



**Figure 3.5.4: Envision Maps WFD Status (EPA, 2016)**

The study area is located within the WFD South Western River Basin District (RBD). The management plan for this area was consulted during the preparation of this report. The main objectives of the management plan are to:

- prevent deterioration;
- restore good status, reduce chemical pollution in surface waters; and
- achieve protected areas objective.

Information on status, objectives and measures in the South Western RBD has been compiled for smaller, more manageable geographical areas than river basin districts, termed water management unit action plans. There are twenty-eight water management units (WMUs) in the South Western RBD. The study area is located within the Owenacurra WMU.

The key measures to be implemented in the Owenacurra WMU are presented in **Appendix 3.5.1** and summarised as follows:

- Upgrade works to Carrigtwohill WWTP;
- Good Agricultural Practice Regulations and Enforcement;
- Septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests; and
- Shellfish Waters Pollution Reduction Programmes for Cork Great Island North Channel and Rostellan.

### 3.5.3 Key Constraints

The scheme design should take into consideration the main objectives of the South West River Basin District Management Plan, by ensuring that any works proposed do not result in the deterioration of water quality and achieve the protected areas objective.

The scheme design should take into consideration the impact that any proposed flood relief scheme will have on the yields of existing groundwater abstractions from the study area groundwater bodies, taking into account the vulnerability rating of the local aquifer.

## 3.6 Soils, Geology and Hydrogeology

This section of the report outlines the environmental constraints associated with the soils, geology and hydrogeology of the study area. The study area has been defined as the catchment for the Owenacurra River and is shown in **Figure 3.6.1**.

There is a high level of interaction between this section of the report and **Section 3.5** on Hydrology and it is recommended that both chapters be read in conjunction.

### 3.6.1 Methodology

The methodology followed is in line with the NRA Guidance document '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' (NRA, 2008). This document outlines the procedures that should be undertaken for constraints studies, including the relevant information that should be gathered. Due to the linear nature of flood relief schemes, these guidelines are deemed to be relevant to this assessment.



The approach to the constraints assessment for soils, geology and hydrogeology was to undertake a desk study of publicly available information within the study area. The sources of information for the desk study are listed below:

- Geological Survey of Ireland (GSI) online mapping and databases ([www.gsi.ie](http://www.gsi.ie)). This includes the following geospatial database resources: Goldmine (historic data), Groundwater, Quaternary, GeoUrban, Geological Heritage, Aggregate Potential Mapping, Geotechnical and Landslides.
- Geological Survey of Ireland. Geology of South Cork, Sheet 25 and associated guide.
- Ordnance Survey of Ireland historical mapping.
- Environmental Protection Agency (EPA) online mapping and databases ([www.epa.ie](http://www.epa.ie)). This includes the historic mines inventory etc.
- Teagasc soils mapping 2004 and subsoils mapping 2007.

A number of other datasets are also relevant to soils, geology and hydrogeology due to their interactions e.g. ecological sites such as SACs, licenced facilities such as IPC/IE sites, however at constraints stage these have been identified in other chapters.

### 3.6.2 Receiving Environment

This section of the report summarises the receiving environment in the study area while **Section 3.6.3** summarises the key constraints present.

The bedrock geology of the study area is dominated by the East –West trending folds of the Devonian Old Red Sandstones of the Cork area and the Carboniferous limestones. These sandstones and limestones folded into ancient hills and valleys (synclines and anticlines) and over time these eroded to develop the rockhead landscape observed today. The limestone beds were shallowest and subject to most erosion. For this reason, the limestone deposits only remain along the axes of the syncline (base of the valley) while the sides and top (anticline) of the folds are composed of sandstone.

Midleton town is underlain by the limestone beds which run along the central axis of the syncline while the north and south of the town are underlain by sandstone. A number of north – south trending faults have also been mapped in the wider area.

The subsoils of the wider study area are predominantly ‘Till derived from Devonian sandstone’. This material is glacial in origin and is variable in nature. Bedrock outcrops are mapped to the north of the study area, reflecting areas of higher topography.

The town of Midleton is underlain by Made ground as is typical for urban areas. To the north and south of the town, glacial ‘Gravels derived from sandstone’ have been deposited. To the east of the town, a paleochannel (historic river channel) composed of river gravels has been mapped. This delineates the historic course of the Dungourney River, before it diverted to its current course in the south.



### 3.6.3 Key Constraints

The key constraints in the study area for soils, geology and hydrogeology are summarised in the following sections. As outlined in **Section 3.6.1**, a number of other constraints which are dependent on soils, geology and hydrogeology have been excluded from this section of the report as they are dealt with in other sections e.g. groundwater dependent terrestrial ecosystems are dealt with in ecology. This is to avoid double-counting of constraints.

#### Depth to bedrock

The depth to bedrock is an engineering constraint which may influence the choice of flood defence type in each area.

A geophysical survey has been undertaken in a small portion of the study area for the purpose of characterising the hydrogeology of those locations.

This survey was undertaken in Flood Cell 1 and Flood Cell 6 and provided an indication of the depth to bedrock. The results indicated that the rock head level are very different in both areas. In Flood Cell 1 the rock head level was very shallow (approximately 3m deep), while in Flood Cell 6 the rock head ranged from 10 – 45 m deep.

The GSI quaternary mapping highlights a number of locations within the study area where rock is at or near the surface. These are predominantly located in topographically elevated areas, however a number of other areas with shallow rock have also been mapped. These are shown on **Figure 3.6.1**.

A ground investigation will be required when options are developed to determine the depth to bedrock.

#### Soft soils and palaeofeatures

The presence of soft soil is also an engineering constraint which may influence the choice of flood defence type in each area. Soft soils would generally be classified as silt or peat. There are no silt or peat deposits mapped within the study area, however, silt can be associated with glacial deposits such as the till and glacial gravel mapped in the study area.

A ground investigation will be required to confirm the presence of soft soils.

A palaeochannel (historic river channel) of the original course of the Dungourney River has been mapped to the north east of Midleton. This palaeochannel can be a source of groundwater flooding by providing an alternative pathway for groundwater. A detailed hydrogeological investigation is ongoing to determine the influence that this palaeochannel will have on flood defences. The location of the palaeochannel is presented on **Figure 3.6.1** indicated as “Alluvium”.

#### Mines and quarries / pits

Historic mines or quarries can be areas associated with instability or contamination. The EPA historic mine database shows no historic mines in the study area.

The GSI Aggregate Potential mapping dataset highlights a number of historic pits and quarries in the study area, likely associated with gravel deposits. These are shown on **Figure 3.6.1**. Active quarries in the study area are also shown on **Figure 3.6.1**.

### **Karst**

Karst features can be associated with instability or changes in the hydraulic regime which can influence the usefulness of the flood defence measures by acting as a conduit / bypass for flood waters. A number of karst features have been mapped in the study area in the limestone which runs from east to west through the town. The mapped features include springs, caves, swallow holes and enclosed depressions and they are presented on **Figure 3.6.1**.

### **Aquifers and groundwater resources**

There are two types of aquifer present within the study area, a 'Regionally Important aquifer with Karstified diffuse flow' (Rkd classification) associated with the limestone, and a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones' associated with the sandstone.

There are no mapped public water supply groundwater abstractions within the study area. The GSI well database highlights a number of wells within the study area. While some of these are likely to be exploratory wells and may not be active, a number are associated with industrial supplies. The mapped wells are presented on **Figure 3.6.1**.

### **Contamination**

The potential for land and water contamination can represent an engineering and environmental constraint. As flood defence structures can change flow paths, this may mobilise contaminants which can negatively impact the environment. Any contaminated material that is encountered during construction will have to be disposed of at an appropriately licensed facility.

Cork County Council hold a register of unregulated landfills which are potential sources of contamination. Two have been identified within the study area and these are presented on **Figure 3.6.1**.

### **Geological Heritage Areas**

The GSI has mapped two Geological Heritage Areas within the study area. The first, Baneshane Quarry, which is described as a red marble quarry, is located to the southwest of the town. The second is the Midleton Distillery Springs and is located to the east of the town at the IDL site. The locations of these are presented on **Figure 3.6.1**.

### **Geohazards**

The GSI maintains a Landslide Susceptibility Mapping database. This database classifies the majority of the study area as having 'Low' susceptibility, however there are a number of small areas around the study area classified as 'Moderately High' or 'High' susceptibility. Landslide susceptibility would be considered an engineering and environmental constraint.





Region

Mineral Locations

Active Quarries

Well (Location Accurate Within 50m)

Well (Location Accurate Within 1km)

Well (Location Accurate Within 500m)

Provisional Geoheritage Site

Landfill (Closed)

Alluvium

Glaciofluvial Sands and Gravel

Rock at or Near Surface or Karst

Source Protection Area (Geological Survey of Ireland)

Potential Natural Heritage Area

Special Area of

Source Protection Area (National Parks and Wildlife Service)

Zone of Contribution (EPA)

Borehole

Cave

Enclosed Depression

Spring

Swallow Hole

Kilometers

0 0.25 0.5 1

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Source: Environmental Protection Agency  
Irish National Soils Map, 1:250,000k, V1b(2014), Teagasc, Cranfield University, Jointly funded by the EPA STRIVE Research Programme 2007-2013 and Teagasc.  
Source: National Parks and Wildlife Services

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Client  
**Cork County Council**

Job Title  
**Middleton Flood Relief Scheme - Constraints Assessment**

Hydrogeological Constraints

Scale at A3  
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**Figure 3.6.1**

Issue  
**D2**

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## 3.7 Archaeology, Architectural and Cultural Heritage

This section assesses and evaluates the potential archaeological, architectural and cultural heritage constraints of the study area.

- Archaeology includes all pre-1700 sites and all levelled/buried features of any date.
- Architecture includes upstanding buildings and structures, which largely date post 1700.
- Cultural Heritage includes history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

### 3.7.1 Methodology

A desktop study was carried out for the purpose of identifying archaeological, architectural and cultural heritage constraints within the study area (Figure 1.2.1). The desktop study was completed in accordance with the following guidance:

- *Guidelines on the information to be contained in Environmental Impact Statements, 2002 (Environmental Protection Agency) and EPA Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports, EIAR (EPA, 2017).*
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Environmental Protection Agency, 2003).*
- *Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).*
- *Policy and Guidelines on Archaeological Excavation (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).*
- *Guidelines for the assessment of Archaeological Heritage Impacts of National Road Schemes (National Roads Authority, 2005).* Although the proposed project is not a road it is a linear corridor extending continuously across the landscape and thus these guidelines were considered appropriate.
- *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (National Roads Authority, 2005).*

In compiling the desktop report, the following sources were used:

- Database of Excavation Reports ([www.excavations.ie](http://www.excavations.ie)).
- Cartographic Sources.
- Record of Monuments and Places (RMP).
- Sites and Monuments Database of the Archaeological Survey of Ireland.
- Files of the National Monuments Service.
- County Development Plan for Cork (2014).

- Midleton Local Area 2013.
- National Inventory of Architectural Heritage (NIAH).

Further definitions can be found in **Appendix 3.7.1**.

### 3.7.2 Receiving Environment

The constraint report provides a broad chronological overview of the study area which includes the channel, floodplain and immediate surrounding areas of the River Owenacurra and Estuary including all of its tributaries, particularly the Dungourney river. Details of the following can be found in **Appendix 3.7.1**:

- All archaeological sites listed in the RMP for County Cork within the study area and referred to in the report.
- Details of all protected structures within the study area.
- A list of all protected structures within the town of Midleton,
- All architectural buildings listed in the NIAH within the CSA.

The River Owenacurra rises in the townlands of Coolguane and Monananig and flows southeast and to the east of Knockeen Wood, continuing through a wooded area between the townlands of Knockeennagroagh and Rathcobane. It continues south, right through the town of Midleton, flowing to the west of the main street in the town. It then joins the Dungourney River and flows south where it meets the Ballynacorra River, heading south to the west of the village of Ballinacurra.

- The Ballynacorra River is a large mass of water that served as an important port for the town of Midleton in times past and facilitated the transportation of timber, coal, iron and flax for the linen industry. The Ballynacorra River flows southwards into the Owenacurra Estuary, which is part of the greater Cork Harbour area.
- The Dungourney River is a tributary of the Owenacurra River and rises to the north-west of Garrylaurence. It runs south along the boundary of the townlands of Ballynona North and Rathorgan. It continues south, running to the west of the village of Dungourney and continues in a south westerly direction before heading west through the town of Midleton and joining the Owenacurra River in the region of Ballick Road.

There are numerous settlements within the study area, apart from Midleton, other smaller villages like Ballinacurra, a small harbour village c. 1km south of Midleton in addition to Lisgoold, Leamlara and Ballincurrag at the northwest and the villages of Dungourney and Clonmult at the northeast.

The main settlement in the study area is the town of Midleton, in Irish *Mainistir na Corrann*, meaning monastery of the ford, in the barony of Barrymore and parish of Midleton. The town is located at the confluence of the Owenacurra and Dungourney Rivers, approximately 22km east of Cork City, within Cork Harbour, on an important routeway (N25) between Cork and Rosslare.

The earliest recorded settlement of Midleton is represented by the establishment of the Cistercian Abbey of Chore, (CO076-063003) in 1180 (Gwynn & Hadcock 1988, 140). The abbey was suppressed in 1543 and in ruins in 1615 (*ibid*). The site is now occupied by Midleton Church of Ireland church and graveyard (CO076-063002 and -063001).

The situation of the town of Midleton on the Owenacurra River, which flows southwards into the Owenacurra Estuary and into the rich tidal estuary of Cork Harbour, has ensured that the area has been a focus of human activity from the earliest of times. Archaeological sites in the greater Midleton area range in date from the Bronze Age in the form of numerous standing stones and fulachta fia, to an array of post medieval structures such as limekilns, country houses and churches, all of which represent various facets of life through the ages in the greater study area.

There are 317 archaeological sites listed in the RMP within the study area providing evidence of early human activity from as early as the Bronze Age (c. 2,400 BC to 500 BC). A list of all archaeological sites within the study area and referred to in the report can be found in **Table 1 of Appendix 3.7.3**.

A chronology of the archaeological and cultural heritage of the study area has been provided below, with further detail in **Appendix 3.7.2**. The archaeological timescale can be divided into three major periods, each with a number of sub-sections:

- The prehistoric period: Mesolithic - (*circa* 7,000 to 4,000 BC); Neolithic - (*circa* 4,000 to 2,400 BC); Bronze Age (*circa* 2,400 to 500 BC) – Iron Age (*circa* 500 BC to AD 400).
- The medieval period: Early medieval 5th – 12th century, high medieval 12th century – *circa* 1400, late medieval *circa* 1400 – 16th century’
- Post Medieval Period: 17<sup>th</sup> century onwards.

### Prehistoric Period

As already mentioned above, the earliest evidence of human activity in the study area dates to the Bronze Age, with a total of 15 standing stones, 27 fulachta fia, a stone pair and a ring barrow.

There are 15 single standing stones scattered throughout the study area and one standing stone pair (CO053-064) in the northwest of the study area in the townland of Knockeennagroagh.

There is one ring barrow (CO053-020) in the townland of Monananig. These monuments are part of the Bronze/Iron Age burial tradition and present on the landscape as a circular or oval raised area enclosed by one or more fosse(s) and outer bank(s) and with or without an entrance.

A pit burial, dating to the Bronze/Iron Age (containing the cremated remains of an adult female), was found during drainage works, c. 150m north of the highest tidal reaches of Ballynacorra river to the southwest of the town of Midleton in 1986.



There are three ogham stones in the study area. These are inscribed stones, which have a series of parallel lines or notches and represent letters of the Roman alphabet. They generally date to the 2<sup>nd</sup>/3<sup>rd</sup> centuries but continued to be used when Christianity was introduced in the late 4<sup>th</sup> century.

### **Medieval Period**

There are a large number of sites within the study area, which date to the Early Christian or early medieval period (c. 500 to 1100 AD). The early medieval period in Ireland is characterised by the introduction of Christianity. One of the most characteristic secular monuments of this period was the ringfort, occupied by the elite of the time.

There are 103 ringforts in the study area and 20 circular enclosures. Very often these enclosures are ringforts or cashels. There are 19 souterrains within the study area, 11 of which are associated with known ringforts, the other 8 are isolated structures.

Contemporary ecclesiastical sites are also represented in the study area. There is one early ecclesiastical enclosure (CO076-016) in the townland of Ballyvodock West at the southwest of the study area.

There are seven holy wells in the study area. One of the wells (CO065-048) is located on a hillside above the Leamlara to Carrigtwohill road. Mass is celebrated at the site each year on August 15<sup>th</sup> on an altar at the rear and the surrounding trees are adorned with rags.

The beginning of the high medieval period in Ireland corresponds largely with the arrival of the Anglo-Normans in 1169 and over the following centuries their influence on the landscape grew. During this period the first castles were built by the Anglo-Norman colonists. There are four unclassified castles within the study area. There are three tower houses in the study area; in Leamlara (CO064-109002) in the Northwest, in Coppingerstown (CO076-051) in the Southeast and in Cahermone (CO076-027001), northeast of Midleton.

### **Post Medieval Period**

Sites and features dating to the post medieval period are numerous in the study area. There are eight churches and their associated graveyards. The Church of Ireland Church (CO076-063002) and graveyard (CO076-063001) in the townland of Townparks are located in Midleton. The church is situated near the site of a Cistercian abbey (CO076-06303).

There are 12 lime kilns scattered throughout the study area. These sites generally date to the 18<sup>th</sup> and 19<sup>th</sup> centuries and were used in the production of fertilizer (quicklime) for agricultural use.

There are numerous country houses and demesnes within the study area; 11 of these are included in the RMP, six of which are listed as Protected Structures in the Cork County Development Plan 2014. The country houses generally date to the 18<sup>th</sup> and 19<sup>th</sup> centuries.

Country Houses within the study area include Caherduggan House (CO054-123) in the northwest, Stumphill (CO077-047) in the southeast, Ballynacorra House (CO076-044) in the south and Ballyannan House (CO076-020004) in the southwest.

Within the town of Midleton, is the internationally known Midleton Distillery (CO076-025) and one of the country's primary tourist destinations. Midleton Distillery is a protected structure in the Midleton Local Area Plan, 2013 (Reg. No. 1). It is made up of a complex of buildings that include a maltings and a mill, store/warehouse and Still house (now the interpretive centre). The still house, constructed in 1825 has the distinction of being the largest such example in the world [www.buildingsofireland.ie](http://www.buildingsofireland.ie).

Other iconic buildings in the town that attest to various stages in the town's development are Midleton College (CO076-108) on the eastern side of the town within its own grounds and the workhouse (CO076-107), 270m northeast of this. Both of these buildings are also Protected Structures in the Midleton Local Area Plan 2013. Midleton College is still in use as a mixed co-educational school.

The former workhouse (CO076-107), built in 1840 and now Our Lady of Lourdes Hospital is a protected structure (Reg. No. 7).

Midleton Railway Station is a protected structure (Reg. No. 5) and lies at the northern end of the town. It consists of a detached nine-bay single-storey structure, built c. 1860 [www.buildingsofireland.ie](http://www.buildingsofireland.ie).

The small harbour village of Ballinacurra lies a short distance from Midleton. Evidence of its former use as a port is in the various quayside 'stores' that are marked on the 1<sup>st</sup> edition OS map (1842), one of which (CO076-111) is now in use as a grain store. Three former maltings are situated in the area: (CO076-074) in the townland of Castleredmond; (CO076-080), 100m to the south, in the townland of Ballynacorra West, and (CO076-075), 100m to the east of this also in the townland of Ballynacorra West.

The Cork County Development Plan (2014), the NIAH and the RMP list houses, public buildings and structures and industrial buildings within the study area. A total of 20 buildings are listed as Protected Structures in the Cork County Development Plan 2014 and shown in **Table 2 of Appendix 3.7.3**, while 51 Protected Structures are listed in the Midleton Local Area Plan, 2013 for the town of Midleton, as outlined in **Table 3 of Appendix 3.7.3**.

There are no Architectural Conservation Areas (ACA) within the study area listed in the Cork County Development Plan (2014). The closest ACA is the village of Castlemartyr, which lies just outside the eastern extent of the study area. Buildings of architectural heritage listed in the NIAH within the study area are given in **Table 4 of Appendix 3.7.3**.

The Owenacurra River and its estuary and tributaries have played their part in the development of the study area. Rivers have been resourced by humans since the earliest times and have served as routeways, crossing points and as a food source. Settlements centred around the crossing points which could have varied from stepping stones to timber or eventually stone bridges.

The earliest evidence for settlement along stream banks is in the form of Fulachtaí Fia dating from the Bronze Age. It is likely that they have been impacted in the past when they were used as a power source for various mills and that they were possibly dredged and deepened in earlier efforts to curb flooding. Therefore, the Owenacurra river, the Dungourney River, the Ballynacorra River and the Owenacurra Estuary can be considered as Areas of Archaeological Potential as outlined in **Table 5 of Appendix 3.7.3**.

### 3.7.3 Key Constraints

For the purpose of this report an assessment is given of the perceived (not necessarily definitive) importance of the various Cultural Heritage sites within the study area. The assessment of perceived importance is based on professional judgement of the information to hand, framed within the confines of the study. On a site-by-site basis, the levels of perceived cultural heritage importance are liable to future revision where new information is brought to light, either through more detailed investigations, surveys or research. The classification of levels of perceived importance is therefore based on an appraisal of current information and an assessment of importance probability.

All recorded archaeological sites are afforded the same protection under National Monuments legislation (1930-2004). An assessment is given below of the perceived (not necessarily definitive) relative importance of the various sites of archaeological heritage.

- *International Importance* is a site deemed to be of international importance where, its known importance is perceived by the study to merit international recognition as a site of exemplary importance.
  - There are no sites considered to be of international importance within the study area.
- *National Importance* is a site deemed to be of national importance where, its known importance is perceived by the study to merit national recognition as a site of considerable importance.
  - There are no sites considered to be of national importance within the study area.
- *Regional Importance:* A site is deemed to be of regional importance where, its known importance is perceived by the study to merit regional recognition as a site of high importance. Examples of site types within the study area include megalithic tombs, anomalous stone groups, stone rows, standing stone pairs, ogham stones, ringforts, souterrains, early ecclesiastical enclosures, castles, tower houses, churches, graveyards and burial grounds.
  - There are 236 archaeological sites considered to be of regional importance within the study area.
  - There are 20 structures listed in the Record of Protected Structures in Cork County Development Plan (2014), eleven of which are also RMP sites.

- There are a further 51 buildings and features of architectural significance listed as protected structures in the Midleton Local Area Plan 2013 (**Table 6 in Appendix 3.7.3**). Seven of these buildings are also RMP sites.
- *Local Importance:* A site is deemed to be of local importance where, its known importance is perceived by the study to merit local recognition as a site of notable importance. Examples of site types within the study area include Fulachtai Fia, standing stones, possible ringforts, enclosures, earthworks, holy wells, cross slabs, bridges and mills.
  - There are 80 archaeological sites considered to be of local importance within the study area (**Table 7 in Appendix 3.7.3**).

All architectural heritage sites listed in the Record of Protected Structures are afforded the same protection under the Planning and Development Act 2000, as amended. Buildings and structures listed in the National Inventory of Architectural Heritage are graded in importance with the majority of buildings classified as being of Regional importance, however, unless they are also listed in the Record of Protected Structures they are not afforded legal protection.

There are no site specific cultural heritage sites within the study area which are not already afforded protection as archaeological sites or architectural heritage sites.

Based on the assessment of the archaeological, architectural and cultural heritage constraints within the study area, the following appraisal can be made:

- There are no sites listed as National Monuments.
- There are no sites subject to Preservation Orders/Temporary Preservation Orders.
- There are two monuments within the study area which are listed in the Register of Historic Monuments as follows; a ringfort (CO065-057) in Ballyleary and a tower house (CO076-051) in Coppingerstown.
- There are no archaeological sites considered to be of international or national importance.
- There are 236 archaeological sites considered to be of regional importance (Table 6).
- There are 71 buildings and structures (mentioned above 20 and 51) listed in the Record of Protected Structures (**Tables 2 and 3 in Appendix 3.7.3**). Eighteen of these structures are also listed as archaeological sites and have RMP numbers.
- There are four Areas of Archaeological Potential - The Owenacurra River and its tributary the Dungourney River, the Ballynacorra River and the Owenacurra Estuary (**Table 5 in Appendix 3.7.3**).
- There are no site specific cultural heritage sites which are not already afforded protection as archaeological sites or architectural heritage sites.

Sites to be considered as key constraints (see **Table 6 in Appendix 3.7.3**):

- All sites listed as National Monuments.
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full).
- All archaeological sites considered to be of international, national or regional importance.
- All buildings or structures listed in the Record of Protected Structures.
- Areas of Archaeological Potential

### **Recommendations**

It is recommended that all sites of archaeological and architectural interest are considered during the appraisal option report phase.

Sections of the Owenacurra, Dungourney and Ballynacorra Rivers and the Owenacurra Estuary are the subject of this study and, as rivers, are considered to be Areas of Archaeological Potential and key constraints. It is likely that the rivers have been impacted in localised areas in the past when they were used as a power source for various mills and industrial activities. It is recommended that further proposed works to the rivers should be archaeologically assessed in advance of works taking place.

## **3.8 Landscape and Visual**

This section identifies sensitive landscape and visual receptors within the Owenacurra catchment study area. These include landscape elements, features or character areas (Landscape receptors) as well as places from which residents and visitors may view aspects of the development where it could affect their visual amenity (Visual receptors). It is considered that the catchment-based study area is appropriate for the landscape and visual appraisal as it is broad enough to encompass all physical landscape receptors and landscape character areas potentially impacted by the proposed scheme. The physical containment of the watershed is also strongly related to visual containment or ‘viewshed’ in respect of potential visual impacts.

### **3.8.1 Methodology**

This Landscape and Visual constraints study considers the following information;

- The Draft Cork Landscape Strategy (2007), which is incorporated into the Cork County Development Plan (2014 – 2020).
- Landscape Policies and objectives in the Cork County Development Plan (2014 – 2020).
- ‘High Value’ landscape areas identified within the Cork County Development Plan (2014 – 2020).
- Scenic Route designations within the Cork County Development Plan (2014 – 2020).

- Mapping and aerial photography of the Owencurra Catchment study area.
- Online tourism and recreational amenity resource information for the local area including the following:

<http://www.irishtrails.ie/>

<https://www.coillte.ie/our-forests/recreation-map/>

<http://www.discoverireland.ie/>

<http://www.ringofcork.ie/midleton/>

<http://www.fishinginireland.info>

### 3.8.2 Receiving Environment

The landscape within the catchment-based study area transitions from rolling rural farmland and forestry in the upper northern portions of the catchment, to lowland agriculture around the settlement of Midleton.

Midleton is the principal settlement within the study area and contributes a significant proportion of urban land cover to the study area in the form of industrial, commercial and residential development on either side of the Owenacurra River. Major routes also converge on Midleton and these include the R626 and R627 Regional roads from the north and northeast respectively. The N25 National road skirts to the south of the town crossing the River Owenacurra and the lower (southern) reaches of the study area in an east – west direction. A section of national railway line also passes through the northern extents of Midleton and across the study area in an east – west direction. Refer to **Figures 1.2.1** and **1.2.2** for further detail.

Within the rural hinterland to the north of Midleton are the Water Rock and East Cork Golf courses and there are also several Coillte forest walks. In terms of tourism, the settlement of Midleton is synonymous with the IDL Distillery (Jameson Distillery), which has a popular visitors' centre.

The Owenacurra River and Dungourney River both pass through and converge in the settlement of Midleton. There are a number of road and rail bridges over these rivers within and around Midleton that afford elevated amenity views along the river corridors. There are also several amenity areas and riverside walks including 'Distillery Walk' near the IDL, which itself lies adjacent to the River Dungourney. Dwellings, businesses and roads flank the Owenacurra River and Dungourney Rivers and draw visual amenity from these watercourses as they pass through Midleton. It would appear that the Owencurra is a 'Closed Fishery' (Fishinginireland.info), however, opportunity exists for informal water based recreation along these rivers and estuaries. Protected structure constraints are presented in **Section 3.7 Archaeology, Architectural and Cultural heritage**).

#### **Cork County Development Plan (2014 - 2020)**

The Draft Cork Landscape Strategy (2007), which is integral to the Cork County Development Plan (2014-2020) divides the county into 16 no. Landscape



Character Types (LCTs). The study area as shown on **Figure 3.8.1** below straddles 3 LCTs as follows:

- Type 1 - City Harbour and Estuary

LCT 1 – ‘City Harbour and Estuary’, which is recognised as having: Very High landscape sensitivity; Very High Landscape Value; and National Landscape Importance. Landscapes designated as having very high landscape sensitivity “are extra vulnerable landscapes (e.g. seascape area with national importance) which are likely to be fragile and susceptible to change.”

- Type 6b - Broad Fertile Lowland Valleys

LCT 6b ‘Broad Fertile Lowland Valleys’ is categorised as having: Medium landscape sensitivity; Medium Landscape Value; and Local Landscape Importance.

- Type 10b - Fissured Fertile Middleground

LCT 10b – ‘Fissured Fertile Middle ground’ is recognised as having: Low landscape sensitivity; Medium Landscape Value; and County Landscape Importance.

The landscape character types are described further in **Appendix 3.8.1**.

The 16 LCTs identified in the Draft Landscape Strategy (2007) are further subdivided into 76 geographically distinct Landscape Character Areas (LCAs). Within LCT 1 – ‘City Harbour and Estuary’ there is only one landscape character area and that is LCA 19 - ‘Cork City and Harbour’. Two landscape character areas occur within LCT 10b, but only one of these falls within the study area and that is LCA 4 Donoughmore / Watergrasshill / Dungourney (Fissured Patchwork Middleground). LCT 6b – ‘Broad Fertile Lowland Valleys’ landscape type comprises of two LCAs, but again, only one of these is within the study area, LCA 42 – Castlemartyr (Broad Shallow Patchwork Valley). **Figure 3.8.2** below shows the locations of the LCAs in relation to the study area.

The Cork County Development Plan (2014-2020) lists a number of objectives in relation to landscape. These are included, along with a number of recommendations specific to each LCT, in **Appendix 3.8.1**.



**Figure 3.8.1: Excerpt from Cork County Development Plan (2014), Appendix E, Map 2 showing Landscape Character Types and approximate study area**



**Figure 3.8.2: Excerpt from County Cork Draft Landscape Strategy 2007. Map 1 showing Landscape Character Areas and approximate study area**

### **Cork County Development Plan (2014 - 2020): Landscape Value**

According to the Cork County Development Plan (2014-2020), Landscape Character Types which have ‘*a very high or high landscape value and high or very high landscape sensitivity and are of county or national importance are considered to be our most valuable landscapes and therefore it is proposed to designate them as High Value Landscapes.*’ The majority of the study area does not lie within an area of High Value Landscape, but there are substantial areas of High Value Landscape around the settlement of Midleton as well as the estuary and Cork Harbour to the southwest. Refer to **Figure 3.8.3**.



**Figure 3.8.3: study area and High Value Landscape (green shading) from the Cork County Development Plan (2014) mapping dataset**

### **Views and Routes of Recognised Scenic Value**

Designated scenic routes are indicated in the Cork County Development Plan map browser. Three designated scenic routes occur within the study area as shown on **Figure 3.8.4** and are follows:

- **S43** - R626 Regional Road between Lisgoold and Carrigogna. Views of wooded landscape & intermittent views of open countryside.
- **S44** - Local Road between Monaleen Bridge, Ardglass & Gurteen Cross Roads. Views of hills & rural landscape.
- **S51** - Road from Ballynacorra via East Ferry to Whitegate and Roche's Point.



**Figure 3.8.4: study area and potentially relevant designated Scenic Routes (green lines) from the Cork County Development Plan (2014) mapping dataset**

### **Tourism and Recreational Amenities**

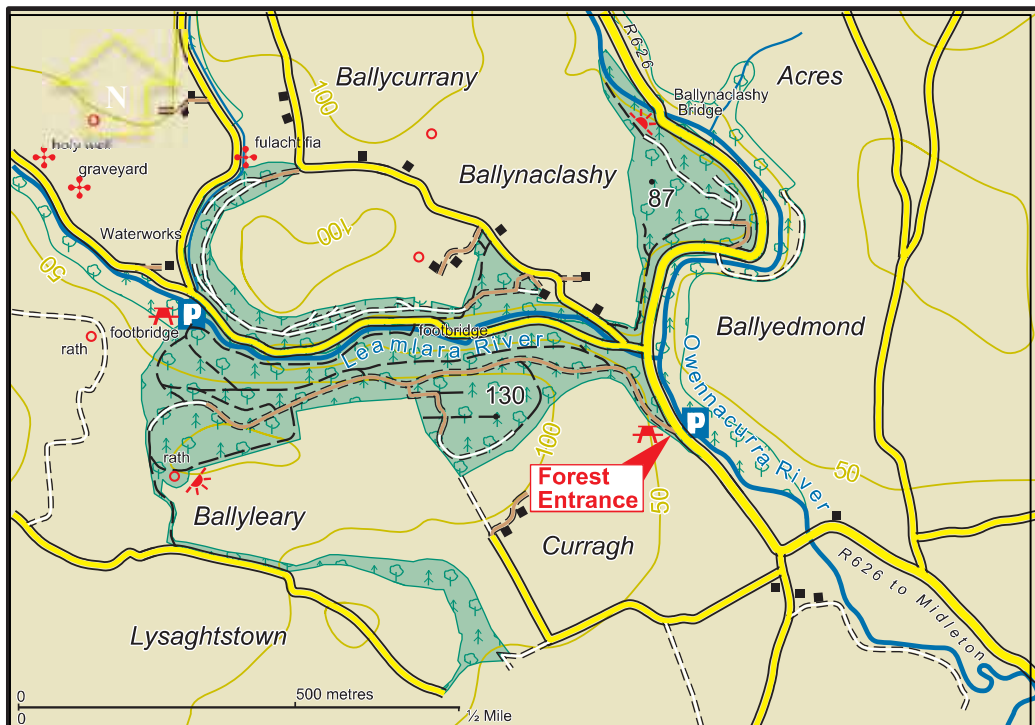
The Coillte Recreation Map identifies three recreation areas within the study area as shown in **Figure 3.8.5 to 3.8.7**. All three areas are located in close proximity to watercourses within the study area. There are also (non-designated) scenic viewpoints in each of the recreation areas. The areas are listed below:

- Ballyannan (Bluebell) Woods- located just south west of Midleton on the western side of the estuary.
- Curragh Wood - North of Midleton and includes sections of the Rivers Leamlara and Owenacurra.
- Moanbaun Forest – is in the far north west of the study area and seems to be the location of several tributaries in addition to Carroll's Pond adjacent to the Leamlara River.

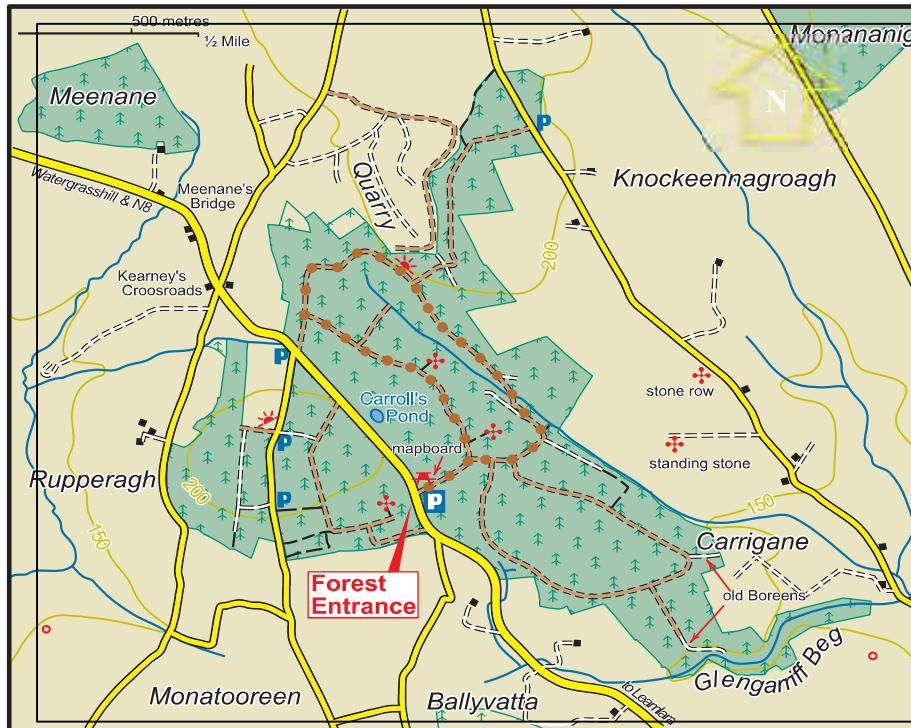




**Figure 3.8.5: Ballyannan (Bluebell) Woods ([www.coillte.ie](http://www.coillte.ie))**



**Figure 3.8.6: Curragh Wood ([www.coillte.ie](http://www.coillte.ie))**



**Figure 3.8.7: Moanbaun Forest ([www.coillte.ie](http://www.coillte.ie))**

The 'Irish Trails' website identifies a trail known as Ballintotis Woodbine Loop located near the Womanagh River, south of the N25 National Road, half way between Midleton and Castlemartyr. This trail is close to Lough Aderra which is a popular coarse fishing lake but is currently closed to fishing. Lough Aderra and Ballybutler Lake to the west are designated as a proposed Natural Heritage Area (pNHA) in the Cork County Development Plan. A portion of the trail is contained within the south-eastern extents of the Owencurra Catchment study area.



**Figure 3.8.8: Ballintotis Woodbine Loop ([www.irishtrails.ie](http://www.irishtrails.ie))**



### 3.8.3 Key Constraints

Key constraints in respect of the proposed Midleton FRS relate to landscape and scenic designations in the County Development Plan as well as places of local and recreational amenity, particularly riverside walks and linear parks. In terms of landscape designations in the Cork County Development Plan there is a substantial area of 'High Sensitivity' landscape covering the settlement of Midleton and the coastal landscape in the south-western corner of the study area (see **Figure 3.8.3**). Any works within the Owenacurra River corridor or estuary will need to be cognisant of the landscape and design policies within this landscape zoning.

In terms of scenic designations, scenic routes S44, S43 and S51 from the County Development Plan are all potentially relevant to any flood relief works within the Owenacurra catchment, but with the latter two in closer alignment with the River itself.

Non-designated outdoor recreational amenities include a series of Coillte forest walks that are in close proximity to the Owenacurra River corridor and estuary and there are also two golf courses to the north of Midleton. The settlement of Midleton and, in particular, those residential areas, roads, bridges and riverside amenity walks with unobstructed views of the Owenacurra and Dungourney River corridors will be sensitive to any flood alleviation works that might impact negatively on visual or recreational amenity, either temporarily or permanently.

Protected structure constraints are presented in **Section 3.7 Archaeology, Architectural and Cultural heritage**).

## 3.9 Air Quality, Climate, Noise and Vibration

### 3.9.1 Methodology

This section describes the existing air quality and existing noise environment in the scheme study area and identifies possible issues which have the potential to constrain the flood relief scheme design.

The methodology included:

- Identification of possible air quality issues,
- Identification of locations where there may be existing noise/vibration sensitive receptors,
- Identification of any existing noise or vibration sources in the area, and
- Qualitative description of the existing noise climate.

The following sources of information were consulted:

- Cork County Development Plan 2014-2020,
- Cork County Council Draft Noise Action Plans 2013-2018,
- Air Quality in Ireland 2015 (EPA 2016), and
- EPA online database of IPPC licensed facilities.

## 3.9.2 Receiving Environment

### 3.9.2.1 Air Quality and Climate

The scheme study area is comprised of rural areas, small villages and settlements, farmland, open spaces and the main town of Midleton. The Environmental Protection Agency publication *Air Quality in Ireland 2015* (EPA 2016) provides an overview of air quality in Ireland for 2015, based on data obtained from 31 monitoring stations that form the National Ambient Air Quality Monitoring Network.

Ireland is divided into zones (Zones A, B C and D) for the assessment and management of air quality, in compliance with EU legislation. The scheme study area is located in Zone B ‘Cork’ (the Cork conurbation).

The EPA publication indicates that the air quality in Zone B in 2015 was ‘good’.

Sensitive receptors within the scheme study area with respect to air quality and climate are predominantly people. This includes homes, schools, hospitals, businesses, and places of worship. Flora and fauna can also be sensitive to air quality and climate. Biodiversity is dealt with in **Section 3.4**.

Residential developments are present throughout the scheme study area. The scheme study area also includes a number of schools and medical centres. Refer to **Section 3.3.2** for full details. During the construction phase, sensitive receptors may be impacted negatively due to construction activities and construction traffic. Climate change may also be considered as a constraint on the design of the scheme, as higher rainfall and extreme weather events attributing to climate changes may lead to higher water levels, which would influence the design of the scheme.

### 3.9.2.2 Noise and Vibration

The scheme study area is comprised of rural areas, small villages and settlements, farmland, open spaces and the main town of Midleton. The existing noise environment in the scheme study area is associated with the activities in a mosaic of busy industrial estates, retail outlets/small businesses and roads, farming activities, the railway line operating, and quieter residential areas.

Sensitive receptors within the scheme study area with respect to noise and vibration are predominantly people. This includes homes, schools, hospitals, businesses, and places of worship. Fauna can also be sensitive to noise and vibration. Biodiversity is dealt with in **Section 3.4**.

Residential developments are present throughout the scheme study area. The scheme study area also includes a number of schools and medical centres. Please refer to **Section 3.3.2** for full details. During the construction phase, there may be a requirement for piling and other noisy activities that are likely to generate noise and vibration impacts on sensitive receptors.

Vibration during construction could have the potential to cause damage to structures, such as buildings, bridges and walls in the vicinity of the works.

### 3.9.3 Key Constraints

The key constraints in relation to air quality, climate, noise and vibration are the sensitive receptors in proximity to the location of construction works. The scheme design should take into consideration any air/climate/noise/vibration sensitive receptors such as residences, schools, businesses, and medical facilities located in proximity to works associated with the flood relief scheme. The potential impacts of climate change will need to be considered in the design of the proposed scheme.

## 3.10 Material Assets

### 3.10.1 Methodology

This section describes the constraints relating to material assets within the scheme study area and identifies possible issues which have the potential to constrain the flood relief scheme design.

The methodology included:

- Identification of possible material assets within the scheme study area,
- Identification of locations where there may be existing sensitive receptors,
- Identification of material assets constraints.

The following sources were used:

- East Cork Municipal District Local Area Plan (Draft) 2016
- Local Authority Waste Facility Register <http://facilityregister.nwcpc.ie/>
- Environmental Protection Agency ENVision Online Database [www.epa.ie](http://www.epa.ie)
- EBS mapping

### 3.10.2 Receiving Environment

Material assets within the study area include:

- Wastewater infrastructure,
- Waste management facilities,
- Utilities,
- Land ownership, and
- Roads and Transportation network.

#### 3.10.2.1 Wastewater

Wastewater infrastructure in the study area comprises sewerage networks and varied domestic treatment systems. A wastewater treatment plant (WwTP) is located at Midleton.

The East Cork Municipal District Draft Local Area Plan 2016 states that there is currently little or no available capacity in the wastewater treatment network to accommodate further development. The WwTP requires further remedial works in relation to infiltration issues.

### 3.10.2.2 Waste Management

The EPA online database was consulted in relation to waste management in the area. There are no licensed waste management facilities within the study area; the closest is the East Cork landfill site (0022-01) at Brick Island in Cork Harbour.

The Local Authority Waste Facility Register was also consulted. **Table 3.10.1** below shows the licensed waste facilities in the scheme study area.

**Table 3.10.1: Licensed Waste Facilities in the scheme study area**

Facility Name	Permit No.	Location
CTO Environmental Solutions Ltd.	WFP-CK-09-0018-03	Rostellan, Midleton
O'Brien Skip Hire Ltd.	WFP-CK-11-0094-03	Ballyrussell, Midleton
Scariff Plant Hire Ltd.	COR-CK-15-0084-01	Ballyvodock, Midleton
Midleton Skip Hire Ltd.	WFP-CK-15-0150-01	Knockgriffin, Midleton
Godfrey Kirby	WFP-CK-11-0108-03	Bandon East Midleton
Rigney Brothers	WFP-CK-10-0069-02	Dungourney

There are two bring centres in Midleton at Distillery Walk and Tesco, with facilities for the recycling of glass, textiles, and cans.

### 3.10.2.3 Utilities

Utilities in the study area include water supply networks, telecommunications, electricity supply and gas pipelines.

Water supply to the area comes from a Public Water Supply, located approximately 1.5km from Midleton Town, and the Whitegate Regional Water Scheme. The supply has one raw water source, which is the Owenacurra River. The design treatment capacity is 200m<sup>3</sup> and serves a population of 8851 (EPA, 2015). The East Cork Draft Local Area Plan 2016 states that there is currently little or no available capacity in the water supply from the Whitegate Regional Water Scheme to accommodate further development. A new reservoir is required at Broomfield.

High speed broadband is widely available in the scheme study area. Fixed line broadband is also available in Midleton, which is part of the Regional Broadband Programme. Midleton has been approved for the provision of a fibre optic communications network.

The ESB maintains a large number of overhead power lines throughout the entirety of the study area. These include 38kV and 110kV lines. Underground services are also maintained within the scheme study area. There are two overhead 220kV power lines, to the north and west of Midleton Town.

Bord Gáis maintains a network of gas distribution infrastructure within the scheme study area. Underground gas mains are present throughout the area.

A gas main runs in the vicinity of the 220kV overhead power line to the north of Midleton.

#### **3.10.2.4 Land Ownership**

Land ownership and land use in the scheme study area are varied, including private, public, residential, commercial, and recreational. This regime may be altered by the proposed scheme.

Access to privately owned lands may be required for construction and maintenance works, and land may also need to be acquired as a result of the scheme. Depending on the nature of the land use in the particular areas, there may be a land use change engendered by the proposed scheme.

#### **3.10.2.5 Roads and Transportation Network**

Midleton is served by the national rail network, and a train station is located in the northern part of the town.

Midleton is also served by a network of roads, including the N25 national road between Cork city and Rosslare Harbour. The N25 National road skirts to the south of the town crossing the River Owenacurra and the lower (southern) reaches of the scheme study area in an east – west direction. The regional road R626 links to Midleton from the northwest, the R627 from the northeast, and the R630 links with Midleton from the south. All roads in the scheme study area are maintained by Cork County Council, however any modifications to National Primary and Secondary roads would require consultation with Transport Infrastructure Ireland (TII). TII has requested that the impacts of the proposed scheme on the national road network be assessed.

#### **3.10.3 Key Constraints**

Impacts on services and utilities such as watermains, gas mains, underground powerlines etc. will all need to be considered during the design process. The possible interruption of these services and utilities should be minimised if at all possible. The protection of water supply from the Owenacurra River and the future provision of additional capacity in the water supply and wastewater treatment networks, and the future provision of widespread broadband, are key constraints. Furthermore, impacts on road and rail infrastructure and land ownership will need to be considered.

## 4 Consultation

---

### 4.1 Public Information Day Exhibition

A public information day (PID) was held on Thursday 23<sup>rd</sup> March 2017 in the Midleton Park Hotel. The purpose of the PID was to present the scheme study area to the general public and to outline the process involved in the preparation for the Midleton FRS.

The PID was held between 3pm and 8pm for members of the general public. The objectives of the Public Information Day were:

- To explain the process involved in the development of the flood relief scheme.
- To gather information from the public regarding their:
  - Experiences of flooding.
  - Thoughts on solutions to the flooding problem and their preferences in this regard.
  - Thoughts on environmental issues, and
  - Thoughts on constraints with regard to environmental issues and implementation of solutions etc.

A presentation was made to elected representatives prior to the PID consultation on 6<sup>th</sup> March at Midleton Town Council.

The PID was attended and staffed by members of Arup's engineering and environmental teams and representatives of Cork County Council and the Office of Public Works, who were available to answer questions from the members of the public who attended, and to explain the scheme study area and the flood relief scheme process, while accepting information from the attendees. A consultation information leaflet was produced introducing the scheme, objectives, areas involved, and planning process. Questionnaires were provided to attendees of the PID soliciting feedback on the scheme and providing the opportunity for the public to comment on flooding in the area. Letters were sent to relevant statutory bodies and responses were invited.

Members of the public visiting the exhibition were invited to sign a visitors' list to enable a record of the number of attendees to be maintained. A total of 88 attendees signed the attendance list at the event in the Midleton Park Hotel. However, the total attendance was estimated to be between 100 and 110 persons.

A full account is provided in **Appendix 4.1** to this report.

### 4.2 Public Consultation Response

Visitors to the exhibition are considered to have, in the main, a good understanding of the proposals as presented at the exhibition. Feedback was generally positive. Most of those who attended had a particular interest in properties or lands in the scheme study area and explained the extent to which their properties had been affected by previous flood events and what they considered to be the contributing factors that resulted in the flooding.



Information was provided by the public, which identified areas in which they felt works should be undertaken to alleviate flooding.

#### 4.2.1 Information Provided Verbally at the PID

A summary of the information relating to previous flood events and which was provided verbally at the PID is as follows:

- Resident of the Willowbank Estate stated that the only reason the entire estate avoided flooding during the December 2015 storm event was due to a block work wall at the northern boundary of the site.
- Midleton residents expressed concerns over not being granted insurance cover for flood damage and the cost associated with repeat flooding in the future before the scheme is constructed.
- Members of the Midleton Rugby Club and residents of Lauriston Estate stated that the cause of their property flooding during the December 2015 event, was due to a trench box installed by Cork County Council, blocking the drainage ditch, which is located just downstream of where the Dungourney river crosses the railway line.
- A landowner living just south of the railway line, on Upper Mill Road, voiced concerns that the regrading of the road to cater for the level crossing was the sole reason they and others avoided serious flood damage during the 2015 storm event.
- One landowner expressed an interest in their plot of land and if the proposed scheme would result in the area being re-categorised, from a non-development zone due to it being located on a flood plain.
- A number of residents asked about the availability of funding of the project and timescale for start and finish of construction phase.
- Some suggested considering a tidal barrier in order to reduce flooding of the town.
- General discussion included local experiences when/where flooding arises; the huge clean up and costs afterwards, particularly if there is sewage in the floodwaters.

As a whole, attendees were very engaged and gave detailed information relating to previous flood events which will be of great value to the project.

#### 4.2.2 Returned Questionnaires

By 28 April 2017, which was the closing date for receipt of comments, a total of 25 questionnaires were returned.

#### 4.2.3 Other Submissions

Letters of consultation were sent to numerous statutory bodies. Refer to **Appendix 4.1** for further information. Responses were received as below:

- A letter from Transport Infrastructure Ireland (TII).  
TII's response stated that the proposed flood relief scheme must consider all existing and future national road networks in the area (N25 Midleton to Youghal) and assess what impact the scheme may have on these road networks. The letter also requested that TII Publications are referred to when conducting an Environmental Impact Assessment particularly when considering noise and air quality impacts during the planning and construction stage. Where appropriate TII requested a Traffic and Transport Assessment be carried out to assess traffic volumes during the construction stage and all haul routes are clearly identified.
- A letter from An Bord Pleanála.  
An Bord Pleanála's letter stated they "will not be making any comments/observations in relation to the matter".
- A letter from Inland Fisheries Ireland (IFI).  
The letter from IFI stated that any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive and that in this context the current assessment should be a catchment wide process. The letter also referred to the significance of the rivers involved in terms of fisheries. Measures for the assessment of existing conditions and for assessment of impacts, at the environmental assessment stage were also included in the letter.
- A letter from the Health Service Executive (HSE).  
The HSE's submission commented on the possible Environmental Health Impacts of the development. The letter referred to the potential permanent, long term and temporary impacts of the proposed project and requested that measures be taken to mitigate the impacts to Midleton Town and Hospital, particularly during the project's construction stage. The HSE also requested that consideration be given to possible changes in the local environment and impact on the water course catchment areas.

## 4.3 Analysis of Public Consultation Response

### 4.3.1 Analysis of Questionnaires

In total, 25 completed questionnaires were received. Responses suggest that 21 respondents rent or occupy a property within the study area and therefore have a direct interest in flooding at Midleton or have previously been affected by the historical flood events. Outlined below is a summary of the information provided in the questionnaires.

#### **Flooding Information (from Questionnaire)**

When asked about previous flood events, 20 of the respondents had personal experience with previous flood events, with the majority of those affected by the December 2015 flood event (18).

Eleven of the properties affected were residential while six were office or retail properties. Other properties affected were open space, Midleton Rugby Club playing pitches and farm land.

Information provided by respondents with regard to previous flood events was that:

- In the Midleton Area, flooding was mainly from the river/stream with 18 reports. There were eight reports of overground (surface water flow) and seven reports of flooding from drains.

Twelve of the respondents had put in place measures to prevent or reduce the impact of flooding, these measures included:

- Investing in sandbags.
- Installing non-return valves.
- Installing individual property protection (door and window flood barriers).
- Rising high risk equipment.
- Setting up a flood committee.
- Sending a report to Cork County Council.
- Installing Aco drains.

A full list of the comments is provided in **Appendix 4.1**.

### **Flood Alleviation Information**

When asked in Question 13 of the questionnaire if they had a preference for the type of flood alleviation method, the various methods were ranked as follows;

- 1) 'Flow Reduction (e.g. upstream catchment management and flood storage)'.
- 2) 'Flood Containment through the Construction of Flood Defences'.
- 3) 'Increase the Conveyance of the Channel'.
- 4) 'Flow Diversion (e.g. river diversion or flood flow bypass channel)'.
- 5) 'Pump storm waters from behind flood defences'.
- 6) 'Sediment Deposition and Possible Sediment Traps'.
- 7) 'Non-structural Measures (e.g. flood warning systems or individual property protection)'.
- 8) 'Reconstruction of Properties and/or infrastructure to a higher level'.
- 9) 'Re-location of Properties and/or Infrastructure'.
- 10) 'No works (Do Nothing)'.

When asked in Question 14 of the questionnaire how they thought the issue of flooding could be resolved, the main suggestions proposed by respondents are summarised as follows:

- Maintain/build up river banks.
- Dredge/keep rivers clean of fallen trees and rubbish.
- Stop covering flood plains and water meadows with concrete.

A full list of the comments is provided in **Appendix 4.1**.

### **Environmental Constraints**

Question 15 of the Questionnaire was to rank the importance of each of seven environmental topics. These topics and the responses are summarised below.

The responses indicated that ‘Water Quality’ was considered the most important of the environmental constraints, with 82% of respondents indicating that it was ‘Very Important’. ‘Flood Related Socio-Economic & Social Issues’ was indicated by 72% of respondents to be ‘Very Important’. ‘Flora and Fauna’, ‘Habitats’ and ‘Landscape & Visual Amenity’ were mainly considered to be ‘Important’, whilst ‘Local Fisheries’ and ‘Architectural & Cultural Heritage’ were mainly considered to be ‘Moderately Important’. ‘Angling, Tourism & Recreation’ were mainly considered to be ‘Of little Importance’.

Not all respondents completed this question or completed this question fully, therefore this should be borne in mind when drawing conclusions from the responses to this question. In addition, the respondents were given the opportunity to provide comments specific to each of the environmental topics.

A full list of the comments is provided in **Appendix 4.1**.

## **4.4 Conclusion**

The Public Consultation was held to inform the general public of the Constraints Study and preliminary aspects of the Midleton FRS and to obtain information about flooding or other relevant environmental information about the scheme study area presented. Interested persons were able to consult the consultation materials, have relevant questions answered and take away an information leaflet setting out the project for future reference.

Valuable information and comment was received at the PID, and from subsequent responses.

The overall feedback from the public was positive.

## **4.5 Presentation to Cork County Council Public Representatives**

Arup gave a presentation to the Municipal Town District (incl. County Councillors) at Midleton Town Council about the study on 6<sup>th</sup> March 2017.

## Appendix 2.1

### Flood Map Report



### Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

**The map centre is in:**

**County:** Cork

NGR: W 884 735

This Flood Report has been downloaded from the Web site [www.floodmaps.ie](http://www.floodmaps.ie). The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.








**Map Scale** 1:62,129

### Map Legend

	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

\* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

## 13 Results

	1. Midleton, Co. Cork. 5th June 2012 County: Cork Additional Information: Reports (1) More Mapped Information	Start Date: 05/Jun/2012 Flood Quality Code:3
	2. Flood Report Bailick Road Midleton 8th of October 2014 County: Cork Additional Information: Reports (1) More Mapped Information	Start Date: 08/Oct/2014 Flood Quality Code:3
	3. Main Street & Bailick Road Midleton Co.Cork on 3rd February 2014 County: Cork Additional Information: Reports (1) More Mapped Information	Start Date: 03/Feb/2014 Flood Quality Code:3
	4. Ballinacurra Village Co.Cork on 3rd February 2014. County: Additional Information: Reports (1) More Mapped Information	Start Date: 03/Feb/2014 Flood Quality Code:3
	5. Midleton, Co.Cork 2nd January 2014 County: Cork	Start Date: 02/Jan/2014 Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



6. Flooding in Midleton 25th July 2013

County: Cork

Start Date: 25/Jul/2013

Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



7. Flooding at Ballinacurra, Midleton, Co. Cork on 25th July 2013

County: Cork

Start Date: 25/Jul/2013

Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



8. Flooding at Midleton Co.Cork 5th June 2012

County: Cork

Start Date: 05/Jun/2012

Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



9. Road 96303 Ballynacorra near Midleton Oct 2004

County:

Start Date: 27/Oct/2004

Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information



10. Midleton Broomfield West Nov 2000

County: Cork

Start Date: 05/Nov/2000

Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



11. Water Rock Midleton, Cork Recurring

County: Cork

Start Date:

Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information



12. Bailich Road Midleton recurring

County: Cork

Start Date:

Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information



13. Road 96303 Ballynacorra near Midleton recurring

County:

Start Date:

Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

## **Appendix 3.4.1**

**Invasive Species Survey May  
2017**



## **Midleton Flood Relief Scheme**

### **Invasive Species Survey**



**Prepared By**

**Moore Group -  
Environmental Services  
In association with Arup**

**On behalf of  
Cork County Council**




**Job Number 17057  
29<sup>th</sup> May 2017**



**ARUP**

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<b>Client</b>	Cork County Council
<b>Project</b>	Midleton Flood Relief Scheme
<b>Title</b>	Midleton Flood Relief Scheme Invasive Species Survey

<b>Project Number</b>	17057	<b>Document Reference</b>	17057 Midleton FRS Inv Spp Survey Rev2.docx	
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<b>Moore Archaeological and Environmental Services Limited</b>				



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## 1. INTRODUCTION

Moore Group was commissioned by Arup on behalf of Cork County Council to carry out an Invasive Species Survey with regard to the River Owenacurra & River Dungourney (Midleton) Flood Relief Scheme. The potential flood alleviation works area at Midleton, Co. Cork is presented in Figure 1 below. The survey was concentrated in this core area.



Figure 1. Survey extent at Midleton, Co. Cork.

## 2. ASSESSMENT METHODOLOGY

This report was compiled by Ger O'Donohoe of Moore Group providing information on invasive species in areas that are likely to contain flood alleviation measures. Ger O'Donohoe M.Sc. is the principal ecologist with Moore Group and has over 20 years' experience in ecological impact assessment.

The present survey was undertaken by surveying water courses and adjacent banks for the presence of invasive species such as Japanese Knotweed. Notes of other non-native species were made during the survey. The survey was carried out on 17 - 19<sup>th</sup> May 2017 which is adequate in terms of botanical survey timing.

It should be noted at all accessible areas of water courses were examined. The survey was terminated at upstream courses where no records were present or where the naturalness of the water course in terms of upland stream type and habitat, e.g. farmland, suggested an unlikely habitat for invasive species presence.

### 2.1. Policy & Legislation

#### **European Communities (Birds and Natural Habitats) Regulations 2011 [SI. 477]**

In September 2011, comprehensive regulations which address deficiencies in Irish law implementing the EU Birds and Habitats Directives were signed into law. The European Communities (Birds and Natural Habitats) Regulations 2011 contain important new provisions to address the problem of invasive species. A black list of unwanted species is set out in the Regulations. It will be an offence without a licence, to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise such species. Two regulations that deal specifically with these scheduled lists of species are:

Regulation 49: Prohibition on introduction and dispersal of certain species;

Regulation 50: Prohibition on dealing in and keeping certain species.

#### ***Regulation 49: Prohibition on introduction and dispersal of certain species***

This places restrictions on the introduction of any plant species listed in Part 1 of the Third Schedule. A person shall be guilty of an offence if they: - plant, disperse, allow or cause to disperse, spread or cause to grow the plant in the Republic of Ireland.

#### ***Regulation 50: Prohibition on dealing in and keeping certain species***

Section 50 of the Regulations makes it an offence to or intend to: import, buy, sell, breed, reproduce or propagate, advertise, offer or expose for sale, publish a price list, transport or distribute; any animal or plant species or vector material listed in the Third Schedule.

Third Schedule, Part 3: Vector materials. Two vector materials are referred to. One is blue mussel seed and the second is: - Soil or spoil taken from places infested with Japanese knotweed, Giant knotweed, or their hybrid Bohemian knotweed. The above activities can be undertaken in accordance with a granted licence.

### **Section 40 of the Wildlife Act 1976**

Under Section 40 of the Wildlife Act 1976 incorporating section 46 of the Wildlife (Amendment) Act 2000, it is an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1<sup>st</sup> day of March and ending on the 31<sup>st</sup> day of August in any year, any vegetation growing on any land not then cultivated or in course of cultivation for agriculture or forestry.

The management of invasive plant species could be considered to fall under these regulations. This is particularly true for habitats that are not usually cultivated such as river banks or woodlands.

It can be noted that while these restrictions may seem prohibitive at first, they can be built into a management plan for target species.

## **3. SURVEY RESULTS**

There were 14 records of Japanese Knotweed (*Fallopia japonica*) in the survey area. The size and extent of cover extends from one plant to relatively large stands up to c. 30 m in length. The locations of records of Invasive Species are presented in Figure 2 below and the location details of each record are presented in Table 1.

Giant rhubarb (*Gunnera tinctoria*) was recorded at only one location in Midleton.

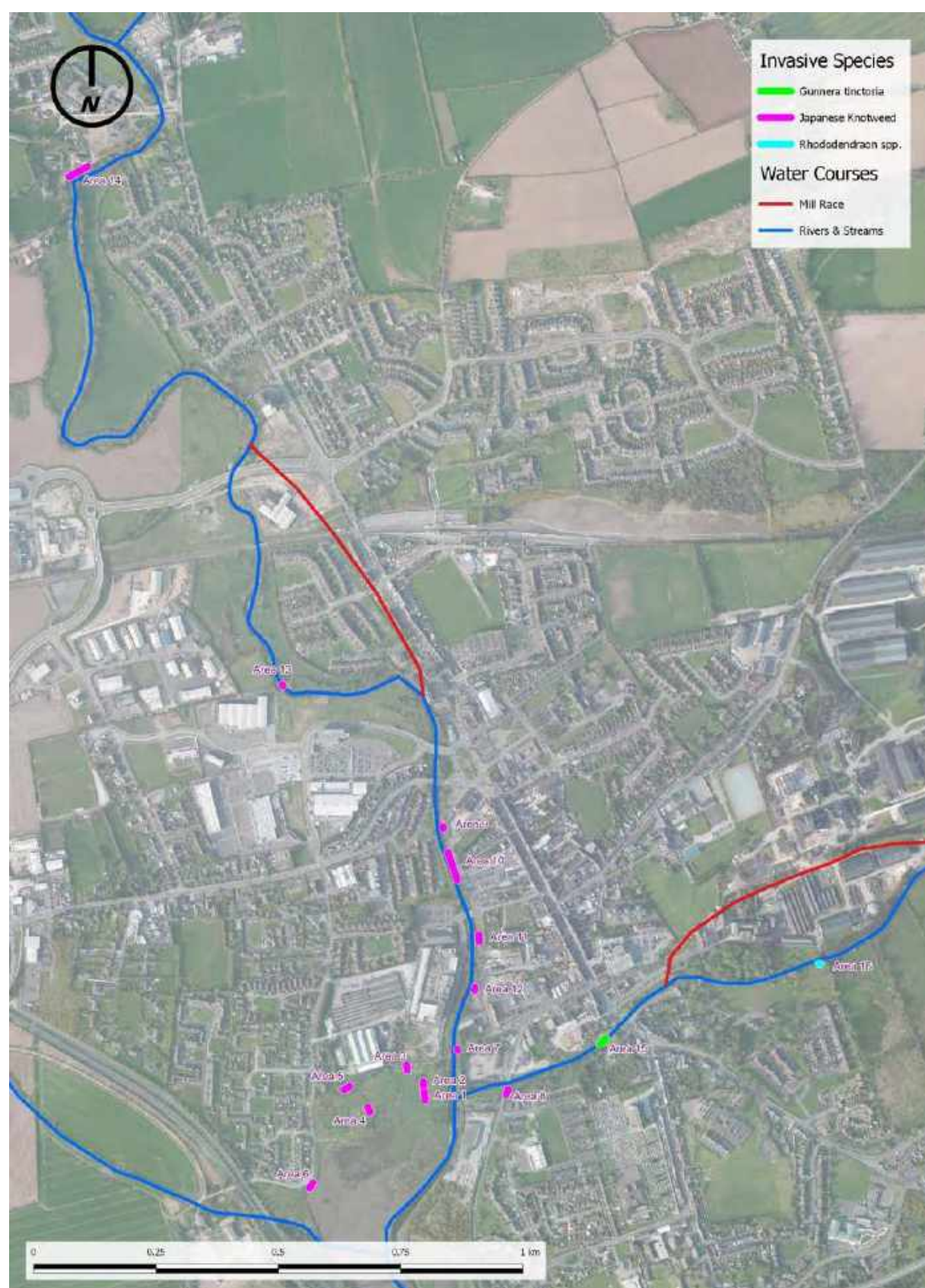
One relatively small stand of Rhododendron spp. was recorded adjacent to the Dungourney River.

Three-cornered Leek (*Allium triquetrum*) is widespread in the survey area and is therefore not mapped. It is listed as a "Non-native species subject to restrictions under Regulations 49 and 50" in the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011. It may be considered naturalised and is considered of moderate risk and may pose a threat to biodiversity where the plant forms early season dense monocultural masses, particularly at protected sites.

Winter heliotrope (*Petasites fragrans*), considered invasive but not of major concern, is also frequent along water course banks and disturbed areas and is widespread and not mapped.

Butterfly bush (*Buddleia davidii*), considered invasive but not of major concern, is frequent in disturbed areas throughout the survey area and is not mapped.





**Figure 2.** Locations of invasive species recorded during the survey.



**Table 1.** Outlining the location of Invasive species recorded in the survey area.

Area No.	Species	ITM_X	ITM_Y	Location
1	Japanese Knotweed	587854	573197	Mogeesha 1
2	Japanese Knotweed	587851	573220	Mogeesha 2
3	Japanese Knotweed	587818	573253	Mogeesha 3
4	Japanese Knotweed	587740	573168	Mogeesha 4
5	Japanese Knotweed	587695	573211	Mogeesha 5
6	Japanese Knotweed	587622	573012	Riversfield Estate
7	Japanese Knotweed	587922	573290	Owenacurra Footbridge
8	Japanese Knotweed	588023	573203	Bailick Road Bridge
9	Japanese Knotweed	587892	573745	Riverside Way 1
10	Japanese Knotweed	587911	573665	Riverside Way 2
11	Japanese Knotweed	587965	573518	Riverside Way 3
12	Japanese Knotweed	587957	573414	Riverside Way 4
13	Japanese Knotweed	587564	574035	Market Green
14	Japanese Knotweed	587146	575087	Knockgriffin
15	<i>Gunnera tinctoria</i>	588219	573307	Midleton House
16	<i>Rhododendron</i> spp.	588661	573466	Midleton Lodge

### 3.1. Japanese Knotweed (*Fallopia japonica*)(JKW)

#### **Area 1 – Mogeeshah 1**

This patch of JKW is located to the south of the path between the town and Riversfield Estate in the townland of Mogeeshah (Photo 1). It is the largest spread of JKW recorded in the survey measuring approximately 30 m x 10 m and is adjacent to a smaller patch recorded separately below.



**Photo 1.** Showing the patch of JKW at Mogeeshah 1.

#### **Area 2 – Mogeeshah 2**

This patch of JKW is located adjacent to the larger patch at Mogeeshah 1 and may be linked through rhizome growth. The patches are separated by a patch of willow scrub but could be considered together in terms of treatment.



**Photo 2.** Showing the patch of JKW at Mogeesh 2.

***Area 3 – Mogeesh 3***

This patch of JKW is located adjacent to the path at Mogeesh. It is approximately 5 m<sup>2</sup> in distribution.



**Photo 3.** Showing the patch of JKW at Mogeesh 3.

**Area 4 – Mogeeshah 4**

This area of JKW is located on higher ground at Mogeeshah. It is comprised of three patches as shown in the foreground in Photo 4 below. The first two areas recorded at Mogeeshah can be seen in the background of the central circled plant (red arrows).



**Photo 4.** Showing the patches of JKW at Mogeeshah 4.

**Area 5 – Mogeeshah 5**

This patch of JKW is located adjacent to and overhanging the path at Mogeeshah. It is approximately 10 m<sup>2</sup> in distribution. The plant stems are extending over the path and being broken by passers and urgent cordoning off is required in this area.





**Photo 5.** Showing the patch of JKW at Mogeesh 5.

***Area 6 – Riversfield Estate***

This patch of JKW is located opposite the Riversfield Estate at Mogeesh 5 on the upper bank of the estuary and is located within the verge of the Great Island Channel SAC (Site code 001058) and on the edge of the Cork Harbour SPA (Site code 004030). It is comprised of approximately four plants.



**Photo 6.** Showing the patch of JKW opposite Riversfield Estate.



**Area 7 – Owenacurra Footbridge**

This plant of JKW is located in dense vegetation on the upstream side of the footbridge on the left bank and comprises one plant.



**Photo 7.** Showing the plant of JKW at the Owenacurra Footbridge.

**Area 8 – Bailick Road Bridge**

This patch of JKW is located in a corner on the upstream side of Bailick Road Bridge on the left bank and comprises a spread of approximately 15 m<sup>2</sup>.



**Photo 8.** Showing the spread of JKW adjacent to Bailick Road Bridge.

**Area 9 – Riverside Way 1**

This patch of JKW is located on the left bank of the main channel of the Owenacurra River and comprises a spread of approximately 4-5 plants.



**Photo 9.** Showing the spread of JKW at Riverside Way 1.

**Area 10 – Riverside Way 2**

This area of JKW is located further downstream on the left bank of the main channel of the Owenacurra River and comprises a linear spread of approximately 30 m.



**Photo 10.** Showing the spread of JKW at Riverside Way 2.



**Area 11 – Riverside Way 3**

This patch of JKW is located on the left bank of the main channel of the Owenacurra River and comprises a linear spread of approximately 5 m.



**Photo 11.** Showing the spread of JKW at Riverside Way 3.

**Area 12 – Riverside Way 4**

This patch of JKW is located on the left bank of the main channel of the Owenacurra River and comprises a patch of approximately 2 m<sup>2</sup>.



**Photo 12.** Showing the spread of JKW at Riverside Way 4.

**Area 13 – Market Green**

This patch of JKW is located on the opposite bank of the main channel of the Owenacurra River from the corner of the Market Green complex in this area and comprises a single plant.



**Photo 13.** Showing the JKW plant on the opposite side of the river from Market Green.

**Area 14 – Knockgriffin**

This linear patch of JKW is located along the local road on the upper right bank of the Owenacurra River. It is approximately 25 m in length.



**Photo 14.** Showing the JKW spread at Knockgriffin.



### 3.2. Giant Rhubarb (*Gunnera tinctoria*)

#### **Area 15 – Midleton House**

This record refers to two Giant rhubarb spreads adjacent to Midleton House on the right bank of the Dungourney River.



**Photo 15.** Showing the extent of *Gunnera* adjacent to Midleton House.

### 3.3. Rhododendron (*Rhododendron spp.*)

#### **Area 16 – Midleton Lodge**

This record refers to a small patch of Rhododendron adjacent to the Dungourney River on the grounds of the Council Regional Offices at Midleton Lodge on the left bank of the river.



**Photo 16.** Showing the Rhododendron plant at Midleton Lodge.



#### 4. DISCUSSION & RECOMMENDATIONS

There were 14 records of Japanese Knotweed (*Fallopia japonica*) in the survey area. The size and extent of cover extends from one plant to relatively large stands up to c. 30 m in length.

The wet grassland and swamp areas of Mogeeshas has obviously experienced varying stages of disposal of construction material. The proximity of the JKW along the path in the area is of urgent concern as broken stems were recorded (Mogeeshas 5) which suggests that the plant material has the potential to spread into other areas on the town side of the footbridge or into the estuary area downstream.

The most adjacent spread at Mogeeshas 5 should be cordoned off immediately in the short term to prevent further spread.

Similarly, the linear spread at Knockgriffin needs to be cordoned off in the short-term and treated in the long-term.

#### 5. JAPANESE KNOTWEED MANAGEMENT

##### 5.1. Management summary

The Local Authority will need to employ the services of a recognised Japanese Knotweed treatment specialist company. N.B. It is the responsibility of the operator to ensure that all appropriate legislation is followed when using herbicides and that their training is commensurate with their duties.

##### Chemical control

Glyphosate is known to be residual in the environment for 24 – 48 hours after spraying/application. The optimum time of application is late season or before the foliage starts to die back. However, the goal to achieve Japanese Knotweed removal along with the restoration of those habitats to native species is a much more sustainable longterm solution. Sometimes non -target species will be unavoidably effected but these impacts should be reduced where possible.

An early season spray maybe required in year 1 to assist with access for the late season spray. Glyphosate will also kill grasses – only approved for use near water in certain products, always check first.

##### Deep excavation and deep burial

This is an option that is used in situations where there is a pressing development need for the site and time which would not allow for *in situ* herbicide control over a longer period of time. A suitably experienced knotweed specialist will provide more information on this method.

**In general**

Herbicides can be applied using a range of suitable applicators such as a knapsack sprayer. Control is easier if dead winter stems are tidied over the winter months to assist with access before growth commences i.e. to prevent tripping on them or them interfering with your knapsack lance. It is advised to leave the canes in situ on a barrier membrane if possible, to reduce the risk of spread to other sites. It is also advised to exercise care and avoid spreading knotweed crowns when tidying dead canes. Application in sensitive vegetation areas is best achieved by stem injection or weed wiper.

**Further details on control measure**

- It is illegal to dump Japanese knotweed waste in the countryside.
- It is illegal to plant or otherwise cause Japanese knotweed to grow.
- To move soil in the Republic of Ireland that contains Japanese knotweed will require a license from NPWS.
- Japanese knotweed can regenerate from very small fragments of rhizome (as little as 0.7 grams).
- Plant material should not be composted as it is ineffective and may result in further spread.
- Plants should be treated in the same season as they are identified.
- Japanese knotweed should be treated before stands become established as this species is very difficult to control. If it is a recent introduction it is best to tackle it quickly to prevent the rhizome system from fully establishing.
- Japanese knotweed is not an easy plant to control due to its extensive underground rhizome system. Therefore, treatment often needs to be repeated until no regrowth is observed over several years for eradication to be achieved.
- Repeated herbicide treatments over several years are normally recommended for complete control of Japanese knotweed. Continued monitoring of the treated areas should also be carried out to ensure that no new shoots appear.
- When planning works with Japanese knotweed ensure biosecurity measures are built into the management plan. For example, fencing off and creating a buffer around the area if it is a development site, warning signs, use of set haulage routes, covering loads, ensuring all staff working on the site are aware of the presence of knotweed, use of a set cleaning area etc.

**5.2. Specific Management****Area 6 – Riversfield Estate**

This patch of JKW is located opposite the Riversfield Estate at Mogeeshan on the upper bank of the estuary and is located within the verge of the Great Island Channel SAC (Site code 001058) and on the edge of the Cork Harbour SPA (Site code 004030). It is likely that these plants could be treated by either chemical control or by physical removal with no adverse impacts on the adjacent Natura 2000 sites.

The plants are not located in a qualifying habitat for the SAC (saltmarsh/sandflats/mudflats) and are not in an area that would be specifically sensitive for wintering birds.

#### **Adjacent Water Courses**

The specialist contractor will advise on the use of chemicals and chemical spraying at or adjacent to water courses, e.g. on the Owenacurra at Riverside Way.

## **6. REFERENCES**

<http://invasivespeciesireland.com/toolkit/invasive-plant-management/terrestrial-plants/japanese-knotweed/>

## **Appendix 3.4.2**

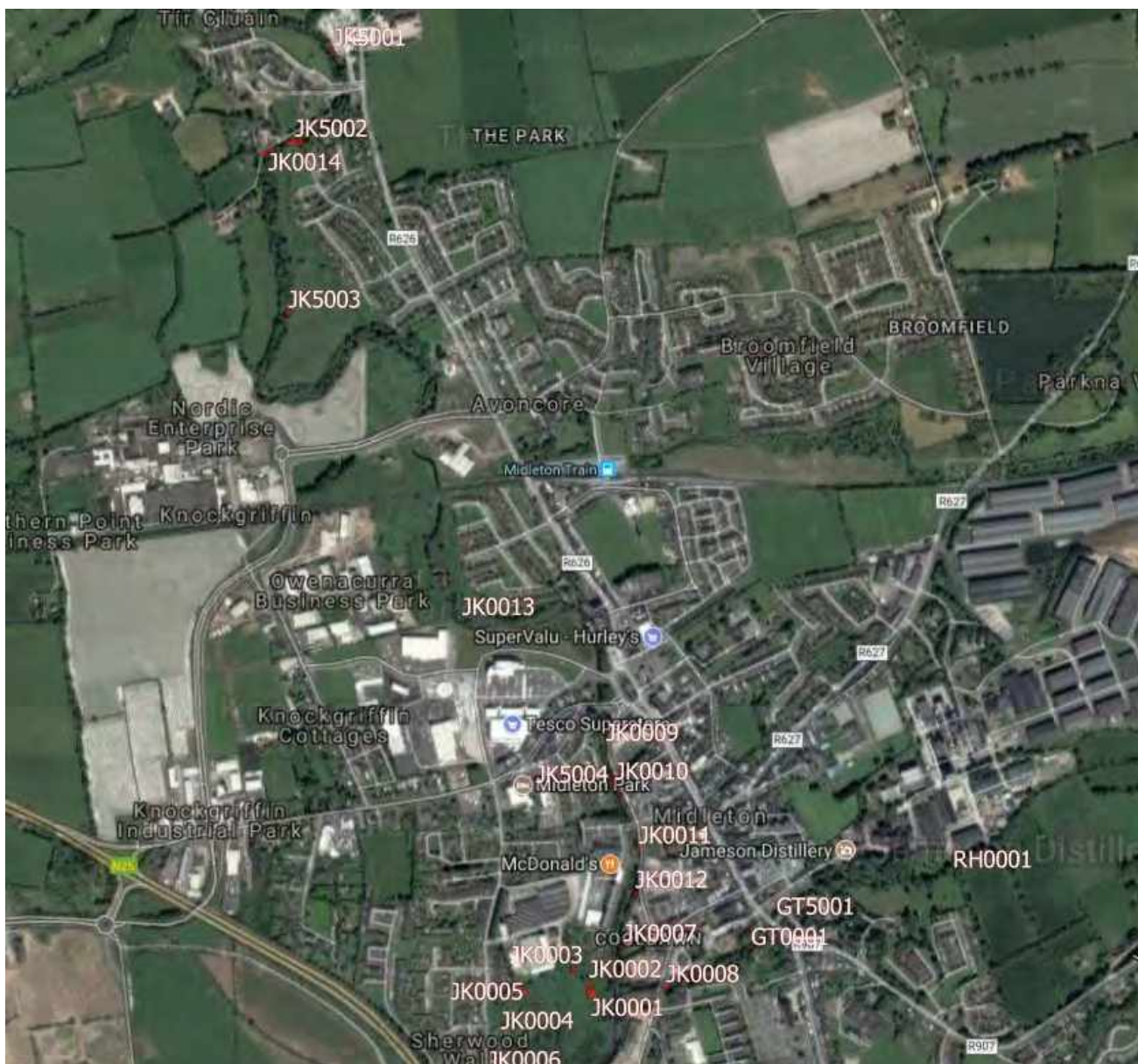
JKI Survey July 2017 drawings

# MIDDLETON FRS JAPANESE KNOTWEED ADVANCE TREATMENT WORKS

Survey drawings 2017

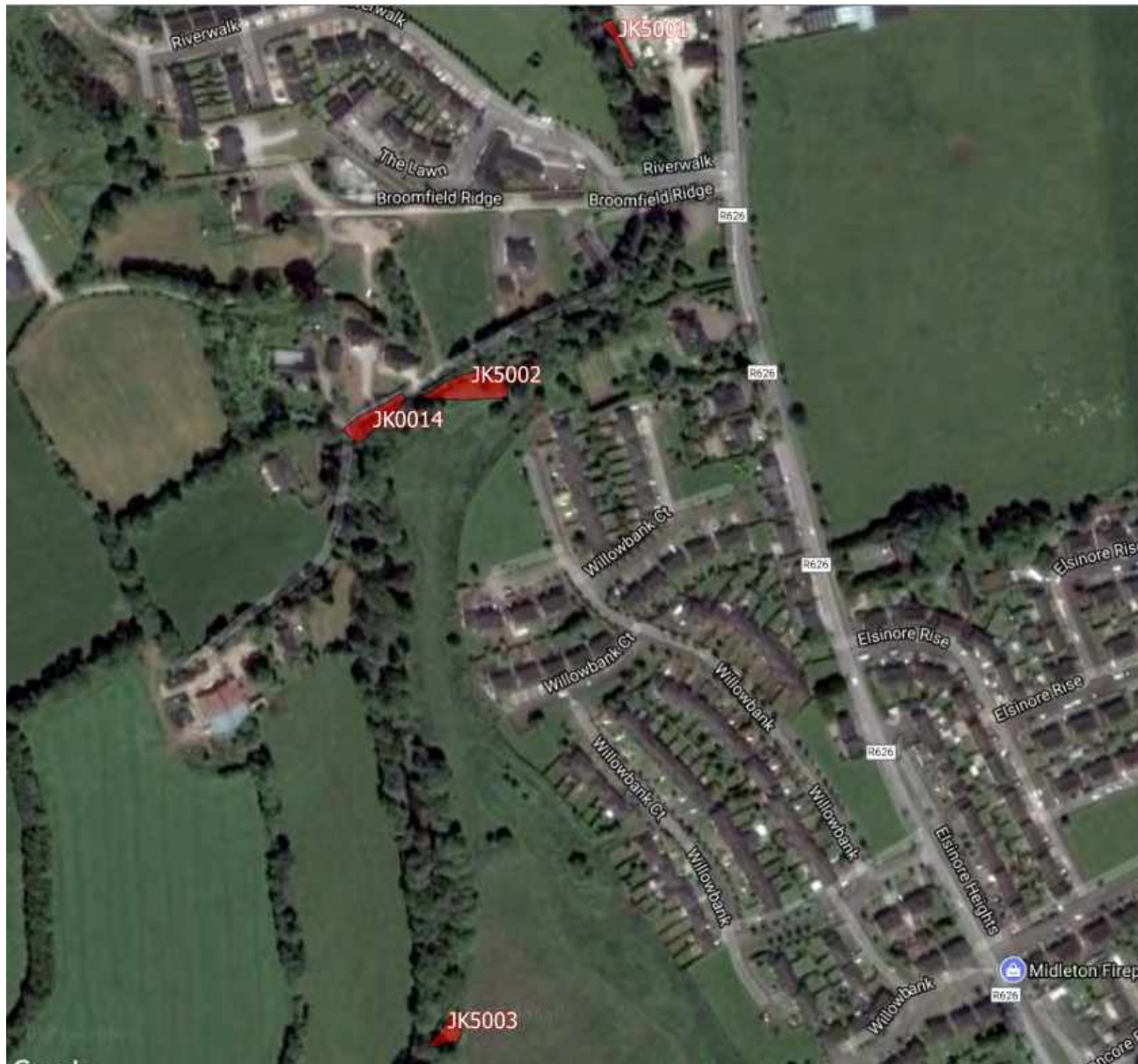






Granig, Minane Bridge,  
Co. Cork, Ireland.

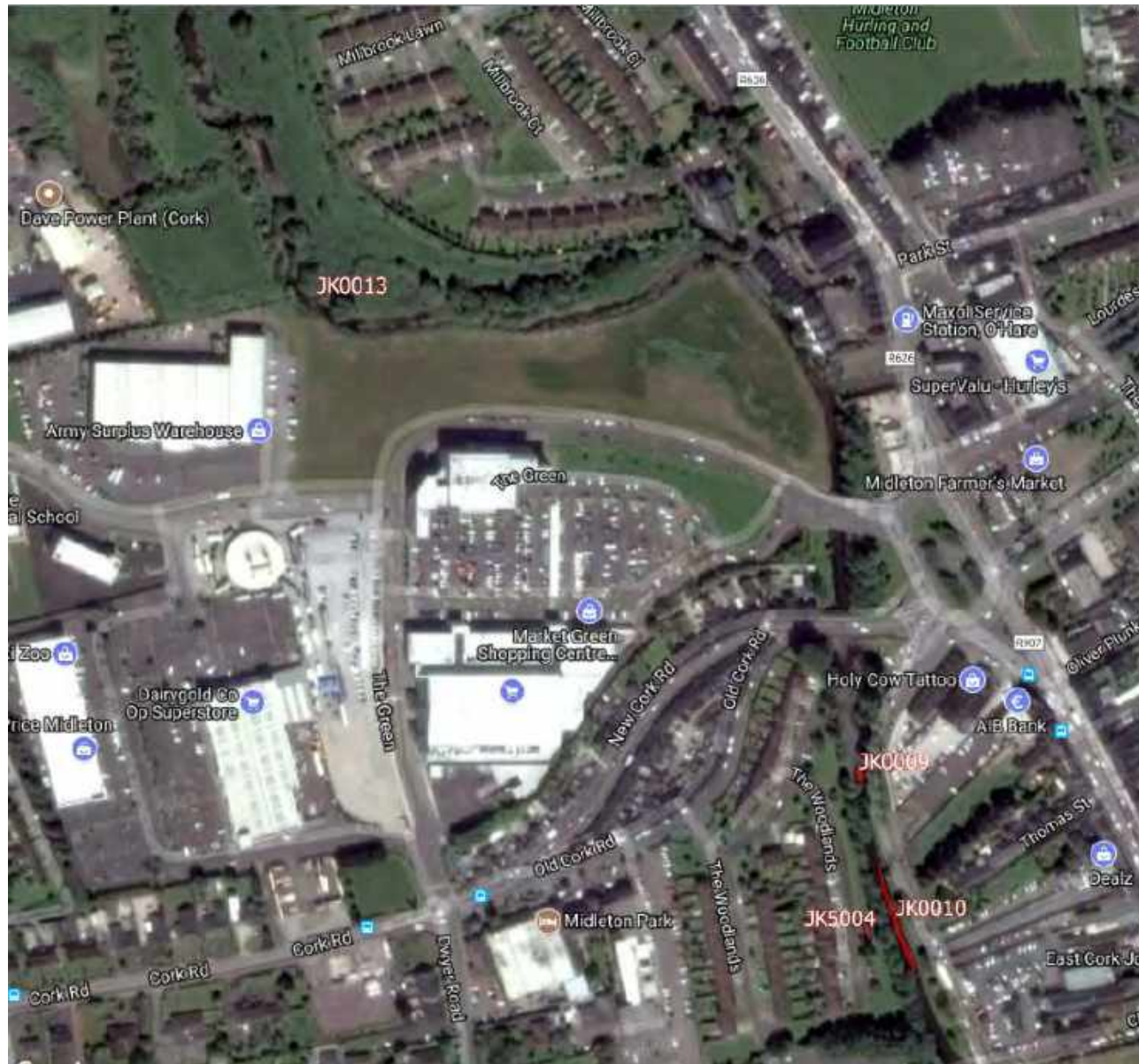
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Granig, Minane Bridge,  
Co. Cork, Ireland.

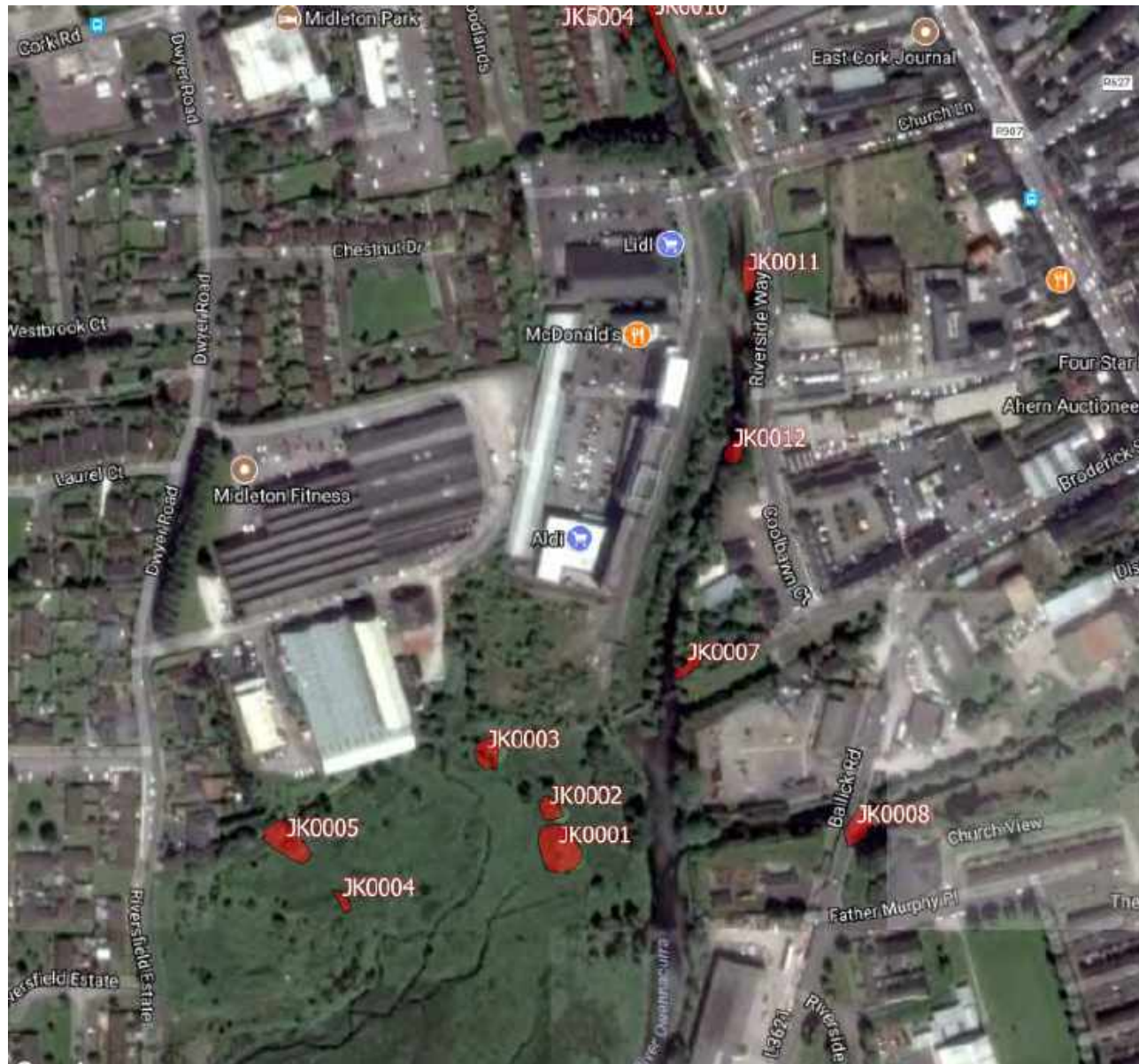
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Co. Cork, Ireland.

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Co. Cork, Ireland.

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Granig, Minane Bridge,  
Co. Cork, Ireland.

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## **Appendix 3.5.1**

**SWRBM (2009-2015) Plan for  
the Owenacurra Water  
Management Unit**

# Owennacurra WMU



**Legend**

- Towns and Villages
- EPA Licensed Facility (IPPC)
- Local Authority Licensed Discharge
- Wastewater Treatment Plants
- Water Treatment Plants
- County Boundary
- River Water Body Boundary

**River Status**

- High
- Good
- Moderate
- Poor
- Bad

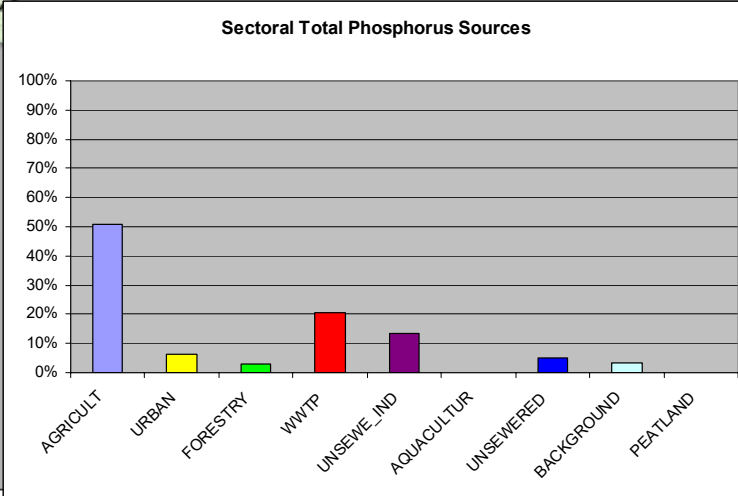
**Lake Status**

- High
- Good
- Moderate
- Poor
- Bad

Cork



Name	Owennacurra Water management Unit
Area	236km <sup>2</sup>
River Basin District	SWRBD
Main Counties	Cork
Protected Areas	3 surface drinking water:Owenacurra River, Tibbotstown Reservoir & Ballyedmond (Owennacurra) 2 UWWTD: Owenacurra River and Owenacurra Estuary / North Channel 1 SAC Great Island Channel.



Calculated in accordance with OSPAR HARP Guidelines.  
Not an indication of risk, rather an indication of potential to cause risk.



# Owennacurra Water Management Unit Action Plan

STATUS/IMPACTS	
Overall status	There are 9 river water bodies in this WMU. 1 Good Status, 6 Moderate Status, 2 Poor Status.
Status elements	Q score dictates overall status
Possible Impacts - EPA Water Quality	<p>DUNGOURNEY – SW_19_1957  2003- Satisfactory except for final location in Midleton (0700) where again moderately polluted. Reversion to satisfactory conditions at first location, Bridge SW of Rathorgan (0200), since previous survey. A protected lamprey species was recorded in the river.  2008 - Mostly satisfactory, with good ecological quality, but continuing with poor status in Midleton.  Status of WB 2009: Poor status dictated by Q score</p> <p>OWENNACURRA – SW_19_1279; SW_19_1955  2008 - Improved in Midleton with good ecological quality throughout.  SW_19_1279 Status of WB 2009: Good status dictated by Q score  SW_19_1955 Status of WB 2009: Good status dictated by Q score</p> <p>TEMPLEBODAN – SW_19_697  2003 - Continuing satisfactory at the only location examined which is at the Bridge SE of Templebodan (or Templebodant).  2008 - Deterioration with only moderate ecological quality recorded.  Status of WB: Moderate status dictated by Q score</p>

PRESSURES/RISKS	
Nutrient sources	51% of TP comes from Agriculture; 14% from unsewered industries, 21% from WWTP, 3% forestry and 6% urban.
Point pressures	5 WWTP - Ballincurragh, Dungourney, Lisgould, Carrigtwohill WWTP, Midleton WWTP 1 WTP (Midleton Pws); 1 contaminated site (Irish Distillers Limited). 17 IPPCs 8 Section 4's
Wastewater Treatment Plants (WWTP) and Industrial Discharges	Carrigtwohill WWTP - Insufficient existing capacity, non-compliant effluent standard Carrigtwohill WWTP - Insufficient existing capacity, no evidence of impact, discharge to a protected area Lisgould - Insufficient existing capacity of treatment plant, no evidence of impact, not a protected area Midleton WWTP - Insufficient existing capacity, no evidence of impact, discharge to a protected area
Quarries, Mines & Landfills	9 quarries and 2 landfills. None at risk.
Agriculture	8 WBs at risk - SW_19_690, SW_19_1955, SW_19_1957, SW_19_711, SW_19_1693, SW_19_698, SW_19_710, SW_19_697.
On-site systems	There are 3654 septic tanks in this WMU. 495 of these are located in areas of very high or extreme risk.
Forestry	None at Risk (local authority note previous reports of impact on Templebodan River from forestry in P Regs. Reports - 19-697)
Dangerous substances	None at Risk
Morphology	None at Risk
Abstractions	None at Risk
Other	Local authority note 19-1957; Record of influence of spring on EPA site 19D070700 in P. Regs. Reports, significant temperature & conductivity difference in stream upstream & downstream of spring discharge. Irish Distillers storm water discharge near this site also.

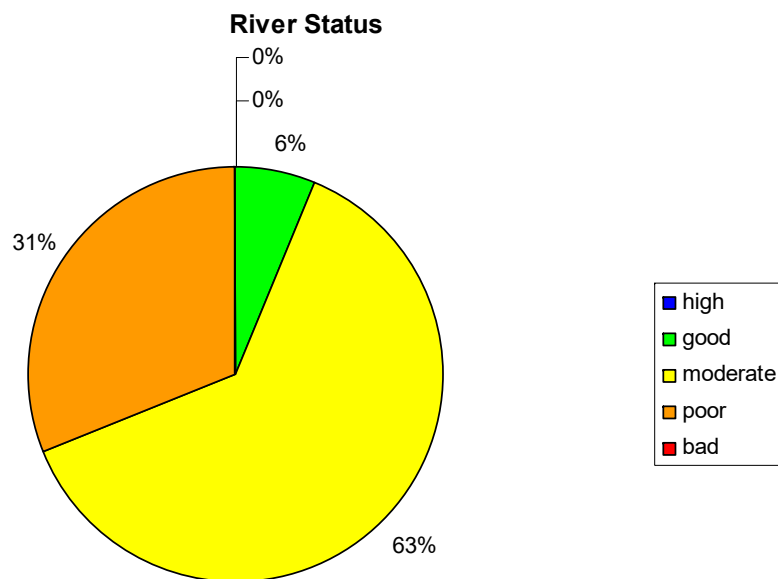
# Owennacurra Water Management Unit Action Plan

## SELECTED ACTION PROGRAMME

NB All relevant basic measures and general supplementary measures/surveys apply

Point Sources	See point source table below for WWTP action programme.  Section 4's & IPPCs - Review licenses.
Diffuse Sources	AGRICULTURE - Good Agricultural Practice Regulations and Enforcement Septic Tanks: At Risk septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests.
Sub-Basin Plans	Shellfish Waters Pollution Reduction Programmes: Cork great Island North Channel and Rostellan North: Apply Prescribed Measures
Other	

Discharge		Measures							Waterbody	
Point Source Discharge	County	Plants Requiring Capital Works	Agglomerations Requiring Further Investigation Prior to Capital Works	Plants Required to Commence Implementation of Pollution Reduction Programmes for Shellfish Waters	Plants Requiring the Implementation of an Appropriate Performance Management System	Plants Requiring the Investigation of CSO's	Plants Required to Ensure Capacity of Treatment Plant is not Exceeded	Extended Timescale for Measure Implementation	Waterbody Code	Extended Deadline to Achieve Waterbody Objective
Carrigtwohill WWTP	Cork South	Yes		Yes				Yes	SW_060_0700	Yes



## OBJECTIVES

Good status 2015	Protect 1 waterbody.
Alternative Objectives	Restore 8 waterbodies by 2021 (SW_19_1693, SW_19_1955, SW_19_1957, SW_19_690, SW_19_697, SW_19_698, SW_19_710, SW_19_711) – extension for nitrogen losses to surface water via groundwater

**Transitional Status** – Refer to separate transitional waters action programme  
**Groundwater Status** – Refer to separate groundwater action programme

## Future Pressures and Developments

Throughout the river basin management cycle future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed.



# Owennacurra Water Management Unit Action Plan - Rivers

IE_SW_Owennacurra																	
Member State Code	Monitored Y (Extrapolated N)	Donor Waterbody	Biological Elements				Supporting Elements				Chemical Status	Protected Areas				Objective	Date objective to be achieved
			Macrobenthos (O)	Freshwater Pearl Mussel	Fish	Phytoplankton (Diatoms)	Morphology	Specific Pollutants	Physio-chemical	Ecological Status		Special Area of Conservation	Special Protection Area	Nutrient Sensitive Waters	Drinking Water		
SW_19_1279	Y		G						H	G						GES	2009
SW_19_1693	N	SW_19_1957								P			Y			GES	2021
SW_19_1955	Y		M						G	M					Y	GES	2021
SW_19_1957	Y		P						M	P			Y			GES	2021
SW_19_690	N	SW_18_876								M						GES	2021
SW_19_697	Y		M							M						GES	2021
SW_19_698	N	SW_18_876								M						GES	2021
SW_19_710	N	SW_19_1547								M					Y	GES	2021
SW_19_711	N	SW_19_1955								M						GES	2021

## **Appendix 3.7.1**

Archaeology, Architectural and  
Cultural Heritage Assessment  
Definitions and Methodology

### 3.7.1 Archaeology, Architectural and Cultural Heritage Assessment Definitions and Methodology

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#### **Definitions:**

- **Archaeological Heritage** can be described as the study of past human societies through their material remains and artefactual assemblages. Our knowledge and understanding of past societies, with no written record, is enhanced by the study of archaeological remains.
- **Architectural Heritage** is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.
- The phrase **Cultural Heritage** is a generic term that spans thousands of years and covers a multitude of cultural, archaeological and architectural sites and monuments within the landscape. EPA Guidelines (2003) define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

#### **Data sources:**

- **Database of Excavation Reports ([www.excavations.ie](http://www.excavations.ie))** – This web site provides a database of summary reports of all archaeological excavations and investigations in Ireland undertaken from 1970 to 2010.
- **Cartographic Sources** – The various editions of the Ordnance Survey six-inch maps; first, second and third editions for Cork were consulted.
- **Record of Monuments and Places (RMP)** - This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It provides a list of all known archaeological monuments and places of archaeological interest, with an accompanying set of constraint maps. Its numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey (OS) map number six-inch to the mile scale, the second part is the number which refers to the specific archaeological site e.g. CO076-075 refers to circle 75 on OS sheet 76 for Cork. This number is generally placed beside a circle which surrounds the archaeological site. The area within the circle is referred to as the Zone of Archaeological Notification for that site. The RMP for County Cork was published in 1998. It is an offence to interfere with any of the sites or monuments listed in the RMP without first giving two months notice in writing to the National Monuments Service (NMS) at the Department of Arts Heritage and the Gaeltacht (DAHG).

- **Sites and Monuments Database of the Archaeological Survey of Ireland -**  
The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. The large archive and databases resulting from the survey is being continually updated. Archaeological sites which are added to the database are proposed to be included in the next published edition of the RMP and will then be afforded its protection. Sites previously listed in the RMP which, following investigation, are deemed not to be of archaeological significance, are now de-listed from the database and generally described as redundant records. There are six such redundant records in the Study Area. However, these sites are still afforded legal protection until the next published edition of the RMP. This database, complete with maps is now available for consultation via the NMS website at [www.archaeology.ie](http://www.archaeology.ie). The database also provides lists of National Monuments that are in the ownership or guardianship of the State.
- *National Monuments* – Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which is deemed to be of national importance. Ministerial consent must be granted before any works are carried out with respect to a National Monument. There are no National Monuments in the ownership or guardianship of the state within the study area. Files of the National Monuments Service - Some recorded archaeological sites have been afforded added protection under the following legislation (National Monuments are mentioned above).
- **Files of the National Monuments Service**  
Some recorded archaeological sites have been afforded added protection under the following legislation (National Monuments are mentioned above)
- *Monuments subject to Preservation Orders and Temporary Preservation Orders* - The National Monuments Act 1930, provides for the making of preservation orders to protect national monuments that are considered to be under threat. The prior written consent of the Minister is required for any works at or in proximity to the monument. There are no monuments subject to preservation orders or temporary preservation orders in the study area.
- *Register of Historic Monuments* - Under Section 5 of the National Monuments (Amendment) Act 1987, two months notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a historic monument or archaeological area entered on the Register. There are three monuments within the Study Area which are listed in the Register as follows; a ringfort (CO065-057) in Ballyleary, a tower house (CO076-051) in Coppingerstown and a ringfort (CO065-059) in Woodstock.
- **County Development Plan for Cork (2014)** – The county development plan for Cork (2014) outlines the county councils objectives with regard to the preservation of the archaeological and architectural heritage of the county. The plan outlines the Council's objectives regarding the protection of the archaeological heritage including the protection of all archaeological monuments listed in the RMP and also those archaeological sites discovered

since the publication of the RMP. The zones of archaeological potential identified in the RMP are to be protected as well as historic towns, underwater archaeology and industrial archaeology. The significance of medieval archaeology, post medieval archaeology, industrial archaeology, battlefield and siege sites as well as structures shown on the 1st and 2nd edition Ordnance Survey 6 inch maps will be assessed prior to any development. The maintenance of burial grounds will be encouraged.

The county development plan also outlines objectives regarding architectural heritage to ensure that changes or alterations to the buildings included in the RPS will retain and enhance their existing special character and setting under criteria set out in Architectural Heritage Protection - Guidelines for Planning Authorities (2005). The plan outlines the extension of the RPS to form a comprehensive schedule for the county; protect structures listed in the RPS as well as their curtilage and attendant grounds; ensure that development proposals for protected structures are appropriate and of high quality and ensure best conservation practises are promoted. In addition the council will seek to enhance all historic structures, features and landscapes not included in the RPS as well as non-structural elements such as historic gardens, stone walls, ditches and street furniture. A list of all protected structures in the County Development Plan within the Study Area is given in Appendix 2.

The plan further defines ACAs as a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of protected structures. The objectives for the ACA include the protection of the features and elements of the ACA from demolition and non-sympathetic alterations, to promote sensitive re-use and rehabilitation of buildings and sites in the ACAs, to ensure new development with or nearby is sympathetic and of high quality. Encourage repair and re-use of traditional shop fronts and high quality architectural design within the ACA, ensure that new signage etc., is appropriate and that open spaces are protected and that appropriate material are used during public infrastructure projects. There are no ACAs within the Study Area. The closest (ACA) is the village of Castlemartyr, which lies just outside the Study Area to the east..

- **Midleton Local Area Plan 2013** – The Plan includes a Record of Protected Structures for the town of Midleton. All of the structures listed in this record are afforded the same protection as outlined in the County Development Plan for Cork, 2014. All protected structures within the town of Midleton are listed in Table 3.
- **National Inventory of Architectural Heritage (NIAH)** - The work of the National Inventory of Architectural Heritage (NIAH) involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey. The main function of both is to identify and evaluate the country's architectural heritage in a uniform and consistent manner as an aid to its protection and conservation. The National Inventory of Architectural Heritage carried out a survey of the buildings of the county between 2006 and 2011. This provides the basis for the recommendations of



the Minister for Arts Heritage and the Gaeltacht to the planning authority for inclusion of structure in the RPS. The minister has recommended that all buildings of 'Regional' importance or higher be included in the RPS. If this is not adopted by the local authority the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online ([www.buildingsofireland.ie](http://www.buildingsofireland.ie)). All buildings and structures listed in the NIAH within the Study Area is given in Table 4.

## **Appendix 3.7.2**

**Chronology of the  
archaeological and cultural  
heritage of the study area**

### 3.7.2 Chronology of the archaeological and cultural heritage of the Study Area

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The prehistoric period: Mesolithic - (*circa* 7,000 to 4,000 BC); Neolithic - (*circa* 4,000 to 2,400 BC); Bronze Age (*circa* 2,400 to 500 BC) – Iron Age (*circa* 500 BC to AD 400)

The medieval period: Early medieval 5th – 12th century, high medieval 12th century – *circa* 1400, late medieval *circa* 1400 – 16th century'

Post Medieval Period: 17<sup>th</sup> century onwards

#### **Prehistoric Period**

The earliest evidence of human activity in the study area dates to the Bronze Age in the form of 27 fulachta fia, 15 standing stones, one stone pair, a ring barrow and a pit burial.

Fulachtaí fia are the most common type of prehistoric site in the country. They have been interpreted as cooking places, bathing places or steam baths. They are sometimes recognisable as horseshoe-shaped mounds of heat-shattered stones, often located near a stream or in waterlogged areas. There are 27 such sites scattered throughout the Study Area. There are also 4 burnt mounds in the Study Area. These sites often present as a sub-circular pit that has evidence of in situ burning, often called fire pits, roasting or boiling pits. While not the classic fulacht fia they are part of the same cooking/industrial tradition that continued from the Bronze Age right up to the Medieval Period.

There are 15 standing stones in the Study Area. The long axis of the ancient stones is frequently oriented northeast southwest. Standing stones had a number of possible functions in the landscape from prehistoric burial markers to boundary markers along ancient routeways.

There is one standing stone pair (CO053-064) in the northwest of the study area in the townland of Knockeennagroagh. These two monuments were quite similar in nature and date and probably had similar ritual or ceremonial functions.

There is one ring barrow (CO053-020) in the townland of Monananig. These monuments are part of the Bronze/Iron Age burial tradition. The example in Monananig consists of a circular area (9m NNE-SSW; 8.8m NNW-SSE) enclosed by fosse (D 0.4m) and external bank (H 0.2m) SW->SSW. There is an entrance with a causeway (width 2m) across the fosse to the SSW.

A pit burial was found during drainage works, c. 150m north of the highest tidal reaches of Ballynacorra river to the southwest of the town of Midleton in 1986. A fragmented cordoned urn was said to contain the cremated remains of an adult female (Zajac, et al. 1995 after O' Kelly 1947). These types of sites generally date to the Bronze and Iron Ages.

There are a total of three ogham stones in the study area. Ogham stones are inscribed stones on which a series of parallel lines or notches represent letters of the Roman alphabet. They are generally dated to the second or third centuries AD and continued in use during the following centuries when Christianity was introduced. They are most commonly found in Co Cork and Kerry. Two of the ogham stones (CO065-033 and CO065-098) are in the townland of Glenawillin at the north of the Study Area. Both examples were discovered in 1844 within a souterrain (CO065-03202-) in a ringfort (CO065-03201-) next to Ballynatrasna House. One of the stones (CO065-033) was re-erected on the site of a ringfort (CO065-097), the other (CO065-098) is now on display in the Stone Corridor at UCC ([www.archaeology.ie](http://www.archaeology.ie) after Power et al. 1997).

## Medieval Period

There are a large number of sites within the Study Area which date to the Early Christian or early medieval period (c. 500 to 1100 AD). The early medieval period in Ireland is characterised by the introduction of Christianity from the late 4th century onwards becoming widely established during the second half of the sixth century. One of the most characteristic secular monuments of this period was the ringfort, occupied by the elite and their families of the time. Ringforts are defended farmsteads generally circular or oval in plan defined by an earthen bank with an external ditch or fosse. On more elaborate sites additional banks and ditches can be present (bi-vallate and tri-vallate) but the large majority of ringforts are uni-vallate. The main phase of construction and occupation of these sites dates from the beginning of the 7th century AD to the end of the 9th century. There are 103 ringforts in the Study Area and 20 circular enclosures. The term enclosure is applied to archaeological sites, which cannot be definitively classified. Very often these enclosures are ringforts or cashels, which fall beyond the accepted size range for these monuments (i.e. less than 20m or more than 60m in diameter). Sometimes they can be of indeterminate shape and may date to as early as the Bronze Age or as recently as the last century, when they were used as animal shelters. Many of these circular enclosures may be levelled ringforts or cashels but in the absence of further archaeological investigation cannot be further classified. There are 19 souterrains within the Study Area, 11 of which are associated with known ringforts, the other 8 are isolated structures. Some secular ringforts have associated souterrains, or man-made underground tunnels leading to a chamber or series of chambers. These were largely defensive features to give refuge at times of strife and may have had a secondary function for storage. Souterrains are man-made underground structures that can consist of one or more chambers connected by narrow tunnels or creepways. Most souterrains appear to have been built by ringfort inhabitants and may have been used for defensive purposes or for more practical purpose such as food storage.

Contemporary ecclesiastical sites are also represented in the study area. Rural monasteries were generally enclosed by an oval or circular earthen enclosure ranging in diameter from 40m to 400m. The largest of these enclosures would have contained a church, graveyard, dwellings, outbuildings and workshops while

the smaller one may only have contained a church and graveyard. Bullaun stones and cross slabs are frequently found associated with the early ecclesiastical enclosures and holy well are frequently found in their general vicinity, located outside the enclosure.

There is one early ecclesiastical enclosure (CO076-016) in the townland of Ballyvodock West at the southwest of the Study Area.

There are seven holy wells in the Study Area.

The tradition of visiting holy wells goes back to the very beginnings of Irish Christianity, but most wells probably have their origin in pre-Christian ritual activities. The majority of the 'wells' are springs or just depressions in rocks where rainwater collects; some have more recently constructed stone or concrete surrounds. Some wells are still maintained for holy use when at certain times of the year they would be visited in the form of a pilgrimage often referred to as a 'round' or 'pattern'. Other wells are known through tradition for their reputed curative properties. One of the wells (CO065-048) is located on a hillside above the Leamlara to Carrigtwohill road. The well is enclosed in stone walls with corbelled roof and a recess that contains votive offerings. Mass is celebrated at the site on August 15th on an altar at the rear and the surrounding trees are adorned with rags [www.archaeology.ie](http://www.archaeology.ie)

The beginning of the high medieval period in Ireland corresponds largely with the arrival of the Anglo-Normans in 1169 and over the following centuries their influence of the landscape grew. During this period the first castles were built in the country by the Anglo-Norman colonists. These functioned as well-defended fortress and private residence and were a strong visual presence in the landscape. The majority of castles in Ireland can be broadly classified into two groups; the early castles of the late 12th and 13th centuries and the tower houses of the 15th – 17th centuries. The latter are more common but frequently if only scant upstanding remains are present these are generally classified as castle (site of). There are four unclassified castles with the Study Area. Unclassified castles cannot be more precisely classified and can date from the late 12th to the 16th century AD. Tower houses were tall, generally rectangular towers of three to five storeys usually built within a bawn or enclosure. These were built by both native Irish and Normans to defend against attacks rather than being substantial defensive military centres. There are three tower houses in the Study Area; in Leamlara (CO064-109002) in the northwest, in Coppingerstown (CO076-051) in the southeast and in Cahermone (CO076-027001), c. 1.5km northeast of Midleton.

## Post Medieval Period

Sites and features dating to the post medieval period are numerous in the Study Area. There are 8 churches and their associated graveyards within the Study Area. Within the largest settlement of Midleton, is the Church of Ireland Church (CO076-063002) and graveyard (CO076-063001) in the townland of Townparks. The church is situated in the southern half of the graveyard, on or near site of



Cistercian abbey (CO076-06303-) and on the site of earlier C of I church called 'St. John's Church' which was 'in good repair' in 1694 ([www.archaeology.ie](http://www.archaeology.ie) after Brady 1863, vol. 2, 109). The new church was built in 1823-5 (Brady *ibid.*, 111).

There are 12 lime kilns scattered throughout the Study Area, a testament to the fertile agricultural land. These sites generally date to the 18th and 19th centuries and were used in the production of fertilizer (quicklime) for agricultural use.

One example of this type of site is the limekiln in Ballynacorra West (CO076-045) in the village of Ballynacorra, is situated in a quarry and built against a rockface. It is described in the Sites and Monuments Database as follows; Front W-facing; arched recess (H 2.1m; Wth 2.1m; D 2.1m) with slabs to rear, stoking-hole evident. Recess arch filled by masonry, formerly supported by wooden lintel. Funnel infilled. Top of kiln enclosed by stone wall. Ramp on S side [www.archaeology.ie](http://www.archaeology.ie)

There are numerous country houses and demesnes within the Study Area, 11 of these are included in the RMP and RPS. The country houses generally date to the 18th and 19th centuries when the post medieval suburbs of the city began to expand as the wealthier citizens left behind the overcrowded, cramped city centre to build attractive spacious houses set within generous estates but still within easy reach of the city. The term 'demesne' or 'demaine' is Norman French in origin and denotes that portion of the manorial estate not leased out to tenants but retained by the Lord for his own use and occupation' (Reeves-Smyth, 1997, 549). The estate system was finally dismantled in Ireland in the early 20th century. Although demesnes were widespread in medieval Ireland, the foundation of those still evident on the modern landscape dates to the middle of the 18th century when 'natural style' landscape parks were adopted by Irish landowners. The typical demesne consisting of the big house with associated buildings, ornamental grounds, landscaped gardens and woodlands, often enclosed by high walls and belts of trees still remains the dominant man-made feature of the post medieval landscape in Ireland. At one time demesnes occupied nearly 6% of the country (Aalen, Whelan & Stout, 2000, 197). Much of the demesne landscapes that enclosed the big houses have been reduced in size from their heyday in the 18th/19th centuries. Country Houses within the Study Area include Caherduggan House (CO054-123) in the northwest of the Study Area, Stumphill (CO077-047) in the southeast, Ballynacorra House (CO076-044) in the south and Ballyannan House (CO076-020004) in the southwest. All of these houses and their associated demesnes are beautifully illustrated on the OS 1st edition maps dating to 1841-42.

Within the Historic town of Midleton, is the internationally known Midleton Distillery (CO076-025) and one of the country's primary tourist destinations. Midleton Distillery is a protected structure in the Midleton Development Plan, 2013 (Reg. No. 1). It is made up of a complex of buildings that include a maltings and a mill, store/warehouse and sill house (now the interpretive centre). The sill

house, constructed in 1825 has the distinction of being the largest example in the world [www.buildingsofireland.ie](http://www.buildingsofireland.ie)

Other iconic buildings in the town that attest to various stages in the town's development are Midleton College (CO076-108) on the eastern side of the town within its own grounds and the workhouse (CO076-107), 270m northeast of this. Both of these buildings are also Protected Structures in the Midleton Development Plan, 2013. According to the NIAH Midleton College was Founded and endowed by Elizabeth Villiers; the building was completed in 1717 (Quane 1952, 14) as a free school for Protestants. Smith (1750, vol. 1, 145) describes it as 'an elegant building, composed of one main structure and two returns'. By 1791 the school was 'in a very unsatisfactory state (Quane *ibid*, 21); closed in 1821 when 'school buildings were allowed to deteriorate into ruins, except one wing, inhabited by the Master' (*ibid*, 22). Reconstructed 1827-9 (*ibid*, 23); wing added to N side in 1878 (*ibid*, 26; see drawing facing 26). Core of building as built in early 18th century but internal fittings and roof of later date [www.buildingsofireland.ie](http://www.buildingsofireland.ie) Midleton College is still in use as a mixed co-educational school.

The former workhouse (CO076-107), built in 1840 and now Our Lady of Lourdes Hospital, a protected structure (Reg. No. 7) consists of a detached fourteen-bay two-storey building with dormer attic. According to NIAH This workhouse serves as a physical reminder of the work of the Poor Law Unions in housing and caring for the impoverished of Ireland in the nineteenth century. Following the Poor Relief (Ireland) Act in 1838, many workhouses, including this one, were built to the designs of the Poor Law Commission architect, George Wilkinson. Set on a seven acre site donated by Viscount Midleton, it was designed to accommodate eight hundred. It was built quickly in 1840-41 at a cost of £6,853 plus £1,347 for fittings [www.buildingsofireland.ie](http://www.buildingsofireland.ie)

Midleton Railway Station is a protected structure (Reg. No. 5) and lies at the northern end of the town. It consists of a detached nine-bay single-storey structure, built c. 1860 [www.buildingsofireland.ie](http://www.buildingsofireland.ie). The section of line between Dunkettle and Midleton opened for traffic on the 10th of November 1859, the line was extended eastwards to Killeagh and then on to Youghal which opened in 1860 (Johnson 2005, 25). The line was closed to all traffic in 1963 but was reopened as far as Midleton in 2009.

The small harbour village of Ballinacurra lies a short distance on the outskirts of Midleton at the confluence of the Owenacurra River and the east channel of Cork Harbour. It served as a port for the town of Midleton in times past and functioned as an entry and exit point for the transportation of timber, coal, iron and flax for the linen industry. The port closed in 1962 due to growing levels of silt and mud which made transportation difficult and dredging of the port was deemed to be too expensive. Evidence of its former use as a port is in the various quayside 'stores' that are marked on the 1st edition OS map (1842), one of which (CO076-111) is now in use as a grain store. There is a former malt house situated on the east shore of Ballynacorra Estuary (CO076-074) in the townland of Castleredmond and a second example (CO076-080), 100m to the south, in the townland of Ballynacorra

West, while there was a third maltings (CO076-075), 100m to the east of this also in the townland of Ballynacorra West. Barley from the surrounding area was malted and supplied the Guinness brewery in Dublin. According to the NIAH It was from studying samples of barley malted in this premises that one of Guinness's employees, William Sealy Gosset, developed his statistical test published under the pseudonym 'Student' in 1908. Student's t-distribution and t-test are still widely used one hundred years later in the study of statistics [www.buildingsofireland.ie](http://www.buildingsofireland.ie)

The Cork County Development Plan (2014), the NIAH and the RMP list houses, public buildings and structures and industrial buildings within the Study Area. A total of 20 buildings are listed as Protected Structures in the Cork County Development Plan 2014 in Table 2, while 51 Protected Structures are listed in the Midleton Development Plan, 2013 for the town of Midleton, as outlined below in Table 3. There are no Architectural Conservation Areas within the Study Area listed in the Cork County Development Plan (2014). The closest ACA is the village of Castlemartyr which lies just outside the eastern extent of the Study Area. Buildings of architectural heritage listed in the NIAH within the Study Area are given in Table 4.

### **Appendix 3.7.3**

Tables Archaeology,  
Architectural and Cultural  
Heritage

**Table 1: Archaeological sites included on the RMP and Sites and Monuments database within the Study Area**

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO053-020----	Barrow - ring-barrow	MONANANIG
CO053-049----	Ringfort - rath	RATHCOBANE
CO053-063----	Ringfort - rath	GLENGARRIFF BEG
CO053-064----	Standing stone - pair	KNOCKEENNAGROAGH
CO053-065----	Standing stone	KNOCKEENNAGROAGH
CO053-066----	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-067----	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-068----	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-069----	Ringfort - rath	CORBALLYBANE
CO054-020001-	Ringfort - cashel	CAHERDESERT
CO054-020002-	Souterrain	CAHERDESERT
CO054-021001-	Enclosure	CAHERDESERT
CO054-021002-	Souterrain	CAHERDESERT
CO054-021003-	Standing stone	CAHERDESERT
CO054-022----	Enclosure	CAHERDESERT
CO054-023----	Ringfort - rath	CAHERDUGGAN
CO054-032001-	Ringfort - rath	CAHERDESERT
CO054-032002-	Souterrain	CAHERDESERT
CO054-033001-	Ringfort - rath	BALLYOGAHA WEST
CO054-033002-	Souterrain	BALLYOGAHA WEST
CO054-034----	Ringfort - rath	BALLYOGAHA WEST
CO054-044----	Standing stone	KNOCKNASKAGH (Barrymore By.)
CO054-065----	Ringfort - rath	BALLYONEEN (Barrymore By., Gortroe Par.)
CO054-066----	Ringfort - rath	BALLYROBERT (Barrymore By., Gortroe Par.)
CO054-067----	Ogham stone	RATHCOBANE
CO054-068----	Ringfort - rath	RATHCOBANE
CO054-069----	Enclosure	RATHCOBANE
CO054-070001-	Castle - unclassified	RATHCOBANE
CO054-070002-	Kiln - lime	RATHCOBANE
CO054-071----	Ringfort - rath	RATHCOBANE
CO054-072----	Ringfort - rath	RATHCOBANE
CO054-073----	Ringfort - rath	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-074----	Standing stone	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-075----	Standing stone	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-076----	Ringfort - rath	RATHCOBANE
CO054-077----	Ringfort - rath	TEMPLEBODAN
CO054-078----	Enclosure	RATHCOBANE
CO054-079----	Ringfort - rath	RATHCOBANE
CO054-080----	Church	TEMPLEBODAN
CO054-081----	Fulacht fia	TEMPLEBODAN
CO054-082----	Castle - unclassified	OLDCOURT (Barrymore By., Templebodan Par.)



<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO054-083----	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-084----	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-085----	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-086----	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-087----	Enclosure	PEAFIELD (Barrymore By.)
CO054-088----	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-089----	Ringfort - rath	BALLYOGAHA WEST
CO054-090----	Ringfort - rath	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-091----	Burial ground	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-092----	Standing stone	WALSHTOWN MORE (West)
CO054-093----	Cist	GARRYLAURENCE
CO054-096----	Burial ground	GARRYLAURENCE
CO054-097----	Ritual site - holy well	GARRYLAURENCE
CO054-098----	Ringfort - rath	RATHCOBANE
CO054-099----	Redundant record	DUNDULLERICK EAST
CO054-100----	Enclosure	BALLYSALLAGH (Barrymore By.)
CO054-101----	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO054-102----	Ringfort - rath	BALLYERRA
CO054-103----	Enclosure	BALLYERRA
CO054-104001-	Fulacht fia	TEMPLEBODAN
CO054-104002-	Ritual site - holy well	TEMPLEBODAN
CO054-105----	Church	TEMPLEBODAN
CO054-106001-	Graveyard	TEMPLEBODAN
CO054-106002-	Church	TEMPLEBODAN
CO054-107----	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-108----	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-109----	Ringfort - rath	WALSHTOWN BEG
CO054-110----	Fulacht fia	WALSHTOWN BEG
CO054-111----	Enclosure	WALSHTOWN BEG
CO054-112----	Standing stone	WALSHTOWN MORE (West)
CO054-113----	Ringfort - rath	GARRYLAURENCE
CO054-114----	Ringfort - rath	GARRYLAURENCE
CO054-115----	Ringfort - rath	RATHORGAN
CO054-120----	Kiln - lime	PEAFIELD (Barrymore By.)
CO054-121----	Kiln - lime	BALLYERRA
CO054-122----	Gateway	LEADINTON
CO054-123----	Country house	CAHERDUGGAN DEMESNE
CO054-124----	Bridge	BALLINCURRIG (Barrymore By.),TEMPLEBODAN,RIESK
CO054-125----	Mill - woollen	BALLINCURRIG (Barrymore By.)
CO054-126----	Earthwork	BALLYONEEN (Barrymore By., Gortroe Par.)
CO054-127----	Kiln - lime	RATHCOBANE

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO054-128----	Kiln - lime	BALLYOGAHA WEST
CO054-129----	Standing stone	PEAFIELD (Barrymore By.)
CO054-131----	Souterrain	CAHERDUGGAN
CO054-133----	Souterrain	PEAFIELD (Barrymore By.)
CO054-134----	Fulacht fia	RATHCOBANE
CO054-139----	Field boundary	RATHCOBANE
CO054-141----	Souterrain	CAHERDESERT
CO054-142001-	Fulacht fia	PEAFIELD (Barrymore By.)
CO054-142002-	Fulacht fia	PEAFIELD (Barrymore By.)
CO054-146001-	Burial ground	BALLYNONA NORTH
CO054-146002-	Burial ground	BALLYNONA NORTH
CO055-028----	Ringfort - rath	CLONMILT
CO055-029----	Enclosure	BALLYDONAGH BEG
CO055-030----	Ringfort - rath	BALLYDONAGH MORE
CO064-032----	Ringfort - rath	BALLYVATTA
CO064-033001-	Graveyard	BALLYNABRANNAGH EAST
CO064-033002-	Church	BALLYNABRANNAGH EAST
CO064-034----	Ringfort - rath	BALLYNABRANNAGH EAST
CO064-035----	Ringfort - rath	GLENGARRIFF MORE
CO064-036----	Ringfort - rath	GLENGARRIFF MORE
CO064-037----	Ringfort - rath	GLENGARRIFF MORE
CO064-038----	Ringfort - rath	BALLYNASKEHA
CO064-039----	Ringfort - rath	CORBALLYBANE
CO064-040----	Ringfort - rath	CORBALLYBANE
CO064-041----	Ringfort - rath	CLASH EAST (Barrymore By., Lisgoold Par.)
CO064-042----	Ringfort - rath	CLASH EAST (Barrymore By., Ballycurrany Par.)
CO064-043----	Designed landscape - tree-ring	LEAMLARA
CO064-104----	Ringfort - rath	GARRANES (Barrymore By.)
CO064-105----	Standing stone	GARRANES (Barrymore By.)
CO064-106----	Ringfort - rath	GARRANES (Barrymore By.)
CO064-107----	Ringfort - rath	GARRANES (Barrymore By.)
CO064-108----	Fulacht fia	DOONEEN (Barrymore By.)
CO064-109001-	Earthwork	LEAMLARA
CO064-109002-	Castle - tower house	LEAMLARA
CO064-178----	Ringfort - rath	CONDONSTOWN (Barrymore By., Ballycurrany Par.)
CO064-179----	Ringfort - rath	LEAMLARA
CO065-001----	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-002----	Fulacht fia	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-003----	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-004001-	Ringfort - rath	CORBALLY SOUTH (Barrymore By., Lisgoold Par.)

RMP	SITE TYPE	TOWNLAND
CO065-004002-	Souterrain	CORBALLY SOUTH (Barrymore By., Lisgoold Par.)
CO065-005----	Ringfort - rath	LISGOOLD NORTH
CO065-006----	Ringfort - rath	LISGOOLD NORTH
CO065-007001-	Ringfort - rath	LISGOOLD NORTH
CO065-007002-	Souterrain	LISGOOLD NORTH
CO065-008001-	Graveyard	LISGOOLD EAST
CO065-008002-	Church	LISGOOLD EAST
CO065-009----	Enclosure	LISGOOLD EAST
CO065-010----	Ringfort - rath	LISGOOLD EAST
CO065-011----	Ringfort - rath	LISGOOLD EAST
CO065-012----	Ringfort - rath	LISGOOLD EAST
CO065-013001-	Ringfort - rath	POUNDQUARTER
CO065-013002-	Ringfort - rath	POUNDQUARTER
CO065-014----	Standing stone	KNOCKAKEEN
CO065-015----	Ringfort - rath	KNOCKAKEEN
CO065-016----	Ringfort - rath	LISGOOLD NORTH
CO065-017----	Ringfort - rath	LISGOOLD NORTH
CO065-018001-	Ringfort - rath	OLDCOURT WEST
CO065-018002-	Souterrain	OLDCOURT WEST
CO065-019001-	Ringfort - rath	OLDCOURT WEST
CO065-019002-	Souterrain	OLDCOURT WEST
CO065-020001-	Graveyard	TEMPLACARRIGA NORTH
CO065-020002-	Church	TEMPLACARRIGA NORTH
CO065-021----	Ringfort - rath	TEMPLACARRIGA SOUTH
CO065-022----	Standing stone	TEMPLACARRIGA SOUTH
CO065-023----	Fulacht fia	TEMPLACARRIGA SOUTH
CO065-024----	Fulacht fia	TEMPLACARRIGA SOUTH
CO065-025----	Ringfort - rath	CURRAGHCONDON
CO065-026----	Redundant record	CURRAGHCONDON
CO065-027----	Ringfort - rath	WALSHTOWN BEG
CO065-028----	Redundant record	WALSHTOWN BEG
CO065-029----	Redundant record	WALSHTOWN BEG
CO065-030----	Redundant record	SHANAVOUGHA
CO065-031001-	Ringfort - rath	RATHGIRE
CO065-031002-	Souterrain	RATHGIRE
CO065-032001-	Ringfort - rath	GLENAWILLIN
CO065-032002-	Souterrain	GLENAWILLIN
CO065-033----	Ogham stone	GLENAWILLIN
CO065-034----	Ringfort - rath	WALSHTOWN MORE (West)
CO065-035----	Ringfort - rath	KILLEENDOOLING
CO065-036----	Kiln - lime	GLENATHONACASH
CO065-037----	Cairn - unclassified	SANDYHILL (Barrymore By.)
CO065-038----	Standing stone	SANDYHILL (Barrymore By.)
CO065-039----	Ringfort - rath	COTTSTOWN
CO065-040----	Ringfort - rath	BALLYNONA NORTH
CO065-041----	Ringfort - rath	GLENBEG (Barrymore By.)
CO065-042----	Ringfort - rath	GLENBEG (Barrymore By.)
CO065-043----	Ringfort - rath	BALLYMARTIN (Barrymore By.)
CO065-044----	Ritual site - holy well	BALLYMARTIN (Barrymore By.)
CO065-045----	Ritual site - holy well	BALLYMARTIN (Barrymore By.)

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO065-046----	Ringfort - rath	BALLYCURRANY WEST
CO065-047001-	Ringfort - rath	BALLYCURRANY WEST
CO065-047002-	Souterrain	BALLYCURRANY WEST
CO065-048----	Ritual site - holy well	BALLYCURRANY WEST
CO065-049----	Burial ground	BALLYCURRANY WEST
CO065-050----	Ringfort - rath	LACKENBEHY (Barrymore By.)
CO065-051----	Ringfort - rath	LACKENBEHY (Barrymore By.)
CO065-052----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-053----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-055----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-056----	Ringfort - rath	BALLYLEARY (Barrymore, By., Carrigtwohill Par.)
CO065-057----	Ringfort - rath	BALLYLEARY (Barrymore, By., Carrigtwohill Par.)
CO065-061----	Hilltop enclosure	CURRAGH (Barrymore By.)
CO065-062----	Ringfort - rath	BALLYNACLASHY
CO065-063----	Ringfort - rath	BALLYNACLASHY
CO065-064----	Ringfort - rath	BALLYNACLASHY
CO065-065----	Fulacht fia	BALLYCURRANY EAST
CO065-066----	Ringfort - rath	BALLYCURRANY EAST
CO065-067----	Ringfort - rath	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-068001-	Ringfort - rath	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-068002-	Souterrain	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-069----	Ringfort - rath	BALLYMACSLINEY
CO065-070----	Ringfort - rath	BALLYMACSLINEY
CO065-071----	Ringfort - rath	BALLYMACSLINEY
CO065-072----	Ringfort - rath	CARRIGOGNA
CO065-073----	Ringfort - rath	ELFORDSTOWN
CO065-074----	Enclosure	ELFORDSTOWN
CO065-075----	Ringfort - rath	GORTACRUE
CO065-076----	Ringfort - rath	GORTACRUE
CO065-077----	Fulacht fia	GORTACRUE
CO065-078----	Ritual site - holy well	BROOMFIELD EAST
CO065-079----	Fulacht fia	BROOMFIELD EAST
CO065-080----	Excavation - miscellaneous	BROOMFIELD EAST
CO065-081----	Ringfort - rath	BALLYSPILLANE WEST
CO065-082----	Ringfort - rath	BALLYSPILLANE WEST
CO065-083001-	Graveyard	BALLYSPILLANE WEST
CO065-083002-	Church	BALLYSPILLANE WEST
CO065-084----	Designed landscape feature	YOUNG-GROVE
CO065-085----	Designed landscape feature	YOUNG-GROVE
CO065-086----	Designed landscape feature	YOUNG-GROVE

RMP	SITE TYPE	TOWNLAND
CO065-087----	Designed landscape feature	YOUNG-GROVE
CO065-088----	Designed landscape feature	YOUNG-GROVE
CO065-089----	Designed landscape feature	YOUNG-GROVE
CO065-090----	Standing stone	YOUNG-GROVE
CO065-091----	House - vernacular house	WALSHTOWN BEG
CO065-092001-	Designed landscape - belvedere	BALLYEDMOND
CO065-092002-	Country house	BALLYEDMOND
CO065-093----	Bridge	BALLYEDMOND
CO065-094----	Mill - threshing	YOUNG-GROVE
CO065-095----	Kiln - lime	BALLYCURRANY EAST
CO065-096----	Graveyard	BROOMFIELD WEST
CO065-097----	Ringfort - rath	GLENAWILLIN
CO065-098----	Ogham stone	GLENAWILLIN
CO065-099----	Fulacht fia	RATHORGAN
CO065-100----	Fulacht fia	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-102----	Souterrain	TEMPLINACARRIGA SOUTH
CO065-103----	Fulacht fia	WALSHTOWN MORE (East)
CO065-104----	Fulacht fia	WALSHTOWN MORE (East)
CO065-105----	Fulacht fia	WALSHTOWN MORE (East)
CO065-106----	Burnt mound	WALSHTOWN MORE (East)
CO065-107----	Fulacht fia	BALLYNONA SOUTH
CO065-108----	Enclosure	CURRAGH (Barrymore By.)
CO066-001001-	Graveyard	GLEBE (Barrymore By)
CO066-001002-	Church	GLEBE (Barrymore By)
CO066-001003-	Castle - unclassified	CASTLEQUARTER
CO066-002----	Ringfort - rath	BALLYDONAGH MORE
CO066-023----	House - vernacular house	DUNGOURNEY
CO066-026----	Ringfort - rath	CASTLEQUARTER
CO066-027----	Ringfort - rath	CASTLEQUARTER
CO066-028----	House - vernacular house	BALLYNONA SOUTH
CO066-029----	Ritual site - holy well	BILBERRY
CO066-030----	Redundant record	BALLYMACOOLY MORE
CO066-043----	Souterrain	SHEEPWALK
CO066-049----	Gate lodge	BALLYNONA SOUTH
CO066-050----	Mill - corn	BALLYNONA SOUTH
CO066-081----	Fulacht fia	BALLYNACOLE
CO076-004----	Cave	PARK NORTH (Imokilly By.)
CO076-016----	Ecclesiastical enclosure	BALLYVODOCK WEST
CO076-017----	Designed landscape - tree-ring	BALLYRICHARD MORE
CO076-018----	Kiln - lime	WATER-ROCK
CO076-020001-	Walled garden	BALLYANNAN



RMP	SITE TYPE	TOWNLAND
CO076-020002-	Gateway	BALLYANNAN
CO076-020003-	House - fortified house	BALLYANNAN
CO076-020004-	Country house	BALLYANNAN
CO076-020005-	Graveyard	BALLYANNAN
CO076-020006-	Church	BALLYANNAN
CO076-021----	Enclosure	BANESHANE
CO076-022----	Enclosure	BALLYANNAN,GARRYDUFF (Barrymore By.)
CO076-023----	Kiln - lime	GARRYDUFF (Barrymore By.)
CO076-024----	Castle - unclassified	CASTLEREDMOND
CO076-025----	Distillery	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-026----	Fulacht fia	KILLEAGH (Imokilly By.)
CO076-027001-	Castle - tower house	CAHERMONE
CO076-028----	Kiln - lime	CAHERMONE
CO076-029----	Country house	ROXBOROUGH
CO076-030001-	Graveyard	CHURCHTOWN (Barrymore By.)
CO076-030002-	Church	CHURCHTOWN (Barrymore By.)
CO076-031----	Ringfort - rath	CASTLEREDMOND
CO076-042001-	Mound	BALLYNACORRA
CO076-042002-	Graveyard	BALLYNACORRA
CO076-042003-	Church	BALLYNACORRA
CO076-043----	Country house	BALLYNACORRA
CO076-044----	Country house	BALLYNACORRA WEST
CO076-045----	Kiln - lime	BALLYNACORRA WEST
CO076-046----	Souterrain	BALLYNACORRA EAST
CO076-050----	Standing stone	GEARAGH (Imokilly By.)
CO076-051----	Castle - tower house	COPPINGERSTOWN
CO076-052----	Burial	COPPINGERSTOWN
CO076-053----	Kiln - lime	GEARAGH (Imokilly By.)
CO076-062----	Pit-burial	OATENCAKE
CO076-063001-	Graveyard	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063002-	Church	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063003-	Religious house - Cistercian monks	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063004-	Market-house	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063005-	Historic town	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-064----	Fulacht fia	CASTLEREDMOND
CO076-066----	Ringfort - cashel	CARRIGSHANE
CO076-073001-	Corn store	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-073002-	Bridge	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-074----	Maltings	CASTLEREDMOND
CO076-075----	Maltings	BALLYNACORRA WEST
CO076-080----	Maltings	BALLYNACORRA WEST
CO076-081----	Architectural fragment	CAHERMONE

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO076-091----	Enclosure	BALLYVODOCK EAST
CO076-092----	Linear earthwork	BALLYNABOINTRA,BALLYVODOCK EAST,BANESHANE,WATER-ROCK
CO076-102----	Souterrain	GEARAGH (Imokilly By.)
CO076-104----	Field system	BALLYVODOCK EAST
CO076-105----	Fulacht fia	BALLYVODOCK EAST
CO076-106----	Bridge	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-107----	Workhouse	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-108----	School	SCHOOL-LAND
CO076-111----	Warehouse	CASTLEREDMOND
CO076-112----	Mill - corn	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-115----	Gasworks	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-118----	Souterrain	KILLEAGH (Imokilly By.)
CO076-134----	Burnt mound	PARK NORTH (Imokilly By.)
CO076-136----	Fulacht fia	WHITEROCK
CO077-001----	Mound	BALLYEDEKIN
CO077-002----	Castle - tower house	BALLINTOTIS
CO077-047----	Country house	STUMPHILL
CO077-048----	House - vernacular house	STUMPHILL
CO077-049----	Country house	BALLYEDEKIN
CO077-050----	House - vernacular house	LOUGHADERRY
CO077-051----	Church	FARRANTRENCHARD
CO077-079----	Enclosure	BALLYEDEKIN

**Table 2: Architectural features included in the County Development Plan Record of Protected Structures in the Study Area**

<b>RPS</b>	<b>Site name</b>	<b>Townland</b>
00516	Ballyannan House	Ballyannan
00517	Grain Store	Ballynacorra
00519	Lakeview House	Castleredmond
00520	Rosehill House	Ballynacorra West
00521	Ballick Mills	Ballynacorra
00522	Ballynacorra House	Ballynacorra
00523	Industrial Buildings, Maltings	Ballynacorra West
00855	Cahermone Castle (in ruins)	Cahermone
00527	St. Colman's Catholic Church	Farrantrenchard
00856	Ballyedkin House	Ballyedkin
01117	Thatch house	Loughaderry
01163	Thatch house	Loughaderry
00450	Dungourney Roman Catholic Church	Dungourney
00425	Dungourney national school	Dungourney
00403	Lisgoold School House	Ballincurragh
00402	St. John the Baptist Catholic Church	Lisgoold

<b>RPS</b>	<b>Site name</b>	<b>Townland</b>
00405	Glebe house	Templenacarriga North
00393	Church of the Sacred Heart	Leamlara
01022	Glenview House	Ballynclashy
00080	Thatch House	Ballyogaha West

**Table 3: Protected Structures in the Midleton Local Area Plan**

<b>Reg.No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Townland</b>
1	Historic Mills Jameson Distillery	Industrial Archaeology	Townparks
2	Iron Foundry buildings at Kennedy Park	Industrial Archaeology	Townparks
3	Redbrick Chimney Dickinson's Lane	Industrial Archaeology	Townparks
4	Mill Building on Drury's Lane	Industrial Archaeology	Townparks
5	Midleton Railway Station	Industrial Archaeology	Townparks
6	Southern Health Board Health Centre	Architectural - Public/institutional	Townparks
7	Our Lady of Lourdes Hospital	Architectural - Public/institutional	Townparks
8	St. John the Baptist National School (the former)	Architectural - Public/institutional	Townparks
9	St. John the Baptist Church and Graveyard	Architectural - Public/institutional	Townparks
10	Midleton College	Architectural - Public/institutional	Townparks
11	National Bank (former) at Lewis Bridge	Architectural - Public/institutional	Townparks
12	Old Dispensary Building (Youghal Road)	Architectural - Public/institutional	Townparks
13	Community Building next door to Old Dispensary	Architectural - Public/institutional	Townparks
14	Town Hall (former) Main Street	Architectural - Public/institutional	Townparks
15	Courthouse, Main Street	Architectural - Public/institutional	Townparks
16	AIB Bank, Main Street	Architectural- Public/institutional	Townparks
17	No. 32 Main Street	Architectural - Buildings	Townparks
18	No. 101 Main Street, Old Bank House	Architectural - Buildings	Townparks
19	Nos. 32/33 Main Street	Architectural – Buildings/Shop Fronts	Townparks
20	Nos. 46 Main Street	Architectural – Buildings/Shop Fronts	Townparks
21	No. 85 Main Street	Architectural – Buildings/Shop Fronts	Townparks
22	No. 74 Main Street (T. Wallis & Sons)	Architectural – Buildings/Shop Fronts	Townparks

<b>Reg.No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Townland</b>
23	No. 6 Main Street (Hyde)	Architectural – Buildings/Shop Fronts	Townparks
24	No. 99 Main Street, Door and Fanlight	Architectural – Buildings/Shop Fronts	Townparks
25	No. 83 Main Street, Door and Fanlight	Architectural – Buildings/Shop Fronts	Townparks
26	No. 82 Main Street, Door and Fanlight	Architectural – Buildings/Shop Fronts	Townparks
27	Between AIB Bank and 103 Main Street	Laneways	Townparks
28	Between 103 and 102 Main Street (Vaulted)	Laneways	Townparks
29	Between 102 and 101 Main Street	Laneways	Townparks
30	Between Town Hall and 82 Main Street	Laneways	Townparks
31	Between 75 and 76 Main Street	Laneways	Townparks
32	Between 73 and 74 Main Street	Laneways	Townparks
33	Between 3 and 4 Broderick Street	Laneways	Townparks
34	Between 46 and 47 Main Street (Stone Arch)	Laneways	Townparks
35	Between 49 and 50 Main Street (Vaulted Open	Laneways	Townparks
36	Between 6 and 5 Main Street, Vaulted Gate	Laneways	Townparks
37	Between 3 and 4 Main Street (Arch Way)	Laneways	Townparks
38	Post Box at corner of Connolly and Main Street	Street Furniture	Townparks
39	Clonmult monument	Street Furniture	Townparks
40	Lewis bridge	Street Furniture	Townparks
41	Cobbled setts at entrance to mill Cuddigan's Yard	Street Furniture	Townparks
42	Plaque at entrance to the Baby's Walk	Street Furniture	Townparks
43	No. 81 Main Street Enclosed space to basement	Street Furniture	Townparks
44	No. 55/56 Main Street McDaid's (Pugin House)	Detached Houses	Townparks
45	Youghal Rd. parish Priest's Residence	Detached Houses	Townparks
46	Youghal Road, Midleton Lodge	Detached Houses	Townparks
47	No. 35 New Cork Road (Turret house)	Detached Houses	Townparks
48	Courtney House, off McDermott Street	Detached Houses	Townparks

<b>Reg.No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Townland</b>
49	Residence of the Dean of Cloyne, off McDermot Street	Detached Houses	Townparks
50	Youghal Road, Midleton House	Detached Houses	Townparks
51	Main Street, detached house, (Motherway's)	Detached Houses	Townparks

The NIAH lists many more buildings in the Study Area, which are listed below in Table 4. Some of these overlap those listed in the County Development Plan.

**Table 4: Architectural features listed in the NIAH within the study area**

<b>Reg. No.</b>	<b>Name</b>	<b>Townland</b>
20830001		OATENCAKE
20830002		OATENCAKE
20830003		OATENCAKE
20830004		OATENCAKE
20830005		OATENCAKE
20830006		TOWNPARKS
20830007		TOWNPARKS
20830008		TOWNPARKS
20830009	Our Lady of Lourdes Hospital	TOWNPARKS
20830010	Our Lady of Lourdes Hospital	TOWNPARKS
20830011	Our Lady of Lourdes Hospital	TOWNPARKS
20830012	Our Lady of Lourdes Hospital	TOWNPARKS
20830013	Cork Bridge	OATENCAKE
20830014	Clonmult Monument	TOWNPARKS
20830015	Midleton Courthouse	TOWNPARKS
20830016		TOWNPARKS
20830017		TOWNPARKS
20830018	Molly's	TOWNPARKS
20830020		TOWNPARKS
20830021	Market House	TOWNPARKS
20830022		TOWNPARKS
20830023	Xtra Vision	TOWNPARKS
20830024	O'Connor's Pharmacy	TOWNPARKS
20830025		TOWNPARKS
20830026		TOWNPARKS
20830027	The Meeting Place	TOWNPARKS
20830028	The Meeting Place	TOWNPARKS
20830029		TOWNPARKS
20830030		TOWNPARKS
20830031	Courtenay House	TOWNPARKS
20830033	The Deanery	TOWNPARKS
20830034		TOWNPARKS
20830035	Midleton College	TOWNPARKS
20830036	Midleton College	PARK NORTH
20830037		TOWNPARKS
20830040		TOWNPARKS
20830041		TOWNPARKS
20830042	O'Briens	TOWNPARKS



<b>Reg. No.</b>	<b>Name</b>	<b>Townland</b>
20830043	M. UaCeocain	TOWNPARKS
20830044		TOWNPARKS
20830045	Ballycotton Seafood	TOWNPARKS
20830046	Jubii	TOWNPARKS
20830047	La Trattoria	TOWNPARKS
20830048	Murphy's	TOWNPARKS
20830049	McDaid's	TOWNPARKS
20830050	The Jameson Experience	TOWNPARKS
20830052	The Jameson Experience	TOWNPARKS
20830053	The Jameson Experience	TOWNPARKS
20830054	The Jameson Experience	TOWNPARKS
20830055	The Jameson Experience	TOWNPARKS
20830056	The Jameson Experience	TOWNPARKS
20830057	The Jameson Experience	TOWNPARKS
20830058	The Jameson Experience	TOWNPARKS
20830059	The Jameson Experience	TOWNPARKS
20830060	The Jameson Experience	TOWNPARKS
20830061	The Jameson Experience	TOWNPARKS
20830062	The Jameson Experience	TOWNPARKS
20830063	The Jameson Experience	TOWNPARKS
20830064	The Jameson Experience	TOWNPARKS
20830065	The Jameson Experience	TOWNPARKS
20830067	Lewis Bridge	TOWNPARKS
20830068	Bartizan Game World	TOWNPARKS
20830069		TOWNPARKS
20830070		TOWNPARKS
20830071		TOWNPARKS
20830072		TOWNPARKS
20830073		TOWNPARKS
20830074		TOWNPARKS
20830075		TOWNPARKS
20830076		TOWNPARKS
20830077		TOWNPARKS
20830078		TOWNPARKS
20830079	Urban District Council	TOWNPARKS
20830080		PARK SOUTH
20830081		TOWNPARKS
20830082		TOWNPARKS
20830083		TOWNPARKS
20830084		TOWNPARKS
20830085		TOWNPARKS
20830086		TOWNPARKS
20830087		TOWNPARKS
20830088		TOWNPARKS
20830090		TOWNPARKS
20830091		TOWNPARKS
20830092		TOWNPARKS
20830093	Holy Rosary Roman Catholic Church	TOWNPARKS
20830094	Holy Rosary Roman Catholic Church	TOWNPARKS

Reg. No.	Name	Townland
20830095		TOWNPARKS
20830096		TOWNPARKS
20830097		TOWNPARKS
20830098		TOWNPARKS
20830099		TOWNPARKS
20830100	Moloney & McCourt Solicitors	TOWNPARKS
20830103		TOWNPARKS
20830104		TOWNPARKS
20830105		TOWNPARKS
20830106		TOWNPARKS
20830107		TOWNPARKS
20830108	Ormonde	TOWNPARKS
20830109	Wallis Bar	TOWNPARKS
20830110	Midleton Library	TOWNPARKS
20830112	Chinnery Mausoleum	TOWNPARKS
20830113	Broderick Mausoleum	TOWNPARKS
20830114	Saint John the Baptist Church of Ireland Church	TOWNPARKS
20830115		TOWNPARKS
20830117	Zara's/Leonardo/Allabri Interiors	TOWNPARKS
20830119	Midleton Bargain Centre	TOWNPARKS
20830122	East Cork Cabs/Look Alive	TOWNPARKS
20830124	Bank of Ireland	TOWNPARKS
20830126	Jessica's	TOWNPARKS
20830127		TOWNPARKS
20830128	Guilfoyles	TOWNPARKS
20830129	Post Office	TOWNPARKS
20830130	Midleton Books	TOWNPARKS
20830131	AIB	TOWNPARKS
20830133	Midleton Enterprise Park	OATENCAKE
20905403		PEAFIELD
20905404		GURTEEN
20905406		RATHORGAN
20905407		GARRYLAWRENCE
20905408	Kathy's Lodge	RIESK
20905409		LEADINTON
20905410	Caherduggan House	CAHERDUGGAN
20905411	Caherduggan House	CAHERDUGGAN
20905514		CLONMULT
20905515	Cronin	CLONMULT
20905516		CLONMULT
20905517	Saint Lawrence's Roman Catholic Church	CLONMULT
20905518		BALLYDONAGH MORE
20905519		BALLYDONAGH MORE
20905520		BALLYDONAGH MORE
20906407	Aghnahan Bridge	BALLYNABRANNAGH EAST,LEAMLARA
20906501		BALLINCURRIG
20906503		WALSHTOWN BEG

Reg. No.	Name	Townland
20906504		CORBALLY SOUTH,LEADINTON
20906505	Cul an Ti	LISGOOLD EAST
20906506	Saint John The Baptist Roman Catholic Church	LISGOOLD EAST
20906507		OLDCOURT WEST
20906508		LISGOOLD EAST,LISGOOLD NORTH,OLDCOURT WEST
20906509		OLDCOURT WEST
20906510		TEMPLINACARRIGA SOUTH
20906511	Bealaghanaffrin Bridge	BALLYREARDON,GLENAWILL IN,SHANAVOUGH
20906513	Glenview	BALLYNACLASHY
20906514	Water Lodges	CURRAGH
20906515	Ballyedmond Bridge	BALLYEDMOND,CARRIGOGN A,CURRAGH
20906516	Ballyedmond House	BALLYEDMOND
20906517	Carrig House	CARRIGOGNA
20906518		CARRIGOGNA
20906519	Cloonmullin	BROOMFIELD WEST
20906520		BALLYSPILLANE WEST
20906521	Bilberry	BILBERRY
20906522	Broomfield House	BROOMFIELD EAST
20906523	The Thatch	LISGOOLD EAST
20906601		DUNGOURNEY
20906602		DUNGOURNEY
20906603	Saint Peter's Roman Catholic Church	DUNGOURNEY
20906605		DUNGOURNEY
20906606		DUNGOURNEY
20906617	Dungourney House	GLEBE
20906618	Dungourney Church of Ireland Church	GLEBE
20906619		CASTLEQUARTER
20906620		BALLYKNOCK
20906626		BALLYNONA SOUTH
20906627		BALLYNONA SOUTH
20906629	Ballynona House	BALLYNONA SOUTH
20906630	Ballynona House	BALLYNONA SOUTH
20906632		BALLYNASCARTY,KILMOUNT AIN
20907607	Woodview	KNOCKGRIFFIN
20907608	Denisfield	KNOCKGRIFFIN
20907609	Knocklawn	KNOCKGRIFFIN
20907610	Midleton Railway Station	TOWNPARKS
20907611	Westpark House	KILLEAGH
20907612		WHITEROCK
20907621	Ballyannan House	BALLYANNAN
20907622		CASTLEREDMOND
20907623		CASTLEREDMOND
20907624		CASTLEREDMOND

Reg. No.	Name	Townland
20907625	Charleston	CASTLEREDMOND
20907626	Oikoseen	CASTLEREDMOND
20907627	Charleston Maltings	CASTLEREDMOND
20907628	Ballinacurra Graveyard	BALLINACORRA
20907629	Ballynacorra House	BALLINACORRA
20907630	Ballynacorra House	BALLINACORRA
20907631	Arch House	BALLYNACORRA WEST
20907632	Ryng	BALLYNACORRA WEST
20907633		BALLYNACORRA WEST
20907634		BALLYNACORRA WEST
20907635	Rose Hill	BALLYNACORRA WEST
20907636	East Village Studios	BALLYNACORRA WEST
20907637	J. H. Bennett & Co.	BALLYNACORRA WEST
20907639	J. H. Bennett & Co.	BALLYNACORRA WEST
20907640		BALLYNACORRA WEST
20907668		TOWNPARKS
20907701	Stump Hill	STUMPHILL
20907702		STUMPHILL
20907709	Saint Colman's Roman Catholic Church	FARRANTRECHARD

**Table 5: Areas of Archaeological Potential in the study area and Key Constraints**

AAP	Site Type
AAP1	Owenacurra River
AAP2	Dungourney River
AAP 3	Ballynacorra River
AAP4	Owenacurra Estuary

**Table 6: Archaeological and Architectural sites in the study area of Regional Importance or Key Constraints (Sites which are included in the RMP and RPS are cross-referenced and thus are included twice).**

RMP and RPS	SITE TYPE	TOWNLAND
CO053-020	Barrow - ring-barrow	MONANANIG
CO053-049	Ringfort - rath	RATHCOBANE
CO053-063	Ringfort - rath	GLENGARRIFF BEG
CO053-064	Standing stone - pair	KNOCKEENNAGROAGH
CO053-065	Standing stone	KNOCKEENNAGROAGH
CO053-066	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-067	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-068	Ringfort - rath	BALLYSALLAGH (Barrymore By.)
CO053-069	Ringfort - rath	CORBALLYBANE

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO054-020001	Ringfort - cashel	CAHERDESERT
CO054-020002	Souterrain	CAHERDESERT
CO054-021001	Enclosure	CAHERDESERT
CO054-021002	Souterrain	CAHERDESERT
CO054-021003	Standing stone	CAHERDESERT
CO054-022	Enclosure	CAHERDESERT
CO054-023	Ringfort - rath	CAHERDUGGAN
CO054-032001	Ringfort - rath	CAHERDESERT
CO054-032002	Souterrain	CAHERDESERT
CO054-033001	Ringfort - rath	BALLYOGAHA WEST
CO054-033002	Souterrain	BALLYOGAHA WEST
CO054-034	Ringfort - rath	BALLYOGAHA WEST
CO054-044	Standing stone	KNOCKNASKAGH (Barrymore By.)
CO054-065	Ringfort - rath	BALLYONEEN (Barrymore By., Gortroe Par.)
CO054-066	Ringfort - rath	BALLYROBERT (Barrymore By., Gortroe Par.)
CO054-067	Ogham stone	RATHCOBANE
CO054-068	Ringfort - rath	RATHCOBANE
CO054-069	Enclosure	RATHCOBANE
CO054-070001	Castle - unclassified	RATHCOBANE
CO054-071	Ringfort - rath	RATHCOBANE
CO054-072	Ringfort - rath	RATHCOBANE
CO054-073	Ringfort - rath	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-074	Standing stone	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-075	Standing stone	BALLYONEEN (Barrymore By., Templebodan Par.)
CO054-076	Ringfort - rath	RATHCOBANE
CO054-077	Ringfort - rath	TEMPLEBODAN
CO054-078	Enclosure	RATHCOBANE
CO054-079	Ringfort - rath	RATHCOBANE
CO054-080	Church	TEMPLEBODAN
CO054-082	Castle - unclassified	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-083	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-084	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-085	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-086	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-087	Enclosure	PEAFIELD (Barrymore By.)
CO054-088	Ringfort - rath	PEAFIELD (Barrymore By.)
CO054-089	Ringfort - rath	BALLYOGAHA WEST



RMP and RPS	SITE TYPE	TOWNLAND
CO054-090	Ringfort - rath	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-091	Burial ground	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-092	Standing stone	WALSHTOWN MORE (West)
CO054-093	Cist	GARRYLAURENCE
CO054-096	Burial ground	GARRYLAURENCE
CO054-098	Ringfort - rath	RATHCOBANE
CO054-100	Enclosure	BALLYSALLAGH (Barrymore By.)
CO054-101	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO054-102	Ringfort - rath	BALLYERRA
CO054-103	Enclosure	BALLYERRA
CO054-105	Church	TEMPLEBODAN
CO054-106001	Graveyard	TEMPLEBODAN
CO054-106002	Church	TEMPLEBODAN
CO054-107	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-108	Enclosure	OLDCOURT (Barrymore By., Templebodan Par.)
CO054-109	Ringfort - rath	WALSHTOWN BEG
CO054-111	Enclosure	WALSHTOWN BEG
CO054-112	Standing stone	WALSHTOWN MORE (West)
CO054-113	Ringfort - rath	GARRYLAURENCE
CO054-114	Ringfort - rath	GARRYLAURENCE
CO054-115	Ringfort - rath	RATHORGAN
CO054-123	Country house	CAHERDUGGAN DEMESNE
CO054-125	Mill - woollen	BALLINCURRIG (Barrymore By.)
CO054-126	Earthwork	BALLYONEEN (Barrymore By., Gortroe Par.)
CO054-129	Standing stone	PEAFIELD (Barrymore By.)
CO054-131	Souterrain	CAHERDUGGAN
CO054-133	Souterrain	PEAFIELD (Barrymore By.)
CO054-141	Souterrain	CAHERDESERT
CO054-146001	Burial ground	BALLYNONA NORTH
CO054-146002	Burial ground	BALLYNONA NORTH
CO055-028	Ringfort - rath	CLONMILT
CO055-029	Enclosure	BALLYDONAGH BEG
CO055-030	Ringfort - rath	BALLYDONAGH MORE
CO064-032	Ringfort - rath	BALLYVATTA
CO064-033001	Graveyard	BALLYNABRANNAGH EAST
CO064-033002	Church	BALLYNABRANNAGH EAST
CO064-034	Ringfort - rath	BALLYNABRANNAGH EAST
CO064-035	Ringfort - rath	GLENGARRIFF MORE
CO064-036	Ringfort - rath	GLENGARRIFF MORE

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO064-037	Ringfort - rath	GLENGARRIFF MORE
CO064-038	Ringfort - rath	BALLYNASKEHA
CO064-039	Ringfort - rath	CORBALLYBANE
CO064-040	Ringfort - rath	CORBALLYBANE
CO064-041	Ringfort - rath	CLASH EAST (Barrymore By., Lisgoold Par.)
CO064-042	Ringfort - rath	CLASH EAST (Barrymore By., Ballycurrany Par.)
CO064-104	Ringfort - rath	GARRANES (Barrymore By.)
CO064-105	Standing stone	GARRANES (Barrymore By.)
CO064-106	Ringfort - rath	GARRANES (Barrymore By.)
CO064-107	Ringfort - rath	GARRANES (Barrymore By.)
CO064-109001	Earthwork	LEAMLARA
CO064-109002	Castle - tower house	LEAMLARA
CO064-178	Ringfort - rath	CONDONSTOWN (Barrymore By., Ballycurrany Par.)
CO064-179	Ringfort - rath	LEAMLARA
CO065-001	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-003	Ringfort - rath	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-004001	Ringfort - rath	CORBALLY SOUTH (Barrymore By., Lisgoold Par.)
CO065-004002	Souterrain	CORBALLY SOUTH (Barrymore By., Lisgoold Par.)
CO065-005	Ringfort - rath	LISGOOLD NORTH
CO065-006	Ringfort - rath	LISGOOLD NORTH
CO065-007001	Ringfort - rath	LISGOOLD NORTH
CO065-007002	Souterrain	LISGOOLD NORTH
CO065-008001	Graveyard	LISGOOLD EAST
CO065-008002	Church	LISGOOLD EAST
CO065-009	Enclosure	LISGOOLD EAST
CO065-010	Ringfort - rath	LISGOOLD EAST
CO065-011	Ringfort - rath	LISGOOLD EAST
CO065-012	Ringfort - rath	LISGOOLD EAST
CO065-013001	Ringfort - rath	POUNDQUARTER
CO065-013002	Ringfort - rath	POUNDQUARTER
CO065-014	Standing stone	KNOCKAKEEN
CO065-015	Ringfort - rath	KNOCKAKEEN
CO065-016	Ringfort - rath	LISGOOLD NORTH
CO065-017	Ringfort - rath	LISGOOLD NORTH
CO065-018001	Ringfort - rath	OLDCOURT WEST
CO065-018002	Souterrain	OLDCOURT WEST
CO065-019001	Ringfort - rath	OLDCOURT WEST
CO065-019002	Souterrain	OLDCOURT WEST
CO065-020001	Graveyard	TEMPLINACARRIGA NORTH
CO065-020002	Church	TEMPLINACARRIGA NORTH

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO065-021	Ringfort - rath	TEMPLINACARRIGA SOUTH
CO065-022	Standing stone	TEMPLINACARRIGA SOUTH
CO065-025	Ringfort - rath	CURRAGHCONDON
CO065-027	Ringfort - rath	WALSHTOWN BEG
CO065-031001	Ringfort - rath	RATHGIRE
CO065-031002	Souterrain	RATHGIRE
CO065-032001	Ringfort - rath	GLENAWILLIN
CO065-032002	Souterrain	GLENAWILLIN
CO065-033	Ogham stone	GLENAWILLIN
CO065-034	Ringfort - rath	WALSHTOWN MORE (West)
CO065-035	Ringfort - rath	KILLEENDOOLING
CO065-037	Cairn - unclassified	SANDYHILL (Barrymore By.)
CO065-038	Standing stone	SANDYHILL (Barrymore By.)
CO065-039	Ringfort - rath	COTTSTOWN
CO065-040	Ringfort - rath	BALLYNONA NORTH
CO065-041	Ringfort - rath	GLENBEG (Barrymore By.)
CO065-042	Ringfort - rath	GLENBEG (Barrymore By.)
CO065-043	Ringfort - rath	BALLYMARTIN (Barrymore By.)
CO065-046	Ringfort - rath	BALLYCURRANY WEST
CO065-047001	Ringfort - rath	BALLYCURRANY WEST
CO065-047002	Souterrain	BALLYCURRANY WEST
CO065-049	Burial ground	BALLYCURRANY WEST
CO065-050	Ringfort - rath	LACKENBEHY (Barrymore By.)
CO065-051	Ringfort - rath	LACKENBEHY (Barrymore By.)
CO065-056	Ringfort - rath	BALLYLEARY (Barrymore, By., Carrigtwohill Par.)
CO065-057	Ringfort - rath	BALLYLEARY (Barrymore, By., Carrigtwohill Par.)
CO065-061	Hilltop enclosure	CURRAGH (Barrymore By.)
CO065-062	Ringfort - rath	BALLYNACLASHY
CO065-063	Ringfort - rath	BALLYNACLASHY
CO065-064	Ringfort - rath	BALLYNACLASHY
CO065-066	Ringfort - rath	BALLYCURRANY EAST
CO065-067	Ringfort - rath	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-068001	Ringfort - rath	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-068002	Souterrain	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-069	Ringfort - rath	BALLYMACSLINEY
CO065-070	Ringfort - rath	BALLYMACSLINEY
CO065-071	Ringfort - rath	BALLYMACSLINEY
CO065-072	Ringfort - rath	CARRIGOGNA
CO065-073	Ringfort - rath	ELFORDSTOWN

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO065-074	Enclosure	ELFORDSTOWN
CO065-075	Ringfort - rath	GORTACRUE
CO065-076	Ringfort - rath	GORTACRUE
CO065-081	Ringfort - rath	BALLYSPILLANE WEST
CO065-082	Ringfort - rath	BALLYSPILLANE WEST
CO065-083001	Graveyard	BALLYSPILLANE WEST
CO065-083002	Church	BALLYSPILLANE WEST
CO065-090	Standing stone	YOUNG-GROVE
CO065-092002	Country house	BALLYEDMOND
CO065-094	Mill - threshing	YOUNG-GROVE
CO065-096	Graveyard	BROOMFIELD WEST
CO065-097	Ringfort - rath	GLENAWILLIN
CO065-098	Ogham stone	GLENAWILLIN
CO065-102	Souterrain	TEMPLINACARRIGA SOUTH
CO065-108	Enclosure	CURRAGH (Barrymore By.)
CO066-001001	Graveyard	GLEBE (Barrymore By
CO066-001002	Church	GLEBE (Barrymore By
CO066-001003	Castle - unclassified	CASTLEQUARTER
CO066-002	Ringfort - rath	BALLYDONAGH MORE
CO066-026	Ringfort - rath	CASTLEQUARTER
CO066-027	Ringfort - rath	CASTLEQUARTER
CO066-043	Souterrain	SHEEPWALK
CO066-050----	Mill - corn	BALLYNONA SOUTH
CO076-016	Ecclesiastical enclosure	BALLYVODOCK WEST
CO076-020001	Walled garden	BALLYANNAN
CO076-020002	Gateway	BALLYANNAN
CO076-020003	House - fortified house	BALLYANNAN
CO076-020004 and 00516	Ballyannan House	Ballyannan
CO076-020005	Graveyard	BALLYANNAN
CO076-020006	Church	BALLYANNAN
CO076-021	Enclosure	BANESHANE
CO076-022	Enclosure	BALLYANNAN, GARRYDUFF (Barrymore By.)
CO076-024	Castle - unclassified	CASTLEREDMOND
CO076-025 and 1	Distillery	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-027001 and 00855	Cahermone Castle (in ruins)	Cahermone
CO076-029	Country house	ROXBOROUGH
CO076-030001	Graveyard	CHURCHTOWN (Barrymore By.)
CO076-030002	Church	CHURCHTOWN (Barrymore By.)
CO076-031	Ringfort - rath	CASTLEREDMOND

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO076-042002	Graveyard	BALLYNACORRA
CO076-042003	Church	BALLYNACORRA
CO076-043 and 00522	Ballynacorra House	Ballynacorra
CO076-044 and 00520	Rosehill House	Ballynacorra West
CO076-046	Souterrain	BALLYNACORRA EAST
CO076-050	Standing stone	GEARAGH (Imokilly By.)
CO076-051	Castle - tower house	COPPINGERSTOWN
CO076-052	Burial	COPPINGERSTOWN
CO076-063001	Graveyard	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063002 and 9	Church	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063003	Religious house - Cistercian monks	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063005	Historic town	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-063004 and 14	Market-house	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-066----	Ringfort - cashel	CARRIGSHANE
CO076-073001	Corn store	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-074 and 00521	Ballick Mills	Ballynacorra
CO076-075 and 0523	Industrial Buildings, Maltings	Ballynacorra West
CO076-080	Maltings	BALLYNACORRA WEST
CO076-091	Enclosure	BALLYVODOCK EAST
CO076-092	Linear earthwork	BALLYNABOINTRA, BALLYVODOCK EAST, BANESHANE, WATER-ROCK
CO076-102	Souterrain	GEARAGH (Imokilly By.)
CO076-107 and 7	Workhouse	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-111 and 00517	Grain Store	Ballynacorra
CO076-112 and 4	Mill - corn	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-115 and 2	Gasworks	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-108 and 10	School	SCHOOL-LAND
CO076-118	Souterrain	KILLEAGH (Imokilly By.)
CO077-047	Country house	STUMPHILL



<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO077-048 and 01117	Thatch house	Stumphill
CO077-049 and 00856	Ballyedkin House	Ballyedkin
CO077-050 01163	Thatch house	Loughaderry
CO077-051 and 00527	St. Colman's Catholic Church	Farrantrenchard
CO077-079	Enclosure	BALLYEDEKIN
<b>Protected Structures listed in Cork County Development Plan 2014</b>		
00393	Church of the Sacred Heart	Leamlara
00402	St. John the Baptist Catholic Church	Lisgoold
00405	Glebe house	Templenacarriga North
00425	Dungourney national school	Dungourney
00450	Dungourney Roman Catholic Church	Dungourney
00463	Lisgoold School House	Ballincurrig
00516 CO076-020004	Ballyannan House	Ballyannan
00517 CO076-111	Grain Store	Ballynacorra
00519	Lakeview House	Castleredmond
00520 CO076-044	Rosehill House	Ballynacorra West
00521 CO076-074	Ballick Mills	Ballynacorra
00522 CO076-043	Ballynacorra House	Ballynacorra
0523 CO076-075	Industrial Buildings, Maltings	Ballynacorra West
00527 CO077-051	St. Colman's Catholic Church	Farrantrenchard
00855 CO076-027001	Cahermone Castle (in ruins)	Cahermone
00856 CO077-049	Ballyedkin House	Ballyedkin
01022	Glenview House	Ballynaclashy
01117 CO077-048	Thatch house	Stumphill
01163 CO077-050	Thatch house	Loughaderry
00080	Thatch house	Ballyogaha West
<b>Protected Structures listed in the Midleton Local Area Plan 2013</b>		

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
1 CO076-025	Distillery	TOWNPARKS (Imokilly By., Middleton Par.)
2 CO076-115	Gasworks	TOWNPARKS (Imokilly By., Middleton Par.)
3	Redbrick Chimney Dickinson's Lane	TOWNPARKS
4 CO076-112	Mill - corn	TOWNPARKS (Imokilly By., Middleton Par.)
5	Midleton Railway Station	TOWNPARKS
6	Southern Health Board Health Centre	TOWNPARKS
7 CO076-107	Workhouse	TOWNPARKS (Imokilly By., Middleton Par.)
8	St. John the Baptist National School (the former)	TOWNPARKS
9 CO076-063002	Church	TOWNPARKS (Imokilly By., Middleton Par.)
10 CO076-108	School	SCHOOL-LAND
11	National Bank (former) at Lewis Bridge	TOWNPARKS
12	Old Dispensary Building (Youghal Road)	TOWNPARKS
13	Community Building next door to Old Dispensary	TOWNPARKS
14 CO076-063004	Market-house	TOWNPARKS (Imokilly By., Middleton Par.)
15	Courthouse, Main Street	TOWNPARKS
16	AIB Bank, Main Street	TOWNPARKS
17	No. 32 Main Street	TOWNPARKS
18	No. 101 Main Street, Old Bank House	TOWNPARKS
19	Nos. 32/33 Main Street	TOWNPARKS
20	Nos. 46 Main Street	TOWNPARKS
21	No. 85 Main Street	TOWNPARKS
22	No. 74 Main Street (T. Wallis & Sons)	TOWNPARKS
23	No. 6 Main Street (Hyde)	TOWNPARKS
24	No. 99 Main Street, Door and Fanlight	TOWNPARKS
25	No. 83 Main Street, Door and Fanlight	TOWNPARKS
26	No. 82 Main Street, Door and Fanlight	TOWNPARKS
27	Between AIB Bank and 103 Main Street	TOWNPARKS

<b>RMP and RPS</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
28	Between 103 and 102 Main Street (Vaulted)	TOWNPARKS
29	Between 102 and 101 Main Street	TOWNPARKS
30	Between Town Hall and 82 Main Street	TOWNPARKS
31	Between 75 and 76 Main Street	TOWNPARKS
32	Between 73 and 74 Main Street	TOWNPARKS
33	Between 3 and 4 Broderick Street	TOWNPARKS
34	Between 46 and 47 Main Street (Stone Arch)	TOWNPARKS
35	Between 49 and 50 Main Street (Vaulted Open)	TOWNPARKS
36	Between 6 and 5 Main Street, Vaulted Gate	TOWNPARKS
37	Between 3 and 4 Main Street (Arch Way)	TOWNPARKS
38	Post Box at corner of Connolly and Main Street	TOWNPARKS
39	Clonmult monument	TOWNPARKS
40	Lewis bridge	TOWNPARKS
41	Cobbled setts at entrance to mill Cuddigan's Yard	TOWNPARKS
42	Plaque at entrance to the Baby's Walk	TOWNPARKS
43	No. 81 Main Street Enclosed space to basement	TOWNPARKS
44	No. 55/56 Main Street McDaid's (Pugin House)	TOWNPARKS
45	Youghal Rd. parish Priest's Residence	TOWNPARKS
46	Youghal Road, Midleton Lodge	TOWNPARKS
47	No. 35 New Cork Road (Turret house)	TOWNPARKS
48	Courtney House, off McDermott Street	TOWNPARKS
49	Residence of the Dean of Cloyne, off McDermot Street	TOWNPARKS
50	Youghal Road, Midleton House	TOWNPARKS
51	Main Street, detached house, (Motherway's)	TOWNPARKS

**Table 7: Archaeological sites in the study area of local importance which are not considered key constraints**

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO054-070002-	Kiln - lime	RATHCOBANE
CO054-081----	Fulacht fia	TEMPLEBODAN
CO054-097	Ritual site - holy well	GARRYLAWRENCE
CO054-099----	Redundant record	DUNDULLERICK EAST
CO054-104001-	Fulacht fia	TEMPLEBODAN
CO054-104002-	Ritual site - holy well	TEMPLEBODAN
CO054-110----	Fulacht fia	WALSHTOWN BEG
CO054-120----	Kiln - lime	PEAFIELD (Barrymore By.)
CO054-121----	Kiln - lime	BALLYERRA
CO054-122----	Gateway	LEADINTON
CO054-124----	Bridge	BALLINCURRIG (Barrymore By.),TEMPLEBODAN,RIESK
CO054-127----	Kiln - lime	RATHCOBANE
CO054-128----	Kiln - lime	BALLYOGAHA WEST
CO054-134----	Fulacht fia	RATHCOBANE
CO054-139----	Field boundary	RATHCOBANE
CO054-142001-	Fulacht fia	PEAFIELD (Barrymore By.)
CO054-142002-	Fulacht fia	PEAFIELD (Barrymore By.)
CO064-043----	Designed landscape - tree-ring	LEAMLARA
CO064-108----	Fulacht fia	DOONEEN (Barrymore By.)
CO065-002----	Fulacht fia	CORBALLY NORTH (Barrymore By., Lisgoold Par.)
CO065-023----	Fulacht fia	TEMPLINACARRIGA SOUTH
CO065-024----	Fulacht fia	TEMPLINACARRIGA SOUTH
CO065-026----	Redundant record	CURRAGHCONDON
CO065-028----	Redundant record	WALSHTOWN BEG
CO065-029----	Redundant record	WALSHTOWN BEG
CO065-030----	Redundant record	SHANAVOUGHA
CO065-036----	Kiln - lime	GLENATHONACASH
CO065-044----	Ritual site - holy well	BALLYMARTIN (Barrymore By.)
CO065-045----	Ritual site - holy well	BALLYMARTIN (Barrymore By.)
CO065-048	Ritual site - holy well	BALLYCURRANY WEST
CO065-052----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-053----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-055----	Fulacht fia	LACKENBEHY (Barrymore By.)
CO065-065----	Fulacht fia	BALLYCURRANY EAST
CO065-077----	Fulacht fia	GORTACRUE
CO065-078----	Ritual site - holy well	BROOMFIELD EAST

<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO065-079----	Fulacht fia	BROOMFIELD EAST
CO065-080----	Excavation - miscellaneous	BROOMFIELD EAST
CO065-084----	Designed landscape feature	YOUNG-GROVE
CO065-085----	Designed landscape feature	YOUNG-GROVE
CO065-086----	Designed landscape feature	YOUNG-GROVE
CO065-087----	Designed landscape feature	YOUNG-GROVE
CO065-088----	Designed landscape feature	YOUNG-GROVE
CO065-089----	Designed landscape feature	YOUNG-GROVE
CO065-091----	House - vernacular house	WALSHTOWN BEG
CO065-092001-	Designed landscape - belvedere	BALLYEDMOND
CO065-093----	Bridge	BALLYEDMOND
CO065-095----	Kiln - lime	BALLYCURRANY EAST
CO065-099----	Fulacht fia	RATHORGAN
CO065-100----	Fulacht fia	KILLEAGH (Barrymore By., Ballycurrany Par.)
CO065-103----	Fulacht fia	WALSHTOWN MORE (East)
CO065-104----	Fulacht fia	WALSHTOWN MORE (East)
CO065-105----	Fulacht fia	WALSHTOWN MORE (East)
CO065-106----	Burnt mound	WALSHTOWN MORE (East)
CO065-107----	Fulacht fia	BALLYNONA SOUTH
CO066-023----	House - vernacular house	DUNGOURNEY
CO066-028----	House - vernacular house	BALLYNONA SOUTH
CO066-029----	Ritual site - holy well	BILBERRY
CO066-030----	Redundant record	BALLYMACOOLY MORE
CO066-049----	Gate lodge	BALLYNONA SOUTH
CO066-081----	Fulacht fia	BALLYNACOLE
CO076-004----	Cave	PARK NORTH (Imokilly By.)
CO076-017----	Designed landscape - tree-ring	BALLYRICHARD MORE
CO076-018----	Kiln - lime	WATER-ROCK
CO076-023----	Kiln - lime	GARRYDUFF (Barrymore By.)
CO076-026----	Fulacht fia	KILLEAGH (Imokilly By.)
CO076-028----	Kiln - lime	CAHERMONE
CO076-042001-	Mound	BALLYNACORRA
CO076-045----	Kiln - lime	BALLYNACORRA WEST



<b>RMP</b>	<b>SITE TYPE</b>	<b>TOWNLAND</b>
CO076-053----	Kiln - lime	GEARAGH (Imokilly By.)
CO076-062----	Pit-burial	OATENCAKE
CO076-064----	Fulacht fia	CASTLEREDMOND
CO076-073002	Bridge	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-081----	Architectural fragment	CAHERMONE
CO076-104----	Field system	BALLYVODOCK EAST
CO076-105----	Fulacht fia	BALLYVODOCK EAST
CO076-106	Bridge	TOWNPARKS (Imokilly By., Middleton Par.)
CO076-134----	Burnt mound	PARK NORTH (Imokilly By.)
CO076-136----	Fulacht fia	WHITEROCK
CO077-001----	Mound	BALLYEDEKIN

## **Appendix 3.8.1**

Landscape Character Type  
Definitions and County  
Development Plan Landscape  
Objectives

### 3.8.1 Landscape Character Type Definitions

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#### **LCT 1 – ‘City Harbour and Estuary’**

Described as “a mix of rural and intensely urban areas, combined with a large expansive harbour. To the south of the city, the western side of the harbour supports major industrial development, while on higher ground telecommunication masts or water storage towers punctuate the skyline. The harbour includes large islands, which, along with much of the harbour shore, comprises landscape of fertile farmland which slopes gently to the sea. The rural areas around much of the greater harbour area are now characterised by a prevalence of infrastructure such as roads, bridges and electricity power lines and some urban sprawl.”

#### **LCT 10b – ‘Fissured Fertile Middleground’**

Running “broadly between Macroom to the west and the county boundary to the east. This landscape type, as a middleground, has characteristics of both the flatter fertile farmland type (Fertile Plain with Moorland Ridge) and the higher marginal hilly or rugged type (Rolling Marginal and Forested Middleground). It comprises an area rising above adjacent plains with moderate to low relief of elongated interlocking hills forming sinuous rivers. It is an elevated landscape, which is sequentially fissured by these rivers and their valleys. Many of the rivers in the western parts extend beyond this landscape type and feed into the River Lee and Bandon River while those to the east head southwards to the sea.”

#### **LCT 6b – ‘Broad Fertile Lowland Valleys’**

Described as stretching “east from the environs of Cork City and is located east of Midleton and along the valley of the River Womanagh. Landcover comprises a mosaic of regularly shaped fields typically of medium size. The fields throughout this landscape are bounded mostly by mature broadleaf hedgerows but also by post and wire fencing.”

### 3.8.2 County Development Plan Landscape Objectives

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#### **County Development Plan Objective GI 6-1: Landscape**

The Cork County Development Plan 2014 lists a number of objectives in relation to landscape in Chapter 13. These include;

- Protect the visual and scenic amenities of County Cork’s built and natural environment;
- Landscape issues will be an important factor in all land use proposals, ensuring that a proactive view of development is undertaken while maintaining respect for the environment and heritage generally in line with the principle of sustainability;

- Ensure that new development meets high standards of siting and design;
- Protect skylines and ridgelines from development; and
- Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments.

A number of recommendations are outlined in regard to LCT 1 – ‘City Harbour and Estuary’, LCT 10b ‘Fissured Fertile Middleground’ and 6b ‘Broad Fertile Lowland Valleys’, some of which relate potentially to the proposed development such as:

#### **LCT 1 – City Harbour and Estuary**

- Protect the north and south ridges and hillsides around the city, to ensure the protection of the visual backdrop to the city. These ridges would be adversely affected by unsympathetic development this interfering with views of special amenity value to the city and surrounding area.

#### **LCT 10b – Fissured Fertile Middleground**

- The majority of this landscape is farmed relatively intensively therefore the promotion of agriculture as the major land use in this LCT will help maintain the existing features of the landscape while also supporting the local economy and rural diversification.
- Provide incentives to landowners to improve condition of farmland, including management of hedgerows and tress in field boundaries.
- Maintain and enhance views to and from areas of visual value including extensive uninterrupted views across open countryside.
- Maintain the visual integrity of the area which has retained a dominantly undisturbed upland character.

#### **LCT 6b - Broad Fertile Lowland Valleys**

- Recognise that the lowlands are made up of a variety of working landscapes that are critical resources for sustaining the economic and social well-being of the county.
- Ensure further planting of deciduous trees as they are dominant feature in this landscape and their continuation is important in retaining this landscape setting.

## **Appendix 4.1**

**Midleton FRS Public  
Consultation Report May 2017**



Cork County Council

**River Owenacurra & River  
Dungourney (Midleton) Flood  
Relief Scheme**

**Public Consultation Report**

REP/1

Issue | 9 May 2017

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    **252803-00**


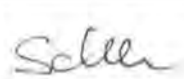

**Ove Arup & Partners Ireland Ltd**

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**ARUP**

# Document Verification

# ARUP

<b>Job title</b>		River Owenacurra & River Dungourney (Midleton) Flood Relief Scheme		<b>Job number</b>		252803-00		
<b>Document title</b>		Public Consultation Report				<b>File reference</b>		
<b>Document ref</b>		REP/1						
<b>Revision</b>	<b>Date</b>	<b>Filename</b>	Midleton FRS Public Consultation Report Issue 1_8.05.2017.docx					
Issue 1	8 May 2017	<b>Description</b>	Issue 1					
			Prepared by		Checked by		Approved by	
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		Name						
		Signature						
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## Appendices

### Appendix A Consultation

# 1 Public Consultation

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This section provides details and analysis of the first Public Consultation (Public Information Day).

## 1.1 Public Consultation Arrangements

### 1.1.1 Public Information Day

A public information day (PID) was held on Thursday 23 March 2017 in the Midleton Park Hotel. The purpose of the PID was to present the Study Area to the general public and to outline the process involved in the preparation for the Midleton FRS.

The PID was held between 3pm and 8pm for members of the general public. The objectives of the Public Information Day were:

- To explain the process involved in the development of the flood relief scheme.
- To gather information from the public regarding their:
  - Experiences of flooding.
  - Thoughts on solutions to the flooding problem and their preferences in this regard.
  - Thoughts on environmental issues, and
  - Thoughts on constraints with regard to environmental issues and implementation of solutions etc.

A presentation was made to elected representatives prior to the PID consultation on 6 March at Midleton Town Council. The PID was attended and staffed by members of Arup's engineering and environmental teams and representatives of Cork County Council and the Office of Public Works, who were available to answer questions from the members of the public who attended, and to explain the Study Area and the flood relief scheme process, while accepting information from the attendees.

#### 1.1.1.1 Advertising of the Public Information Day

Arup prepared publicity leaflets, brochures, posters, and letters to stakeholders, newspaper and radio advertisements. Advertising of the PID was undertaken in the local printed press and on local radio shows in the week preceding the event, as follows.

Advertisements in Local Press:

- Irish Examiner
- Evening Echo
- Cork Independent
- Cork News

#### Advertisements on Local Radio:

- 96 FM and C103
- Red FM
- Cork City Community Radio

The event was also publicised through the Cork County Council website and a number of articles written by various local and national news websites;

- [www.irishexaminer.com](http://www.irishexaminer.com) (19 March 2017)
- [www.rte.ie](http://www.rte.ie) and tweeted by RTÉ journalist [@PaschalSheehy](https://twitter.com/PaschalSheehy) (23 March 2017)
- [www.opw.ie](http://www.opw.ie) and tweeted by [@opwireland](https://twitter.com/opwireland) (15 March 2017)
- [www.corkindependent.com](http://www.corkindependent.com) (23 March 2017)
- [www.eastcorkjournal.ie](http://www.eastcorkjournal.ie) (23 March 2017)
- [www.c103.ie](http://www.c103.ie) (23 March 2017)

In addition, letters were delivered to 7,000 local residents.

#### 1.1.1.2 Literature Available for the Public Information Day

Information leaflets, posters and questionnaires were available at the PID on the 23 March. Copies are provided in **Appendix A**. The return date for receipt of completed questionnaires was the 28 April 2017. Information in addition to the questionnaires was also accepted on the day of the event or subsequently by post, by using the stamped addressed envelopes which were distributed. Letters of response and also information provided in the questionnaires are presented in **Appendix A**.

### 1.2 Public Consultation Materials

#### 1.2.1 Public Consultation Information Leaflet

A Constraints Study Public Consultation information leaflet was produced for the scheme. The information leaflet showed the Study Area under consideration and provided a brief explanation as to the process involved and the options being considered. The information leaflets were freely available to the members of the public and interested parties, both during and after the PID. A copy of the information leaflet is attached in **Appendix A**.

#### 1.2.2 Public Consultation Questionnaire

A questionnaire with pre-printed questions was provided to each attendee, in association with the information leaflet. This provided an opportunity for members of the public to express their views on the Study Area shown and to provide information regarding flooding in their area, in addition to other comments they may have had relating to any design or the Environmental Constraints Study. A copy of the blank questionnaire is attached in **Appendix A**.



### 1.2.3 Pubic Consultation Posters

Posters exhibited during the PID Constraints Study Consultation included the following information:

- Constraints Study – including Primary Constraints.
- Public Involvement.
- Scheme Objectives and Overview.
- Planning Process for the Proposed Scheme.
- Flood Relief Scheme Process.
- Map of Flood Relief Scheme area.
- Map Highlighting Areas Affected by the December 2015 Flood Event.

Copies of the posters are included in **Appendix A**.

### 1.2.4 Project Website

A dedicated website, to make details of the Midleton FRS, has been set up and is live. The website address [www.midletonfrs.ie](http://www.midletonfrs.ie) was publicised at the PID, and attendees were informed that all information on display at the public exhibition, including information leaflets, posters, questionnaires etc. would be available for download from the website.

It is intended to keep the website live for the duration of the scheme and for it to become a destination for interested members of the public to get project information and news and where project documentation can be made available for download.

## 1.3 Public Information Day Exhibition

### 1.3.1 Numbers of Public Attendees

Members of the public visiting the exhibition were invited to sign a visitors' list to enable a record of the number of attendees to be maintained. A total of 88 attendees signed the attendance list at the event in the Midleton Park Hotel. However, the total attendance was estimated to be between 100 and 110 persons.

## 1.4 Public Consultation Response

Visitors to the exhibition are considered to have, in the main, a good understanding of the proposals as presented at the exhibition. Feedback was generally positive. Most of those that attended had a particular interest in properties or lands in the Study Area and explained the extent to which their properties had been affected by previous flood events and what they considered to be the contributing factors that resulted in the flooding.

Information was provided by the public which identified areas in which they felt works should be undertaken to alleviate flooding.

Information provided at the PID by a number of attendees is summarised below.

#### **1.4.1 Information Provided Verbally at the PID**

A summary of the information relating to previous flood events and which was provided verbally at the PID is as follows:

- Resident of the Willowbank Estate stated that the only reason the entire estate avoided flooding during the December 2015 storm event was due to a block work wall at the northern boundary of the site.
- Midleton residents expressed concerns over not being granted insurance cover for flood damage and the cost associated with repeat flooding in the future before the scheme is constructed.
- Members of the Midleton Rugby Club and residents of Lauriston Estate stated that the cause of their property flooding during the December 2015 event, was due to a trench box installed by Cork County Council, blocking the drainage ditch, which is located just downstream of where the Dungourney river crosses the railway line.
- A landowner living just south of the railway line, on Upper Mill Road, voiced concerns that the regrading of the road to cater for the level crossing was the sole reason they and others avoided serious flood damage during the 2015 storm event.
- One landowner expressed an interest in their plot of land and if the proposed scheme would result in the area being re-categorised, from a non-development zone due to it being located on a flood plain.
- A number of residents asked about the availability of funding of the project and timescale for start and finish of construction phase.
- Some suggested considering of tidal barrier in order to reduce flooding of the town.
- General discussion included local experiences when/where flooding arises, the huge clean up and costs afterwards, particularly if there is sewage in the flood waters.

As a whole attendees were very engaged and gave detailed information relating to previous flood events which will be of great value to the project.

#### **1.4.2 Returned Questionnaires**

By 28 April 2017, which was the closing date for receipt of comments, a total of 25 questionnaires were returned.

#### **1.4.3 Other Submissions**

In addition to the returned questionnaires, other submissions were received by post following the PID. These comprised of the following:

- An unsigned letter.  
The anonymous submission suggested erecting signs or cameras along the Leamlara/Ballycrana Roads to deter people from disposing of their

“rubbish and garden waste” in the rivers. They also suggest taking an education based approach to inform people of “the damage they are doing to the water and countryside”.

- A letter from Transport Infrastructure Ireland (TII).

TII's response stated that the proposed flood relief scheme must consider all existing and future national road networks in the area (N25 Midleton to Youghal) and assess what impact the scheme may have on these road networks. The letter also requested that TII Publications are referred to when conducting an Environmental Impact Assessment particularly when considering noise and air quality impacts during the planning and construction stage. Where appropriate TII requested a Traffic and Transport Assessment be carried out to assess traffic volumes during the construction stage and all haul routes are clearly identified.

- A letter from An Bord Pleanála.

An Bord Pleanála's letter stated they “will not be making any comments/observations in relation to the matter”.

- A letter from Inland Fisheries Ireland (IFI).

The letter from IFI stated that any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive and that in this context the current assessment should be a catchment wide process. The letter also referred to the significance of the rivers involved in terms of fisheries. Measures for the assessment of existing conditions and for assessment of impacts, at the EIS stage were also included in the letter.

- A letter from the Health Service Executive (HSE).

The HSE's submission commented on the possible Environmental Health Impacts of the development. The letter referred to the potential permanent, long term and temporary Impacts of the proposed project and requested that measures be taken to mitigate the Impacts to Midleton Town and Hospital, particularly during the projects construction stage. The HSE also requested that consideration for changes in the local environment and impact on the water course catchment areas be taken.

- A letter from Councillor Noel Collins.

The letter from Councillor Noel Collins gave an overview of flooding in the Midleton area and expressed a need for an up to date flood relief scheme to replace the current sandbag defence approach. Mr Collins referred to the Swedish Flood Defences System - Geodesign Barriers in detail and suggested that it would be a suitable system to be implemented in Midleton.

- A report from Michael Loftus on behalf of the Willowbank Flood Defence Task Force.

The Willowbank Flood Defence Task Force Report outlined the actions taken by Willowbank residents in the aftermath of the December 2015 flood event. The Task Force also put forward a number of findings and recommendations based on experiences during the flood event. The report was accompanied by maps and photographs taken during and after the flood event.

- A time sequence of flooding event at Lauriston Park and Lauriston Mews 30/31 December 2015.

The Lauriston Park and Mews time sequence gave details of the December 2015 flood event from 6.30pm on the evening on 30 December to 4.30pm on the afternoon of the 31 December. The report highlighted the depth of water at various locations during this period and what actions were taken by local residents, the fire brigade, Cork County Council and the Civil Defence.

- A letter on behalf of the Residents Group on the L3619 (Ballyvodock Road) and surrounding area.

The letter from the Residents Group on the L3619 highlighted inconsistencies in the category of Flood Zone applied to the area. They state that the Lee CFRAMS maps do not accurately reflect the flood risk in the area. The group expressed concern over the suitability of the local drainage network and the increased pressure the system would be put under, should there be any further development in the area. The letter listed the 7 dates on which the L3919 since November 2009.

Copies of the above letters and reports are provided in **Appendix A** of this report.

## 1.5 Analysis of Public Consultation Response

### 1.5.1 Analysis of Questionnaires

In total, the Design Team received 25 completed questionnaires. Responses suggest that 21 rent or occupy a property within the Study Area and therefore have a direct interest in flooding at Midleton or have previously been affected by the historical flood events. Outlined below is a summary of the information provided in the questionnaires.

#### 1.5.1.1 Flooding Information (from Questionnaire)

When asked about previous flood events, 20 of the respondents had personal experience with previous flood events, with the majority of those affected by the December 2015 flood event (18). 11 of the properties affected were residential while six were office or retail properties. Other properties affected were open space, Midleton Rugby Club playing pitches and farm land.

Information provided by respondents with regard to previous flood events was that:

- In the Midleton Area, flooding was mainly from the river/stream with 18 reports. There were eight reports of overground (surface water flow) and seven reports of flooding from drains.

12 of the respondents had put in place measures to prevent or reduce the impact of flooding, these measures included:

- Investing in sandbags.
- Installing non-return valves.

- Installing individual property protection (door and window flood barriers).
- Rising high risk equipment.
- Setting up a flood committee.
- Sending a report to Cork County Council.
- Installing Aco drains.

A full list of the comments is provided in **Appendix A**.

### 1.5.1.2 Flood Alleviation Information

When asked in Question 13 of the questionnaire if they had a preference for the type of flood alleviation method, the various methods were ranked as follows;

- 1) 'Flow Reduction (e.g. upstream catchment management and flood storage)'.
- 2) 'Flood Containment through the Construction of Flood Defences'.
- 3) 'Increase the Conveyance of the Channel'.
- 4) 'Flow Diversion (e.g. river diversion or flood flow bypass channel)'.
- 5) 'Pump storm waters from behind flood defences'.
- 6) 'Sediment Deposition and Possible Sediment Traps'.
- 7) 'Non-structural Measures (e.g. flood warning systems or individual property protection)'.
- 8) 'Reconstruction of Properties and/or infrastructure to a higher level'.
- 9) 'Re-location of Properties and/or Infrastructure'.
- 10) 'No works (Do Nothing)'.

When asked in Question 14 of the questionnaire how they thought the issue of flooding could be resolved, the main suggestions proposed by respondents are summarised as follows:

- Maintain/build up river banks.
- Dredge/keep rivers clean of fallen trees and rubbish.
- Stop covering flood plains and water meadows with concrete.

A full list of the comments is provided in **Appendix A**.

### 1.5.1.3 Environmental Constraints

Question 15 of the Questionnaire was to rank the importance of each of seven environmental topics. These topics and the responses are summarised in the following **Table 1.1**.



Table 1.1: Summary of Question 15 of the Questionnaire ranging the importance of each of seven environmental topics.

Topic	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
Flood Related Socio-Economic & Social Issues	72%	18%	5%	5%	0%
Flora & Fauna	5%	40%	20%	15%	20%
Local Fisheries	14%	19%	33%	14%	19%
Habitats	14%	38%	10%	29%	10%
Water Quality	82%	5%	5%	5%	5%
Architectural & Cultural Heritage	5%	26%	32%	26%	11%
Landscape & Visual Amenity	9%	36%	32%	18%	5%
Angling, Tourism & Recreation	19%	19%	24%	29%	10%

The above table indicates that ‘Water Quality’ was considered the most important of the environmental constraints, with 82% of respondents indicating that it was ‘Very Important’. ‘Flood Related Socio-Economic & Social Issues’ was indicated by 72% of respondents to be ‘Very Important’.

‘Flora and Fauna’, ‘Habitats’ and ‘Landscape & Visual Amenity’ were mainly considered to be ‘Important’, whilst ‘Local Fisheries’ and ‘Architectural & Cultural Heritage’ were mainly considered to be ‘Moderately Important’. ‘Angling, Tourism & Recreation’ were mainly considered to be ‘Of little Importance’.

Not all respondents completed this question or completed this question fully, therefore this should be borne in mind when drawing to conclusions from the responses to this question.

In addition, the respondents were given the opportunity to provide comments specific to each of the environmental topics.

A full list of the comments is provided in **Appendix A**.

#### 1.5.1.4 Conclusion

The Public Consultation was held to inform the general public of the Constraints Study and preliminary aspects of the Midleton FRS and to obtain information about flooding or other relevant environmental information about the Study Area presented. Interested persons were able to consult the consultation materials, have relevant questions answered and take away an information leaflet setting out the project for future reference.

Valuable information and comment was received on the PID, and also received subsequently.

The overall feedback from the public was positive.

## **1.6 Presentation to Cork County Council Public Representatives**

Arup gave a presentation to the Municipal Town District (incl. County Councillors) at Midleton Town Council about the study on 6 March 2017.

# Appendix A

## Consultation

## A1 List of Consultees

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The list of consultees is provided overleaf.

Table A1.1: List of Consultees

Organisation	Interest
An Bord Pleanala	Planning
An Comhairle Ealaíon (The Arts Council)	Development of the Arts
Angling Council Ireland	Fisheries and the marine environment
Angling in Ireland - The Irish Federation of Pike Angling Clubs	Fisheries and the marine environment
An Oige	Youth hostels and outdoor events
An Taisce - The National Trust for Ireland	Heritage and conservation
Archaeology Section, Heritage Unit, Cork County Council	Heritage Sites
Bat Conservation Ireland	Bat conservation
Birdwatch Ireland	Ecology (in particular birds) and conservation
Bord Gáis Networks	Gas networks
Faite Ireland	Tourism
BSBI Recorder	Recording of flora
Coillte Teoranta	Owns and manages forest and associated parks
Commission for Electricity Regulation	Energy regulation
Conor Kelleher, Bat Consultant	Bat recording and conservation
Cork & District Angling Club	Fisheries and the marine environment
Cork Business Association	Local business interests
Cork Chamber of Commerce	Promotion, development and expansion of commercial life in the Cork region
Cork County Council	Local issues
Biodiversity Officer	Flora and fauna
Environment Directorate	Local environmental issues
Divisional Manager	Local issues
Development Board	Integration of the economic, social and cultural development of Cork County.
Cork Environmental Forum	Local umbrella organisation with an interest in promoting sustainable development
Cork Federation of Gun Clubs	Shooting and conservation issues
Cork GAA	GAA sports issues
Cork Historical & Archaeological Society	Historical and archaeological issues
Discover Ireland	Tourism issues
Department of Agriculture, Food and Marine	Agriculture, food and marine issues



Organisation	Interest
Department of Arts Heritage & the Gaeltacht	Arts Heritage
Department of Communications, Energy & Natural Resources	Communications, Energy and Natural Resources
Department of Housing, Planning, Community and Local Government	Housing, Planning, Community and Local Government
Department of Tourism, Transport and Sport	Tourism, Transport and Sport
Department of Arts, Heritage, Regional, Rural & the Gaeltacht	Architectural and archaeological heritage and nature conservation
Eircom	Eircom services
Electricity Supply Board	ESB services
ENFO	Public environmental and sustainable development services
Environmental Protection Agency Regional Inspectorate	Environmental issues
Environmental Sciences Association of Ireland	Environmental issues
Faite Ireland	Tourism
FISSTA - Federation of Irish Salmon & Sea Trout Anglers	Salmon and Sea trout issues
Forest Service (Dept. of Agriculture)	Forestry issues
Geographical Society of Ireland	Status and study of geography
Geological Survey of Ireland	Local geology and geological heritage
Health & Safety Authority	H & S
Health Service Executive	H & S
HSE Southern Regional Health Forum	Human health
Inland Fisheries Ireland Macroom	State agency responsible for protection management and conservation of inland fisheries and sea angling resources
Institute of Geologists of Ireland	Promotion of geology and geosciences and
Irish Creamery Milk Suppliers Association (ICMSA)	Represents the views of dairy farmers
Irish Farmers Association (Cork Region)	Farming
Irish Heritage Trust	Heritage
Irish Planning Institute	Represents professional planners
Irish Wildlife Trust	Nature and conservation
Landscape Alliance Ireland	Landscape quality
National Association of Regional Game Councils	Game shooting and conservation

Organisation	Interest
National Building Agency	Sustainable communities and development
National Federation of Group Water Schemes	Represents community-owned rural water services Ireland
National Monuments Service	Heritage
National Museum of Ireland	Collection and preservation of Ireland's portable material heritage and natural history
National Parks & Wildlife Service	Flora and fauna
Transport Infrastructure Ireland	National road network
National Trails Office	Recreational trails
Office of Public Works	Flooding
Railway Procurement Agency	Local rail
Salmon Research Agency of Ireland	Salmon research
Southern & Eastern Regional Assembly	
South-western River Basin District Office	River Basin management
Teagasc	Agriculture and the environment
The Heritage Council	Heritage Sites
The Meteorological Service	Weather and climate. Agricultural and environmental services
The Mining Heritage Trust of Ireland	Conservation of mining heritage
Tourism Ireland	Tourism
Voice of Irish Concern for the Environment	Environmental issues
Discover Ireland	Tourism
Electricity Supply Board	ESB services
Irish Water	Water services
Midleton RFC	Local Rugby
Midleton Hurling and Football Club	Local GAA
Midleton Football Club	Local football
East Cork Golf Club	Local golf
Water Rock Golf Course	Local golf
Midleton Floods Committee	Local flooding events
Midleton and Area Chamber	Promotion, development and expansion of commercial life in the local area
Midleton and Area Chamber & Midleton Traders	Local business interests
SECAD Ltd	Regional development, Environmental and Social
Bus Éireann	Local roads network
Cork National Road Design Office	Regional road network

Organisation	Interest
Port of Cork	Marine and environmental
The Heritage Council (An Chomhairle Oidhreachta )	Heritage Sites
County Councillors Mr Noel Collins Mr Aaron O'Sullivan Mr Michael Hegarty Ms Susan McCarthy Ms Mary Lenihane Foley Ms Danielle Twomey	Local Issues
County Mayor: Mr Seamus McGrath	
Dr Pdraig Whelan (UCC)	Plant issues
Dr Patrick Sleeman (UCC)	Wildlife issues, in particular Otter

## A2 Letter of Consultation

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A copy of the letter of consultation is provided overleaf.

Your ref  
Our ref 252803-00  
File ref L0001

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10 March 2017

Dear Sir/ Madam

## 252803-00 River Owenacurra & River Dungourney (Midleton) Flood Relief Scheme Public Information Day

Arup has been appointed by Cork County Council to develop a Flood Relief Scheme for the River Owenacurra & River Dungourney, particularly in the vicinity of the Midleton Area. An Environmental Impact Statement will be prepared as part of this work. This project follows on from the Lee Catchment Flood Risk Assessment and Management Study (CFRAMS) and the major flood event of December 2015.

The Study Area for the scheme is shown in red on the enclosed map. In advance of the preparation of a full Engineering Study, it is not possible at this point to say exactly what flood alleviation measures will be proposed as part of the Flood Relief Scheme, however the range of flood measures typically considered are included on the enclosed sheet for your information.

The first stage of the project is to prepare a Constraints Study in order to identify the key issues (including environmental issues) in the study area which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the viability and/or design of these measures.

A Public Information Day will be held in The Midleton Park Hotel on the 23 March between 3:00pm and 7:00pm.

**Directors** Eoghan Lynch (Chairman) Joe Burns Paul Coughlan Denis Crowley Philip Dilley (British) Michael Evans Gregory Hodkinson (Australian) Liam Luddy  
Donal McDaid Fergus Monaghan **Company Secretary** Ken Freeman

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The objectives of the Public Information Day are:

- To explain the process involved in the development of the flood relief scheme
- To gather information from the public regarding their:
  - Experiences of flooding.
  - Thoughts on solutions to the flooding problem and their preferences in this regard.
  - Thoughts on environmental issues, and
  - Thoughts on constraints with regard to environmental issues and implementation of solutions etc.

Alternatively, if you are unable to attend the Public Information Day, you are invited to submit your comments in writing to:

*Middleton Flood Relief Scheme*  
*Arup*  
*50 Ringsend Road*  
*Dublin 4*

or email us at [middletonfrs@arup.com](mailto:middletonfrs@arup.com).

We would welcome your comments in relation to the study area and particularly in relation to any relevant issues associated with a potential Flood Relief Scheme.

A second public consultation will take place later on this year prior to preparation of the Environmental Impact Statement for the scheme, at which stage details of the emerging preferred option will be available. You will be given a further opportunity to comment at this stage.

For further information please visit [www.middletonfrs.ie](http://www.middletonfrs.ie).

Yours sincerely  
for  
Ove Arup & Partners Ireland Ltd t/a Arup



Wolfram Schluter

Enc



## **A3 Leaflet Accompanying Consultation Letter**

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A copy of the leaflet which accompanied the letter of consultation is provided overleaf.

# Midleton

(Owenacurra / Dungourney)

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**Public Information Day**  
23rd March 2017  
The Midleton Park Hotel  
3pm – 8pm



ARUP



Arup has been appointed by Cork County Council to undertake the design and implementation of the proposed Midleton (River Owenacurra / Dungourney) Flood Relief Scheme.

This is the first public consultation day for the project; its objective is to gather information from the public about their experiences of flooding in the Study Area along with their thoughts on possible solutions to the flooding problem and their preferences in this regard. Local experience, knowledge and insight is an essential pre-requisite for any successful Flood Relief Scheme. We also welcome any thoughts on potential environmental issues within the Study Area, in particular thoughts on constraints with regard to environmental issues and implementation of solutions.

### **Purpose Of The Project**

The purpose of the Midleton Flood Relief Scheme is to assess and develop a viable, cost effective and sustainable Flood Relief Scheme to alleviate flooding along the Owenacurra and Dungourney Rivers.

### **Current Position**

The OPW in partnership with Cork City and Cork County Councils have carried out a Catchment Flood Risk Assessment and Management (CFRAM) Study for the Lee Catchment. The Draft Catchment Flood Risk Management Plan was published in February 2010 and recommended the following for the Midleton sub-catchment;

- Review feasibility of Fluvial Flood Forecasting System
- Targeted Public Awareness and Education Campaign
- Permanent Flood Walls and/or Embankments

As a result Cork County Council, acting as Agents for the OPW has now commissioned this project to develop a Flood Relief Scheme for Midleton. The Study Area for the project is outlined in red on the map to the right.

### **What is a Constraints Study?**

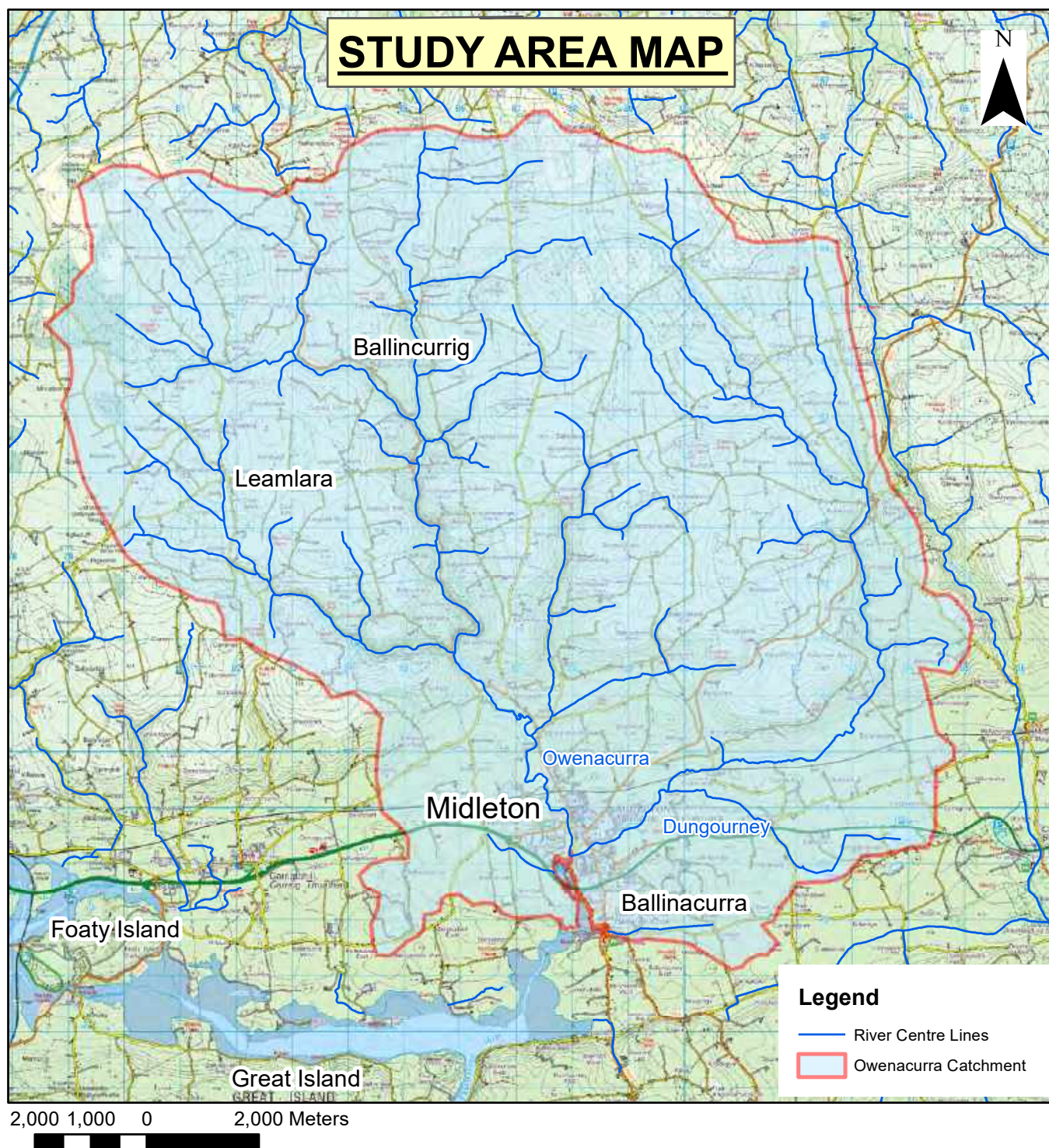
A Constraints Study identifies the key environmental issues in a study area which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the design and viability of these measures.

### **Engineering Study**

The Engineering Study will assess a range of engineering measures typically considered for possible flood alleviation schemes including, but not limited to those listed in the box to the right. Typically an Engineering Study of this nature may identify between three and five viable options.







### Potential Flood Alleviation Measures

- Do nothing (i.e., implement no new flood alleviation measures)
- Non-Structural Measures (e.g. flood warning system or individual property protection)
- Relocation of properties and/or infrastructure
- Reconstruction of properties and/or infrastructure at a higher level
- Flow Diversion (e.g. river diversion or flood flow bypass channel)
- Flow Reduction (e.g. upstream catchment management or flood storage)
- Flood Containment through Construction of Flood Defences
- Increase Conveyance of Channel (upstream and/or through and/or downstream of the town)
- Sediment Deposition and Possible Sediment Traps
- Pump storm waters from behind flood defences

## What Happens Next?

All comments received in response to this Public Information Event will be considered by Cork County Council and will be taken into account in the preparation of the first stage of the Midleton Flood Relief Scheme Engineering Study and Environmental Impact Assessment.

The Environmental Impact Assessment and Engineering Study for the Midleton Flood Relief Scheme will be delivered in the following stages:

Environmental Impact Assessment		Engineering Study	
Stage I	Constraints Study (this stage)	Stage I	Scheme Development
	Invasive Species		Data Gathering, Surveying and SI
	Prelim. Screening		Hydrology Study & Hydraulic Modelling
	Environmental Assessment of Viable Options		Flood Risk Management Options
	Environmental Impact Statement and Appropriate Assessment		Selection of Preferred Option
Stage II	Public Exhibition or Part 8 Planning	Stage II	Public Exhibition
		Stage III	Detailed Design
		Stage IV	Construction

## Your Feedback is Important

Cork County Council wishes to consider all viewpoints in relation to the Study Area being examined. This is your opportunity to take part at the early stages of the planning of the Midleton Flood Relief Scheme. Time spent communicating your views to Cork County Council is appreciated.

The general public and all interested parties are invited to give their opinions on the Study Area. Please examine the Study Area shown overleaf and let your views be known by:

- Completing and returning the attached questionnaire using the stamped self addressed envelope provided one month after the Public Information Day.
- Emailing us at [midletonfrs@arup.com](mailto:midletonfrs@arup.com)
- Writing to the address below using the stamped and addressed envelope provided, by Friday 28th April 2017
- Website: [www.midletonfrs.ie](http://www.midletonfrs.ie)

## Further Information

Wolfram Schluter  
Project Manager

50 Ringsend Road  
Dublin 4  
D04 T6X0  
Ireland

t +353 1 233 4455

e [midletonfrs@arup.com](mailto:midletonfrs@arup.com)

## Outline Delivery Programme

Stage	Description	Key Dates
Stage I	Development of a number of flood defence options and the identification of a preferred Scheme	Complete by Autumn 2018
Stage II	Public Exhibition of Scheme	Complete by Summer 2019
Stage III	Detailed Design, Confirmation and Tender	Complete by Summer 2020
Stages IV and V	Construction and Handover of the Works	Commence Summer 2020

## A4 Posters

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Copies of the posters are provided overleaf.



# Midleton (Owenacurra / Dungourney) Flood Relief Scheme



## Constraints Study

A Constraints Study is currently being undertaken by the Project Design Consultants. The purpose of the Constraints Study is to determine and document the constraints that may inform the selection and design of the proposed Flood Alleviation Measures.

## Primary Constraints

A range of constraints is being considered including the following topics:

- Flood Related Socio-Economic and Social Issues
- Flora and Fauna
- Fisheries
- Habitats
- Water Quality
- Archaeological, Architectural and Cultural Heritage
- Landscape and Visual Amenity
- Angling, Tourism and Recreational Use



ARUP

# Midleton (Owenacurra / Dungourney)

## Flood Relief Scheme



### Public Involvement

Consultation will be undertaken throughout the process to ensure that the views of the public and other stakeholders are taken into account.

The purpose of this initial Public Information Day (PID) is to:

- Provide information about the Objectives of the Scheme
- Outline the Design and Statutory Process
- Provide an Opportunity for Comment at a preliminary stage
- Gather information about Environmental Constraints
- Obtain other information relevant to the Scheme

Following this initial public consultation, there will be further opportunities for involvement through attendance at future information days, when updates on the scheme progress will be presented. A questionnaire is available for you to complete and return with your own comments.

Members of the project team are present today to answer any questions you have, or take note of any relevant information.



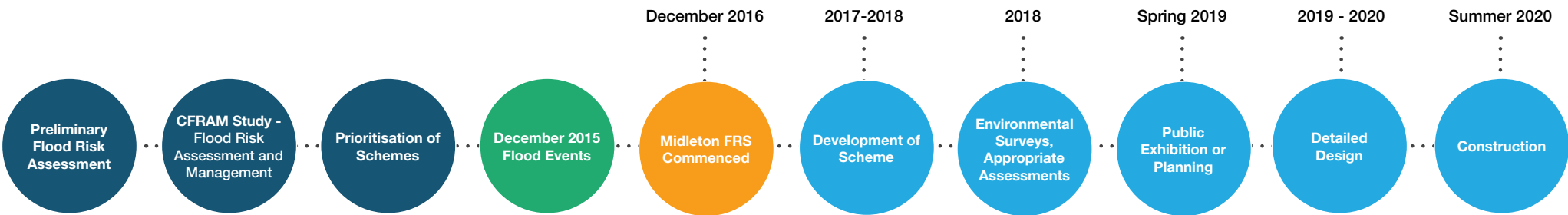
ARUP

# Midleton (Owenacurra / Dungourney) Flood Relief Scheme

## Scheme Objectives and Overview

The Office of Public Works (OPW) has carried out a Catchment Flood Risk Assessment and Management (CFRAM) Study for the Lee Catchment. From this study, the draft Catchment Flood Risk Management Plan, published in February 2010, set out a range of potential flood risk management options for particular areas within the catchment. Cork County Council has now commissioned an Engineering and Environmental Study to assess and develop a viable, cost-effective and sustainable Flood Relief Scheme. A report will be prepared describing the findings of the Engineering and Environmental Study, which will include a description of the measures and scheme options assessed and the justification for its selection.

The Project Team includes a Design Team made up of Arup (Consulting Engineers), Cork County Council and the OPW. A study area has been identified and the initial stages of the Relief Scheme have commenced, including the Constraints Study and Preliminary Design Surveys. An Indicative Flow chart showing the process from inception through to construction for the Flood Relief Scheme is shown on the figure below:





# Midleton (Owenacurra / Dungourney)

## Flood Relief Scheme



### Planning Process For The Proposed Scheme

The planning process for the preferred scheme will be decided at the end of Stage 1. The planning options are as follows.

Once a preferred Flood Relief Scheme has been determined and an outline design completed, Cork County Council will decide whether to formally publicly exhibit the proposed scheme in accordance with Section 5 of the Arterial Drainage Acts 1945, or choose Part 10 Planning under the Planning and Development Regulations 2001-2002.

#### If Public Exhibition is Chosen:

- This statutory process includes a four week Public Exhibition, during which the plans and particulars of the proposed scheme will be put on Public Display.
- Representatives of the Project Team will attend the Public Exhibition on various dates to explain the scheme to members of the public and to address queries.
- Copies of the EIS (Environmental Impact Statement) for the scheme will be available for sale to the public during this time.
- Members of the public will be invited to submit written observations which will be considered and responded to
- An Exhibition Report, including all observation received will be sent to the Minister for Public Expenditure and Reform before formal approval of the Scheme. This will form the basis for the next stage.

#### If Part 10 Planning is Chosen:

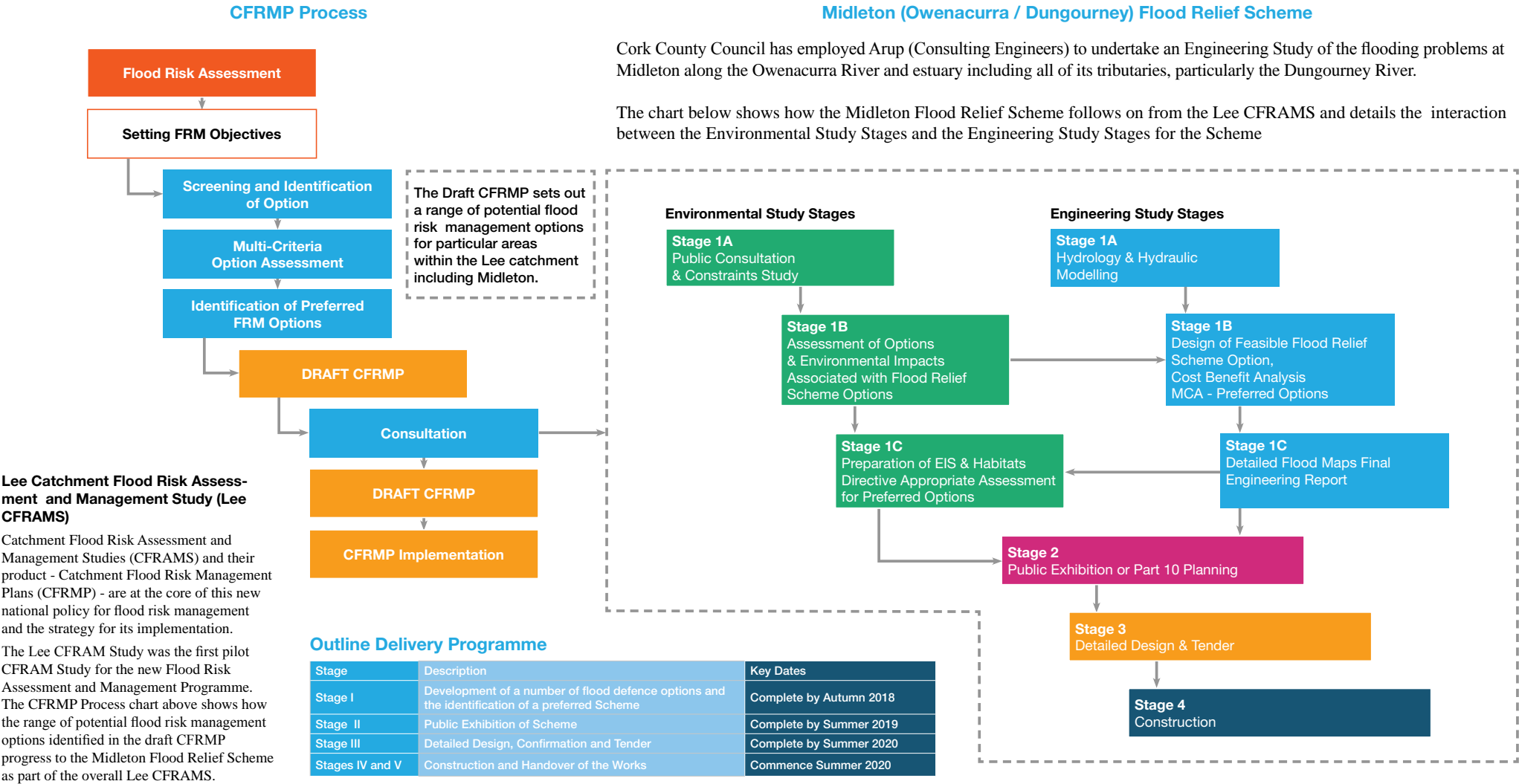
- Complete the necessary planning and any and all other statutory process, which may include; Appropriate Assessment (if determined necessary); EIS; CPO of lands required for the implementation of the preferred scheme, Section 50 licenses & etc.
- Amend the final draft Flood Relief Scheme if and as necessary following completion of the planning and statutory procedures.



ARUP

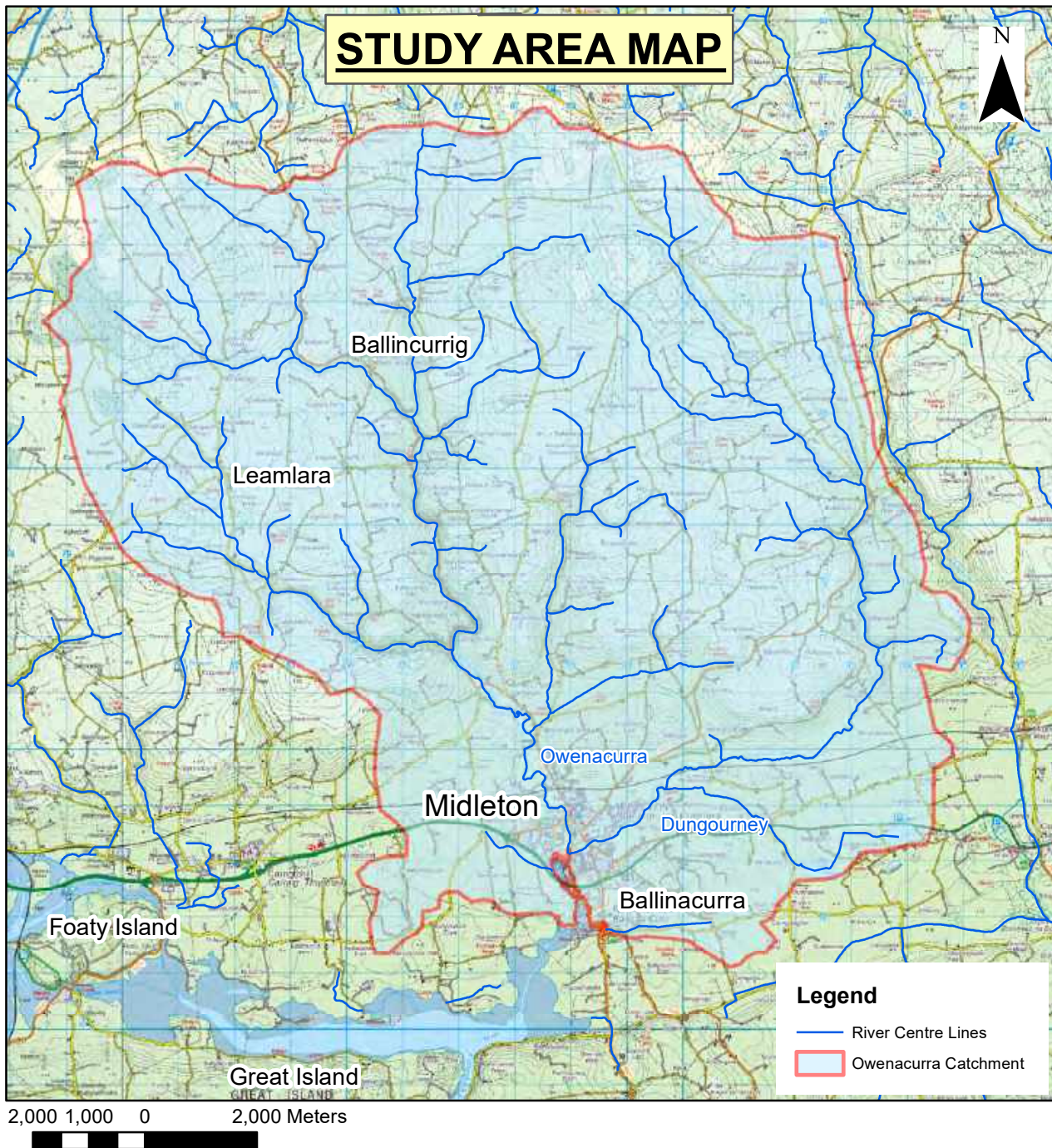
# Midleton (Owenacurra / Dungourney)

## Flood Relief Scheme





# Midleton (Owenacurra / Dungourney) Flood Relief Scheme



## Potential Flood Alleviation Measures

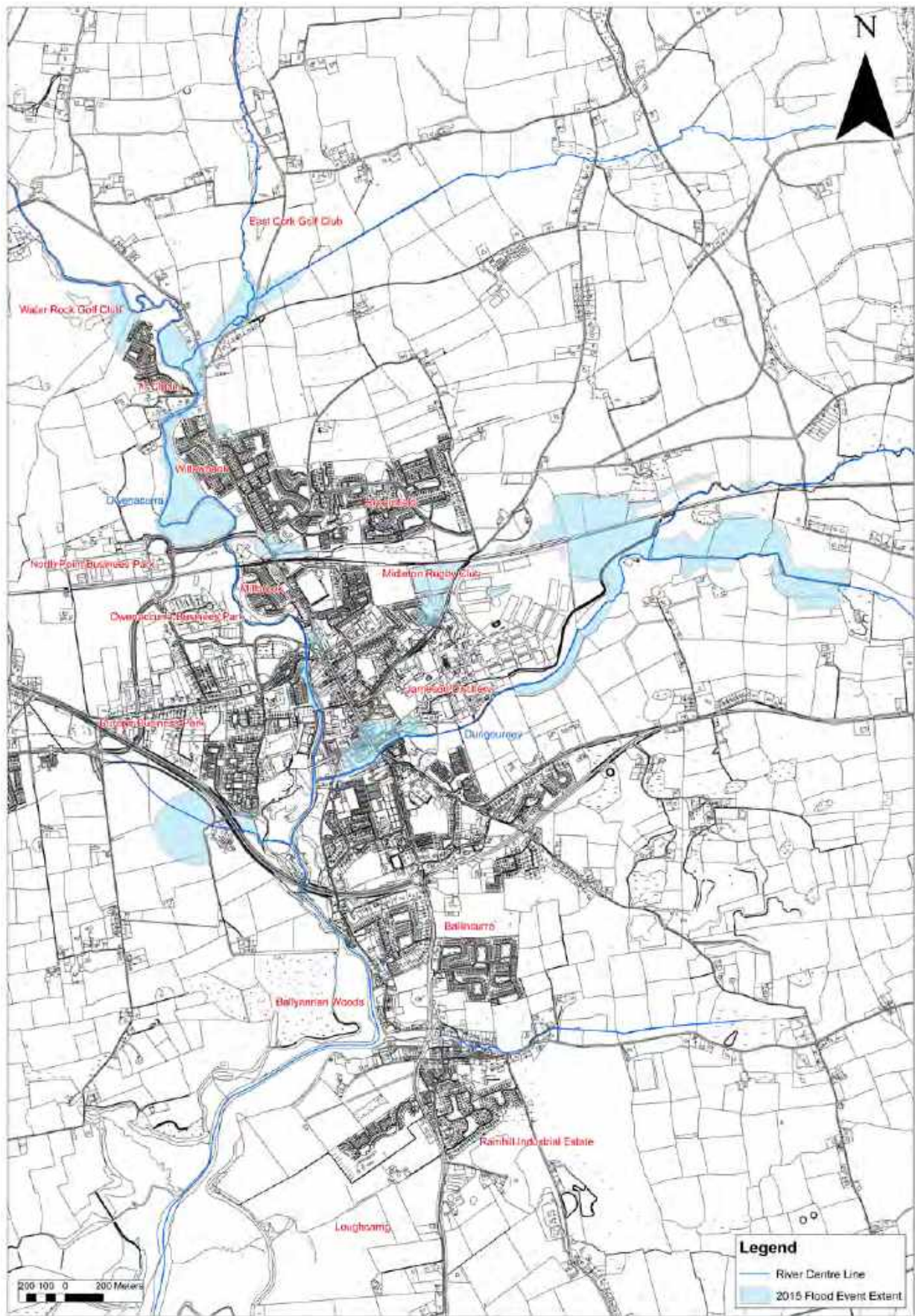
- Do nothing (i.e., implement no new flood alleviation measures)
- Non-Structural Measures (e.g. flood warning system or individual property protection)
- Relocation of properties and/or infrastructure
- Reconstruction of properties and/or infrastructure at a higher level
- Flow Diversion (e.g. river diversion or flood flow bypass channel)
- Flow Reduction (e.g. upstream catchment management or flood storage)
- Flood Containment through Construction of Flood Defences
- Increase Conveyance of Channel (upstream and/or through and/or downstream of the town)
- Sediment Deposition and Possible Sediment Traps
- Pump storm waters from behind flood defences



ARUP



# Midleton (Owenacurra / Dungourney) - Flood Relief Scheme



## A5 Questionnaire

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A copy of the blank questionnaire is provided overleaf.

### Landscape & Visual Amenity

Comment:

### Angling, Tourism & Recreation

Comment:

### Other

Comment:

Cork County Council undertakes to hold any information provided to it by individuals or others on a confidential basis, subject to Cork County Council's obligations under law, including the Freedom of Information Act. If, for any reason, it is intended that information provided to Cork County Council should not be disclosed due to the sensitive nature of such information, it is incumbent on the person or body supplying the information to make clear this wish and to specify the reasons for the information's sensitivity. Cork County Council will consult with any individual or body so supplying sensitive information before making a decision on any freedom of information request received.

**THANK YOU FOR YOUR CO-OPERATION**



# ARUP

## River Owenacurra & River Dungourney (Midleton)

### Flood Relief Scheme

## PUBLIC CONSULTATION No.1 - CONSTRAINTS STUDY QUESTIONNAIRE

(Please complete this questionnaire and return to Midleton Flood Relief Scheme, Arup Consulting Engineers, 50 Ringsend Road, Dublin, or [midletonfrs@arup.com](mailto:midletonfrs@arup.com) by Friday 28th April 2017)

1. Name (optional): \_\_\_\_\_

Address:

Phone (optional): \_\_\_\_\_ Email (optional): \_\_\_\_\_

2. Are you aware of the Lee Catchment Flood Risk Assessment and Management Study, CFRAMS and its findings or recommendations? Yes ☐ No ☐

3. Do you own, rent or occupy a property within the study area being considered? Yes ☐ No ☐

4. Address of property (if different from home address)

5. Have you had any personal experience of flooding? Yes ☐ No ☐

6. If yes, please give date(s):  
Most recent \_\_\_\_\_  
Previous \_\_\_\_\_  
Previous \_\_\_\_\_

7. Type of property flooded:

Residential <input type="checkbox"/>	Retail <input type="checkbox"/>
Office <input type="checkbox"/>	Workshop <input type="checkbox"/>
Open Space <input type="checkbox"/>	Other <input type="checkbox"/>

If other, please describe: \_\_\_\_\_

8. Approximate maximum depth of flooding: \_\_\_\_\_

9. Source of Flooding: Directly from River/ Stream ☐  
From Drains ☐  
Overground flow (surface water) ☐

10. Do you have photographs of flooding? Yes ☐ No ☐

11. If you do, may Cork County Council have permission to use them? Yes ☐ No ☐

Note: Photographs will be collected at a later date

12. Have you put in place measures to prevent or reduce the impact of flooding? Yes ☐ No ☐

If so, please describe:

13. Please indicate, in order of preference, your preferred flood defence works:  
(please score from 1-11 as appropriate)

No Works (Do Nothing)		Non-Structural Measures (e.g. flood warning system or individual property protection)	
Relocation of Properties and/or infrastructure		Reconstruction of Properties and/or infrastructure to a higher level	
Flow Diversion (e.g. river diversion or flood flow bypass channel)		Flow Reduction (e.g. upstream catchment management or flood storage)	
Flood Containment through Construction of Flood Defences		Increase Conveyance of Channel (upstream and/or through and/or downstream of the town)	
Sediment Deposition and Possible Sediment Traps		Pump storm waters from behind flood defences	

14. How do you think the issue of flooding can be resolved?

15. In your opinion, how important are the following environmental constraints to the proposed Flood Risk Assessment & Management Scheme?  
(please tick appropriate boxes)

Issue	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
Flood Related Socio-Economic & Social Issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flora and Fauna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Habitats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Archaeology, Architectural & Cultural Heritage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landscape and Visual Amenity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Angling, Tourism & Recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have any comments relating to the proposed scheme or the constraints, please record them here:

Flood Related Socio-Economic and Social Issues

Comment:

Flora and Fauna

Comment:

Local Fisheries

Comment:

Habitats

Comment:

Water Quality

Comment:

Archaeology, Architectural & Cultural Heritage

Comment:

## A6 Letters of Response from Consultees

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Letters received in response to consultation are provided overleaf.



<b>ARUP</b> Dublin		Job No:		File A		B	C
Proj Man:		Init:		Date:			
Date:		29 MAR 2017					
To:	Init:	Date:	To:	Init:	Date:		
WS							

**Mr. Wolfram Schluter**  
**Midleton Flood Relief Scheme**  
**Arup**  
**50 Ringsend Road**  
**Dublin 4**

**Dáta | Date**  
**28 March 2017**

**Ár dTag | Our Ref.**  
**TII17-97028**

**Bhur dTag | Your Ref.**  
**252803-00**

**Re: River Owenacurra & River Dungourney (Midleton) Flood Relief Scheme**  
**Public Information Day**

**Dear Mr. Schluter,**

TII acknowledges receipt of your correspondence of 10 March, 2017, concerning the above matter.

TII endeavours to consider and respond to planning applications and other requests referred to it given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines as outlined in the DoECLG Spatial Planning and National Roads Guidelines for Planning Authorities (2012). Regard should also be had to other relevant TII guidance, which is available at [www.tii.ie](http://www.tii.ie).

TII was unable to attend the Public Information Day on 23 March and therefore, provides the following observations for your consideration in the preparation of a Flood Relief Scheme.

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals following the examination of any valid planning application referred.

With respect to any Flood Relief Scheme, the recommendations indicated below provide only general guidance in relation to matters which may affect the national road network and may form part of your scoping and scheme preparation.

The scheme promoter/developer should have regard, *inter alia*, to the following:

- Consultations should be had with the relevant local authority/ Regional Design Office with regard to locations of existing and future national road schemes in the area; N25 Midleton to Youghal.

Although some national road schemes may currently be suspended pending the availability of funding for further progress, it is considered good practice to address impact or relationship with the relevant national road schemes in the proposed drainage scheme.



- The developer should assess impacts on existing national roads. TII would be specifically concerned as to potential significant impacts of development on the national road network (i.e. N25, national primary road) in the vicinity and/or downstream of any proposed works.
- In the interests of maintaining the safety and standard of the national road network, the Environmental Impact Statement (EIS) should identify the methods/techniques proposed for any works traversing/in proximity to the national road network, in particular any works that might affect existing structures on the national road network; early consultation with TII is recommended.
- In particular due to the potential for structures that may be required in the scheme to have an impact on the national road network, the developer is reminded of the requirements of TII Publications DN-STR-03001 (formerly NRA BD 2) - Technical Approval of Road Structures on Motorways and Other National Roads for structures. This Standard specifies the procedures to be followed in order to obtain Technical Acceptance for structures on motorway and other national road schemes and for the submission of as built records. The procedures cover the design of all road structures, including bridges, tunnels, subways, culverts, buried corrugated steel structures, retaining walls, reinforced earth structures, gantries, environmental noise barriers and temporary structures under or over motorways or other roads carrying public traffic.
- The Technical Acceptance requirements, if any, for the assessment, alteration, modification, strengthening and repair of all road structures (national roads) shall be agreed with the Structures Engineering & Asset Management Section of TII.
- The developer should have regard to any EIS and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts.
- The developer, in conducting an Environmental Impact Assessment, should have regard to TII Publications (formerly the NRA DMRB and the NRA Manual of Contract Documents for Road Works).
- The developer, in conducting an Environmental Impact Assessment, should have regard to TII's Environmental Assessment and Construction Guidelines, including the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (National Roads Authority, 2006).
- The EIS should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (1<sup>st</sup> Rev., National Roads Authority, 2004)).
- It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines and best practice, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. TII's TTA Guidelines (2014) should be referred to in this regard. Please also have regard to Section 2.2 of the Guidelines which address circumstances where sub-threshold TTA may be required.

- The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.
- In relation to potential need for haul routes, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load that might be proposed.

Notwithstanding, any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practise.

I hope that the above comments are of use in your continuing process.

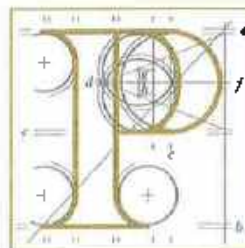
Yours sincerely,



*PP* Michael McCormack  
Senior Land Use Planner

**Our Ref:**

**Your Ref:**



**An  
Bord  
Pleanála**

**Wolfram Schluter**  
**ARUP**  
**50 Ringsend Road**  
**Dublin 4**  
**D04 T6X0**

<b>ARUP</b> Dublin		Job No: File A		B	C
Proj Man:		Init:		Date:	
Date:		23 MAR 2017			
To:	Init:	Date:	To:	Init:	Date:
WS					

**22<sup>nd</sup> March 2017**

**Re: Proposed River Owenacurra and River Dungourney (Midleton) Flood Relief Scheme.**

Dear Sir,

I have been asked by An Bord Pleanála to refer to your letter dated 10<sup>th</sup> March 2017 in which you invite the Board to submit any comments it may have in relation to the flood relief scheme.

Please be advised that the Board will not be making any comments / observations in relation to the matter.

Yours faithfully,

**Kieran Doherty**  
**Executive Officer**  
**Direct Line: 01-8737246**



Mr Wolfram Schluter  
ARUP  
50 Ringsend Road  
Dublin 4  
D04 T6X0

ARUP		Job No:			
Dublin	File A	B	C		
Proj Man:	Init:	Date:			
Date:		03 APR 2017			
To:	Init:	Date:	To:	Init:	Date:
LS					

31 March 2017

**RE: River Owenacurra and River Dungourney (Midelton) Flood Relief Scheme**

Dear Mr Schluter,

Thank you for contacting IFI regarding the above-mentioned.

The study area encompasses the Owenacurra and Dungourney River Catchments which are salmon, sea trout and brown trout spawning, nursery and angling waters. In addition to salmonids, lamprey and eels have been recorded within the constraints study area.

While IFI are fully aware of, and sensitive to, the hardship caused by flooding events any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive.

In this context IFI feels that the current assessment of flooding events must be a catchment wide process assessing the impact of changes in drainage, development and land use patterns and practices on the response of flows in rivers to rainfall events involved to rainfall events. Likewise potential solutions should consider the catchment in its entirety and not focus solely on the relatively small area set out in the constraints study. Each solution or series of solutions proposed should be considered not alone in financial terms but also in the context of long term sustainability and durability in combination with flood control effectiveness.

More specifically considering the significance of the rivers involved terms of fisheries, the EIS associated with any proposed flood alleviation measures needs to address the following

**Assessment of Existing Conditions**

The following data is necessary, both within the study area and to the limits of the zone of influence of any proposed works, to assess existing conditions:-

- Mapping of the range, location and extent of each aquatic habitat type e.g. pools, nursery and spawning areas.
- Redd counting in the proposed study area and upstream to the limits of the zone of influence of any proposed works be carried out over at least the next 2 years.

- c) Mapping of both the extent and nature of bankside vegetation, highlighting in particular all areas subject to river bank erosion at present.
- d) A complete stock survey of all fish species.
- e) Characterization and quantification of each habitat area, identified in (a), based on its macro invertebrate population.
- f) Detailed assessment and characterization of all potentially impacted channels in terms of their surface and sub-surface sedimentology.

Impact Assessment:

The following requirements apply from a fisheries perspective in relation to impact assessment of any proposed works:-

- a) Quantification of habitat losses and the impact on both flora and fauna.
- b) Impact of any proposed works on fish stock densities for each species.
- c) Changes in flow dynamics, the consequent impact on fish migrations and the loss of opportunity for fish movement.
- d) Compatibility of any proposed measures with existing legislative requirements.

Additionally there are a number of weirs on the Owenacurra system which to varying degrees limit the passage of fish. IFI would suggest that the impact of removal of these weirs be assessed in terms of the impact on flooding.

I would ask that you keep IFI updated as the study progresses. Should you require any clarification please do not hesitate to contact me.

Yours sincerely,

  
\_\_\_\_\_  
Michael McPartland  
Environmental Officer



## North Lee Environmental Health

Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive

Environmental Health,  
HSE South,  
Floor 3, Block I  
St Finbarr's Hospital,  
Cork  
Tel: 021 4921801  
Fax: 021 4921824  
Email [shane.oflynn@hse.ie](mailto:shane.oflynn@hse.ie)

13<sup>th</sup> April 2017

Arup,  
50 Ringsend Road,  
Dublin 4

Re: **River Owenacurra & River Dungourney (Middleton) Flood Relief Scheme.**

Our Ref: **0585**

Proposed Development; **Flood Relief Scheme and Associated Works**

Dear Sir,  
Please find enclosed the HSE consultation report in relation to the above Constraints Study.

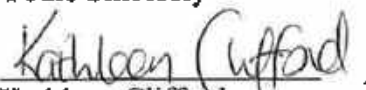
If you have any queries regarding this report, the initial contact is Kathleen Clifford, Principal Environmental Health Officer, who will refer your query to the appropriate person.

The following HSE departments were made aware of the consultation request for the proposed development on the 14<sup>th</sup> of March 2017

- Emergency Planning – David O'Sullivan
- Assistant National Director for Health Protection – Kevin Kelleher / Marie Woods
- CHO – Ger Reaney
- Estates – Helen Maher, Estates Manager, Environmental Services

All correspondence or any queries with regard to this report including acknowledgement of this report should be forwarded to Kathleen Clifford, Principal Environmental Health Officer, HSE South, Floor 3, 26 South Mall, Cork.

Yours Sincerely

  
Kathleen Clifford  
Principal Environmental Health Officer

ARUP		Job No:			
Dublin	File A	B	C		
Proj Ment:	Init:	Date:			
Date:		14 APR 2017			
To:	Init:	Date:	To:	Init:	Date:
Janet					
Barnett					



**HSE EIS SUBMISSION REPORT**  
**Environmental Health Service Consultation Report**  
*(as a Statutory Consultee (Planning and Development Acts 2000,  
& Regs made thereunder).*

Report to: **Midleton Flood Relief Scheme, Arup, 50 Ringsend Road, Dublin 4.**

Type of consultation: **Constraints Study.**

Planning Authority: **Cork County Council**

Reference Number: **252803-00**

EHIS Reference Number: **0585**

Applicant: **Cork County Council/Office of Public Works**


Proposed Development: **Midleton Flood Relief Scheme**

**General Introduction**

This initial report only comments on the possible Environmental Health (EH) Impacts of the proposed development.

1. Consideration should be given to the permanent, long term and temporary Impacts of the proposed project. Particularly, during the construction phase, the temporary impacts on the health care establishments within the town of Midleton should be considered and mitigated against to ensure that there is minimum disruption. Midleton Hospital may be Significantly Impacted by this Project during the Construction phase.
2. Consideration should be given to any possible changes in the locality that may Impact on local residents in the vicinity of the study area. Such changes may include clearance of existing land, creation of new land uses, pre-construction borehole investigations, construction and demolition works.
3. Consideration should be given to the impact on water course catchment areas where there is extraction for commercial and domestic use. This is with particular reference to the industries in the Midleton area such as Irish Distillers and Dairygold that take large amounts of water from the proposed study area. Any temporary, permanent or cumulative Impacts on Water Supply for the study area should be considered in this regard.

*All correspondence or any queries with regard to this report including acknowledgement of this report should be forwarded to Kathleen Clifford, Principal Environmental Health Officer, North Lee Environmental Health, HSE South, Floor 3, 26 South Mall, Cork.*

  
**Shane O Flynn**  
**Environmental Health Officer.**

*Celler Noel Collins*

INFORMATION DAY-

FOR THE PUBLIC.

Speaker- **THURSDAY, MARCH 23rd. 2017.**  
**Cllr. Noel Collins.**

**-Time - 3.p.m. to 7.p.m.**

**EXPERIENCES of FLOODING.**

**CORK CO. COUNCIL, IRISH WATER, O.P.W. OFFICIALS  
WILL ATTEND.**

Midleton Flood Defences Meeting with O.P.W., Council & Irish Water Officials.

Venue- The Park Hotel, Midleton, Thursday 23rd. March-2017-.....

**Speaker- Cllr. Noel Collins.**

**3.p.m. to 7.p.m.**

Since 1967, I have represented the people of Midleton, on Cork Co. Council, & the now defunct Midleton Town Council. Despite my untiring efforts, over the years, little or no improvements, by way of Flood Defences, have taken place- other than the make-shift remedy of sandbags. Homes & the commercial life of Midleton town and adjoining areas, have been seriously damaged with every rain storm. I hope from to day's meeting, we can bring forward up-to-date Flood Storm Defences and have them put in place immediately - thus putting an end to the devastation, following rain-storms.

**Perennial problem.**

..... is  
Flooding a perennial problem for householders and, according to experts, it is going to get worse, with sudden-- if less frequent storm surges, affecting low-lying areas, over the coming years. The authorities seem ill-prepared for the deluge, in some areas. Our sympathy must go out to the many people of Cork city and County, and many other parts of Ireland, who have seen their homes and shops damaged or ruined over the years, resulting in the devastation of many commercial concerns in Midleton, and adjoining towns and villages. The authorities seemed ill-prepared for these flood storms, in some areas. Down through the years thousands of EURO have been spent on flood defences in Midleton town, with little or no success. Despite my many calls on the O.P.W. to have the two Midleton rivers dredged, both remain clogged-up with silt and waste-materials.

I hope from to days meeting, we will learn from mistakes of the past, and that Government funding approved, will be expended, wisely and for the betterment of town and people, and not on make-shift defences.

### Sandbags.

It is becoming clear that while sandbags are a tried & tested situation, they are not able to cope with the extremes we have experienced, in recent years. It is surely time for local authorities & Irish Water to look at more up-to-date solutions, such as the fighting system developed in Sweden, in conjunction with the country's rescue services.

### Urgency of Flood Defences in Midleton.

The urgency of the flood defences in Midleton, as early as possible, must be addressed. A Major problem with the current flood defences-is that remedial work often just pushes the problem down the river, to another housing estate, village or town, which has been the act-- for far too long. There have been reports of people actually selling sandbags to desperate homeowners, to help keep the flood waters at bay. This make-shift and stop-gap approach must make way, for up-to-date flood defences.

### Funding.

It is projected that €250 million EURO will be spent on flood defences over the coming years, including €45 million EURO now, which will include Midleton. It is my wish that there <sup>will</sup> be co-operation amongst officials and flood-victims, to have this development brought to fruition, sooner rather than later. To help progress the development at Tender stage, in a constructive manner, I put forward the following proposal, at a full meeting of Cork County Council, Monday 13th. February, 2017, which was agreed unanimously.

### Tender proposal.

"That Cork County Council call on the Dept. of the Environment to modernise its flood defence systems, and have Local Authorities look at more Up-To-Date solutions- such as the flood fighting system developed in Sweden, in conjunction with the country's rescue services." I spoke at length to this proposal and supplied the Swedish estimate of costs, which I later submitted to our County Manager, and Cork Co. Council Secretaries- Helen Bowman, & Nicola Eadley, S.E.O. The proposal was agreed unanimously and forwarded to the D.O.E. & Geodesign Barriers- Flood Defences, Sweden, with a request to the latter, to have an agent attend a meeting of Cork County Council, with a video, showing estimate & costings for Cork County.

### No conflict of interest.

Not the record, I have no conflict of interest in the Swedish Company, other than to see, the people of Co. Cork, getting value for public finances, and to see an end, once and for all, to the flooding of homes and commercial properties, when millions of EURO have been spent on worthless defences, down through the years.

### Swedish Flood Defences.

From the correspondence I received on the Swedish Flood Defences---is termed-- Geodesign Barriers, EUR. IOI- Steel Barrier. It is low priced, light and quick flood-barrier. Designed to meet the need of large scale flooding operations-- Dam Height-- 1.01 metre. Quick & easy to deploy-- low storage volume- self anchoring. No ground work needed.

### Quick to Deploy.

The EURO IOI Flood Defence system consists of only five 'Different PARTS;' This makes it easy and quick to set up. 15 persons can easily deploy 1000 M in one hour. The simplicity of the construction also reduces the storage volume. 1000 M. of EUR IOI - Steel Barrier, can be stored in 60 M. 3.

### Manufacture.

The EUR IOI is, made of new, high strength low alloy steel for cold forming produced by SSAB. The steel -420LADZ275, gets its high strength from the addition of very small quantities of alloying elements making it twice as strong, as standard steel.

### Case put for Middleton.

I have once again, to the best of my ability, put the case for Middleton town and adjoining villages and towns, for major improvements in Flood Defences. There I rest my case; hopefully, not for another day, other than the official date for major improvements of Flood Defences. God speed the day.

**Willowbank Estate,  
Mill Road, Midleton, Co. Cork**

**Flood Defence Review Task Force**

**Final Report**

**6-Feb-2016**

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## 1.0 Introduction

During the overnight period spanning 29-Dec-2015 – 30-Dec-2015, the greater Midleton area experienced significant flooding as a consequence of extremely heavy rainfall on the night (associated with Storm Frank), very high tide levels and land saturation arising as a consequence of exceptionally heavy rainfall during previous weeks. On the night in question, the residents of Willowbank Estate, located on the Mill Road in Midleton, worked through the night clearing drains, monitoring flood defences and tracking water levels. These actions were prompted by concerns arising from the flooding of areas adjacent to Willowbank Estate and the high level of water seen at key Willowbank flood defence structures. Following a meeting of residents held on 12-Jan-2016, the Willowbank Flood Defence Review Task Force was established to review flood defence structures and processes, and to implement any relevant actions arising from said review. This report provides details of the findings and conclusions of the Task Force.

## 2.0 Review Actions Completed

To date, the following actions have been completed:

2.1 A general meeting of residents of Willowbank Estate was held on 12-Jan-2016. The views, comments and first-hand accounts of all present were noted and are reflected in the initial recommendation list set out below:

- a. Insist that Cork County Council and/or the Office of Public Works (OPW) employ an independent expert to consider most serious risks and provide advice re: how to address same. The following areas require specific attention in this context:
  - i. Wall on river boundary side of 67 Willowbank Court
  - ii. Wall on Midleton Show Field side of Mill Road
- b. Clean storm drains regularly and, in particular, after fall of leaves in autumn. Retain external company to clean all drains professionally, if/as required.
- c. Procure rapid setup flood defence system for deployment at entrance to Willowbank.
- d. Establish alert system for all Willowbank residents. Opt-in option to be provided to all.
- e. Install speed ramp at entrance to Willowbank, to provide initial defence to flood water entering the Estate as well as reducing speed of traffic entering the Estate.
- f. Procure high visibility vests and storm drain keys for distribution at short notice, if/as required.
- g. Engage with Cork County Council to check planning status of flood plain with a view to protecting current flood plain designation.

- h. Engage with Cork County Council, the OPW and local politicians to ensure that Willowbank requirements are being addressed to the maximum extent possible in any planned works.
  - i. Keep residents apprised of progress through regular newsletters and updates.
- 2.2 A meeting of the Willowbank Flood Defence Review Task Force was held on 26-Jan-2016. The actions and decisions listed below were taken at this meeting:
- a. The Task Force was divided into two subgroups, one to review technical aspects of relevant flood defences (the technical subgroup) and the other to engage with local politicians and representative bodies (the representative subgroup) to ensure that Willowbank would be included in all flood defence review work scheduled by the various bodies with responsibility for same in the region.
  - b. Based on first-hand accounts of events on the night of 29-Dec-2015/30-Dec-2015 and a review of the 2010 flood risk analysis for the area, key locations were identified for review and these are detailed in the Google Earth image copied in Image 1, where the relevant locations are marked as A, B, C, D, E, F and G.
  - c. A meeting was scheduled for 2-Feb-2016 to review progress.
- 2.3 On 30-Jan-2016, key structures in the vicinity of location A were visually examined by technical subgroup members. Photographs of relevant structures and features were recorded.
- 2.4 On 31-Jan-2016, the initial draft of this report was prepared.
- 2.5 On 1-Feb-2016, the initial draft of this report was discussed with the relevant representative of Arup, the firm of consulting engineers retained by Cork County Council “to advise on the possible causes of the flooding in Middleton and recommend any immediate corrective actions”, as referenced in the Cork County Council report of 11-Jan-2016 entitled “Response to the Severe Weather Events of 28<sup>th</sup> December, 2015 – 6<sup>th</sup> January 2016”.
- 2.6 On 2-Feb-2016, the Task Force met and decided to:
- a. Conduct a walk-through review with Arup of the relevant areas referenced in this report.
  - b. Distribute the draft report to all Task Force members for review, with feedback requested by 6-Feb-2016.
  - c. Finalise and release report to relevant parties as soon as possible following receipt of feedback.
- 2.7 On 5-Feb-2016, the Task Force conducted a thorough walk-through review with the Arup representative of the relevant areas referenced in this report.
- 2.8 On 6-Feb-2016, this report was finalised.

### 3.0 Task Force Findings and Recommendations

- 3.1 Concern had been expressed by many residents that the reinforced concrete wall at location A (a section of which is shown in Image 2) did not run the entire length of the relevant Willowbank Estate boundary blockwork wall. Given that many residents had witnessed flood waters rise above the level of the reinforced concrete wall on the night of 29-Dec-2015/30-Dec-2015, this concern was considered by the technical subgroup. The visual review conducted on 30-Jan-2016 confirmed that the reinforced concrete wall runs the full length of the relevant blockwork wall, as illustrated by the yellow line in Image 3. However, this review also found that the blockwork wall, which is protected by the reinforced concrete wall, is cracked in at least two locations, as shown in Image 4 and Image 5. Given the fact that the reinforced concrete wall was overtopped and the residents were relying on the blockwork wall behind it to prevent flooding, it is clear that the height of the reinforced concrete wall is insufficient. The Task Force should seek to have the entire reinforced concrete wall and adjacent blockwork wall included in the scope of any flood defence reviews being conducted in the Midleton region.
- 3.2 The Owenacurra River runs in close proximity to the flood defence reinforced wall which has been constructed at location A. An inspection of the river in this vicinity found many significant impediments to water flow (see Image 6 and Image 7 for examples). In addition, an inspection of Moore's Bridge (located approximately 100m upstream from location A) was conducted shortly after flood water levels had receded. Leafy vegetation was observed on the upstream side of the bridge parapet to a height of 600mm above the concrete deck indicating the bridge had been overtopped by this amount. Minor levels of vegetation were observed at the bridge piers but these were not of a scale which would lead to damming and debris build-up on the upstream side of the bridge. This indicates that the river reached a level at Moore's Bridge of 600mm above the deck and that this was due to sheer volume of water and associated flow pressure. It is very likely that the impediments to flow at location A exacerbated this situation. At this location, debris (including large areas of deposited gravels and tree trunks) and the remnants of a mill weir, along with the presence of a blockwork wall perpendicular and adjacent to the river bank, create a significant impediment to water flow. The Task Force should seek to have the potential removal of impediments to flow in the vicinity of location A included in the scope of any flood defence reviews being conducted in the Midleton region.
- 3.3 On the night of 29-Dec-2016/30-Dec-2016, many Willowbank residents witnessed at first hand water being forced, at high pressure, through the stone wall at location B in Image 1. Concerns were expressed that failure of this stone wall structure would present a flooding risk to Willowbank Estate. These concerns were considered seriously by the technical subgroup. The Task Force should seek to have the stone wall at location B included in the scope of any flood defence reviews being conducted in the Midleton region.
- 3.4 On the night of 29-Dec-2016/30-Dec-2016, water levels were observed at first hand at location C in Image 1 by a number of Willowbank Residents. While no flood waters entered Willowbank in this area, water levels on the night in question were observed to be elevated significantly [ref: Image 9(1) and Image 9(2)]. It was noted that the Lee Catchment Flood Risk Assessment and Management Study conducted in 2010 by Halcrow Group Ireland (with extract copied in Image 8) identified a flood risk in this area. In addition, water continued to issue through a manhole cover in the flood plain adjacent to

location C for several weeks after the events of 29-Dec-2015/30-Dec-2015. The Task Force should seek to have location C included in the scope of any flood defence reviews being conducted in the Midleton region.

- 3.5 On the night of 29-Dec-2016/30-Dec-2016, water levels were observed at first hand to have reached location D (Image 1) on the Mill Road, and pooled between location D and the railway line crossing on the Mill Road [ref: Image 9(c)]. The Task Force should seek to have location D included in the scope of any flood defence reviews being conducted in the Midleton region.
- 3.6 On the night of 29-Dec-2016/30-Dec-2016, strong water flows at locations E and F were observed at first hand by Willowbank residents. These flows combined into a stronger flow at location G, which was forced in the direction of Tir Cluain Estate by a rise in elevation of the Mill Road at this location, flooding a property which sat on its line of flow. The Task Force should seek to have location G included in the scope of any flood defence reviews being conducted in the Midleton region.
- 3.7 The map in Image 8, from the Lee Catchment Flood Risk Assessment and Management Study conducted in 2010 by Halcrow Group Ireland, is in draft form and is based on information gathered prior to 2010. The level of detail associated with the surveys used to compile the information which led to the production of the map is unknown. In addition, the rainfall and other data on which predictive flows and levels were calculated may now be defunct given significant recent developments in flood mapping technology. The Task Force should insist that Cork County Council and/or the OPW ensure that the extent and detail of topographical, hydraulic, hydrological and other surveys is sufficient to accurately reflect the river flow constraints, and that the most recent flood data and flood prediction technology is used to inform any flood defence reviews being conducted in the Midleton region.
- 3.8 Willowbank Estate was constructed in 1999/2000 at a time when flood risk was assessed in a relatively low-tech manner relative to how this type of risk would be assessed in 2016. Consequently, there is a lack of confidence in the selection of the design parameters which would have been used to inform the development of the flood defences and concern has been expressed regarding the permeability and adequacy of the height of earth bunds around the estate, which were designed to act as impermeable flood defences. Bunds constructed from cohesive clay are much less permeable than those constructed from granular material and, therefore, are more likely to prevent water seepage through the bund. The material used to construct the Willowbank bunds is unknown. The Task Force should seek to ensure that the height of all bunds is checked for adequacy using the most recent flood assessment data and predictive hydrological technology, and that geotechnical investigations are undertaken to establish the material used in the construction of all bunds in order to confirm that they are impermeable.

## 4.0 Conclusions

The findings in this report clearly illustrate that action needs to be taken in relation to strengthening the flood defences protecting Willowbank Estate. The Residents Association and Flood Defence Review Taskforce consider that, given the predicted increase in frequency and intensity of flood events associated with climate change, and the apparent flood defence weaknesses highlighted in this report, as a matter of urgency Cork County Council and the OPW must engage the services of an expert to improve the relevant flood defences to ensure that they will provide adequate protection to residents and property if/when similar or higher river levels to those experienced on 29-Dec-2015/30-Dec-2015 occur in the future.

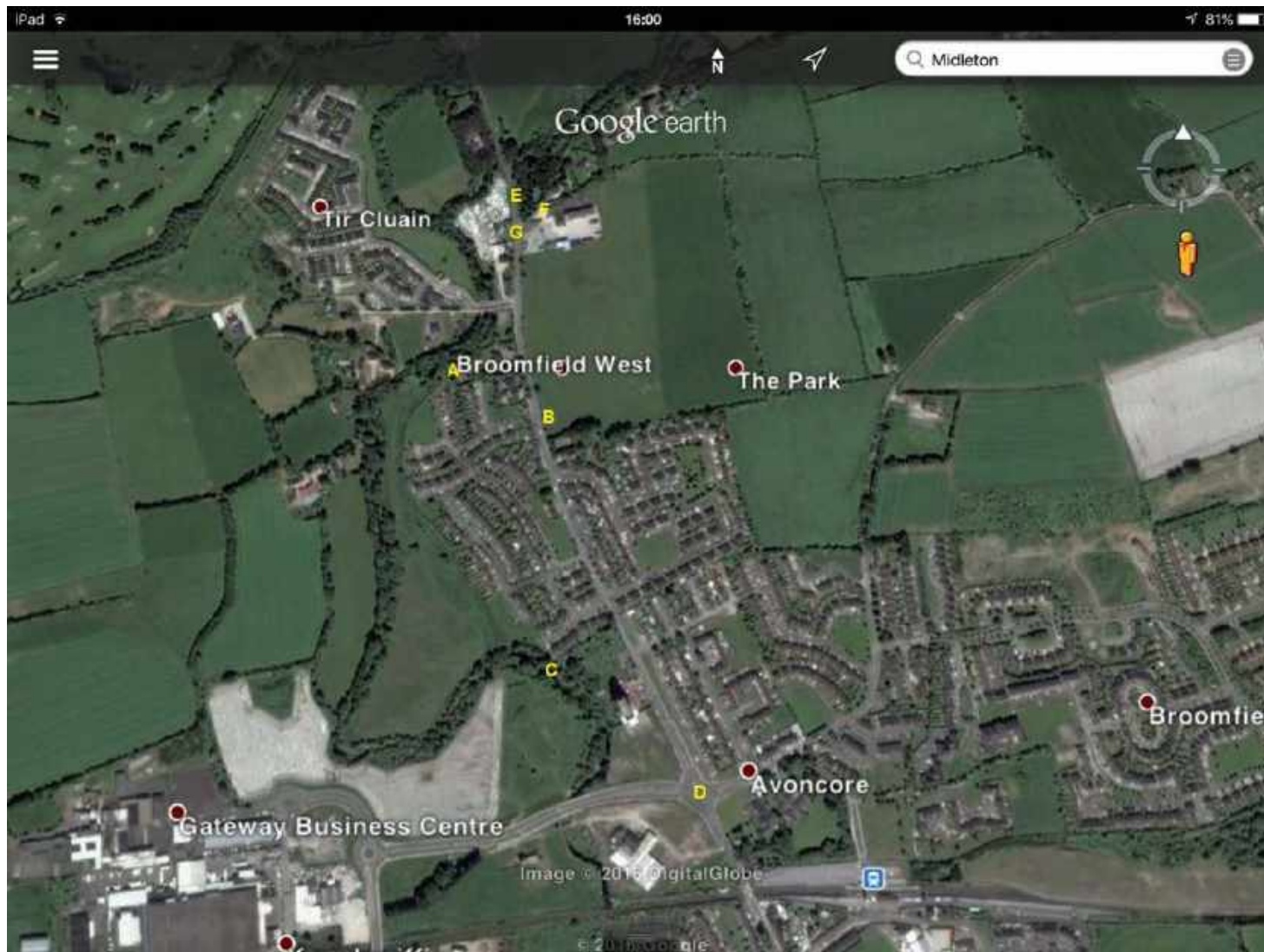
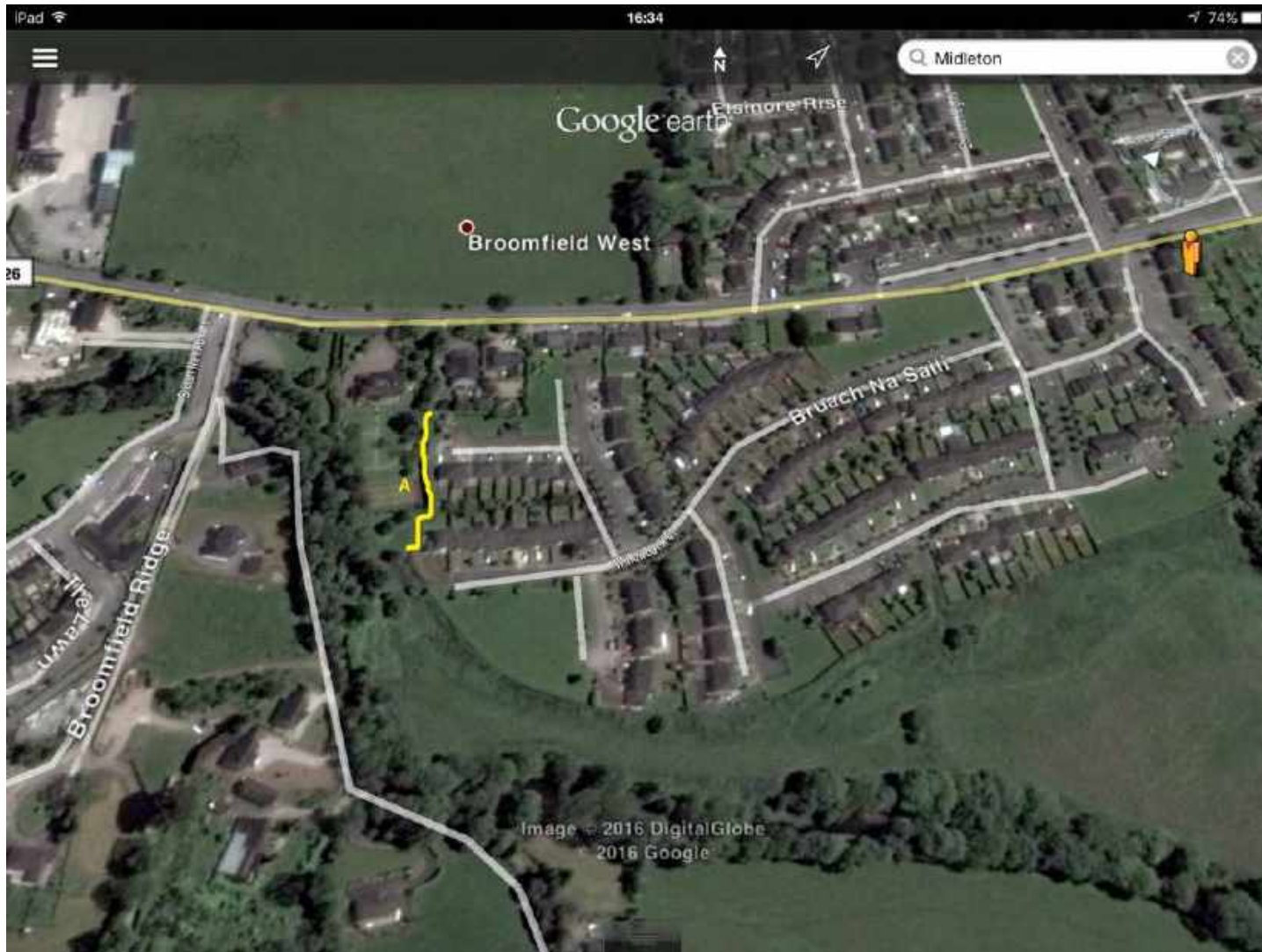


Image 1. Aerial view of Willowbank Estate and adjacent areas, with key review locations highlighted.





**Image 2. A Section of the Reinforced Wall at Location A in Willowbank Estate.**



**Image 3. Aerial view of Location A in Willowbank Estate and adjacent areas, with key defence structure highlighted.**





**Image 4. Crack 1 in Wall at Location A in Willowbank Estate.**



**Image 5. Crack 2 in Wall at Location A in Willowbank Estate.**





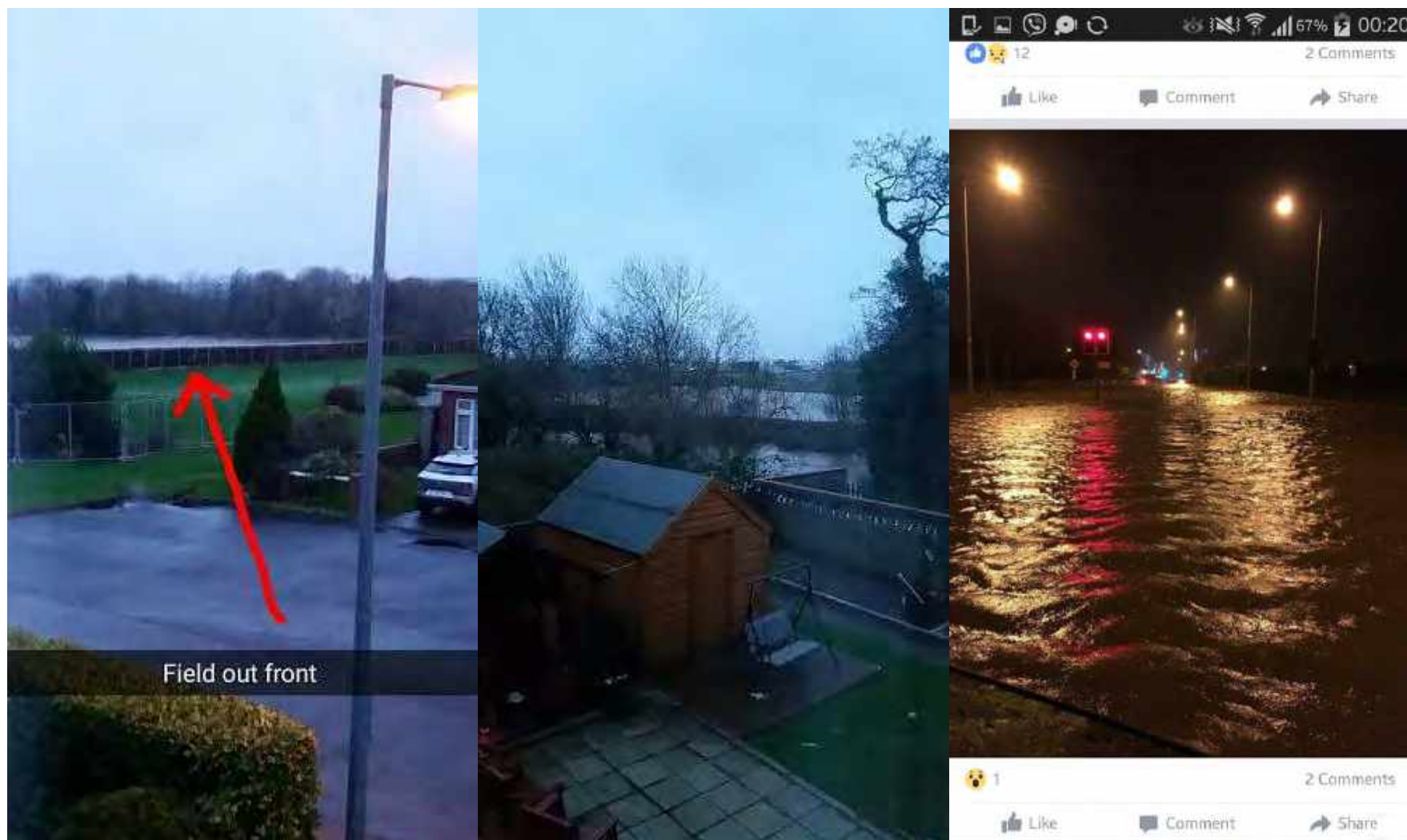
**Image 6. Flow Obstruction 1 in Owenacurra River near Location A in Willowbank Estate.**



**Image 7. Flow Obstruction 2 in Owenacurra River near Location A in Willowbank Estate.**







**Image 9. Relevant Social Media Photographs.**

**L to R, (1) the Flood Plain Viewed from 14 Willowbank, (2) Location C Viewed from 14 Willowbank, (3) View from Location D Towards Railway Crossing on Mill Road**

**Time sequence for flooding event at Lauriston Park and Lauriston Mews  
30<sup>th</sup>/31<sup>st</sup> December 2015**

Prior to the flooding event it was noted that water had accumulated in the rugby pitch.

**December 30<sup>th</sup> 2015**

6.30pm: Tattan's Yard on eastern side of the estate under 2 feet of water at this stage: the sewerage pump for the estate stopped working for the front houses  
7.30pm: water pouring into estate near the ESB box at the corner, residents getting sandbags  
8-8.30pm a fire brigade near the entrance was seen to leave; no flood warning were given  
9.30-10pm: 3 fire engines arrived alerted by residents; the houses at the front of the Park were flooding; water at top of front door step in some houses and 4 inches deep in another and coming through brick work in another  
10.15pm: the road into the estate becoming impassable  
10.30pm: firemen gave some sandbags to the residents of the Mews  
11.00pm: water was coming in under the wall on Tattan's side; the back gardens of the houses at the northern end bordering the rugby pitch were now three quarters flooded; water coming into the front houses through the front, back and side doors and through floors  
11.30pm: all front houses were flooding and road water building inside estate

**December 31<sup>st</sup> 2015**

12.00 midnight approx: fire brigade left; the houses in the Mews started to flood  
12.15am: resident in house at front of Park who rang and requested the fire brigade to return was informed no and informed it was on the instructions of the chief fire officer; water now 3 feet in one house at front; water now 3 inches behind the Mews  
2.00am: water coming around the corner on the road approaching houses on western side; water here 4 inches deep  
12am-onwards: sandbags were filled by residents using supplies from Middleton College and distributed to other residents; residents moved cars and moved household effects upstairs  
3.00am: water rising from drains; 3.30am: one house at front water had risen to 18 inches  
4.00am: one family rang 999 and asked for assistance. No help arrived. Calls made by residents to the fire brigade at 2am. and 5am.; water had advanced 3 metres around the bend along the road on the western side  
5a.m: a fire brigade arrived and started pumping near front of Park; flooding at front houses and Mews was worse; one resident who had battled the water for hours had to leave  
6am: water had rapidly advanced between 2 and 6am; road and grass area at front submerged  
7.00am: a fire engine was seen to enter the estate and left again without doing anything  
9.00am: water rose to 30 inches in one house at front of Park; the back gardens of the houses at the northern end of the Park completely flooded; the houses facing Tattans on the eastern side of the Park were flooded; the back gardens of the houses in the next row (on western side) also were flooded and one family arranged for a pump and pumped water all day from the back garden into a nearby drain.  
9.35am: fire brigade arrived and started pumping water towards the town; residents were continuing to ring the Council for help and for sandbags and relying on facebook for information. No way in or out of estate except by dingy.  
11.00am: no sandbags available from Council; an industrial type pump appeared; one family left by dingy; residents rang the ESB due to safety concerns; power went off in some houses.  
11.20am: another family was able to leave with the assistance of Civil Defence  
12am-1pm: Civil Defence came into the estate in a dingy with sandbags from volunteers  
4.00p.m: estate still not accessible and this continued for the day. 1<sup>st</sup> January 2016; 10am power returned to houses at front, Pumping continued until 4p.m. on 3/1/2016.  
From 1/1/2016 to 4/1/2016 water gradually receded from back gardens at northern end.

Residents of Ballyvodock Road  
And surrounding Area

Tel: [REDACTED]  
26-4-2017.

#### **Ref Midleton Flood Relief Scheme**

Submission on behalf of Residents Group on the L3619 road (Ballyvodock Road) and surrounding area.

I [REDACTED] on behalf of the residents group on the L3619 road (Ballyvodock Road) wish to make a submission to the Midleton Flood Relief Scheme on our recent experiences of flooding in the area and the potential risk of further flooding if proper remedial measures are not taken. In support of our submission I have included a number of maps and photographs. We hope that the above area will be included in your study as it is our understanding that to date the Ballinabointra-Ballyvodock catchment area has not been included in any study.

#### **Flooding in the Area**

##### **Section 3.1 Flood Risk Assessment**

Flood Risk Assessment carried out by JB Barry & Partners in December 2015 and November 2016 did not include the Ballinabointra-Ballyvodock catchment area in their calculations and concluded that the area should be considered in Flood Zone C for development purposes. Appendix 1.

We refute this conclusion based on the following evidence. Section 3.1.2. of the same document clearly states that the site 15/6969 is considered to be an area "Susceptible to Flooding Zone B" according to zoning map from the Midleton Electoral LAP 2011. Appendix 1a.

#### **Discharge of 1200mm diameter pipe to Estuary**

All of the land highlighted in yellow in Appendix 2 drains into the land drain along the L3619. This drain flows by the road and is all tied into a 1200mm diameter storm drain. In addition this drain is met with an underground river at the bottom of the Tobin garden and it is understood that this river is the main drainage from the Waterock catchment area, which was severely flooded in the Dec 2015 storms. This river flows under the road and discharges into the estuary. The point of discharge of the 1200mm pipe is within the tidal and fluvial flood zone rendering the drainage pipe ineffective during high tides and heavy rainfall. Appendix 3.

Our concern is that any development in this area will exacerbate the situation resulting in further flooding upstream of the development. Our recent experience is that as it stands this current system is not adequate to prevent flooding as demonstrated in the photos attached.

#### **Flooding on the L3619 Road**

The L3619 Road (Ballyvodock Road) has flooded on a total of 7 occasions in the recent past- 20 Nov 2009, 13 Nov 2013, 6 Dec 2015, 15 Dec 2015, 26 Dec 2015, 31 Dec 2015, and 2 Jan 2016. See photos attached. Appendix 5, 6, 7.

It should also be noted that this road is the main relief road for the N25 and has been used as such on numerous occasions. It is important therefore that the road be kept in good condition and flood free at all times.

### **Existing Stream**

In a recent planning application 15/6969 it was proposed to redirect the Banshane stream around the boundary of the development. Condition no. 18 of the original planning 04/8575 referred to this stream as a river and that the natural bend of this river shall be left intact.

As can be seen from Photo Appendix 8 and 9, this river floods, rising to a level of approximately 1M above ground level and 2.3M above the base of the river at its peak during the recent past.

The residents were so concerned at the prospect of development on this site and the risk of further flooding that it was decided to appeal the grant of permission by Cork County Council.

We are of the opinion that the current maps do not accurately reflect the flood risks in the area and request that these be re-examined and upgraded where necessary.

In formulating an overall plan for the Midleton Flood Relief Scheme, we, the residents on the Ballyvodock Road hope that you will take our concerns as expressed above into consideration.

Yours faithfully,

A large black rectangular redaction mark covering the signature of the sender.



## APPENDIX 1

### SECTION 3 - FLOOD RISK ASSESSMENT

### 3.1 Step 1 – Identification of the Flood Zone at the site

- 3.1.1 The first step in a flood risk assessment is therefore to ascertain if the development site is in a flood risk area.
- 3.1.2 According to the Zoning Map from the Middleton Electoral Area Local Area Plan 2011, part of the site is considered to be an "Area Susceptible to Flooding Zone B". However, the Council LAP document acknowledged in respect of the LAP flood maps "... That there is some evidence of possible anomalies in the flood risk mapping resulting in the possibility of inaccuracy in the local level and that "both OPW and the Consultants retained by the County Council are of the view that some anomalies will inevitably occur especially at the local level in this type of broad scale modelling".
- 3.1.3 In 2012 the Lee Catchment Flood Risk Assessment and Management Study (Lee CFRAMS) produced, for the OPW, an Owenacurra Model Flood Extent map for fluvial flooding in the area, and, a Harbour Model Flood Extent Map for tidal flooding in the area.
- These flood extent and flood height maps were based on detailed surveys and site specific flood modelling of the area and are therefore a more robust assessment of flood risk than the earlier Cork County Council flood maps.
- 3.1.4 In this context it is considered that the Lee CFRAMS modelling and mapping provides the definitive information on flood risk in the area, and is more accurate than the Council's LAP flood model.
- 3.1.5 For assessment of risk the relevant Lee CFRAMS mapping to be checked is the Mid-Range Future Scenario for an Annual Exceedance Probability (AEP) of 0.1% (1:1000 probability in any given year). These are robust assessment criteria.
- 3.1.6 The Owenacurra Model Flood Extent Map - Fluvial Flooding shows no predicted fluvial flooding at the site.
- 3.1.7 The Harbour Model Flood Extent Map - Tidal Flooding shows no predicted tidal flooding at the site.
- 3.1.8 In both Lee CFRAMS maps the highest predicted water levels at the modelling nodes nearest the site are 3.22m O.D. (Fluvial) and 3.61m O.D. (Tidal) for the 0.1% AEP. The minimum road or house levels in the proposed development will be 6.00m O.D., which is well above these highest-anticipated flood levels.
- 3.1.9 There is an open-drain which runs diagonally across the site which is not affected by Owenacurra or Tidal flooding. This watercourse will be piped across the site into a 1200mm diameter culvert already laid across the main access road in the development as a whole.

This piping of the watercourse will provide the capacity to carry existing flows in this watercourse, at existing levels of the watercourse, and will therefore not impact on the proper pluvial drainage of the area.

Based on all of the above the site can be stated to be in Flood Zone C (low risk of flooding).



# APPENDIX Ia.

Jim Luby & Tim Rogers (Joint Authors)

Proposed Housing Development at Baneshane, Mallow, Co. Cork  
Flood Risk Assessment Report

## SECTION 3: Existing Hydrological Environment

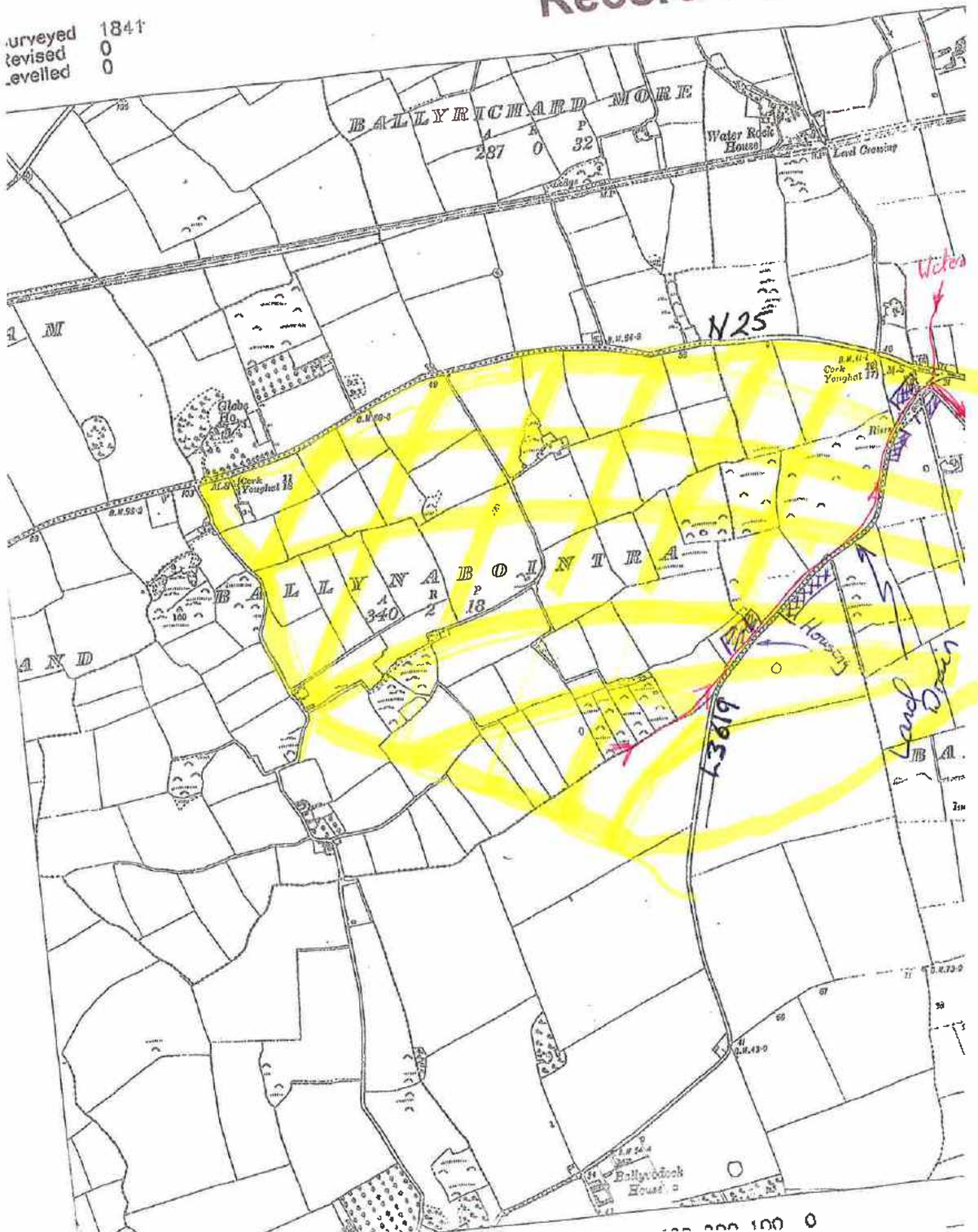
### 3.1 Salient Hydrological Features

NOV 2016

The main hydrological features of the area are the Owenacurra and Dungourney Rivers and their tributaries most notably the Baneshane Stream. The Owenacurra River rises north of Middleton and flows in a southerly direction through the town and discharges into the Owenacurra River Estuary. The Baneshane Stream flows in a south east direction and its catchment area includes a karst area where the river flows through a series of underground caves at Water Rock and re-emerges south of the N25. This provides hydrological difficulties when determining the flow rate of the Baneshane Stream. The Baneshane Stream flows through the proposed development site and is culverted through a 1200mm pipe at the southern boundary of the site to an outfall area east of the roundabout which is to be used as an access road to the proposed site where it continues flowing down the stream channel to the Owenacurra River.

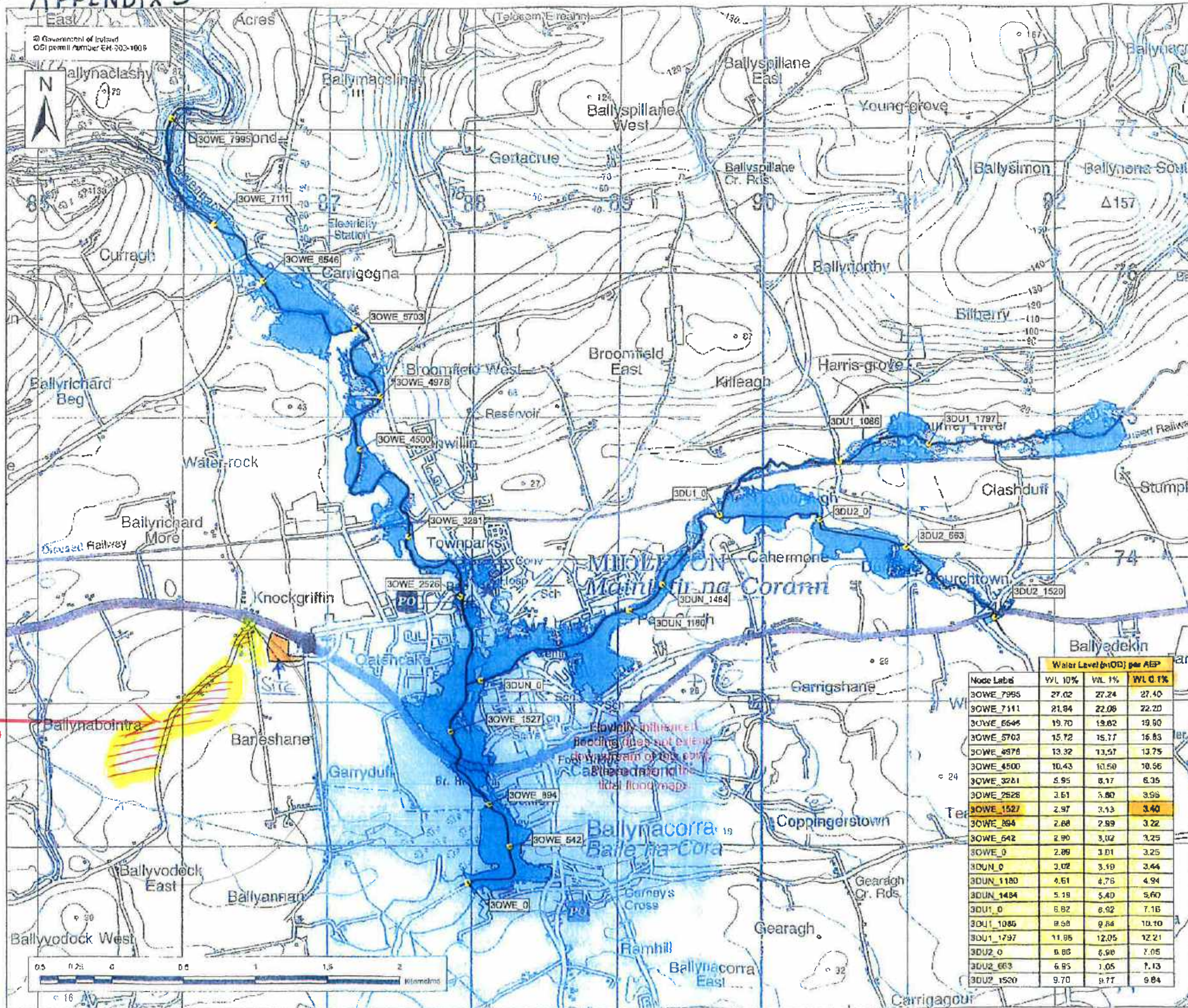


Surveyed	1841
Revised	0
Levelled	0

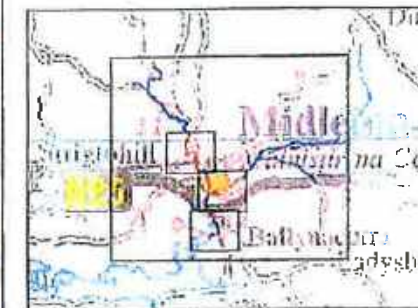




# APPENDIX 3



Location Plan:



EXTENT MAP

Legend:

- 10% AEP Flood Extent  
(1 in 10 chance in any given year)
- 1% AEP Flood Extent  
(1 in 100 chance in any given year)
- 0.1% AEP Flood Extent  
(1 in 1000 chance in any given year)
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Cor Volume
- Node Point
- Node Label (refer to table)

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF A BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

**Malcrow**  
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Malcrow Group Ireland  
3A Eastgate Road  
Ballygole  
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**OPW**  
Office of Public Works  
17-19 Lower Hatch Street  
Dublin 2  
Ireland

Project:  
LEE CATCHMENT FLOOD RISK  
ASSESSMENT AND MANAGEMENT STUDY

Map:  
OWENNACORRA MODEL FLOOD EXTENT

Map Type: FLOOD EXTENT

Scenario: FLUVIAL FLOODING

Map area: RURAL AREA

Scenario: MID RANGE FUTURE SCENARIO

Figure by: Vanda Madigan Date: 22 June 2012

Checked By: Paul Drine Date: 22 June 2012

Approved By: Claire Drine Date: 22 June 2012

Figure No.: M3/RA/EXT/MRFS/001

Revision: 1

Drawing Scale: 1:25,000 Map Scale: 1:10,000

Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
30WE 7995	27.02	27.24	27.40
30WE 7111	21.94	22.06	22.20
30WE 5645	19.70	19.82	19.90
30WE 5703	15.72	15.77	16.83
30WE 4978	13.32	13.57	13.75
30WE 4500	10.43	10.50	10.56
30WE 3281	5.95	6.17	6.35
30WE 2526	3.51	3.60	3.98
30WE 1527	2.97	3.13	3.40
30WE 894	2.68	2.89	3.22
30WE 642	2.90	3.02	3.25
30WE 0	2.89	3.01	3.25
30UN 0	3.02	3.19	3.44
30UN 1180	4.51	4.76	4.94
30UN 1484	5.19	5.40	5.60
30U1 0	6.82	6.92	7.16
30U1 1086	8.58	8.84	10.10
30U1 1797	11.85	12.05	12.21
30U2 0	6.66	6.98	7.05
30U2 663	6.95	7.05	7.13
30U2 1520	9.70	9.77	9.84



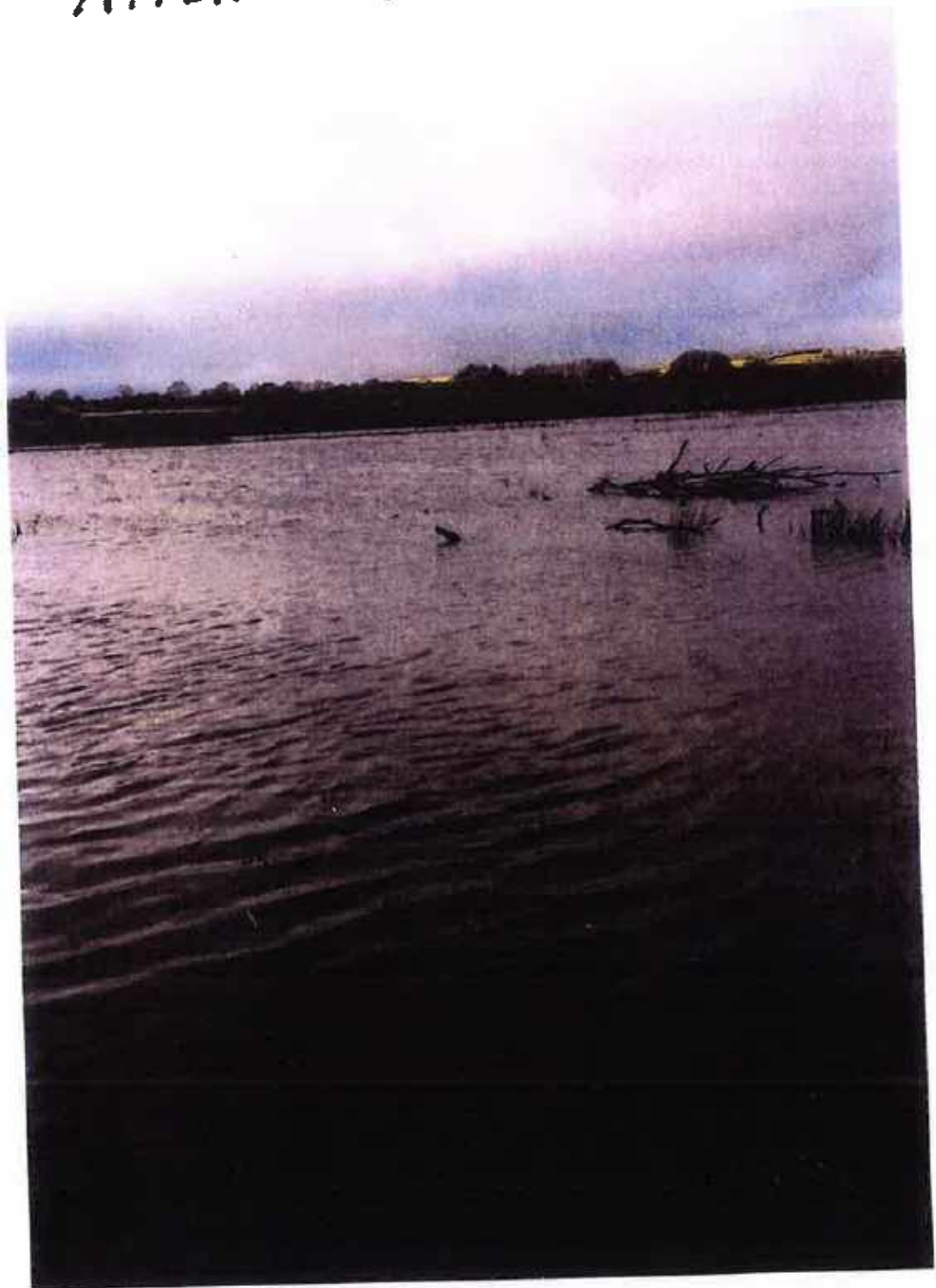




APPENDIX 6 - L3619



## APPENDIX 7



Field adjacent to L3619 S.S.W of the site



# APPENDIX 8

LAAT DE LUCHTERE HEDERIG WIL IN VUURDE OROU V. WOJDE KANDE. INNOVATIE EN INNOVATIE





# APPENDIX 93



EVIDENCE OF EXTENT OF RECENT  
FLOODING ON PROPOSED SITE.

## A7 Comments from Questionnaires

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A list of comments provided in questionnaires are presented in the tables overleaf.

## A7.1 Comments Provided in Questionnaires

Comments on ‘Preventing/ Reducing Flood Measures’, ‘Flood Related Socio-Economic & Social Issues’, ‘Flora & Fauna’, ‘Local Fisheries’, ‘Habitats’, ‘Water Quality’, ‘Archaeology, Architectural & Cultural Heritage’, ‘Landscape & Visual Amenity’, ‘Angling, Tourism & Recreation’ and ‘Other’ comments were provided in the questionnaires. These are shown in the following Tables D7.1 and D7.10.

Table A7.1: ‘Have you put in place measures to prevent or reduce the impact of flooding? If so please describe:’

Comment
<i>Planners gave permission to lift ground at back of our premises and fall of ground now slopes into our premises. Drains totally inadequate- water flowed up the drains</i>
<i>Doorway and window flood shutters</i>
<i>Non-returns on drains and sewers</i>
<i>Sandbags</i>
<i>Sandbags and raising high risk equipment</i>
<i>Raising high risk equipment, electric devices and pieces of furniture</i>
<i>Stocked up on sandbags</i>
<i>Sent report to Cork County Council to address high risk factors</i>
<i>A) Some have installed non return valves</i> <i>B) Organised as a committee and ensure communication channels are in place to try and prevent a repeat of damage done</i> <i>C) Met with other stakeholders in the area</i>
<i>Active residents group to liaise with council and public representatives RE: Prevention measures</i>
<i>Non-return valves on foul sewers. Aco drains around house</i>

Table A7.2: 'How do you think the issue of flooding can be resolved?'

Comment
<i>Yes after 1986 flooding we got a perfect job, a large pipe and storage tanks completely solved, no more door barrier for 15 years, system was changed and back to flooding.</i>
<i>Repair breach on Dungourney River</i>
<i>Barriers across river/ estuary below Ballinacurra and pump out from behind</i>
<i>One of the following; A) Build up river banks B) Diversion of some of river flow C) Upstream catchment system</i>
<i>Education and catchment based approach</i>
<i>Slow the flow at high tide and high water table levels and release at lower levels</i>
<i>In our area the banks of the river need to be maintained</i>
<i>There appears to be a multiple of causes including the percolation of ground water sources. Upstream measures to combat this may need to be ambitious</i>
<i>Keep drains clear and dredge river</i>
<i>Possibly using a variety of the above measures</i>
<i>Having an overall view rather than a fragmented one. Stop covering flood plains and water meadows with concrete.</i>
<i>Whatever work is decided on will have to be a permanent solution and not something which will have to be revisited in 10-20 years</i>
<i>I would like to see trench boxes that were put into the Mill Stream on the 30/31 of December 2015 removed. Blocking the Mill Stream at that point caused unnecessary flooding in my opinion.</i>
<i>Risk analysis based.</i>
<i>A combination of the above, rivers kept clean of fallen trees and rubbish</i>

Comment
<p>A) Increased maintenance and upkeep of waterways throughout the area. The river needs to be dredged in areas.</p> <p>B) Better communication with residence in regards issues of flooding</p> <p>C) Faster response of authorities when first signs of potential issues are noted, such as flooding of the rugby pitch</p>
<p>A) Diverging/ re-channelling water from rivers</p> <p>B) Dredging rivers</p> <p>C) Preventing damage to river banks</p>
Improved maintenance of Dungoruney River and active policing of breached in river. Review flood planes with possible management thereof.
Dredging the river and estuary. Keep river embankments secure. Increase size of mains drains.

Table A7.3: 'Flood Related Socio-Economic and Social Issues'

Comment
As a rate payer we feel badly treated. Damage to our business and property foundation damage
Those already flooded will feel these issues as important
A priority should be to resolve the issue of flooding from the Dungorney River of the Eastern end of Main Street
All issues mentioned are very important but the welfare of the people of Midleton is of great need
The impact of flood damage is devastating to those involved. Knock on effect of not being able to get flood insurance can have massive economic effect on businesses and households
Impact on availability and continuation of flood cover (insurance)
Impact on house values due to water damage to property
Impact of flood to residential area is devastating.
Pressure must be put on insurance companies to provide protraction for premises at risk



Table A7.4: 'Flora and Fauna'

Comment
<i>Not in the interest of serious personal damage/ loss</i>
<i>Must be protected</i>
<i>Flora and fauna will grow back</i>
<i>Flora and Fauna will obviously grow back but it was most unpleasant and unhygienic having dirty water and sewage on grass</i>
<i>Will re-establish after dredging</i>

Table A7.5: 'Local Fisheries'

Comment
<i>Not in the interest of serious personal damage/ loss</i>
<i>Any dredging of river upstream or down should take into account the preservation of local fish stocks e.g. brown and sea trout and salmon</i>
<i>We have concerns that the proposed works may lead to more storm overflows from the Midleton Waste Water Treatment Plant. We are negatively impacted already and would not appreciate any more overflows</i>
<i>We have concerned by any flood defence works which could lead to more storm overflows from the Midleton Waste Water Treatment Plant. We are negatively impacted already and would not appreciate any more overflows</i>
<i>Give priority</i>
<i>Fisheries will restock given time. You cannot expect the town and houses to flood on a repeat basis because of fish stock and the hobbies of a small number of people, many of whom don't live in the area.</i>
<i>Will recover</i>

Table A7.6: 'Habitats'

Comment
<i>Not in the interest of serious personal damage/ loss</i>
<i>Preservation of tidal mud flats South East of the town (that is North of the By-pass road). This is a feeding area for wading birds. But I suggest that consideration be given to a possible outflow under the By-pass to ease the constriction caused by the By-pass bridge</i>
<i>Must be protected</i>
<i>Not too concerned about this. Animals can be relocated on a temporary basis</i>
<i>Due to the depth of the water local habitats must have suffered damage</i>
<i>Will recover</i>

Table A7.6: 'Water Quality'

Comment
<i>Interference with water quality should not be significant</i>
<i>We had sewerage back up from the storm water drains. This may (or may not) have been sorted since 2015</i>
<i>As an oyster farmer operating in the North Channel, water quality is a big issue for us. We would not like to see an increase in storm overflows as a result of any flood defence works</i>
<i>As an oyster farmer operating in the North Channel, water quality is at the core of our business. Any increase in storms overflow would directly impact on our business. We could be grateful if our point of view was taken into account before any flood defence work.</i>
<i>Must reach highest standards</i>
<i>Very important. Water is used daily. Impact can be terrible for those on boil notice for extended periods</i>
<i>Concerned about this. Full extent of impact on water quality not know</i>
<i>Any solution need to ensure quality is not compromised</i>
<i>Must be protected</i>

Table A7.7: 'Archaeology, Architectural &amp; Cultural Heritage'

Comment
<i>Should not be significantly abused in any plans</i>
<i>None that I know of at this time</i>
<i>Should be cared for</i>
<i>Important but we can surely work around these concerns</i>
<i>Due to the depth of the water underground damage must have occurred</i>

Table A7.8: 'Landscape &amp; Visual Amenity'

Comment
<i>Should only be a secondary issue</i>
<i>The Bailick Road public park (with the Native America Sculpture) is only partially embanked. Thus the park floods, which in turn floods the Bailick Road and houses there. Height levelling would be a cheap and easy way to solve this</i>
<i>Kept Natural where possible</i>
<i>Important, we only need flood defences for certain times of the year while we need to look at them year round</i>
<i>It took months for the surface dirt to go completely</i>
<i>Not something that cannot be improved</i>

Table A7.9: 'Angling, Tourism &amp; Recreation'

Comment
<i>Should only be a secondary issue</i>
<i>Poor water quality can lead to a negative impact on all of the above</i>
<i>Should be well catered for</i>
<i>Not terribly important to me</i>